**SUBJECT: ALTERNATIVE ENGLISH**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose | 13X1=13 |
| 2 | Poetry | 12X1=12 |
| 3 | Grammar | 15X1=15 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS:**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (3 marks) | DESCRIPTIVE TYPE QUESTIONS (4/6/10 marks) | TOTAL |
|---|---|---|---|
| Prose | 1X3=3 | 1X4=4 | 07 |
| Poetry | 1X3=3 | 1X4=4 | 07 |
| Short Stories | - | 1X6=6 | 06 |
| Writing Skill: Letter Writing and Essay | - | 2x10=20 | 20 |
| TOTAL | 06 | 34 | 40 |

**Class XII TOTAL Theory MARKS:**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose | 13X1=13 |
| 2 | Poetry | 12X1=12 |
| 3 | Grammar | 15X1=15 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS:**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (3 marks) | DESCRIPTIVE TYPE QUESTIONS (4/6/10 marks) | TOTAL |
|---|---|---|---|
| Prose | 1X3=3 | 1X4=4 | 07 |
| Poetry | 1X3=3 | 1X4=4 | 07 |
| Short Stories | - | 1X6=6 | 06 |
| Writing Skill: Comprehension & Precis/Report Writing | - | 2X10=20 | 20 |
| TOTAL | 06 | 34 | 40 |

**SUBJECT: ARABIC**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose | 10X1=10 |
| 2 | Poetry | 10X1=10 |
| 3 | History of Arabic Literature | 10X1=10 |
| 4 | Grammar | 5X1=5 |
| 5 | Translation | 5X1=5 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (4/5 marks) | TOTAL |
|---|---|---|---|
| Prose | 3X2=6 | 1X4=4 | 10 |
| Poetry | 3X2=6 | 1X4=4 | 10 |
| History of Arabic Literature | - | 1X5=5 | 05 |
| Grammar | 3X2=6 | 1X4=4 | 10 |
| Translation | - | 1X5=5 | 05 |
| TOTAL | 18 | 22 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose | 10X1=10 |
| 2 | Poetry | 10X1=10 |
| 3 | History of Arabic Literature | 10X1=10 |
| 4 | Grammar | 5X1=5 |
| 5 | Translation | 5X1=5 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (4/5 marks) | TOTAL |
|---|---|---|---|
| Prose | 3X2=6 | 1X4=4 | 10 |
| Poetry | 3X2=6 | 1X4=4 | 10 |
| History of Arabic Literature | - | 1X5=5 | 05 |
| Grammar | 3X2=6 | 1X4=4 | 10 |
| Translation | - | 1X5=5 | 05 |
| TOTAL | 18 | 22 | 40 |

**SUBJECT: BENGALI A**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | **গল্প** | **8X1=8** |
| 2 | **প্রবন্ধ** | **5X1=5** |
| 3 | **কবিতা** | **7X1=7** |
| 4 | **আন্তর্জাতিক গল্প ও ভারতীয় কবিতা** | **5X1=5** |
| 5 | **ভাষা** | **10X1=10** |
| 6 | **বাংলা শিল্প-সাহিত্য ও সংস্কৃতির ইতিহাস** | **5X1=5** |

- **Class XI SEMESTER 2 TOPICS: [SAQ,LAQ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5/10 marks) | TOTAL |
|---|---|---|---|---|
| **গল্প** | - | - | 1X5=5 | 05 |
| **কবিতা** | 1X2=2 | 1X3=3 | - | 05 |
| নাটক | - | - | 1X5=5 | 05 |
| পূর্ণাঙ্গ সহায়ক গ্রন্থ | 2X2=4 | 2X3=6 | - | 10 |
| বাংলা শিল্প-সাহিত্য ও সংস্কৃতির ইতিহাস | 1X2=2 | 1X3=3 | - | 05 |
| প্রবন্ধ রচনা | - | - | 1X10=10 | 10 |
| TOTAL | 08 | 12 | 20 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | **গল্প** | **8X1=8** |
| 2 | **প্রবন্ধ** | **5X1=5** |
| 3 | **কবিতা** | **7X1=7** |
| 4 | **ভারতীয় গল্প ও আন্তর্জাতিক কবিতা** | **5X1=5** |
| 5 | **ভাষা** | **10X1=10** |
| 6 | **বাংলা শিল্প-সাহিত্য ও সংস্কৃতির ইতিহাস** | **5X1=5** |

- **Class XII SEMESTER 2 TOPICS: [SAQ,LAQ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5/10 marks) | TOTAL |
|---|---|---|---|---|
| **গল্প** | - | - | 1X5=5 | 05 |
| **কবিতা** | 1X2=2 | 1X3=3 | - | 05 |
| নাটক | - | - | 1X5=5 | 05 |
| পূর্ণাঙ্গ সহায়ক গ্রন্থ | 2X2=4 | 2X3=6 | - | 10 |
| বাংলা শিল্প-সাহিত্য ও সংস্কৃতির ইতিহাস | 1X2=2 | 1X3=3 | - | 05 |
| প্রবন্ধ রচনা | - | - | 1X10=10 | 10 |
| TOTAL | 08 | 12 | 20 | 40 |

**SUBJECT: BENGALI B**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | **গল্প** | **8X1=8** |
| 2 | **প্রবন্ধ** | **5X1=5** |
| 3 | **কবিতা** | **7X1=7** |
| 4 | **আন্তর্জাতিক গল্প ও কবিতা** | **5X1=5** |
| 5 | **ভাষা** | **10X1=10** |
| 6 | **বাংলা শিল্প-সাহিত্য ও সংস্কৃতির ইতিহাস** | **5X1=5** |

- **Class XI SEMESTER 2 TOPICS: [SAQ,LAQ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5/10 marks) | TOTAL |
|---|---|---|---|---|
| **গল্প** | - | - | 1X5=5 | 05 |
| প্রবন্ধ | - | - | 1X5=5 | 05 |
| **কবিতা** | 1x2=2 | 1x3=3 | - | 05 |
| পূর্ণাঙ্গ সহায়ক গ্রন্থ | 2X2=4 | 2X3=6 | - | 10 |
| বাংলা শিল্প-সাহিত্য ও সংস্কৃতির ইতিহাস | 1X2=2 | 1X3=3 | - | 05 |
| প্রবন্ধ রচনা | - | - | 1X10=10 | 10 |
| TOTAL | 08 | 12 | 20 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | **গল্প** | **8X1=8** |
| 2 | **কবিতা** | **7X1=7** |
| 3 | নাটক | **5X1=5** |
| 4 | **ভারতীয় গল্প ও কবিতা** | **5X1=5** |
| 5 | **ভাষা** | **10X1=10** |
| 6 | **বাংলা শিল্প-সাহিত্য ও সংস্কৃতির ইতিহাস** | **5X1=5** |

- **Class XII SEMESTER 2 TOPICS: [SAQ,LAQ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5/10 marks) | TOTAL |
|---|---|---|---|---|
| **গল্প** | - | - | 1X5=5 | 05 |
| **কবিতা** | 1X2=2 | 1X3=3 | - | 05 |
| নাটক | - | - | 1X5=5 | 05 |
| পূর্ণাঙ্গ সহায়ক গ্রন্থ | 2X2=4 | 2X3=6 | - | 10 |
| বাংলা শিল্প-সাহিত্য ও সংস্কৃতির ইতিহাস | 1X2=2 | 1X3=3 | - | 05 |
| প্রবন্ধ রচনা | - | - | 1X10=10 | 10 |
| TOTAL | 08 | 12 | 20 | 40 |

**SUBJECT: English A**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose | 10X1=10 |
| 2 | Verse | 10X1=10 |
| 3 | Rhetoric | 5X1=5 |
| 4 | Grammar Non textual ) | 5X1=5 |
| 5 | Reading Comprehension (unseen) | 10X1=10 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (5/6 marks) | TOTAL |
|---|---|---|---|
| Prose | 2X2=4 | 1X6=6 | 10 |
| Verse | 2X2=4 | 1X5=5 | 09 |
| Textual : Prosody | - | 1X6=6[3+3] | 06 |
| Non Textual Grammar | - | 1X5=5[3+2] | 05 |
| Reading Comprehension | 2X2=4 | 1X6=6[Precis] | 10 |
| TOTAL | 12 | 28 | 40 |

**Class XII TOTAL Theory MARKS:**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose | 10X1=10 |
| 2 | Verse | 10X1=10 |
| 3 | Drama | 5X1=5 |
| 4 | Textual Grammar | 5X1=5 |
| 5 | Reading Comprehension (unseen) | 10X1=10 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS:**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (5/6/10 marks) | TOTAL |
|---|---|---|---|
| Prose | 2X2=4 | 1X6=6 | 10 |
| Verse | 2X2=4 | 1X6=6 | 10 |
| Drama | - | 1X5=5 [ any 1 question out of 2 questions ] | 05 |
| Non Textual Grammar | - | 1X5=5[2+3] | 05 |
| Writing Skill : Essay | - | 1X10=10 | 10 |
| TOTAL | 08 | 32 | 40 |

**SUBJECT: ENGLISH B**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Unit | Topic | Marks allotted |
|---|---|---|
| 1 | Prose | 10X1=10 |
| 2 | Verse | 10X1=10 |
| 3 | Rapid Reader | 10X1=10 |
| 4 | Textual Grammar | 5X1=5 |
| 5 | Reading Comprehension( Unseen ) | 5X1=5 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| Unit | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (5/6/10 marks) | TOTAL |
|---|---|---|---|
| Prose | 2X2=4<br>[ Any 2 questions out of 4 questions ] | 1X6=6<br>[ Any 1 question out of 3 questions ] | 10 |
| Verse | 2X2=4<br>[ Any 2 questions out of 4 questions ] | 1X6=6<br>[ Any 1 question out of 2 questions ] | 10 |
| Rapid Reader | - | 1X5=5<br>[ Any 1 question out of 3 questions ] | 05 |
| Non Textual Grammar | - | Fill in the blanks : (6X1/2)=3<br>+<br>1x2=2<br>[1 question to be attempted out of two questions from Transformation of sentences **or** Correction of errors] | 05 |
| Writing Skill :<br>Paragraph Writing OR<br>Formal Letter Writing & Event Report Writing | - | 1X10=10<br>OR<br>2X5=10 | 10 |
| TOTAL | 08 | 32 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **<u>Class XII SEMESTER 1 TOPICS:</u> [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Unit | Topic | Marks allotted |
|---|---|---|
| 1 | Prose | 10X1=10 |
| 2 | Verse | 10X1=10 |
| 3 | Drama [ Scene 1 ] | 5X1=5 |
| 4 | Textual Grammar | 5X1=5 |
| 5 | Reading Comprehension( Unseen ) | 10X1=10 |

- **<u>Class XII SEMESTER 2 TOPICS:</u> [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| Unit | SHORT ANSWER TYPE QUESTIONS (2/3 marks) | DESCRIPTIVE TYPE QUESTIONS (5/6/10 marks) | TOTAL |
|---|---|---|---|
| Prose | 2X2=4<br>[ Any 2 questions out of 4 questions ] | 1X6=6<br>[ Any 1 question out of 2 questions ] | 10 |
| Verse | 2X2=4<br>[ Any 2 questions out of 4 questions ] | 1X6=6<br>[ Any 1 question out of 3questions ] | 10 |
| Drama | - | 1X5=5<br>[ Any 1 question out of 2 questions ] | 05 |
| Non Textual Grammar | 1X2=2<br>1X3=3 | - | 05 |
| Writing Skill :<br>Essay or Precis | - | 1X10=10 | 10 |
| TOTAL | 13 | 27 | 40 |

**SUBJECT: HINA**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 mark per question ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Sahitya ( Kavya & Gadya ) | 20X1=20 |
| 2 | Upanyas | 5X1=5 |
| 3 | Apathit Bodh ( Kavya & Gadya ) | 5X1=5 |
| 4 | Vyakaran | 5X1=5 |
| 5 | Paribhashik Shabda | 5X1=5 |

- **Class XI SEMESTER 2 TOPICS: [SAQ,LAQ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| Sahitya( Kavya & Gadya) | 4X2=8 | 2X3=6 | 2X5=10 | 24 |
| Upanyas | - | 2X3=6 | 1X5=5 | 11 |
| Rachana | - | - | 1X5=5 | 05 |
| TOTAL | 08 | 12 | 20 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 mark per question ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Sahitya ( Kavya & Gadya ) | 20X1=20 |
| 2 | Natak | 5X1=5 |
| 3 | Apathit Bodh ( Kavya & Gadya ) | 5X1=5 |
| 4 | Vyakaran | 5X1=5 |
| 5 | Paribhashik Shabda | 5X1=5 |

- **Class XII SEMESTER 2 TOPICS: [SAQ,LAQ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| Sahitya( Kavya & Gadya) | 4X2=8 | 2X3=6 | 2X5=10 | 24 |
| Natak | - | 2X3=6 | 1X5=5 | 11 |
| Rachana | - | - | 1X5=5 | 05 |
| TOTAL | 08 | 12 | 20 | 40 |

**SUBJECT: HINDI B**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 mark per question ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Sahitya ( Kavya & Gadya ) | 20X1=20 |
| 2 | Natak | 5X1=5 |
| 3 | Apathit Bodh ( Kavya & Gadya ) | 5X1=5 |
| 4 | Vyakaran | 5X1=5 |
| 5 | Paribhashik Shabda | 5X1=5 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions]MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| Sahitya( Kavya & Gadya) | 4X2=8 | 2X3=6 | 2X5=10 | 24 |
| Natak | - | 2X3=6 | 1X5=5 | 11 |
| Rachana | - | - | 1X5=5 | 05 |
| TOTAL | 08 | 12 | 20 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 mark per question ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Sahitya ( Kavya & Gadya ) | 20X1=20 |
| 2 | Upanyas | 5X1=5 |
| 3 | Apathit Bodh ( Kavya & Gadya ) | 5X1=5 |
| 4 | Vyakaran | 5X1=5 |
| 5 | Paribhashik Shabda | 5X1=5 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| Sahitya( Kavya & Gadya) | 4X2=8 | 2X3=6 | 2X5=10 | 24 |
| Upanyas | - | 2X3=6 | 1X5=5 | 11 |
| Rachana | - | - | 1X5=5 | 05 |
| TOTAL | 08 | 12 | 20 | 40 |

**SUBJECT: ODIA**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prabandha | 7X1=7 |
| 2 | Kabita | 7X1=7 |
| 3 | Galpa | 7X1=7 |
| 4 | Bhasa | 12X1=12 |
| 5 | Odia Sahitya Samaj , Sanskrutir Itihas | 7X1=7 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (4/10 marks) | TOTAL |
|---|---|---|---|
| Prabandha | 1X2=2 | 1X4=4 | 06 |
| Kabita | 1X2=2 | 1X4=4 | 06 |
| Galpa | 1X2=2 | 1X4=4 | 06 |
| Bhasa | 3X2=6 | 1X10=10 | 16 |
| Odia Sahitya Samaj , Sanskrutir Itihas | 1X2=2 | 1X4=4 | 06 |
| TOTAL | 14 | 26 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prabandha | 7X1=7 |
| 2 | Kabita | 7X1=7 |
| 3 | Galpa | 7X1=7 |
| 4 | Bhasa | 12X1=12 |
| 5 | Odia Sahitya Samaj , Sanskrutir Itihas | 7X1=7 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (4/10 marks) | TOTAL |
|---|---|---|---|
| Prabandha | 1X2=2 | 1X4=4 | 06 |
| Kabita | 1X2=2 | 1X4=4 | 06 |
| Galpa | 1X2=2 | 1X4=4 | 06 |
| Bhasa | 3X2=6 | 1X10=10 | 16 |
| Odia Sahitya Samaj , Sanskrutir Itihas | 1X2=2 | 1X4=4 | 06 |
| TOTAL | 14 | 26 | 40 |

**SUBJECT: PERSIAN**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose( including forms of Prose) | 13X1=13 |
| 2 | Poetry ( including forms of Poetry ) | 12X1=12 |
| 3 | Applied Grammar | 10X1=10 |
| 4 | Translation | 5X1=5 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (5/6 marks) | TOTAL |
|---|---|---|---|
| Prose | 1X2=2 | 1X5=5<br>1X6=6[ comprehension] | 13 |
| Poetry | 1X2=2 | 1X5=5 | 07 |
| Applied Grammar | 5X2=10 | - | 10 |
| Translation | - | 2X5=10<br>[ 2 passages Persian to English & English to Persian ] | 10 |
| TOTAL | 14 | 26 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose( including forms of Prose) | 13X1=13 |
| 2 | Poetry ( including forms of Poetry ) | 12X1=12 |
| 3 | Applied Grammar | 10X1=10 |
| 4 | Translation | 5X1=5 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (5/6 marks) | TOTAL |
|---|---|---|---|
| Prose | 1X2=2 | 1X5=5<br>1X6=6[ comprehension] | 13 |
| Poetry | 1X2=2 | 1X5=5 | 07 |
| Applied Grammar | 5X2=10 | - | 10 |
| Translation | - | 2X5=10<br>[ 2 passages Persian to English & English to Persian ] | 10 |
| TOTAL | 14 | 26 | 40 |

**SUBJECT: SANTHALI**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose & Story | 10X1=10 |
| 2 | Poetry | 10X1=10 |
| 3 | Translated Prose | 5X1=5 |
| 4 | Rapid Reader | 5X1=5 |
| 5 | History of Literature | 5X1=5 |
| 6 | Grammar | 5X1=5 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS:**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (3/5 marks) | TOTAL |
|---|---|---|---|
| Prose & Story | - | 2X5=10 | 10 |
| Poetry | - | 2X5=10 | 10 |
| Translated Poetry | - | 1X5=5 | 05 |
| Rapid Reader | - | 1X5=5 | 05 |
| History of Literature | 1X2=2 | 1X3=3 | 05 |
| Grammar | 1X2=2 | 1X3=3 | 05 |
| TOTAL | 04 | 36 | 40 |

**Class XII TOTAL Theory MARKS:**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose & Story | 10X1=10 |
| 2 | Poetry | 10X1=10 |
| 3 | Rapid Reader | 5X1=5 |
| 4 | Play | 5X1=5 |
| 5 | History of Literature | 5X1=5 |
| 6 | Grammar | 5X1=5 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (3/5 marks) | TOTAL |
|---|---|---|---|
| Prose & Story | - | 2X5=10 | 10 |
| Poetry | - | 2X5=10 | 10 |
| Rapid Reader | - | 1X5=5 | 05 |
| Play | - | 1X5=5 | 05 |
| History of Literature | 1X2=2 | 1X3=3 | 05 |
| Grammar | 1X2=2 | 1X3=3 | 05 |
| TOTAL | 04 | 36 | 40 |

**SUBJECT: SANSKRIT**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 mark per question ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Unit 1 : Prose | 5X1=5 |
| 2 | Unit 2 : Verse | 5X1=5 |
| 3 | Unit 3 : Drama | 5X1=5 |
| 4 | Unit 4 : Grammar | 15X1=15 |
| 5 | Unit 5 : History of Vedic , Epic & Classical Sanskrit Litrerature | 10X1=10 |

- **Class XI SEMESTER 2 TOPICS: [SAQ,DQ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (4 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| Unit 1 : Prose | 5X2=10 5 questions out of 6 questions | - | 2X5=10 2 questions out of 3 questions | 20 |
| Unit 2 : Verse | | | | |
| Unit 3 : Drama | | | | |
| Unit 4 : Grammar | 5X2=10 5 questions out of 6/7 questions | | | 10 |
| Unit 5 : History of Vedic , Epic & Classical Sanskrit Litrerature | 3X2=6 5 questions out of 4 questions | 1X4=4 1 question out of 2 questions | | 10 |
| TOTAL | 26 | 04 | 10 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 mark per question ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Unit 1 : Prose | 5X1=5 |
| 2 | Unit 2 : Verse | 5X1=5 |
| 3 | Unit 3 : Drama | 5X1=5 |
| 4 | Unit 4 : Grammar | 15X1=15 |
| 5 | Unit 5 : History of Purāṇic and Classical Sanskrit Literature | 10X1=10 |

- **Class XII SEMESTER 2 TOPICS: [SAQ,DQ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (4 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| Unit 1 : Prose | 5X2=10 5 questions out of 6 questions | - | 2X5=10 2 questions out of 3 questions | 20 |
| Unit 2 : Verse | | | | |
| Unit 3 : Drama | | | | |
| Unit 4 : Grammar | 5X2=10 5 questions out of 6/7 questions | | | 10 |
| Unit 5 : History of Classical and Modern Sanskrit Literature | 3X2=6 5 questions out of 4 questions | 1X4=4 1 question out of 2 questions | | 10 |
| TOTAL | 26 | 04 | 10 | 40 |

**SUBJECT: Telugu**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Poetry | 15X1=15 |
| 2 | Prose | 15X1=15 |
| 3 | History of Telugu Literature | 6X1=6 |
| 4 | Grammar | 4X1=4 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (4 marks) | TOTAL |
|---|---|---|---|
| Poetry | 2X2=4 | 1X4=4 | 08 |
| Prose | 2X2=4 | 1X4=4 | 08 |
| History of Telugu Literature & Biography of a Poet | - | 4X4=16 | 16 |
| Grammar | - | 2X4=8 | 08 |
| TOTAL | 08 | 32 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Poetry | 15X1=15 |
| 2 | Prose | 15X1=15 |
| 3 | History of Telugu Literature | 6X1=6 |
| 4 | Grammar | 4X1=4 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS:**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (4 marks) | TOTAL |
|---|---|---|---|
| Poetry | 2X2=4 | 1X4=4 | 08 |
| Prose | 2X2=4 | 1X4=4 | 08 |
| History of Telugu Literature & Biography of a Poet | - | 4X4=16 | 16 |
| Grammar | - | 2X4=8 | 08 |
| TOTAL | 08 | 32 | 40 |

**SUBJECT: URDU**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose | 10X1=10 |
| 2 | Poetry | 10X1=10 |
| 3 | Fiction | 5X1=5 |
| 4 | Drama | 5X1=5 |
| 5 | History of Urdu Literature | 10X1=10 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (1/2 marks) | DESCRIPTIVE TYPE QUESTIONS (3/4 marks) | TOTAL |
|---|---|---|---|
| Prose | 2X2=4 | 2X3=6 | 10 |
| Poetry | 2X2=4<br>1X1=1 | 2X3=6<br>1X4=4 | 15 |
| Fiction | 1X2=2 | 1X3=3 | 05 |
| History of Urdu Literature | 1X2=2 | 1X3=3 | 05 |
| Grammar | 1X2=2 | 1X3=3 | 05 |
| TOTAL | 15 | 25 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Prose | 10X1=10 |
| 2 | Poetry | 10X1=10 |
| 3 | Fiction | 5X1=5 |
| 4 | Drama | 5X1=5 |
| 5 | History of Urdu Literature | 10X1=10 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (1/2 marks) | DESCRIPTIVE TYPE QUESTIONS (3/4 marks) | TOTAL |
|---|---|---|---|
| Prose | 2X2=4 | 2X3=6 | 10 |
| Poetry | 2X2=4<br>1X1=1 | 2X3=6<br>1X4=4 | 15 |
| Fiction | 1X2=2 | 1X3=3 | 05 |
| History of Urdu Literature | 1X2=2 | 1X3=3 | 05 |
| Grammar | 1X2=2 | 1X3=3 | 05 |
| TOTAL | 15 | 25 | 40 |

**SUBJECT: ARTIFICIAL INTELLIGENCE**

**Class XI TOTAL Theory MARKS: 70**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 35 [ 1 MARK PER QUESTION ]**

| Unit | Topic | Marks allotted |
|---|---|---|
| 1 | Computer Fundamentals | 15X1=15 |
| 2 | Introduction to Python Programming | 15X1=15 |
| 3 | Introduction to Linear Algebra | 5X1=5 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 35**

| Unit | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (3/4/5 marks) | TOTAL |
|---|---|---|---|
| 4 : Foundation of AI & Search as optimization | 1X2=2 | 2X5=10<br>2X3=6 | 18 |
| 5: Knowledge representation and reasoning | 3X2=6 | 1X4=4 | 10 |
| 6: Uncertainty Management | - | 1X5=5 | 05 |
| 7: Preliminary Concept of Chatbots | 1X2=2<br>2 | - | 02 |
| TOTAL | 10 | 25 | 35 |

**Class XII TOTAL Theory MARKS: 70**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 35 [ 1 MARK PER QUESTION ]**

| Unit | Topic | Marks allotted |
|---|---|---|
| 1 | Foundation of Statistics for Machine Learning | 5X1=5 |
| 2 | Introduction to Machine Learning | 15X1=15 |
| 3 | Supervised Learning | 15X1=15 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 35**

| Unit | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (3/4/5 marks) | TOTAL |
|---|---|---|---|
| 4 : Unsupervised Learning | 3X2=6 | 3X3=9 | 15 |
| 5: Artificial Neural Network | 2X2=4 | 2X5=10<br>1X3=3 | 17 |
| 6: Ethics in AI | - | 1X3=3 | 03 |
| TOTAL | 10 | 25 | 35 |

**SUBJECT: BIOLOGICAL SCIENCE**
**Class XI TOTAL Theory MARKS: 70**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 35 [ 1 mark per question ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Unit I : Diversity of Living Organism<br>Chapter 1 : The Living World<br>Chapter 2 : Biological Classification<br>Chapter 3 : Animal Kingdom | 8X1=8 |
| 2 | Unit II : Structural Organizations in Plants and Animals<br>Chapter 5 : Morphology of Flowering Plants<br>Chapter 6 : Anatomy of Flowering Plants<br>Chapter 7 : Structural Organization in Animals | 12X1=12 |
| 3 | Unit III : Cell Structure and Functions<br>Chapter 8 : Cell- The Unit of Life<br>Chapter 9 : Biomolecules<br>Chapter 10 : Cell Cycle and Cell Division | 15X1=15 |

- **Class XI SEMESTER 2 TOPICS: [SAQ,LAQ] MARKS: 35**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | Competency based QUESTIONS (4 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|---|
| Unit IV : Plant Physiology<br>Chapter 11 : Photosynthesis in Higher Plants<br>Chapter 12 : Respiration in Plants<br>Chapter 13 : Plant- Growth and Development | 2X2=4 | 3X3=9 | 1X4=4 | - | 17 |
| Unit V : Human Physiology<br>Chapter 14 : Digestion and Absorption<br>Chapter 15 : Breathing and Exchange of Gases<br>Chapter 16 : Body Fluids and Circulation<br>Chapter 17 : Excretory Products and their elimination<br>Chapter 18 : Locomotion and Movement<br>Chapter 19 : Neural Control and Coordination<br>Chapter 20 : Chemical Coordination and Integration | 2X2=4 | 3X3=9 | - | 1X5=5 | 18 |
| TOTAL | 08 | 18 | 04 | 05 | 35 |

**Class XII TOTAL Theory MARKS: 70**

- **<u>Class XII SEMESTER 1 TOPICS:</u> [MCQ] MARKS: 35 [ 1 mark per question ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Unit VI : Reproduction<br>Chapter 1 : Sexual Reproduction in Flowering Plants<br>Chapter 2 : Human Reproduction<br>Chapter 3 : Reproductive Health | 15X1=15 |
| 2 | Unit VII : Genetics and Evolution<br>Chapter 4 : Principles of Inheritance and Variation<br>Chapter 5 : Molecular basis of inheritance<br>Chapter 6 : Evolution | 20X1=20 |

- **<u>Class XII SEMESTER 2 TOPICS:</u> [SAQ,LAQ] MARKS: 35**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | Competency based QUESTIONS (4 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|---|
| Unit VIII : Biology and Human Welfare<br>Chapter 7 : Human Health and Diseases<br>Chapter 8 : Improvement in food production<br>Chapter 9 : Microbes in Human Welfare | 2X2=4 | 2X3=6 | - | - | 10 |
| Unit IX : Biotechnology and its application<br>Chapter 10 : Biotechnology and its application | 1X2=2 | 2X3=6 | 1X4=4 | - | 12 |
| Unit X : Ecology and Environment<br>Chapter 11 : Organisms and Populations<br>Chapter 12 : Ecosystem<br>Chapter 13 : Biodiversity and its conservation<br>Chapter 14 : Environmental issues | 1X2=2 | 2X3=6 | - | 1X5=5 | 13 |
| TOTAL | 08 | 18 | 04 | 05 | 35 |

**SUBJECT: Chemistry**

**Class XI TOTAL Theory MARKS: 70**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 35 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Some Basic Concepts of Chemistry | 3X1=3 |
| 2 | Structure of Atom | 6X1=6 |
| 3 | Classification of elements and periodicity in properties | 4X1=4 |
| 4 | Chemical Bonding & Molecular structure | 6X1=6 |
| 5 | States of Matter: Solids & Gases | 4X1=4 |
| 6 | s-block elements | 5X1=5 |
| 7 | Some p-block elements | 7X1=7 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 35**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| Thermodynamics | 1X2=2 | - | 1X5=5 | 07 |
| Equilibrium | - | 2X3=6 | - | 06 |
| Redox Reactions | - | 1X3=3 | - | 03 |
| Organic Chemistry : some basic principles | 1X2=2 | - | 1X5=5 | 07 |
| Hydrocarbons | 1X2=2 | 2X3=6 | - | 08 |
| Environment Chemistry | 2X2=4 | - | - | 04 |
| TOTAL | 10 | 15 | 10 | 35 |

**Class XII TOTAL Theory MARKS: 70**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 35 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Liquid State | 8X1=8 |
| 2 | p-block elements | 8X1=8 |
| 3 | Haloalkanes and Haloarenes | 5X1=5 |
| 4 | Alcohols, Phenols and Ethers | 5X1=5 |
| 5 | Biomolecules : Carbohydrates , Proteins and Nucleic Acids | 5X1=5 |
| 5 | Polymers | 4X1=4 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 35**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| Electrochemistry | 1X2=2 | 1X3=3 | - | 05 |
| Chemical Kinetics | 1X2=2 | - | 1X5=5 | 07 |
| d and f block elements | - | 2X3=6 | - | 06 |
| Co-ordination compounds | 1X2=2 | 1X3=3 | - | 05 |
| Aldehydes , Ketones and Carboxylic acids | - | - | 1X5=5 | 05 |
| Organic compounds containing Nitrogen | 2X2=4 | 1X3=3 | - | 07 |
| TOTAL | 10 | 15 | 10 | 35 |

# SUBJECT:COMS

## CLASS XI TOTAL THEORY MARKS:70

- **CLASS XI SEMESTER I TOPICS: (MCQ) MARKS: 35 1 MARKS PER QUESTION**

| Sl No | Topic | Marks obtain |
|---|---|---|
| 1. | Computer System and Organisation | 15X1=15 |
| 2. | Programming Fundamentals | 10X1=10 |
| 3. | Introduction to C | 10X1=10 |

- **CLASS XI SEMESTER II TOPICS: (Short Answer Questions, Descriptive Questions) MARKS:35**

| TOPIC | Short Answer Type Questions (2 Marks) | Short Answer Type Questions (3 Marks) | Descriptive Type Questions (5 Marks) | Total |
|---|---|---|---|---|
| Data Structure | 1X2=2 | 1X3=3 | 2X5=10 | 15 |
| Computer networks | 1X2=2 | 1X3=3 | 1X5=5 | 10 |
| Ethics | 1X2=2 | 1X3=3 | 1X5=5 | 10 |
| **TOTAL:** | **6** | **9** | **20** | **35** |

## CLASS XII TOTAL THEORY MARKS:70

- **CLASS XI SEMESTER I TOPICS: (MCQ) MARKS: 35 1 MARKS PER QUESTION**

| Sl No | Topic | Marks obtain |
|---|---|---|
| 1. | Python Programming | 25X1=25 |
| 2. | E-Commerce | 10X1=10 |

- **CLASS XI SEMESTER II TOPICS: (Short Answer Questions, Descriptive Questions) MARKS:35**

| TOPIC | Short Answer Type Questions (2 Marks) | Short Answer Type Questions (3 Marks) | Descriptive Type Questions (5 Marks) | Total |
|---|---|---|---|---|
| Data Base Management System | 1X2=2 | 1X3=3 | 3X5=15 | 20 |
| Foundation of Artificial Intelligence | 1X2=2 | 1X3=3 | 2X5=10 | 15 |
| **TOTAL:** | **4** | **6** | **25** | **35** |

**SUBJECT: DATA SCIENCE**

**Class XI TOTAL Theory MARKS: 70**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 35 [ 1 MARK PER QUESTION ]**

| Unit | Topic | Marks allotted |
|---|---|---|
| 1 | Computer Fundamentals | 15X1=15 |
| 2 | Introduction to Python Programming | 15X1=15 |
| 3 | History of AI and Introduction to Linear Algebra | 5X1=5 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 35**

| Unit & TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (3/5 marks) | TOTAL |
|---|---|---|---|
| 4: History of Data Science and Statistics | 2X2=4 | 2X3=6<br>1X5=5 | 15 |
| 5 : Data Visualization | 2X2=4 | 2X3=6 | 10 |
| 6 : Database Management | - | 1X5=5 | 05 |
| 7 : Basics of Business Theory | 1X2=2 | 1X3=3 | 05 |
| TOTAL | 10 | 25 | 35 |

**Class XII TOTAL Theory MARKS: 70**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 35 [ 1 MARK PER QUESTION ]**

| Unit | Topic | Marks allotted |
|---|---|---|
| 1 | Foundation of Statistics for Machine Learning | 5X1=5 |
| 2 | Introduction to Machine Learning | 15X1=15 |
| 3 | Supervised Learning | 15X1=15 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 35**

| Unit & TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (3/5 marks) | TOTAL |
|---|---|---|---|
| 4 : Decision Tree Learning and Unsupervised Learning | 1X2=2 | 1X3=3<br>1X5=5 | 10 |
| 5 : Data Visualization Technique | 2X2=4 | 2X3=6 | 10 |
| 6 : Artificial Neural Network | 2X2=4 | 2X3=6 | 10 |
| 7 : Case Studies in Data Science | - | 1X5=5 | 05 |
| TOTAL | 10 | 25 | 35 |

**SUBJECT: Mathematics**

**Class XI TOTAL Theory MARKS: 80**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Sets , Relation and Functions , Trigonometric Functions | 15X1=15 |
| 2 | Algebra : Complex Numbers and Quadratic Equations, Linear Inequations , Permutations and Combinations | 15X1=15 |
| 3 | Calculas : Limit and Derivatives | 10X1=10 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (3/4 marks) | TOTAL |
|---|---|---|---|
| Principle of Mathematical Induction | - | 1X3=3 | 03 |
| Binomial Theorem | 1X2=2 [ one alternative] | 1X4=4 | 06 |
| Sequence and Series | 1X2=2 | 1X4=4 [ one alternative] | 06 |
| Coordinate Geometry | 2X2=4 [ one alternative] | 1X3=3 2X4=8 [ one alternative with 4 mark question] | 15 |
| Statistics | - | 1X3=3 [ one alternative] | 03 |
| Probability | 2X2=4 [ one alternative] | 1X3=3 | 07 |
| TOTAL | 12 | 28 | 40 |

**Class XII TOTAL Theory MARKS: 80**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 40 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Relations and Functions , Inverse Trigonometric Functions | 7X1=7 |
| 2 | Algebra : Matrices and Determinants | 10X1=10 |
| 3 | Calculas : Continuity & Differentiability , Application of Derivatives | 15X1=15 |
| 4 | Probability | 8X1=8 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 40**

| TOPIC | SHORT ANSWER TYPE QUESTIONS (2 marks) | DESCRIPTIVE TYPE QUESTIONS (3/4 marks) | TOTAL |
|---|---|---|---|
| Vectors | 1X2=2 | 1X3=3 [ one alternative] | 05 |
| Three-Dimensional Geometry | 1X2=2 [ one alternative] | 2X4=8 [ one alternative] | 10 |
| Integrals | 1X2=2 | 1X3=3 1X4=4 [one alternative with 4 mark question] | 09 |
| Application of Integrals | 1X2=2 [ one alternative] | 1X4=4 | 06 |
| Differential Equation | 1X2=2 | 1X3=3 [ one alternative] | 05 |
| Linear Programming | 1X2=2 [ one alternative] | 1X3=3 | 05 |
| TOTAL | 12 | 28 | 40 |

**SUBJECT: PHYSICS**

**Class XI TOTAL Theory MARKS: 70**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 35 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Physical World & Measurement | 3X1=3 |
| 2 | Kinematics | 12X1=12 |
| 3 | Laws of Motion | 8X1=8 |
| 4 | Work , Energy , Power | 5X1=5 |
| 5 | Motion of System of particles & Rigid body | 7X1=7 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 35**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| 1. Gravitation | 1X2=2 | 1X3=3 | - | 05 |
| 2. Properties of Bulk matter | 1X2=2 | 1X3=3 | 1X5=5 | 10 |
| 3. Thermodynamics | 1X2=2 | 1X3=3 | - | 05 |
| 4. Behaviour of perfect gases and Kinetic Theory | 1X2=2 | 1X3=3 | - | 05 |
| 5. Oscillation & Wave | 1X2=2 | 1X3=3 | 1X5=5 | 10 |
| TOTAL | 10 | 15 | 10 | 35 |

**Class XII TOTAL Theory MARKS: 70**

- **<u>Class XII SEMESTER 1 TOPICS:</u> [MCQ] MARKS: 35 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Electrostatics | 8X1=8 |
| 2 | Current Electricity | 8X1=8 |
| 3 | Magnetic Effect of Current | 8X1=8 |
| 4 | Electromagnetic Induction | 8X1=8 |
| 5 | Electromagnetic Waves | 3X1=3 |

- **<u>Class XII SEMESTER 2 TOPICS:</u> [Short Answer Questions , Descriptive Questions ] MARKS: 35**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| 1. Optics | 3X2=6 | 1X3=3 | 1X5=5 | 14 |
| 2. Dual Nature of Matter | 2X2=4 | - | - | 04 |
| 3. Atomic Nuclei | - | 2X3=6 | - | 06 |
| 4. Electronic Device | - | 1X3=3 | 1X5=5 | 08 |
| 5. Communication | - | 1X3=3 | - | 03 |
| TOTAL | 10 | 15 | 10 | 35 |

**SUBJECT: Statistics**

**Class XI TOTAL Theory MARKS: 70**

- **Class XI SEMESTER 1 TOPICS: [MCQ] MARKS: 35 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Unit 1 | 10X1=10 |
| 2 | Unit 2 | 6X1=6 |
| 3 | Unit 3 | 12X1=12 |
| 4 | Unit 4 | 3X1=3 |
| 5 | Unit 5 | 4X1=4 |

- **Class XI SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 35**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| Unit 1 | 1X2=2 | 1X3=3 | 1X5=5 | 10 |
| Unit 2 | - | 2X3=6 | - | 06 |
| Unit 3 | 2X2=4 | 1X3=3 | 1X5=5 | 12 |
| Unit 4 | - | 1X3=3 | - | 03 |
| Unit 5 | 2X2=4 | - | - | 04 |
| TOTAL | 10 | 15 | 10 | 35 |

**Class XII TOTAL Theory MARKS: 70**

- **Class XII SEMESTER 1 TOPICS: [MCQ] MARKS: 35 [ 1 MARK PER QUESTION ]**

| Sl No | Topic | Marks allotted |
|---|---|---|
| 1 | Unit 1 | 6X1=6 |
| 2 | Unit 2 | 10X1=10 |
| 3 | Unit 3 | 12X1=12 |
| 4 | Unit 4 | 2X1=2 |
| 5 | Unit 5 | 5X1=5 |

- **Class XII SEMESTER 2 TOPICS: [Short Answer Questions , Descriptive Questions ] MARKS: 35**

| TOPIC | SHORT ANSWER TYPE QUESTIONS Type 1 (2 marks) | SHORT ANSWER TYPE QUESTIONS Type 2 (3 marks) | DESCRIPTIVE TYPE QUESTIONS (5 marks) | TOTAL |
|---|---|---|---|---|
| Unit 1 | 1X2=2 | 1X3=3 | 1X5=5 | 10 |
| Unit 2 | 1X2=2 | - | 1X5=5 | 07 |
| Unit 3 | 1X2=2 | 1X3=3 | - | 05 |
| Unit 4 | 1X2=2 | - | - | 02 |
| Unit 5 | - | 1X3=3 | - | 03 |
| Unit 6 | 1X2=2 | 1X3=3 | - | 05 |
| Unit 7 | - | 1X3=3 | - | 03 |
| TOTAL | 10 | 15 | 10 | 35 |

# WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION
# SYLLABUS FOR CLASSES XI AND XII
# SUBJECT : PHYSICS ( PHYS )

## Preamble:

This Higher Secondary level Physics syllabus has been framed in such a way that it can serve as a bridge between the general physical science course taught at the secondary level and the discipline based curriculum followed at higher education. Effort has been given to make this crucial transition as smooth as possible.

The syllabus is divided into **Units** spread over two year's duration. The Units are logically so arranged that the students can gradually learn the different topics of Physics with higher degree of difficulty. Conventional topics as well as modern concepts have been included in the syllabus so that the students can cope up with the present day needs of the society committed to the use of Physics and technology. Both breadth and depth wise the syllabus is comparable with the national as well as international standards. At the same time emphasis has been given to reduce the syllabus load by eliminating overlapping contents within the subject or with other subjects.

Hope the students will enjoy learning Physics at this stage and will develop passion for the subject.

## Outcome:

- The students will learn the basic physics laws and will develop conceptual understanding of the physical processes.
- Students will be able to understand and analysis the real-life events from physics point of view.
- Develop problem solving ability, experimental ability and analytical skills.
- Sufficient conceptual background of physics will be created to make the students competent to meet the requirements of academic and professional courses after the higher secondary stage.
- Interest will be developed for pursuing career in Physics.
- Inculcate scientific aptitude in the learners.

# Course Structure :

| Class | Semester | Contact Hours | | | | Marks | | Credit | |
|---|---|---|---|---|---|---|---|---|---|
| | | Theory | Remedial Tutorial | Practical | Total | Theory | Practical | Theory | Practical |
| 11 | I | 70 | 10 | 30 + 20 (50) | 110 | 35 | 30 | | |
| | II | 60 | 10 | | 90 | 35 | | | |
| 12 | III | 70 | 10 | 30 + 20 (50) | 110 | 35 | 30 | | |
| | IV | 60 | 10 | | 90 | 35 | | | |

# CLASS - XI

## SEMESTER – I

## SUBJECT: PHYSICS ( PHYS )

**FULL MARKS: 35** **CONTACT HOURS: 70 Hours**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| 1 | **PHYSICAL WORLD AND MEASUREMENT**<br>Physics - scope and excitement, nature of physical Law, physics technology and society.<br>Need for measurement, units of measurement, length, mass and time measurement, accuracy and precision of measuring instruments, error in measurement, rounding off and order of magnitude, significant figures.<br>Dimensions of physical quantities, dimensional analysis and its applications. | 6 | 3 |
| 2 | **KINEMATICS**<br>**SUB TOPIC : MOTION IN A ONE DIMENSION AND TWO DIMENSION**<br>Frame of reference (inertial and non-inertial frames).Motion in a straight line, position - time graph, speed and velocity.<br>Elementary concepts of differentiation and integration for describing motion. Uniformly accelerated motion. Graphical analysis: position - time and velocity - time graph and calculation of relevant quantities Relations for uniformly accelerated motion (using graphical and calculus method).<br>**SUB TOPIC : MOTION IN A PLANE**<br>Scalar and vector quantities, position and displacement vectors, general vectors and their notations, equality of vectors, multiplication of vectors by a real number, addition and subtraction of vectors.<br>Relative velocity. Unit vector, resolution of a vector in a plane - rectangular and non - rectangular components.<br>Scalar and vector product. Motion in a plane. Cases of uniform velocity and uniform acceleration - projectile motion. | 24 | 12 |
| 3 | **LAWS OF MOTION**<br>Intuitive concept of force.<br>Inertia, Newton's first law of motion. Momentum and Newton's second law of motion, impulse and concept of impulsive force, Newton's third law of motion and its examples. | 16 | 8 |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| | Law of Conservation of Linear Momentum and its application, concept of free body diagram and its application (simple cases). Equilibrium of concurrent forces. Static and kinetic friction, laws of friction, ideas of coefficient of friction, angle of friction and angle of repose. Rolling friction.<br>Dynamics of uniform circular motion, centripetal force, and example of circular motion (motion of a cyclist, vehicle on level circular road, vehicle on bank road).<br>Concept of centrifugal force. | | |
| **4** | **WORK ,ENERGY AND POWER**<br>Work done by a constant force and variable force, kinetic energy.<br>Work - energy theorem, power. Notion of potential energy, potential energy of a spring, conservative forces, conservation of mechanical energy (kinetic and potential energies).<br>Non-conservative forces.<br>Motion in a vertical circle.<br>Elastic and inelastic collisions in one and two dimensions. | **10** | **5** |
| **5** | **MOTION OF SYSTEM OF PARTICLES AND RIGID BODY**<br>Centre of mass of a two - particle system. Momentum conservation and motion of centre of mass.<br>Centre of mass of a rigid body (examples of simple geometrical bodies).<br>Moment of a force, torque, angular momentum, conservation of angular momentum with examples.<br>Equilibrium of rigid bodies, rigid body rotation and equations of rotational motion, comparison of linear and rotational motion, moment of inertia, radius of gyration.<br>Values of moment of inertia for simple geometrical objects (no derivation).<br>Statement of parallel and perpendicular axis theorem and their applications. | **14** | **7** |

**FOR SEMESTER I**

- **CONTACT HOURS FOR THEORY PART – 70 HOURS**
- **CONTACT HOURS FOR PRACTICAL PART – 30 HOURS**
- **CONTACT HOURS FOR REMEDIAL CLASSES AND TUTORIAL – 10 HOURS**

**SO TOTAL CONTACT HOURS FOR 1st SEMESTER IS 110 HOURS.**

# CLASS - XI

## SEMESTER – II

## SUBJECT: PHYSICS ( PHYS )

**FULL MARKS: 35** **CONTACT HOURS: 60 HOURS**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| 6 | **GRAVITATION**<br>The universal law of gravitation. Acceleration due to gravity and its variation with altitude, depth and rotation of earth.<br>Kepler's laws of planetary motion. Gravitational potential energy, Gravitational potential.<br>Escape velocity,<br>Orbital velocity of a satellite. Geostationary satellite. | 9 | 5 |
| 7 | **PROPERTIES OF BULK MATTER**<br>**SUB TOPIC : MECHANICAL PROPERTIES OF SOLIDS**<br>Elastic behavior, stress - strain relationship. Hooke's law, Young's modulus( Y), bulk modulus(K), shear modulus of rigidity( η), Poisson's ratio(σ), relation between Y, K, η,σ<br>(no derivation). Elastic energy for stretched string andextended spring.<br>**SUB TOPIC: MECHANICAL PROPERTIES OF FLUIDS**<br>Streamline and turbulent flow, Critical velocity.<br>Viscosity, Newton's law of viscosity, Stoke's law, terminal velocity, Reynolds' number. Bernoulli's theorem and its applications. Surface energy and surface tension, angle of contact, excess of pressure, application of surface tension, ideas to drops, bubbles. Capillary rise and fall<br>(no derivation, only analytical treatment).<br>**SUB TOPIC : THERMAL PROPERTIES OF MATTER**<br>Heat, temperature, thermal expansion of solids, liquids, and gases. Anomalous expansion of water and its effects.<br>Specific heat capacity, principle of calorimetry, change of state, latent heat capacity.<br>Heat transfer: conduction, convection and radiation, black body radiation, Kirchhoff's law, absorptive and emissive powers, thermal conductivity.<br>Newton's law of cooling, Wien's displacement law, Stefan's law and | 17 | 10 |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| | Boltzmann's correction. | | |
| 8 | **THERMODYNAMICS**<br>Thermal equilibrium and definition of temperature, Zeroth law of thermodynamics.<br>Heat, work and internal energy, First law of thermodynamics, $C_P$ and $C_V$ and determination of their relation.<br>Isothermal and Adiabatic processes. P-V diagram, calculation of external work done in different cases.<br>Second law of thermodynamics, reversible and irreversible processes.<br>Heat engine, Calculation of efficiency of Carnot engine only, efficiency of refrigerator (only qualitative idea). | 9 | 5 |
| 9 | **KINETIC THEORY OF GASES**<br>Assumptions for the kinetic theory of gases, RMS speed of gas molecules, degrees of freedom.<br>Concept of pressure, kinetic energy and temperature in the light of kinetic theory, ideas of gas laws in the light of kinetic theory of gases.<br>Law of equipartition of energy (statement only) and application regarding of specific heats of the gases. Concept of mean free path, Avogadro's number. | 8 | 5 |
| 10 | **OSCILLATION AND WAVES**<br>**SUB TOPIC : OSCILLATION**<br>Periodic motion-period, frequency, displacement as a function of time, Periodic functions.<br>Simple harmonic motion (S.H.M) and its equation, phase, oscillation of a spring - restoring force and force constant, combination of springs, energy in S.H.M - kinetic and potential energies.<br>Simple pendulum, loaded spring - derivation of expression for time period.<br>Free, damped and forced oscillations, resonance (qualitative ideas only).<br><br>**SUB TOPIC : WAVES**<br>Wave Motion: longitudinal and transverse waves, speed of travelling wave motion.<br>Velocity of sound in gaseous medium - Newton's law and Laplace's correction.<br>Displacement relation for a progressive wave.<br>Principle of superposition of waves.<br>Formation of Stationary waves, reflection of waves in string and organ pipes: fundamental mode and harmonics.<br>Formation of beats.<br>Doppler effect of sound. | 17 | 10 |

**FOR SEMESTER II**

- **CONTACT HOURS FOR THEORY PART – 60 HOURS**
- **CONTACT HOURS FOR PRACTICAL PART – 20 HOURS**
- **CONTACT HOURS FOR REMEDIAL CLASSES AND TUTORIAL – 10 HOURS SO TOTAL CONTACT HOURS FOR 2nd SEMESTER IS 90 HOURS.**

# CLASS: XI

## SUBJECT: PHYSICS ( PHYS )

## COURSE CODE: PRACTICAL

**FULL MARKS: 30** **CONTACT HOURS: 50 HOURS (30+ 20)**

## PRACTICAL WORKS + VIVA (16+4) = 20 MARKS

Given below is a list of required experiments.

In each experiment students are expected to record their observations in tabular form with unit at the column head.

Students should plot an appropriate graph where required, work out the necessary calculation and arrive at the result.

### SECTION: A

| No. OF EXPT. | TOPICS |
|---|---|
| 1 | To measure diameter of a small spherical / diameter and length of a cylindrical body using slide calipers, hence calculate its volume with proper formula |
| 2 | To measure the internal diameter and depth of a beaker using slide calipers and hence find its volume. |
| 3 | To measure diameter of a given thin wire using screw gauge |
| 4 | To determine the volume of an irregular but uniform thickness lamina using screw gauge and graph paper. |
| 5 | To determine the radius of curvature of a given spherical surface by a spherometer. |
| 6 | Consider equilibrium of three concurrent coplanar forces. To verify the parallelogram Law of forces and to determine weight of a body. |
| 7 | To study the force of limiting friction for a wooden block placed on horizontal plane surface and to study is relationship with normal reaction. To determine the coefficient of friction. |
| 8 | To study the downward force acting along the inclined plane on a roller due to gravitational pull of earth and to study its relationship with angle of inclination($\theta$) by plotting graph between force and sin $\theta$. |

### SECTION: B

| No. OF EXPT. | TOPICS |
|---|---|
| 1 | To study the acceleration due to gravity by measuring variation in time period (T) with effective length (L) of a simple pendulum, plot graphs of L - T and L - $T^2$. Determine the effective length of second pendulum from L - $T^2$ graph |
| 2 | To study the force constant of a spring and to study variation in time period of oscillation with mass (m) of a body suspended by a spring. To find the spring constant by plotting a graph of m – $T^2$ |
| 3 | To study the force constant of a helical spring by plotting graph between load and extension. |
| 4 | To study the variation in volume with pressure for a sample of air at constant temperature by plotting graphs between<br>P – (1 / V) and between P - V |
| 5 | To study the fall in temperature of a body (like hot water) with time, by plotting a cooling curve. |

| | |
|---|---|
| 6 | To study the surface tension of water by capillary rise method. |
| 7 | To study the coefficient of viscosity of a given viscous liquid by measuring the terminal velocity of given spherical body. |
| 8 | To study the speed of sound of in air at room temperature using resonance column apparatus by two resonance positions. |
| 9 | To study the frequency of a tuning fork using resonance column apparatus is by two resonance positions, where the data of the speed of sound in air medium at room temperature will be supplied |
| 10 | To study the relationship between frequency and length of a given wire under constant tension using sonometer |

**The students have to do one practical each from section A and section B in the examination.**

## PROJECT WORK (MARKS – 7)

All candidates will be required to do one project involving physics related topic/topics of their theory syllabus under the guidance of the Physics teacher.

Candidate should take under any one of the following types of projects:

1) Theoretical project

2) Working model

Candidates are to prepare a technical report formally written including title, abstract, some theoretical discussion, experiment set up, observations with tables of data collected, graph / chart ( if any), analysis and discussion of result, deduction, conclusion etc. The report should be kept simple but neat and elegant.

No extra credit shall be given for typewritten material or decorative cover etc.

Suggested heading of project file for theory based project

| |
|---|
| Title of the project |
| Introduction |
| Contains |
| Analysis / material aid (graph, Data, Structure, diagram etc) |
| Conclusions/ comments |

**Suggested heading of project file for model based projects**

| |
|---|
| Title of the project |
| Model construction |
| Principle used, concise project report |
| Conclusion / comments |

## PRACTICAL FILE – (MARKS – 3)

Teachers are required to access the students on the basis of Physics practical file maintained by them during the academic year. Generally students are not expected to write the procedure of the experiments. The students will write the working formula, draw the figure or circuit diagram, collection of data in proper tabular form, results and few ideas of precautions associated with the experiments.

## PRACTICAL MARKS SCHEME

| EXPERIMENT | | | | | | SUB TOTAL (16) | VIVA (4) | L.N.B (3) | PROJECT (7) | TOTAL (30) |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 1(2+5+1=8) | | | No. 2 (2+5+1=8) | | | | | | | |
| THEORY | RECORD | RESULT | THEORY | RECORD | RESULT | | | | | |

# CLASS - XII

## SEMESTER – III

## SUBJECT: PHYSICS ( PHYS )

**FULL MARKS: 35** **CONTACT HOURS: 70 Hours**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| 1 | **ELECTROSTATICS**<br>**SUB TOPICS: ELECTRIC CHARGES AND FIELDS**<br>Electric charges, conservation of charge.<br>Coulomb's law - force between two point charges, forces between multiple charges, superposition principle and continuous uniform distribution of charges.<br>Electric field: electric field due to a point charge, electric field lines. Electric dipole, electric field due to a dipole (at a point on its axis, at a point on its perpendicular bisector, at any point), torque on a dipole in uniform electric field. Electric flux, statement of Gauss's theorem and its application to find the field due to infinitely long straight wire, uniformly charged infinite plane sheet and uniformly charged thin spherical shell (field inside and outside)<br>**SUB TOPICS: ELECTROSTATIC POTENTIAL AND CAPACITANCE**<br>Electric potential, potential difference, relation between electric field intensity and potential, electric potential : due to a point charge, a dipole and system of point charges, equipotential surface and its properties, electrical potential - energy of a system of two point charges and of electric dipole in electrostatic field.<br>Conductors and insulators, free charges and bound charges inside a conductor.<br>Dielectrics and electric polarization.<br>Capacitors and capacitance, combination of capacitors in series and in parallel.<br>Capacitance of parallel plate capacitors with or without dielectric medium between the plates. Capacitances of solid and hollow spherical capacitors.<br>Energy stored in a capacitor. Example of capacitors in our daily life (only qualitative idea ). | 18 | 8 |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| 2 | **CURRENT ELECTRICITY**<br>Electric current, flow of electric charge in a metallic conductor. Drift velocity, mobility and their relation with electric current. Ohm's law, electrical resistance, resistivity and conductivity.<br>V-I characteristics for ohmic resistance, temperature dependence of resistance.<br>Series, parallel and mixed grouping of resistances.<br>Internal resistance of a cell, potential difference and emf of a cell, combination of cells in series and in parallel and in mixed grouping.<br>Parallel combination of two cells of unequal emfs, series combination of n cells of unequal emfs.<br>Kirchhoff's law and simple applications.<br>Wheatstone bridge principle, Metre Bridge principle (end error correction not required). Potentiometer: principle and its applications to measure the potential difference and for comparing emfs of two cells and measurement of internal resistance of a cell. | **16** | **8** |
| 3 | **MAGNETIC EFFECTS OF CURRENT AND MAGNETISM**<br>SUB TOPICS: MOVING CHARGE AND MAGNETIC FIELD<br>Concept of magnetic field, Oersted's experiment.<br>Biot - Savart law, calculation of magnetic field for linear and circular current carrying conductors and its simple applications.<br>Ampere's circuital law and its application to infinitely long straight wire and straight solenoid. Force on a moving charge in a uniform magnetic and electric fields - Lorentz force.<br>Motion of a charged particle in a perpendicular magnetic field (Cyclotron frequency).<br>Force on a current carrying conductor in a uniform magnetic field.<br>Force between two parallel current carrying conductors - definition of ampere.<br>Torque experienced by a current carrying loop in uniform magnetic field, moving coil galvanometer -its current sensitivity.<br>Conversion of galvanometer into ammeter and voltmeter.<br>SUB TOPICS: MAGNETISM AND MATTER<br>Current loop as a magnetic dipole and its magnetic dipole moment. Magnetic dipole moment of a revolving electron.<br>Magnetic field intensity due to a magnetic dipole (bar magnet) along its axis and perpendicular to its axis.<br>Torque on a magnetic dipole (bar magnet) in a uniform magnetic field, magnetic field lines. Magnetic properties of a material: | **16** | **8** |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| | magnetic permeability, magnetic susceptibility, intensity of magnetization, magnetic retentivity and coercivity. Hysteresis: B - H loop and its significance, (only qualitative idea) Earth's magnetic field and magnetic elements.<br>Dia, Para and Ferro - magnetic substances with examples. Electromagnets and factor affecting their strengths. | | |
| 4 | **ELECTROMAGNETIC INDUCTION AND ALTERNATING CURRENT**<br>SUB TOPICS : ELCTROMAGNETIC INDUCTION<br>Electromagnetic induction, concept of magnetic flux. Faraday's laws, induced emf and current, Lenz's law, Eddy current. Concept of self and mutual inductance, self-inductance of a solenoid and mutual inductance of two coaxial solenoids (qualitative ideas).<br>SUB TOPICS : ALTERNATING CURRENT<br>Alternating current, peak and RMS values of alternating current/voltage, reactance and impedance.<br>Concept of phasor diagram, only resistive circuit, only inductive circuit , only capacitive circuit, LR circuit, CR circuit, and LCR series circuit, resonance, LC oscillator (qualitative idea only). Power in AC circuit, power factor in AC circuit, wattless current.<br>AC generator and transformer. | **15** | **8** |
| 5 | **ELECTROMAGNNETIC WAVES**<br>Basic idea of displacement current, electromagnetic waves and their characteristics (qualitative ideas only).<br>Transverse nature of electromagnetic waves. Electromagnetic spectrum (radio waves, infrared, visible, ultraviolet, X-rays, Gamma Rays) including elementary facts about their uses. | **5** | **3** |

**<u>FOR SEMESTER III</u>**

- **CONTACT HOURS FOR THEORY PART – 70 HOURS**
- **CONTACT HOURS FOR PRACTICAL PART – 30 HOURS**
- **CONTACT HOURS FOR REMEDIAL CLASSES AND TUTORIAL – 10 HOURS**

**<u>SO TOTAL CONTACT HOURS FOR 3RD SEMESTER IS 110 HOURS.</u>**

## SEMESTER – IV

## SUBJECT CODE : PHYSICS ( PHYS )

**FULL MARKS: 35** **CONTACT HOURS: 60 HOURS**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| 6 | **OPTICS**<br>**SUB TOPICS : RAY OPTICS AND OPTCAL INSTRUMENTS**<br>Reflection of light, spherical mirrors, mirror formula, refraction of light, total internal reflection and its applications, optical fibers. Refraction at spherical surfaces, lenses, thin lens formula.<br>Lens -Maker's Formula. Displacement method to find the position of image (conjugate points), magnification power of a lens.<br>Combination of thin lenses in contact, combination of lens and mirrors. Refraction and dispersion of light through a Prism. Scattering of light - blue colour of the sky and reddish appearance of the sun at sunrise and sunset.<br>Optical instruments: human eye, image formation and accommodation, correction of eye defects (myopia and hypermetropia) only qualitative Ideas.<br>Microscopes and astronomical telescopes (reflecting and refracting) and their magnifying powers.<br>**SUB TOPICS : WAVE OPTICS**<br>Wave front and Huygens' principle, reflection and refraction of plane wave at a plane surface using Huygens' principle. Interference: interference of monochromatic light by double slits –Young's experiment, conditions for sustained interference of light - coherent sources, condition of maxima and minima in the term of path difference and phase difference, expression for the fringe width.<br>Diffraction: Fraunhoffer's diffraction due to single slit, width of central maximum.<br>Resolving power of microscope and astronomical telescope. Polarization, plane polarized light. Brewster's law, uses of plane polarized light and polaroid. | 25 | 14 |
| 7 | **DUAL NATURE OF RADIATION AND MATTER**<br>Dual nature of radiation. Photoelectric effect.<br>Hertz and Lenard's observations, Einstein's Photoelectric equation - particle nature of light.<br>Matter waves - wave nature of particles,<br>de Broglie relation and its simple applications. | 7 | 4 |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| 8 | **ATOMS AND NUCLEI**<br>**SUB TOPICS: ATOMS**<br>Alpha - particle scattering experiment, Rutherford's model of atom, Bohr model of hydrogen like atoms, energy levels, hydrogen spectrum. Elementary theory of X -ray production, continuous and characteristic X-ray(their origin and properties only),Moseley's law.<br>**SUB TOPICS : NUCLEI**<br>Composition and size of nucleus, atomic mass, isotope, isobar, isotone. Radioactivity: alpha, beta and gamma particles / rays and their properties, radioactive decay law. Mass - energy relation, mass defect, binding energy per nucleon and its variation with mass number, Nuclear fission and fusion. | 10 | 6 |
| 9 | **ELETRONIC DEVICES**<br>Thermal emission of electrons and only the basic concepts of vacuum diode and triodes.<br>Energy bands in solids: conductors, insulators and semiconductors ( qualitative idea only)<br>Intrinsic and extrinsic semiconductors, band diagram.<br>P- N junction diode, forward and reverse bias, I - V characteristics of junction diode (nonlinear concept).<br>Special type of diodes: LED, photodiode, solar cell and Zener diode with their characteristics.<br>Zener diode as a voltage regulator.<br>Junction transistor, npn and pnp transistor, transistor action, characteristics of a transistor, transistor as an amplifier (common emitter configuration). Transistor as a switch.<br>Elementary idea of analogue and digital signals.<br>Concepts of decimal and binary numbers.<br>Logic gates : OR,AND,NOT,NAND,NOR<br>(Symbols, input, output Boolean equations, truth table, qualitative explanation).<br>Simple cases of combination of gates. | 15 | 8 |
| 10 | **COMMUNICATION SYSTEM**<br>Elements of a communication system<br>(Block diagram only), concepts of amplitude and frequency modulation. Band width of signals (speech, TV and digital data).<br>Band width of transmission medium.<br>Propagation of electromagnetic waves in the atmosphere, sky wave and space wave propagation (qualitative idea only). | 5 | 3 |

**FOR SEMESTER IV**

- **CONTACT HOURS FOR THEORY PART – 60 HOURS**
- **CONTACT HOURS FOR PRACTICAL PART – 20 HOURS**
- **CONTACT HOURS FOR REMEDIAL CLASSES AND TUTORIAL – 10 HOURS**

**SO TOTAL CONTACT HOURS FOR 4$^{TH}$ SEMESTER IS 90 HOURS.**

# CLASS: XII

## SUBJECT: PHYSICS ( PHYS )

## COURSE CODE: PRACTICAL

**FULL MARKS: 30** **CONTACT HOURS: 50 HOURS (30+ 20)**

**PRACTICAL WORKS + VIVA (16+4) = 20 MARKS**

The experiments for laboratory work are from two groups:

1) Experiment based on current electricity and Magnetism

2) Experiments based on ray optics and Semiconductor devices.

The main skill required in group 1 is understanding the circuit diagram and making connections, polarity of cells, meters, their ranges, zero error, least count, concept of magnetic lines of force and neutral point.

The main skill required in group 2 is to remove parallax between a needle and a real image of another needle. Basic circuit idea and knowledge of characteristic graphs of Semiconductor devices.

A graph is a convenient and effective way of representing result of measurement so it is an important part of the experiments. (Where it is applicable).

All the calculations should be rounded off up to proper decimal places or significant figures.

## SECTION: A

| No. OF EXPT. | TOPICS |
|---|---|
| 1 | Verify Ohm's law for a given unknown resistance (a 100 cm uniform wire) by plotting a graph of potential difference versus current. Calculate the resistance and hence resistance per cm of the wire from the slope of the graph. |
| 2 | Using a Metre Bridge determine the resistance of about 100 cm of uniform wire. If its length and diameter are supplied, calculate the specific resistance of the material of the wire. |
| 3 | To verify the law of series combination of resistances, using two resistances (2 ohm / 3 ohm range) in the Metre Bridge circuit. |
| 4 | To verify the law of parallel combination of resistances using two resistances ( 2 ohm / 3 ohm range) in Metre Bridge circuit. |
| 5 | To compare emfs of two cells using potentiometer circuit. |
| 6 | To determine the internal resistance of a cell using potentiometer circuit. |
| 7 | To determine resistance of a galvanometer by half deflection method and to find its figure of merit. |
| 8 | To convert a given Galvanometer (of known resistance and figure of merit) into an ammeter and voltmeter of desired range and verify same. |
| 9 | Draw the lines of forces for a magnet placing its north pole towards the geographic north. Also determine the position of neutral points on two sides of the magnet. |

## SECTION: B

| No. OF EXPT. | TOPICS |
|---|---|
| 1 | To find the value of image distance (v) for different values of object distance (u) of a concave mirror. By drawing 1/ v - 1/ u graph determine the focal length of the mirror. |
| 2 | To find the focal length of a convex mirror, using a convex lens. |
| 3 | To find the focal length of a convex lens by plotting graphs between u - v and between 1/u - 1/ v |
| 4 | To find the focal length of a concave lens using a convex lens. |
| 5 | To determine the angle of minimum deviation for a given prism by plotting a graph between angle of incidence and angle of deviation |
| 6 | To determine the refractive index of a glass slab using a travelling microscope. |
| 7 | To draw I - V characteristic curves of a P - N junction diode in forward and reverse bias. |
| 8 | To draw the reverse bias characteristics of Zener diode and to determine its breakdown voltage |
| 9 | To study the characteristic of common emitter configuration of NPN or PNP transistor and to find dynamic resistances and amplification factor. |

**The students have to do one practical each from section A and section B in the examination.**

# PROJECT WORK (MARKS – 7)

All candidates will be required to do one project involving physics related topic/topics of their theory syllabus under the guidance of the Physics teacher.

Candidate should take under any one of the following types of projects:

1) Theoretical project

2) Working model

Candidates are to prepare a technical report formally written including title, abstract, some theoretical discussion, experiment set up, observations with tables of data collected, graph / chart ( if any), analysis and discussion of result, deduction, conclusion etc. The report should be kept simple but neat and elegant.

No extra credit shall be given for typewritten material or decorative cover etc.

Suggested heading of project file for theory based project

| |
|---|
| Title of the project |
| Introduction |
| Contains |
| Analysis / material aid (graph, Data, Structure, diagram etc) |
| Conclusions/ comments |

Suggested heading of project file for model based projects

| |
|---|
| Title of the project |
| Model construction |
| Principle used, concise project report |
| Conclusion / comments |

# PRACTICAL FILE – (MARKS – 3)

Teachers are required to access the students on the basis of Physics practical file maintained by them during the academic year. Generally students are not expected to write the procedure of the experiments. The students will write the working formula, draw the figure or circuit diagram, collection of data in proper tabular form, results and few ideas of precautions associated with the experiments.

## PRACTICAL MARKS SCHEME

| EXPERIMENT | | | | | | SUB TOTAL (16) | VIVA (4) | L.N.B (3) | PROJECT (7) | TOTAL (30) |
|---|---|---|---|---|---|---|---|---|---|---|
| No. 1(2+5+1=8) | | | No. 2 (2+5+1=8) | | | | | | | |
| THEORY | RECORD | RESULT | THEORY | RECORD | RESULT | | | | | |

# WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION
# SYLLABUS FOR CLASSES XI AND XII
# SUBJECT : CHEMISTRY (CHEM)

## CLASS - XI

### SEMESTER – I

### SUBJECT : CHEMISTRY (CHEM)

**FULL MARKS : 35** **CONTACT HOURS : 70 Hours**

### COURSE CODE : THEORY

**Sub-topics**

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit - 1** | **Some Basic Concepts of Chemistry:**<br>Laws of chemical combination. Concept of elements, atoms and molecules. Atomic and molecular masses. Mole concept and molar mass, percentage composition, empirical and molecular formula, chemical reactions, stoichiometry and calculations based on stoichiometry. Different concentration terms of solutions and related calculations. | **07** | **03** |
| **Unit - 2** | **Structure of Atom:**<br>Bohr's model and its limitations, concept of shell and sub-shells, the dual nature of matter and light, de Broglie's relationship. Heisenberg uncertainty principle, Schrödinger wave equation (elementary idea only). Concept of orbitals, quantum numbers, shapes of *s, p* and *d* orbitals, rules for filling electrons in orbitals: Aufbau principle, Pauli exclusion principle and Hund's rule, exchange energy, electronic configuration of atom, stability of half-filled, completely filled orbitals. | **12** | **06** |
| **Unit - 3** | **Classification of Elements and Periodicity in Properties:**<br>Modern periodic law and the present form of the periodic table, periodic trends in properties of elements – atomic radii, ionic radii, van der Waals' radii, ionization enthalpy, electron gain enthalpy, electronegativity, valency. Nomenclature of elements with atomic number greater than 100. | **07** | **04** |
| **Unit - 4** | **Chemical Bonding and Molecular Structure:**<br>Valence electrons, ionic bond, bond parameters, covalent bond, Lewis structure, polar character of covalent bond, covalent character of ionic bond, valence bond theory, resonance, geometry of covalent molecules, VSEPR theory, concept of hybridisation, involving *s, p* and *d* orbitals and shapes of some simple molecules, intermolecular interactions, Hydrogen bonding, Molecular orbital theory of homonuclear diatomic molecules ($H_2$, $He_2$, $O_2$, $N_2$, $F_2$ – qualitative idea only) | **13** | **06** |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit - 5** | **States of Matter — Solids and Gases:**<br>Classification of solids (elementary idea): molecular, ionic, covalent and metallic solids, amorphous and crystalline solids (elementary idea), unit cell in two-dimensional and three-dimensional lattices, packing efficiency, calculation of density of unit cell, packing in solids, voids, number of atoms per unit cell in a cubic unit cell, point defects.<br>Kinetic theory of gas, molecular speeds, Dalton's law of partial pressure, Graham's law, deviation of ideal behaviour and van der Waals' equation, Liquefaction of gases, critical temperature. | **09** | **04** |
| **Unit - 6** | ***s*-Block Elements (Group 1 and Group 2 elements):**<br>Electronic configuration, occurrence, trends in the variation of properties (such as ionization enthalpy, atomic and ionic radii), trends in chemical reactivity with oxygen, water, hydrogen and halogens, hydrides (ionic, covalent and interstitial), hydrogen peroxide (preparation, properties, structure & use.), hydrogen as a fuel. Biological importance of Na, K, Mg, Ca. | **10** | **05** |
| **Unit - 7** | ***p*-Block Elements (Group 13 and Group 14 elements):**<br>General introduction to *p*-block elements, electronic configuration, occurrence, variation in properties, oxidation states, and trends in chemical reactivity of group 13 and 14 elements.<br>**Group 13**: Boron: physical and chemical properties of compounds of Boron: Boron oxides, boric acid, borates and $B_2H_6$<br>Aluminium: Reactions of Al with acid and alkali, uses of Al, Preparation and uses of $LiAlH_4$ and $Al_2O_3$.<br>**Group 14:** Carbon: catenation, allotropic forms, nano carbon, graphene, physical and chemical properties of two oxides of carbon- CO and $CO_2$,<br>Silicon: some compounds of silicon and their important uses –<br>Silicon tetrachloride (Structure, preparation, hydrolysis and reduction reaction only), silicates [structure of open chain silicates constructing of $(SiO_3)_n^{2n-}$ ions], use of zeolites, | **12** | **07** |

# CLASS - XI

## SEMESTER – II

## SUBJECT : CHEMISTRY (CHEM)

**FULL MARKS : 35** **CONTACT HOURS : 60 HOURS**

## COURSE CODE : THEORY

**Sub-topics**

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit - 1** | **Thermodynamics:**<br>Concepts of system (including types of system), surroundings. Work, heat, energy, extensive and intensive properties, state function, Zeroth law of thermodynamics and definition of temperature. The first law of thermodynamics – internal energy change (ΔU) and enthalpy change (ΔH), Enthalpy of bond dissociation, combustion, formation, atomization, ionization, solution and sublimation. Transformation of state. Hess's law of constant heat summation, Born Haber Cycle and its application. $2^{nd}$ law of thermodynamics, the introduction of entropy as a state function, Gibbs energy change for spontaneous and non-spontaneous processes, criteria for equilibrium. | **12** | **07** |
| **Unit - 2** | **Equilibrium:**<br>Equilibrium in physical and chemical processes, dynamic nature of equilibrium, law of mass reaction, equilibrium constant, factors affecting equilibrium – Le Chatelier's principle; ionic equilibrium, ionization of acids and bases, strong and weak electrolytes, degree of ionization of polybasic acids, acid strength, concept of pH Henderson Equation. Hydrolysis of salts (elementary idea). Buffer solutions, solubility product, common ion effect (with illustrative examples). | **10** | **06** |
| **Unit - 3** | **Redox Reactions:**<br>Concept of oxidation and reduction, redox reactions, oxidation number, balancing redox reactions in terms of loss and gain of electrons and change in oxidation number, applications of redox reactions in permanganometry and dichromatometry | **05** | **03** |
| **Unit - 4** | **Organic Chemistry: Some basic principles:**<br>General introduction, classification and IUPAC nomenclature of organic compounds.<br>Electronic displacements in a covalent bond: inductive effect, resonance and hyperconjugation. Homolytic and Heterolytic fission of a covalent bond: free radicals, carbocations, carbanions electrophiles and nucleophiles, types of organic reactions. Elementary idea of addition, elimination and substitution reactions. | **12** | **07** |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit - 5** | **Hydrocarbons: Classification of hydrocarbons**<br>Alkanes – Nomenclature, isomerism, conformations (ethane only), physical properties (up to 6 carbons) and chemical reactions including halogenations, free radical mechanism, combustion and pyrolysis.<br>Alkenes – Nomenclature, structure of double bond (ethene), geometrical isomerism, physical properties (up to 3 carbons) methods of preparation; chemical reactions; addition of hydrogen, halogen, water hydrogen halides (Markovnikov's addition and peroxide effect), ozonolysis, oxidation, mechanism of electrophilic addition.<br>Alkynes – Nomenclature, structure of triple bond (ethyne), physical properties (up to 3 carbons) preparation, chemical reactions; acidic character of Alkynes, addition reaction of – hydrogen, halogens, hydrogen halides and water.<br>Aromatic hydrocarbons; Introduction, IUPAC nomenclature; Benzene; resonance aromaticity; chemical properties; mechanism of electrophilic substitution – nitration, sulphonation, halogenations, Friedel-Crafts alkylation and acylation, carcinogenicity and toxicity. | **14** | **08** |
| **Unit - 6** | **Environmental Chemistry:**<br>Environmental pollution – air, water and soil pollution (cause and effects), Primary and secondary pollutants (solid and liquid), chemical reactions in the atmosphere, smog, pollution due to industrial wastes; solid waste management (elementary idea only), SPM, RSPM, green chemistry as an alternative tool for reducing pollution. Water preservation and protection, Strategy for control of environmental pollution. | **07** | **04** |

# CLASS - XII

## SUBJECT : CHEMISTRY (CHEM)

## SEMESTER – III

**FULL MARKS : 35** **CONTACT HOURS : 70 HOURS**

## COURSE CODE : THEORY

**Sub-topics**

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit - 1** | **Liquid State**<br>Introduction, Solubility of gases in liquids, solid solutions, Vapour pressure and Raoult's law. Colligative properties; relative lowering of vapour pressure, elevation of boiling point, depression of freezing point, osmotic pressure. Determination of molecular mass using colligative properties. Abnormal molecular mass, van't Hoff factor and calculations involving it. Colloidal solution, the difference between true solutions, colloids and suspensions; lyophilic, lyophobic, multi-molecular colloids; properties of colloids; Tyndal effect, Brownian movement, electrophoresis, coagulation, emulsions and types of emulsions. | **16** | **08** |
| **Unit - 2** | ***p*-Block Elements (Groups 15, 16, 17 and 18)**<br>**Group 15 elements:** general introduction, electronic configuration, occurrence, oxidation states, Structure and reaction of $NH_3$, $HNO_3$, $NCl_3$, oxides of nitrogen (structure only); Phosphorus – allotropic forms( White and Red), preparation and properties of phosphine, phosphorus halides ($PCl_3$, $PCl_5$) and oxoacids (elementary idea only)<br>**Group 16 elements:** General introduction, electronic configuration, occurrence, oxidation states;<br>Oxygen: classification of oxides. Preparation and properties of Ozone.<br>Sulphur: allotropic forms (rhombic and monoclinic). Properties and uses of oxides, oxoacids and peracids of sulphur.<br>**Group 17 elements:** General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties;<br>Compounds of halogen; preparation, structure and uses of oxides, oxoacids of halogens, interhalogen compounds. Elementary idea of pseudohalogens and polyhalides.<br>**Group 18 elements :**<br>General introduction, electronic configuration, occurrence, uses of noble gases. Preparation, structure and chemical reactions of $XeO_2$, $XeO_3$, $XeF_2$, $XeF_4$, $XeF_6$, $XeOF_2$. | **18** | **08** |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit - 3** | **Haloalkanes and Haloarenes**<br>**Haloalkanes:**<br>Nomenclature, nature of C-X bond, physical and chemical properties, mechanism of substitution reactions. Stability of carbocations. *R/S* and *D/L* configurations Uses and environmental effects of – dichloromethane, trichloromethane, tetrachloromethane, iodoform, freons,<br>**Haloarenes:**<br>Nature of C-X bond, substitution reaction (directive influence of halogen for monosubstituted compounds only), stability of carbocations, *R/S* and *D/L* configurations. Uses and environmental effects of DDT. | **10** | **05** |
| **Unit - 4** | **Alcohols, Phenols and Ethers**<br>**Alcohols:**<br>Nomenclature, methods of preparation, physical and chemical properties (primary alcohols only); identification of primary, secondary and tertiary alcohols; mechanism of dehydration, uses of methanol and ethanol.<br>**Phenols:**<br>Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reaction, uses of phenol.<br>**Ethers:**<br>Nomenclature, methods of preparation, physical and chemical properties, uses. | **10** | **05** |
| **Unit - 5** | **Biomolecules :**<br>**Carbohydrates**<br>Classification (aldoses and ketoses), monosaccharides (glucose and fructose), D/L configuration, oligosaccharides (sucrose), polysaccharides (starch, cellulose)<br>**Proteins**<br>Elementary idea of α-amino acids, peptide bonds, polypeptides, structure of proteins (primary structure only), denaturation of proteins; enzymes.<br>**Nucleic Acids:** DNA & RNA (introduction and basic concept) | **08** | **05** |
| **Unit - 6** | **Polymers:**<br>Classification- (natural and synthetic), methods of polymerization (addition and condensation), copolymerization. Some important polymers; like polythene, nylon, polyesters, bakelite, and rubber. Biodegradable and non-biodegradable polymers | **08** | **04** |

# CLASS - XII

## SUBJECT : CHEMISTRY (CHEM)

## SEMESTER – IV

**FULL MARKS : 35** **CONTACT HOURS : 60 HOURS**

## COURSE CODE : THEORY

**Sub-topics**

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit - 1** | **Electrochemistry**<br>Redox reactions, conductance in electrolytic solutions, specific and molar conductivity, variation of conductivity with concentration, Kohlrausch's law, electrolysis and laws of electrolysis (elementary idea), dry cell – electrolytic cells and Galvanic cells, emf of a cell, standard electrode potential, Nernst equation and its application to chemical cells, relation between Gibbs energy change and emf of a cell, fuel cells, Li-ion battery. | **08** | **05** |
| **Unit - 2** | **Chemical Kinetics**<br>Rate of a reaction (average and instantaneous), factors affecting rate of reactions- concentration, temperature and catalyst. Order and molecularity of a reaction; rate law and specific rate constant, integrated rate equations and half-life (only for zero and first order reactions); the concept of collision theory (elementary idea, no mathematical treatment) activation energy, Arrhenius equation<br>Catalysis, homogeneous and heterogeneous catalysis, enzyme catalysis. | **10** | **07** |
| **Unit - 3** | ***d* and *f* Block elements**<br>General introduction, electronic configuration, occurrence and characteristics of transition metals, general trends in properties of the first-row transition metals – ionic radii, ionization enthalpy, oxidation states, colour, catalytic property, magnetic property. Preparation and properties of $K_2Cr_2O_7$ and $KMnO_4$.<br>**Lanthanoids**<br>Electronic configuration, oxidation states, chemical reactivity, lanthanoid contraction and its consequences, uses.<br>**Actinoids**<br>Electronic configuration, oxidation states, comparison with lanthanoids, uses. | **10** | **06** |
| **Unit - 4** | **Coordination compounds**<br>Introduction, ligands, classification of ligands based on denticity and field intensity, coordination number, colour, magnetic properties and shape, IUPAC nomenclature of mononuclear coordination compounds, EAN rule, Bonding (Werner's theory, VBT and CFT), CFSE, structural-isomerism and stereo-isomerism, importance of coordination compounds (in qualitative analysis, extraction of metals and biological systems) | **08** | **05** |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit - 5** | **Aldehydes, Ketones and Carboxylic Acids**<br>**Aldehydes and Ketones:**<br>Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes; uses.<br>**Carboxylic Acids:**<br>Nomenclature, acidic nature, methods of preparation, physical and chemical properties, uses | **10** | **05** |
| **Unit - 6** | **Organic compounds containing Nitrogen**<br>**Nitro compounds:** General methods of preparation and reduction reactions.<br>**Amines:** Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines.<br>**Cyanides and Isocyanides –** Nomenclature, structure, methods of preparation, chemical reactions (hydrolysis and reduction reactions only).<br>**Diazonium salts:** Preparations, chemical reactions and importance in synthetic organic chemistry | **14** | **07** |

# PRACTICAL FOR CLASSES XI AND XII

## SUBJECT : CHEMISTRY (CHEM)

## CLASS – XI

## COURSE CODE : PRACTICAL

### FULL MARKS : 30

| **Evaluation Scheme for Examination** | **Marks** |
|---|---|
| Volumetric analysis | 10 |
| Environment-related experiments | 08 |
| Characterization and purification of chemical substances | 06 |
| Class Record, Project and Viva | 06 |
| **Total** | **30** |

## Practical Syllabus

**A. Basic Laboratory Techniques**

i. Cutting glass tube and glass rod
ii. Bending a glass tube
iii. Drawing out a glass jet
iv. Boring a cork

**B. Characterization and purification of chemical substances**

i. Determination of the melting point of an organic compound
ii. Determination of the boiling point of an organic compound
iii. Crystallization of impure sample of any of the following: Alum, Copper, Sulphate, Benzoic acid.

**C. Environment-related experiments**

i. Calculation of pH of soil sample.
ii. Determination of turbidity for a given sample of water
iii. Determination of dissolved oxygen in a given sample of water
iv. Determination of TDS of water sample

**D. Quantitative estimation (**Use of digital balance (precession up to 3 decimal points)**) ( Volumetric analysis)**

i. Determination of strength of a given sodium hydroxide solution by titrating it against a standard oxalic acid solution.
ii. Determination of strength of a given hydrochloric acid solution by titrating it against standard sodium carbonate solution.
iii. Standardisation of $KMnO_4$ solution by using standard Oxalic acid solution.
iv. Estimation of Fe in Mohr's salt solution using standard $KMnO_4$ solution or standard $K_2Cr_2O_7$ solution.

**Project Work**

**a) Preparation of standard solutions:**

i) Preparation of (N/10) Oxalic acid solution.
ii) Preparation of (N/10) Mohr's salt solution.
iii) Preparation of (N/10) Sodium carbonate solution.
iv) Preparation of (N/10) Hydrochloric acid solution.
v) Preparation of (N/10) Sodium hydroxide solution.

**b) Preparation of inorganic compounds:**

i) Preparation of potash alum.

ii) Preparation of potassium ferric oxalate.

**c) Study of acidity of-**

i) Different samples of tea leaves.

ii) Fruit and vegetable juices.

# CLASS – XII

# COURSE CODE : PRACTICAL

## FULL MARKS : 30

| **Evaluation Scheme for Examination** | **MARKS** |
|---|---|
| Potentiometric Analysis | 06 |
| Salt Analysis | 08 |
| Detection of functional groups in Organic compounds | 04 |
| Content-Based Experiment (Chemical Kinetics/Thermochemistry/ Preparation of Organic Compounds) | 06 |
| Class record, Viva and Project work | 06 |
| **Total** | **30** |

**Practical Syllabus**

**A. Chemical kinetics**

(i) Study of the rate of reaction of iodide ions with hydrogen peroxide at room temperature using different concentrations of iodide ions. (with Excel plot)

(ii) Study of the reaction rate of hydrolysis of ester in an acidic medium (with Excel plot)

**B. Thermochemistry :**

**Any one of the following experiments :**

(i) Enthalpy of dissolution of copper sulphate or potassium nitrate.

(ii) Enthalpy of neutralization of strong acid (HCl) and strong base (NaOH)

(iii) Determination of enthalpy change during interaction (hydrogen bond formation) between acetone and chloroform.

**C. Electrochemistry**

(i) Potentiometric titration of $Fe^{3+}/Fe^{2+}$ system with Potassium dichromate and Potassium permanganate solutions.

(ii) Potentiometric determination of concentration of $AgNO_3$ solution (N/100 or N/200) using standard KCl solution (N/10).

**D. Tests for the functional groups present in organic compounds:**

Unsaturation, alcoholic -OH (1° ), phenolic -OH, aldehyde, ketone, carboxylic acid and primary aromatic amine groups.

**E. Preparation of Organic compounds:**

Preparation of any two of the following compounds :

(i) Benzilic acid (From Benzil)

(ii) Aniline yellow or 2-Naphthol aniline dye.

(iii) Iodoform.

**F. Characteristic test of carbohydrates, fats and proteins in pure samples and their detection in given foodstuffs.**

**G. Qualitative analysis**

Determination of one cation and anion in a given salt.

Cations - $Pb^{2+}, Cu^{2+}, Al^{3+}, Fe^{3+}, Cr^{3+}, Mn^{2+}, Ni^{2+}, Zn^{2+}, Co^{2+}, Ca^{2+}, Sr^{2+}, Ba^{2+}, Mg^{2+}, NH_4^+$

Anions – $CO_3^{2-}, S^{2-}, SO_4^{2-}, S_2O_3^{2-}, NO_2^-, NO_3^-, , Cl^-, Br^-, I^-, PO_4^{3-}$

(Note: Insoluble salts excluded)

**Project work – where feasible may include**

(i) Model preparation

(ii) Investigatory project

(iii) Science exhibits

(iv) Participation in science fairs

(v) Testing purity of food articles like butter, pulse, milk etc.

# WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION
# SYLLABUS FOR CLASS XI AND XII
# SUBJECT : MATHEMATICS ( MATH )

## Course Objectives

The Mathematics curriculum has undergone periodic revisions in response to the field's expansion and the changing demands of society. The senior secondary stage serves as a springboard for students to pursue professional programs in engineering, physical and biological science, commerce, or computer applications, or to pursue higher education in mathematics. In order to address the evolving demands of all student categories, the current revised syllabus has been created. More focus has been placed on the application of certain principles, drawing inspiration for the issues from real-world scenarios and other academic disciplines.

The following are the main goals of teaching mathematics to senior school students:

- To develop general interest in Mathematics as a discipline.
- To gain critical insight and knowledge of fundamental terminology, concepts, principles, symbols, and skills, especially through motivation and visualization, as well as mastery of underlying procedures and abilities.
- To experience the logic flowing while demonstrating an outcome or resolving an issue.
- To use the gained information and abilities to solve issues, using many approaches where feasible.
- To familiarize students with the various applications of mathematics in everyday life.
- Developing a sense of appreciation and respect for notable mathematicians and their contributions to mathematics is important.
- To cultivate an optimistic outlook in order to reason, evaluate, and speak coherently.
- To cultivate curiosity for the topic by taking part in competitions related to it.

## Course Outcomes

At the end of the course the students are expected to develop expertise in various areas of the subject and gain critical insights into the background dynamics of the problem solving process.

The following are the major course outcomes. A student is expected to:

- Develop problem solving skills and apply mathematical concepts to real life situations.
- Cultivate critical thinking and analytical skills in mathematical context.
- Collaborate with peers to solve complex mathematical problems.
- Make predictions and draw conclusions based on statistical data.
- Get a preliminary idea of using technology, like calculators in problem solving.
- Effectively communicate mathematical ideas and solutions both verbally and in writing.
- Present mathematical arguments and justifications.
- Prepare for standardized examinations based on the curriculum.
- Understand the relevance of mathematics in real-world applications.

# CLASS - XI

## SEMESTER – I

## SUBJECT: MATHEMATICS ( MATH )

**FULL MARKS: 40** **CONTACT HOURS: 100 Hours**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| UNIT-I | **SETS AND FUNCTIONS** | 45 | 15 |
| | **1. Sets**<br>Sets and their representations, Empty set, Finite and Infinite sets, Equal sets, Subsets, Subsets of the set of real numbers especially intervals (with notations).<br>Power set. Universal set. Venn diagrams. Union and Intersection of sets. Difference of sets. Complement of a set. Properties of Complement sets. | 15 | 4 |
| | **2. Relations and Functions**<br>Ordered pairs. Cartesian product of sets, Number of elements in the Cartesian product of two finite sets. Cartesian product of the set of reals with itself (up to $R \times R \times R$). Definition of relation, pictorial diagrams, domain, co-domain and range of a relation. Function as a special kind of relation from one set to another. Pictorial representation of a function, domain, co-domain and range of a function. Real valued functions, domain and range of these functions, constant, identity, polynomial, rational, modulus, exponential, logarithmic, signum and greatest integer functions with their graphs. sum, difference, product and quotients of functions. | 15 | 4 |
| | **3. Trigonometric Functions**<br>Positive and negative angles, Measuring angles in radians and in degrees and conversion from one measure to another. Definition of trigonometric functions with the help of unit circle. Truth of the identity $\sin^2 x + \cos^2 x = 1$, for all $x$. Signs of trigonometric functions, domain, range and sketch their graphs. Expressing $\sin(x \pm y)$ and $\cos(x \pm y)$ in terms of $\sin x$, $\cos x$, $\sin y$ and $\cos y$. | 15 | 7 |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| | Deducing identities like the following:<br>$\tan(x \pm y) = \frac{\tan x \pm \tan y}{1 \mp \tan x \tan y}$, $\cot(x \pm y) = \frac{\cot x \cot y \mp 1}{\cot y \pm \cot x}$<br>$\sin x + \sin y = 2 \sin \frac{x+y}{2} \cos \frac{x-y}{2}$<br>$\cos x + \cos y = 2 \cos \frac{x+y}{2} \cos \frac{x-y}{2}$,<br>$\sin x - \sin y = 2 \cos \frac{x+y}{2} \sin \frac{x-y}{2}$,<br>$\cos x - \cos y = -2 \sin \frac{x+y}{2} \sin \frac{x-y}{2}$<br>Identities related to sin2*x*, cos2*x*, tan2x, sin3*x*, cos3*x* and tan3*x*.<br>General solutions of trigonometric equations of the type $\sin\theta = \sin\alpha$, $\cos\theta = \cos\alpha$ and $\tan\theta = \tan\alpha$. | | |
| **Unit-II** | **ALGEBRA** | **30** | **15** |
| | **1. Complex Numbers and Quadratic Equations**<br>Need for complex numbers, especially $\sqrt{-1}$, to be motivated by inability to solve some of the quadratic equations. Algebraic properties of complex numbers. Argand plane, polar representation of complex numbers, modulus, argument. solution of quadratic equation in complex number system. | **13** | **6** |
| | **2. Linear Inequalities**<br>Linear inequalities. Algebraic solutions of linear inequalities in one variable and modulus function and their representation on the number line. Graphical solution of linear inequalities in two variables. | **5** | **4** |
| | **3. Permutations and Combinations**<br>Fundamental principle of counting. Factorial $n$ $(n!)$. Permutations and combinations, derivation of formulae for ${}^nP_r$ and ${}^nC_r$ and their connections, simple applications. | **12** | **5** |
| **Unit-III** | **CALCULUS** | **25** | **10** |
| | **1. Limits and Derivatives**<br>Intuitive idea of limit. Limits of polynomials and rational functions, trigonometric, exponential and logarithmic functions. Derivative introduced as rate of change both as that of distance function and geometrically. Definition of derivative, relate it to scope of tangent of the curve, derivative of sum, difference, product and quotient of functions. Derivatives of polynomial and trigonometric functions. | | |

## SEMESTER – II

## SUBJECT: MATHEMATICS ( MATH )

**FULL MARKS: 40** **CONTACT HOURS: 80 HOURS**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit-I** | **ALGEBRA** | **35** | **15** |
| | **1. Principle of Mathematical Induction**<br>Process of the proof by induction motivating the application of method by looking at natural numbers as the least inductive subset of real numbers. The principle of mathematical induction and simple applications. | **7** | **3** |
| | **2. Binomial theorem**<br>History, Statement and proof of the binomial theorem for positive integral indices. Pascal's Triangle, General and middle term in Binomial expansion, Simple applications. | **13** | **6** |
| | **3. Sequence and series**<br>Sequence and series. Arithmetic Progression (A.P.), Arithmetic Mean (A.M.), Geometric Progression (G.P.), Geometric Mean (G.M,) relation between A.M. & G.M., Arithmetic-Geometric Progression Series (AGP series), infinite G.P. and its sum, sum to *n* terms of the special series $\sum x, \sum x^2$ and $\sum x^3$ | **15** | **6** |
| **Unit-II** | **COORDINATE GEOMETRY (2D)** | **30** | **15** |
| | **1. Straight lines**<br>Brief recall of two dimensional geometry from earlier classes. Slope of a line and angle between two lines. Various forms of equations of a line: Parallel to Axis, Point–slope form, slope intercept form, two point form, intercept form, distance of a point from a line. | **10** | **5** |
| | **2. Conic sections**<br>Sections of a Cone: circle, ellipse, parabola, hyperbola, a point, a straight line and a pair of intersecting lines as a degenerated case of conic section; Standard equation of circle, general equation of circle, Standard equations and simple properties of Parabola, Ellipse and Hyperbola. | **20** | **10** |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit-III** | **STATISTICS AND PROBABILITY** | **15** | **10** |
| | **1. Statistics**<br>Measures of dispersion: Range, mean deviation, variance and standard deviation of ungrouped/ grouped data | **5** | **3** |
| | **2. Probability**<br>Random experiments, outcomes, Sample spaces (set representation), Events: Occurrence of events, 'not', 'and' and 'or' events, exhaustive events, mutually exclusive events, Axiomatic (set theoretic) probability, connections with other theories of earlier classes. Probability of an event, probability of 'not', 'and' and 'or' events. | **10** | **7** |

**[ Note:20 Hours reserved for Remedial classes, Tutorials and Home Assignments.]**

## Course: Project for Class XI

## Full Marks: 20

Projects should be conducted regularly throughout the year. A project notebook is to be prepared by each and every student where all the below mentioned activities should be recorded. There should be a project assessment once a year (once in Class XI and once in Class XII) where the student will be asked to do one of the activities and write it in his/her script provided for the purpose. The student should carry his/her project notebook during the assessment. A viva should also be conducted during the assessment to test the knowledge of the student regarding the project activity.

**List of Projects for Class XI**

| Sl. No. | Topics | Activities |
|---|---|---|
| 1 | Sequence and Series | To illustrate that the arithmetic mean of two different positive numbers is always greater than the geometric mean. |
| 2 | Complex Number | To interpret geometrically the meaning of $i = \sqrt{-1}$ and its integral powers. |
| 3 | Trigonometric Functions | To illustrate the values of sine and cosine functions for different angles which are multiples of $\frac{\pi}{2}$ and $\pi$. |
| 4 | Theory of Sets | To show that the total number of subsets of a given set with $'n'$ number of elements is $2^n$ . |
| 5 | Theory of Sets | Theoretic Operations using Venn Diagrams. |
| 6 | Relations and Functions | To verify that for two sets $A$ and $B$, $n(A \times B) = pq$ and the total number of relations from $A$ and $B$ is $2^{pq}$, where $n(A) = p$ and $n(B) = q$. |
| 7 | Limits and Derivatives | To find analytically $\lim_{x \to c} f(x) = \frac{x^2 - c^2}{x - c}$ |
| 8 | Probability | To write the sample space, when a coin is tossed once, two times, three times. |
| 9 | Conic Sections | To recognize different types of conics and its parts. |
| 10 | Permutations and Combinations | To find out the number of permutations and combinations from a set of 3 different objects taking 2 at a time. |

**Marks Division for the Project Assessment**

| Sl. No. | Item | Marks |
|---|---|---|
| 1 | Project Notebook | 10 |
| 2 | Doing and writing a project during the project assessment | 5 |
| 3 | Viva | 5 |
| | **Total** | **20** |

# CLASS - XII

## SEMESTER – III

## SUBJECT: MATHEMATICS ( MATH )

**FULL MARKS: 40** **CONTACT HOURS: 100 Hours**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **UNIT-I** | **RELATIONS AND FUNCTIONS** | **20** | **7** |
| | **1. Relations and Functions**<br>Types of relations: Reflexive, symmetric, transitive and equivalence relations. One-to-one and onto functions, composite functions, inverse of a function. | **10** | **4** |
| | **2. Inverse Trigonometric Functions**<br>Definition, range, domain, principal value branches. Graphs of inverse trigonometric functions. Elementary properties of inverse trigonometric functions. | **10** | **3** |
| **UNIT- II** | **ALGEBRA** | **25** | **10** |
| | **1. Matrices**<br>Concept, notation, order, equality, types of matrices, zero matrix, identity matrix, transpose of a matrix, symmetric and skew-symmetric matrices. Addition, multiplication and scalar multiplication of matrices; properties of addition, multiplication and scalar multiplication. Simple properties of addition, multiplication and scalar multiplication. Non-commutativity of multiplication of matrices. Existence of non-zero matrices whose product is a zero matrix (restrict to square matrices of order 2). Invertible matrices and proof of the uniqueness of inverse (if it exists). (Here all matrices will have real entries). | **15** | **6** |
| | **2. Determinants**<br>Determinant of a square matrix (upto $3 \times 3$ matrices), properties of determinants, minors, cofactors and application of determinants in finding the area of a triangle.<br>Adjoint and inverse of a square matrix. Consistency, inconsistency and number of solutions of system of linear equations by examples. Solutions of system of linear equations in two or three variables (having unique solution) using inverse of a matrix. | **10** | **4** |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **UNIT-III** | **CALCULUS** | **38** | **15** |
| | **1. Continuity and Differentiability**<br>Concept of Continuity and differentiability, derivative of composite functions, chain rule, derivatives of inverse trigonometric functions, derivative of implicit functions, concept of exponential and logarithmic functions, Derivatives of logarithmic and exponential functions, Logarithmic differentiation, derivative of functions expressed in parametric forms. Second order derivatives. | **20** | **8** |
| | **2. Application of Derivatives**<br>Application of derivatives, Rate of change of quantities, increasing and decreasing functions, tangents and normals, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems on basic principles and real life situations. | **18** | **7** |
| **UNIT-IV** | **PROBABILITY** | **17** | **8** |
| | Conditional Probability, Multiplication theorem on probability, independent events, total probability, Bayes' theorem, Random variable and its probability distribution. Mean and variance of a random variable. | | |

## SEMESTER – IV

## SUBJECT: MATHEMATICS ( MATH )

**FULL MARKS: 40** **CONTACT HOURS: 80 HOURS**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **Unit-I** | **VECTORS AND THREE-DIMENSIONAL GEOMETRY** | **30** | **15** |
| | **1. Vectors**<br>Vectors and scalars, magnitude and direction of a vector. Direction cosines and direction ratios of a vector. Types of vectors (equal, unit, zero, parallel and collinear vectors), position vector of a point, negative of a vector, components of a vector, addition of vectors, multiplication of a vector by a scalar, position vector of a point dividing a line segment in a given ratio. Definition, Geometrical Interpretation, properties and application of scalar (dot) product of vectors, vector (cross) product of vectors. | **10** | **5** |
| | **2. Three-Dimensional Geometry**<br>Introduction to 3D geometry, Coordinate axes and coordinate planes in 3D. Coordinates of a point, distance between two points, Direction cosines and direction ratios of a line joining points. Cartesian equation and vector equation of a line, skew lines, shortest distance between two lines. Angle between two lines. | **20** | **10** |
| **Unit-II** | **CALCULUS** | **40** | **20** |
| | **1. Integrals**<br>Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts. Evaluation of simple integrals of the following types and problems based on them.<br>$\int \frac{dx}{x^2 \pm a^2}$ $\int \frac{dx}{\sqrt{x^2 \pm a^2}}$ $\int \frac{dx}{\sqrt{a^2 - x^2}}$ $\int \frac{dx}{ax^2+bx+c}$ $\int \frac{dx}{\sqrt{ax^2+bx+c}}$<br>$\int \frac{px+q}{ax^2+bx+c}\,dx$ $\int \frac{px+q}{\sqrt{ax^2+bx+c}}\,dx$ $\int \sqrt{a^2 \pm x^2}\,dx$ $\int \sqrt{x^2 - a^2}\,dx$<br>$\int \sqrt{ax^2 + bx + c}\,dx$<br>Fundamental theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals. | **20** | **9** |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| | **2. Applications of the Integrals**<br>Applications in finding the area under simple curves, especially lines, circles/parabolas/ ellipses (in standard form only) | **10** | **6** |
| | **3. Differential Equations**<br>Definition, order and degree, general and particular solutions of a differential equation. Solution of differential equations by method of separation of variables, solutions of homogeneous differential equations of first order and first degree. Solutions of linear differential equation of the type:<br>$\frac{dy}{dx} + py = q$ where $p$ and $q$ are functions of $x$ or constants<br>$\frac{dx}{dy} + px = q$ where $p$ and $q$ are functions of $y$ or constants | **10** | **5** |
| **Unit-III** | **LINEAR PROGRAMMING** | **10** | **5** |
| | Introduction, related terminology such as constraints, objective function, optimization, graphical method of solution for problems in two variables, feasible and infeasible regions (bounded or unbounded), feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints). | | |

**[ Note:20 Hours reserved for Remedial classes, Tutorials and Home Assignments. ]**

## Course: Project for Class XII

## Full Marks: 20

Projects should be conducted regularly throughout the year. A project notebook is to be prepared by each and every student where all the below mentioned activities should be recorded. There should be a project assessment once a year (once in Class XI and once in Class XII) where the student will be asked to do one of the activities and write it in his/her script provided for the purpose. The student should carry his/her project notebook during the assessment. A viva should also be conducted during the assessment to test the knowledge of the student regarding the project activity.

**List of Projects for Class XII**

| Sl. No. | Topics | Activities |
|---|---|---|
| 1. | Relations and Function | To verify that the relation $R$ in the set L of all straight lines in a plane, defined by $R = \{(l, m): l \parallel m\}$ is an equivalence relation, |
| 2. | Relations and Function | To demonstrate a function which is one-one but not onto. |
| 3. | Relations and Function | To demonstrate a function which is not one-one but onto. |
| 4. | Differential Calculus | To find analytically the limit of a function $f(x)$ at $x = c$ and also to check the continuity of the function at that point. |
| 5. | Differential Calculus | To verify that amongst all the rectangles of the same perimeter, the square has the maximum area. |
| 6. | Differential Calculus | To understand the concepts of absolute maximum and minimum values of a function in a given closed interval through its graph. |
| 7. | Three-Dimensional Geometry | To explain the concept of octant by three mutually perpendicular planes in space. |
| 8. | Three-Dimensional Geometry | To measure the shortest distance between two skew lines and verify it analytically. |
| 9. | Probability | To explain the computation of conditional probability of a given event A, when event B has already occurred, through an example of throwing a pair of dice. |
| 10. | Linear Inequalities | To verify that a given inequality of the form<br>$ax + by + c < 0$ , $a, b > 0$, $c < 0$ represents only one of the two half planes. |

**Marks division for the Project Assessment**

| Sl. No. | Item | Marks |
|---|---|---|
| 1. | Project Notebook | 10 |
| 2. | Doing and Writing a project during the project assessment | 05 |
| 3. | Viva | 05 |
| | **Total** | **20** |

# WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION
## SYLLABUS FOR CLASSES XI AND XII

## SUBJECT : GEOGRAPHY (GEGR)

# Syllabus

*for*

# Higher Secondary Course in Geography

*under*

## West Bengal Council of Higher Secondary Education

*(as per NCERT Guidelines for NEP 2020)*

# Class XI

*Effective from*

## Academic Session 2024-2025

## Objectives of H.S. Geography Course

***Objective 1:*** Familiarize with basic concepts and core contents of Geography and examine man environment relationship.

***Objective 2:*** Description and interpretation of spatial pattern of features on thematic maps with location, time and space.

***Objective 3:*** Understanding the physico-cultural relationship with respect to different environmental adaptations.

***Objective 4:*** Apply geographical knowledge and skills of inquiry to emerging situations and problems at different levels, i.e. local, regional, national and international.

***Objective 5:*** Develop geographical skills to collect primary data from field survey and preparation of field based project report either manually or using computer based techniques whichever possible.

## Learning Outcomes of H.S. Geography Course

***LO1: Understanding the Geosystems:*** Students will accrue a comprehensive understanding of the basics of man-environment interactions at global, regional, and local scales.

***LO2: Synthesizing Environmental and Sustainability issues:*** Students will be able to synthesize social and environmental issues and grasp the know-hows of sustainable development.

***LO3: Acquiring Skills of Geographical Analysis:*** Students will acquire fundamentals of geospatial skills and geographical instrument handling capabilities to analyze geographical problems.

## Detailed Semester-wise Syllabus

## Class XI: Semester – I

## Course Code: GEGR

## Course Type: (Theory)

**FULL MARKS: 15** **HOURS: 34**

**SUB-TOPIC: FUNDAMENTALS OF PHYSICAL GEOGRAPHY**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **Geography as a discipline:**<br>Definition, nature and classification of Geography; Scope and content of Physical Geography | **03** |
| **Unit 2** | **I. Origin of Earth:**<br>Classical theories (Kant, Jean and Jeffrey); Modern theory (Big Bang theory)<br><br>**II. Interior of the Earth:**<br>Sources of information regarding the Earth's interior; Application of Seismology for analyzing Earth's interior; Layering of the earth | **09** |
| **Unit 3** | **Geomorphic Processes:**<br>**Endogenic processes** – Definition, concept, and types; Vulcanicity (Definition, concept, causes, and types of vulcanicity; associated landforms; global distribution of volcanoes); Earthquake (Concept and definition of earthquake related aspects; causes, and consequences; measuring instruments and scale; global earthquake prone zones with special reference to India; Seaquake and Tsunami)<br>**Exogenic processes** – Definition, concept, and types | **14** |
| **Unit 4** | **Weather and Climate:**<br>Composition and structure of the Atmosphere: gaseous, liquid, and solid components of atmosphere; Layering of atmosphere based on thermal characteristics and elemental distribution; Importance of Ozonosphere; Causes and consequences of Ozone depletion | **08** |

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 12** **HOURS: 26**

**SUB-TOPIC: FUNDAMENTALS OF HUMAN GEOGRAPHY**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **Scope and Content of Human Geography:**<br>Concept of man-environmental relationship; Fields and sub-fields of Human Geography | **04** |
| **Unit 2** | **Economic Geography:**<br>**Classification of Economic activities** – Primary, Secondary, Tertiary, Quaternary, and Quinary sectors with characteristics and examples<br>**Primary Activities** – Hunting and gathering; Pastoralism; Agriculture (Subsistence, Commercial, Mixed, Market gardening, and Dairy farming); Production-wise distribution of important cash crop of two globally leading countries (except India) – coffee, sugarcane, and cotton; Mining: types and environmental problems | **22** |

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 08** **HOURS: 20**

**SUB-TOPIC: GEOGRAPHY OF INDIA**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **India as a country:**<br>Geographical location; Size; Administrative setup; Neighbouring countries | **02** |
| **Unit 2** | **India – Structure and Physiography:**<br>Physiographic divisions of India with special reference to Tectonic provinces (Peninsular; Extra-peninsular; Indo-Gangetic; Coastal plains and Islands) | **10** |
| **Unit 3** | **India – Drainage systems:**<br>Drainage systems of India with reference to flow directions and perenniality (The Himalayan drainage system; The Peninsular drainage system); Usages and sharing of river water | **08** |

## Class XI: Semester – II

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 15** **HOURS: 30**

**SUB-TOPIC: FUNDAMENTALS OF PHYSICAL GEOGRAPHY**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **Concept of Isostasy:**<br>Concept of Isostatic anomalies; Theories of Airy and Pratt; Isostatic Adjustments; Cymatogeny | **04** |
| **Unit 2** | **Geomorphic processes:**<br>**Endogenic Processes** – Folding and faulting (mechanism, structure, and types)<br>**Exogenic processes** – Weathering (Definition, types, and resultant features); Soil forming process and factors; Soil profile development; Soil erosion; Soil conservation and management | **12** |
| **Unit 3** | **Weather and Climate:**<br>**Climatic Elements** - Solar Radiation; Heat balance; Temperature distribution (horizontal and vertical); Controlling factors of temperature distribution; Inversion of temperature<br>**Atmosphere Circulation** - Controlling factors of atmospheric motion; Tri-cellular model; Planetary winds; Zonal winds (Surface – Walker circulation; Upper Air – Jet stream) | **10** |
| **Unit 4** | **Hydrosphere:**<br>Modes and Occurrence of water on Earth; Global hydrological cycle ; Concept of run-off; Drainage basin as a hydrological unit | **04** |

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 12** **HOURS: 16**

**SUB-TOPIC: FUNDAMENTALS OF HUMAN GEOGRAPHY**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **Secondary Activities – Industry:**<br>Classification of Industries; Factors responsible for industrial location; Production-wise distribution pattern of industries (leading two countries worldwide except India) -<br>a) Agro-based: food processing industries<br>b) Sea-based: commercial marine fishing<br>c) Forest-based: paper industries<br>d) Mineral-based: Metallic (Iron and steel); Non-metallic (Petrochemical)<br>e) Manufacturing-based: Automobile | **12** |
| **Unit 2** | **Tertiary Activities:**<br>Definition, Classification, Case study (Trade; Transport; Service; Communication; Tourism) | **02** |
| **Unit 3** | **Quaternary Activities:**<br>Nature and characteristics of Information and Communication Technology (ICT) based industries; Research and Development (R&D) based industries | **01** |
| **Unit 4** | **Quinary Activities:**<br>Roles of specialists; decision-makers; consultants, policy formulators | **01** |

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 8** **HOURS: 14**

**SUB-TOPIC: GEOGRAPHY OF INDIA**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **Indian Climate:** Controlling factors of Indian climate; Nature of Indian monsoon; Seasonal variability of weather; Monsoon and Indian Economy; Impact of ENSO Phenomena and global warming on Indian climate | **06** |
| **Unit 2** | **Forests of India:** Types of forests; Ecological and economic significance; Programmes and policies of forest management in India | **03** |
| **Unit 3** | **Natural Hazards and Disasters of India:** Concept and classification of hazards; Types of disasters; Hazard management approaches (pre-hazard, during occurrence, and post-hazard); Natural disaster management policy; Hazard prone zones of West Bengal | **05** |

# CLASS-XI
## Course Code: GEGR
## Course Type: (Practical)

**FULL MARKS: 30** **HOURS: 40**

| Unit No. | Unit Content** | Hours | Marks |
|---|---|---|---|
| Unit 1 | **Introduction to Maps:**<br>Definition; components; types, importance and uses | 02 | 02 |
| Unit 2 | **Map scale:**<br>Concept and types of map scales; Graphical scale (Concept of Linear; Comparative; Diagonal; and Vernier scales; Construction of Linear scale) | 09 | 04 |
| Unit 3 | **Map Projection:**<br>Concept of map projection; Classification; Mathematical construction and properties of following projections –<br>a. Polar Zenithal Stereographic<br>b. Simple Conical with One Standard Parallel<br>c. Mercator's Projection | 10 | 05 |
| Unit 4 | **Interpretation of Topographical Maps:**<br>Study of Open series topographical maps (1:50000 scale) Preferably of a plateau region; Identification of topographical features using cross section drawings. Identification of break of slopes from cross section drawing and preparation of Broad Physiographic Divisions Map. Typical features identification (Drainage; Natural Vegetation; Transport and Communication; Settlement); Establishment of relationship between different Physical and cultural elements using Transect Chart (Schematic method) | 12 | 06 |
| Unit 5 | **Interpretation of Indian Daily Weather Maps:**<br>Daily Weather Maps of January and July months under following Heads - Pressure condition; Wind condition; Sky condition (cloudiness and precipitation) | 05 | 04 |
| Unit 6 | **Preparation and Presentation of Poster†:**<br>Poster related to any one prominent hazard/ disaster (Causes, consequences, Preparedness and Management) with respect to West Bengal | 02 | 04(2+2) |
| Unit 7 | **Laboratory Notebook* and Viva voce** | - | 05(3+2) |

* The laboratory notebook should contain A3 sized (42 cm ×29.7 cm) white pages in landscape mode.

†Poster related to selected topic should be of A1 (59.4 cm × 84.1 cm, approximately). Technique of preparing the hardcopy poster can be manual/ digital/ blended. The poster should carry signatures of teachers responsible for supervising the poster preparation.

**Each topic of laboratory notebook should contain the following sub-heads: statement of the problem, objectives, materials and methods (with data source), calculations, drawings/ representation (if any), analysis and interpretation.

**Tutorial + Remedial + Assignments: 6+10+4 = 20 Hours (Semester: I+II)**

# Syllabus

*for*

# Higher Secondary Course in Geography

*under*

## West Bengal Council of Higher Secondary Education

*(as per NCERTGuidelines for NEP 2020)*

## Class XII

*Effective from*

## Academic Session 2025-2026

## Objectives of H.S. GeographyCourse

***Objective 1:***Familiarize with basic concepts and core contents of Geography and examine man-environment relationship.

***Objective 2:***Description and interpretation of spatial pattern of features on thematic maps with location, time and space.

***Objective 3:***Understanding the physico-cultural relationship with respect to different environmental adaptations.

***Objective 4:***Apply geographical knowledge and skills of inquiry to emerging situations and problems at different levels, i.e. local, regional, national and international.

***Objective 5:***Develop geographical skills to collect primary data from field survey and preparation of field based project report either manuallyor using computer based techniques whichever possible.

## LearningOutcomesofH.S.Geography Course

***LO1:Understanding theGeosystems:*** Students will accrue a comprehensive understandingof the basics of man-environment interactions atglobal, regional, and local scales.

***LO2:Synthesizing Environmental and Sustainability issues:*** Students will be able to synthesize social and environmental issues and grasp the know-hows of sustainable development.

***LO3:Acquiring Skills of Geographical Analysis:***Students will acquire fundamentals of geospatial skills and geographical instrument handlingcapabilities to analyze geographical problems.

## Detailed Semester-wise Syllabus

## Class XII: Semester – III

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 15** **HOURS: 34**

**SUB-TOPIC: FUNDAMENTALS OF PHYSICAL GEOGRAPHY**

| Unit No. | Unit Content | Hours |
|---|---|---|
| Unit 1 | **Geotectonic:**<br>Continental Drift Theory according to Alfred Wegner | 06 |
| Unit 2 | **Geomorphic Process:**<br>**Exogenic processes** - Mass wasting, Glacial landforms, and Karst landforms | 09 |
| Unit 3 | **Climate:**<br>Water in the atmosphere (Condensation – formation and types, Precipitation – formation and types ) | 05 |
| Unit 4 | **Hydrosphere:**<br>Characteristics of ocean floor; Temperature and salinity; Ocean minerals, food, and power; Ocean deposits | 09 |
| Unit 5 | **Biosphere:**<br>Nature, concept and types of ecosystem; Concept of trophic levels; Food chain and food web | 05 |

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 10** **HOURS: 18**

**SUB-TOPIC: FUNDAMENTALS OF HUMAN GEOGRAPHY**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **Population:**<br>Concept of Demography; Distribution and density of population (worldwide); Determinants and measures of population growth - birth rate, death rate, migration | **10** |
| **Unit 2** | **Settlement:**<br>Classification, types and patterns of settlement; Factors determining the types of rural settlement; Functional classification of urban settlement; Problems of rural and urban settlements | **08** |

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 10** **HOURS: 28**

**SUB-TOPIC: GEOGRAPHY OF INDIA**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **Population of India:**<br>Distribution, density, growth, and composition of population | **03** |
| **Unit 2** | **Water Resources:**<br>Water conservation and management; Watershed management and rainwater harvesting; Nature and types of irrigation systems; Sustainable use of water resources | **03** |
| **Unit 3** | **Mineral and Energy Resources:**<br>Types, distribution and uses – Mineral resource (Iron Ore, Manganese, Bauxite, Copper, Mica); Conventional energy resource (Coal, Petroleum, Natural Gas, Nuclear Energy); Non-conventional energy resource(Solar, Wind, Tidal, Geothermal, Biogas energy, OTEC) | **10** |
| **Unit 4** | **Agriculture:**<br>Importance of agriculture in Indianeconomy; Concept of crop calendar; Crop rotation; Crop combination; Cropping intensity; Green, White, and Blue Revolution in India; Production-wise distribution of important cash crops (Jute, Cotton, Sugarcane and Tea) | **08** |
| **Unit 5** | **Transport and Communication:**<br>Importance of different modes of Transport; Types and importance of personal and mass communication systems | **02** |
| **Unit 6** | **Trade and Economy:**<br>Concept; Classification; Bases; Importance | **02** |

## Class XII: Semester - IV

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 15** **HOURS: 34**

**SUB-TOPIC: FUNDAMENTALS OF PHYSICAL GEOGRAPHY**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **Geotectonic:**<br>Sea floor spreading; Plate tectonic and associated landforms | **06** |
| **Unit 2** | **Geomorphic Processes:**<br>**Exogenic processes -** Fluvial landforms; Coastal landforms; Aeolian landforms; Combined works of exogenic processes and associated landforms | **10** |
| **Unit 3** | **Cycle of erosion:**<br>The role of WM Davis; Davis's concept of landform evolution; Concept of rejuvenation | **03** |
| **Unit 4** | **Atmosphere:**<br>Weather systems and atmospheric disturbances; Climatic classification after Koppen; Concept of climate change | **05** |
| **Unit 5** | **Hydrosphere:**<br>Movement of ocean currents and associated environmental effects | **06** |
| **Unit 6** | **Biosphere:**<br>Biodiversity -Definition, types, significance; Factors responsible for biodiversity depletion; Strategies and programs of biodiversity conservation | **04** |

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 10** **HOURS: 12**

**SUB-TOPIC: FUNDAMENTALS OF HUMAN GEOGRAPHY**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **Population Geography:**<br>Impact of migration on global demographic changes; Malthusian theory of population growth;Concept of optimum, under, and over population; Demographic Transition Model; Need of population control measures and population policy | **09** |
| **Unit 2** | **Human Development:**<br>Concept; definition; measurement (Human Development Index, Concept of human poverty index); and approaches (Welfare approach; AmartyaSen's Capability approach) | **03** |

## Course Code: GEGR
## Course Type: (Theory)

**FULL MARKS: 10** **HOURS: 14**

**SUB-TOPIC: GEOGRAPHY OF INDIA**

| Unit No. | Unit Content | Hours |
|---|---|---|
| **Unit 1** | **Indian Industries:**<br>a. Agro-based – Food processing<br>b. Sea-based – Commercial marine fishing<br>c. Forest-based –Paper industry<br>d. Mineral-based –Metallic (Iron and steel); Non-metallic (Petrochemical)<br>e. Manufacturing-based –Automobile<br>f. Information and communication technology | **07** |
| **Unit 2** | **Human Settlement and Development in Indian context:**<br>Human settlement types in India; Land resources and agricultural planning; Sustainable development in Indian context | **02** |
| **Unit 3** | **Geographical Perspectives on Selected Issues and Problems:**<br>a. Water pollution in Ganga Basin – Causes, consequences, and management<br>b. Air pollution in Kolkata and National Capital Region – Causes, consequences, and management<br>c. Arsenic pollution in southern West Bengal – Causes, consequences, and management<br>d. Human-wildlife conflict in Dooars and Sundarbans regions – Causes, consequences, and management<br>e. Land degradation in Jangalmahal– Causes, consequences, and management | **05** |

# CLASS-XII

## Course Code: GEGR

## Course Type: (Practical)

**FULL MARKS: 30** **HOURS: 40**

| Unit No. | Unit Content | Hours | Marks |
|---|---|---|---|
| Unit 1 | **Data Processing Using Statistical Techniques:**<br>a. Type and source of data<br>b. Tabulation and processing of data;Construction of data array; Frequency distribution table; Histogram,Frequency polygon;andOgives<br>c. Measures of central tendency - Mean; Median; Mode<br>d. Measures of dispersion – Absolute measures (range, mean deviation, standard deviation); Relative measure (co-efficient of variation) | 10 | 05 |
| Unit 2 | **Cartograms and Thematic Mapping:**<br>a. Bar graphs – Simple; Multiple; Compound<br>b. Divided proportional circles<br>c. Flow chart<br>d. Ombrothermicdiagram<br>e. Thematic maps – Dot and sphere; Isopleths; Choropleth | 10 | 05 |
| Unit 3 | **Application of Geographical Instruments:**<br>a. Angular measurement using Prismatic Compass (forward and backward bearings)<br>b. Pebble diameter measurement using Slide Caliper (major, minor, and intermediate axes)<br>c. Measurement of strike direction and dip amount using Clinometer Compass<br>d. Six's maximum & minimum thermometer | 12 | 05 |
| Unit 4 | **Remote Sensing and Geographic Information System (GIS):**<br>a. **Remote sensing** - Concept of remote sensing;Definition; Source of energy; Types of sensors; Types of image acquisition platforms; Modern application<br>b. **GIS** – Introduction to GIS; Hardware and software requirements; Data formats – vector and raster; Concept of data input, editing, analysis, manipulation, and representation | 04 | 05 |
| Unit 5 | **Preparation and Presentation of Field Report:**<br>Report based of structured survey schedule on (any one) –<br>a. Household survey<br>b. Market survey<br>c. Traffic survey<br>Note: Student of school in rural area will visit any type of urban centre or unit/Student of school in urban area will visit a rural area ( household survey only ) | 04 | 05 (3+2) |
| Unit 6 | **Laboratory Notebook* and Viva Voce** | - | 05 (3+2) |

* The laboratory notebook should contain A3 sized white pages (42 cm ×29.7 cm) in landscape mode

**Tutorial+ Remedial+ Assignments: 6+10+4= 20 Hours(Semester: I+II)**

# Guidelines for Preparation of Field Report

***Every student needs to participate in fieldwork and prepare a filed report according to the following guidelines:***

**A. Household Survey:**

1. Each student will prepare a report based on primary data collected from household survey with the help of properly formulated and structured survey schedule having open ended, double choice, and multiple choice questions.
2. Student will select either a rural area/ mouza (for school students from urban area) or an urban (at least a Class-VI Town as categorized by Census of India) area/ municipal ward (for school students from rural area) for the study, with primary objective of demographic and socio-economic information.
3. Each student should survey at least five households selected through simple random sampling without replacement method.
4. The report should be hand written in A4 sized white pages in candidate's own words. The word limit should be of 500 words excluding tables, figures, maps, photographs, and appendices.
5. A copy of the field report duly signed by the concerned teacher will be submitted on the date of examination.
6. The field report should contain the following sections – Introduction, Selection of Study Area, Objectives of the Study, Methodology, Results and Discussion/ Major Inferences, Conclusions.

**B. Market Survey:**

1. Each student will prepare a report based on primary data collected from market survey with the help of properly formulated and structured survey schedule having open ended, double choice, and multiple choice questions.
2. Each student should survey at least five shops selected through simple random sampling without replacement method.
3. The report should be hand written in A4 sized white pages in candidate's own words. The word limit should be of 500 words excluding tables, figures, maps, photographs, and appendices.
4. A copy of the field report duly signed by the concerned teacher will be submitted on the date of examination.
5. The field report should contain the following sections – Introduction, Selection of Study Area, Objectives of the Study, Methodology, Results and Discussion/ Major Inferences, Conclusions.

**C. Traffic Survey:**

1. Each student will prepare a report based on primary data collected from road traffic survey with the help of properly formulated and structured inventory, specifically having frequency distribution tables.
2. Each student should survey at an important three-point or four-point junction, nearest to the school.
3. The survey should be conducted in two sessions (forenoon and afternoon) of one hour duration.
4. The report should be hand written in A4 sized white pages in candidate's own words. The word limit should be of 500 words excluding tables, figures, maps, photographs, and appendices.
5. A copy of the field report duly signed by the concerned teacher will be submitted on the date of examination.
6. The field report should contain the following sections – Introduction, Selection of Study Area, Objectives of the Study, Methodology, Results and Discussion/ Major Inferences, Conclusions.

# WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION

## SYLLABUS FOR CLASS XI AND XII

# SUBJECT : BIOLOGICAL SCIENCE ( BIOS )

## CLASS - XI

### SEMESTER – I

**FULL MARKS : 35** **CONTACT HOURS : 55 Hours**

### COURSE CODE: THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **UNIT I** (DIVERSITY OF LIVING ORGANISM) | Chapter-1: The Living World<br>Biodiversity; need for classification; three domains of life; Taxonomy and Systematics; concept of species; and taxonomical hierarchy; binomial nomenclature; Tools for study of Biodiversity; Museums; Zoological and Botanical Gardens; Herbaria (Definition: World's largest herbarium, name of the herbarium in Bengal, Importance of herbarium) | 2 | 19 |
| | Chapter-2: Biological Classification<br>Five Kingdoms of Classification; Salient features and classification of Monera; Protista and Fungi into major groups; Lichens, Viruses, Viroids and Prions. | 5 | |
| | Chapter-3: Plant Kingdom<br>Classification of Plants into major Groups, Salient and distinguishing features and a few examples of Algae, Bryophyta, Pteridophyta, Gymnosperm. | 5 | |
| | Chapter-4: Animal Kingdom<br>Salient features and classification of animals, non-chordates up to phyla level and chordates up to class level. | 7 | |
| **UNIT II** STRUCTURAL ORGANIZATIONS IN PLANTS AND ANIMALS) | Chapter-5: Morphology of Flowering Plants<br>Morphology of different parts of flowering plants: root, stem, leaf, inflorescence, flower, fruit, and seed. Description of families : Malvaceae, Solanaceae, Brassicaceae, Compositae, Leguminosae (Dicots), Poaceae, Liliaceae (Monocots). | 8 | 16 |
| | Chapter-6: Anatomy of Flowering Plants<br>Plant tissue systems including Mechanical tissue systems, anatomy and functions of tissue systems in dicots and monocots. | 4 | |
| | Chapter-7: Structural Organization in Animals<br>Animal Tissue Systems: epithelial, connective, muscular and nervous systems (structure, organization and function); morphology, anatomy and functions of different systems; digestive, circulatory, respiratory, nervous, and reproductive systems of frog. | 4 | |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **UNIT III** (CELL STRUCTURE AND FUNCTIONS) | Chapter-8: Cell- The Unit of Life<br>Cell theory and cell as the basic unit of life; structure of prokaryotic and eukaryotic cells; Plant cell and Animal cell; cell envelope; cell membrane, cell wall; cell organelles — structure and function; endo-membrane system, nucleus, endoplasmic reticulum, golgi bodies, lysosomes, vacuoles, mitochondria, ribosomes, plastids, microbodies, cytoskeleton, cilia, flagella, centrioles (ultra-structure and function). | 7 | 20 |
| | Chapter-9: Biomolecules<br>Chemical constituents of living cells: biomolecules; structure and function of proteins; carbohydrates; lipids; and nucleic acids; Enzyme — types; properties; enzyme action. | 9 | |
| | Chapter-10: Cell Cycle and Cell Division<br>Cell cycle; mitosis; meiosis; and their significance. | 4 | |

## CLASS - XI

## SEMESTER – II

## SUBJECT : BIOLOGICAL SCIENCE ( BIOS )

**FULL MARKS : 35** **CONTACT HOURS : 97 HOURS**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **UNIT IV** (PLANT PHYSIOLOGY) | Chapter-11: Photosynthesis in Higher Plants<br>Photosynthesis as a means of autotrophic nutrition; site of photosynthesis, pigments involved in photosynthesis (structure of chlorophyll; empirical formula of chlorophyll a, b, c, d, e, bacteriochlorophyll, carotene and xanthophyll); photochemical and biosynthetic phases of photosynthesis; cyclic and non-cyclic photophosphorylation; chemiosmotic hypothesis, photorespiration, C3 and C4 pathways, CAM Cycle (schematic pathway only), factors affecting photosynthesis. | 14 | 34 |
| | Chapter-12: Respiration in Plants<br>Exchange of gases; cellular respiration — glycolysis, fermentation (anaerobic), TCA cycle and electron transport system (aerobic); energy relations — number of ATP molecules generated; amphibolic pathways; respiratory quotient. | 14 | |
| | Chapter-13: Plant Growth and Development<br>Seed germination; phases of plant growth and plant growth rate; conditions of growth; differentiation, dedifferentiation and redifferentiation; sequence of developmental processes in a plant cell; plant growth regulators — auxin, gibberellin, cytokinin, ethylene, ABA, Photoperiodism — Definition and different types. | 6 | |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| **UNIT V** (HUMAN PHYSIOLOGY) | Chapter – 14: Digestion and Absorption<br>Introduction; Structure of human alimentary canal (drawing, labelling and function of different parts including dental arrangement and digestive glands); Role of digestive enzymes and the GI hormone in digestion; Peristalsis; Digestion, absorption and assimilation of protein, carbohydrate and fat; egestion; Nutritional and digestive disorders — PEM (protein energy malnutrition) indigestion, constipation, vomiting, jaundice, diarrhoea. | 9 | 63 |
| | Chapter-15: Breathing and Exchange of Gases<br>Respiratory organs in animals (name only); Respiratory system in humans; mechanism of breathing and its regulation in humans - exchange of gases, transport of gases and regulation of respiration, respiratory volume; disorders related to respiration — asthma, emphysema, occupational respiratory disorders. | 9 | |
| | Chapter-16: Body Fluids and Circulation<br>Composition of blood, blood groups, coagulation of blood; composition of lymph and its function; human circulatory system - Structure of human heart and blood vessels; cardiac cycle, cardiac output, ECG; double circulation; regulation of cardiac activity; disorders of circulatory system — hypertension, coronary artery disease, angina pectoris, heart failure. | 9 | |
| | Chapter-17: Excretory Products and their Elimination<br>Modes of excretion — ammonotelism, ureotelism, uricotelism; human excretory system – structure and function; urine formation, osmoregulation; counter-current mechanism; regulation of kidney function — renin-angiotensin system, atrialnatriuretic factor, ADH and diabetes insipidus; role of other organs in excretion; disorders — uremia, renal failure, renal calculi, nephritis; dialysis and artificial kidney, kidney transplant. | 7 | |
| | Chapter-18: Locomotion and Movement<br>Types of movement - ciliary, flagellar, muscular; skeletal muscle, contractile proteins and muscle contraction; skeletal system and its functions; joints; disorders of muscular and skeletal systems - myasthenia gravis, tetany, muscular dystrophy, arthritis, osteoporosis, gout. | 8 | |
| | Chapter-19: Neural Control and Coordination<br>Mechanism of neural control and co-ordination; Neuron and nerves; Nervous system in humans - central nervous system; peripheral nervous system and visceral nervous system; Brain and its major parts- cerebral cortex, thalamus, hypothalamus and limbic system; mid-brain, pons, medulla, cerebellum and spinal cord (function only); Modes of distribution and function of P.N.S. and autonomic nervous system; Generation and conduction of nerve impulse; reflex action and reflex arc; Sense organs – Sensory perception, outline structure and function of eye and ear; Disorders — Parkinson's and Alzheimer's diseases. | 12 | |
| | Chapter-20: Chemical Coordination and Integration<br>Endocrine glands and hormones; human endocrine system — hypothalamus, pituitary, pineal, thyroid, parathyroid, adrenal, pancreas, gonads; mechanism of hormone action (protein and steroid hormones); role of hormones as messengers and regulators, hypo- and hyperactivity and related disorders; dwarfism, acromegaly, cretinism, goitre, exophthalmic goitre, diabetes, Addison's disease. | 9 | |

# CLASS: XI

## SUBJECT : BIOLOGICAL SCIENCE ( BIOS )

## COURSE CODE : PRACTICAL

**FULL MARKS : 30** **CONTACT HOURS: 30 HOURS**

**Time allowed : 3 hours.** **Max. Marks : 30**

| EVALUATION SCHEME | MARKS |
|---|---|
| One major experiment Part A.(experiment no-1,3,7) | 6 |
| One minor experiment Part A.(experiment no-6,8,9,10,11) | 5 |
| Slide preparation Part A.(experiment no-2,4,5)<br>(any one) | 3 |
| Spotting. Part – B ( three) | 6(2x3) |
| Practical record+Viva voce | 5(3+2) |
| Investigatory project viva voce | 5(3+2) |
| Total: SEM-I = 14 PRACTICAL CLASSES + SEM-II = 22 PRACTICAL CLASSES ( 24HRS.) | 30 |

**A. List of Experiments**

1. Study and describe locally available common flowering plants from family Malvaceae, Solanaceae,Brassicaceae, Asteraceae,Leguminosae including dissection and display of floral whorls,Anther and Ovary to show number of chambers(Placentation).(Floral formula and floral diagrams.),Type of root.(Tap and adventitious.);Type of stem.(Herbaceous and woody); Leaf (Arrangement,shape,venation,simple and compound)
2. Preparation and study of TS of dicot and monocot roots and stems.(Primary.)
3. Study of osmosis by Potato Osmometer.
4. Study of plasmolysis in epidermal peels ( e.g..Rheo/lily or fleshy scale leaves of onion bulb )
5. Study of distribution of stomata on the upper and lower surfaces of leaves.
6. Comparative study of the rates of transpiration in the upper and lower surfaces of leaves.
7. Test for the presence of sugar. starch, proteins and fats in suitable plant and animal materials.
8. Test for presence of urea in urine.
9. Test for presence of sugar in urine.
10. Test for presence of Albumin in urine.
11. Test for presence of Bile salts in urine.

**B. Study and observe the following (Spotting)**

1. Parts of a compound microscope.
2. Specimens./Slides./Models. Identify with reasons.—Bacteria, Spirogyra,Rhizopus,mushroom,yeast,liverwort, moss, fern,pine cone: male and female,one monocotyledonous plant, one dicotyledonous plant, one lichen.Different types of inflorescence.(Racemose and Cymose)
3. Virtual specimens/Slides/Models. Identifying features of Amoeba, Hydra, Liver Fluke, Ascaris, Leech, Earthworm, Prawn, Silkworm, Honeybee, Snail, Starfish, Shark, Rohu, Frog, Lizard, Pigeon and Rabbit. Human blood, and Toad blood
4. Mitosis in onion root tip cells and animal cells (Grasshopper) from permanent slides.
5. Human skeleton and different types of joints with the help of Virtual image/Models only.

[Note:*18 **Hours** reserved for Remedial classes, Tutorials and Home Assignments.]

# CLASS - XII

## SEMESTER – III

## SUBJECT : BIOLOGICAL SCIENCE ( BIOS )

**FULL MARKS : 35** **CONTACT HOURS : 90 Hours**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| UNIT VI REPRODUCTION | Chapter 1: Sexual Reproduction in flowering plants<br>Flower structure;Development of male and female Gametophytes; Pollination — Types, Agencies and examples; Out breeding devices;Pollen pistil interaction; Double fertilization; Post-fertilization events-development of endosperm and embryo, development of seed and formation of fruit; Special modes — Apomixis; Parthenocarpy; Polyembryony; Seed dispersal and fruit formation and their significance. | 15 | 33 |
| | Chapter 2: Human reproduction<br>Male and female reproductive systems; Anatomy and Histology of testis and ovary, Gametogenesis-Spermatogenesis and Oogenesis; Menstrual cycle; Fertilization,embryo development up to blastocyst, formation and implantation; Pregnancy and placenta formation and function;Parturition: mechanism and neuroendocrine system involved in this mechanism, Lactation. | 15 | |
| | Chapter 3: Reproductive health<br>Need for reproductive health and prevention of sexually transmitted diseases (STDs); Birth control-need and methods, Contraception and medical termination of pregnancy(MTP); Amniocentesis;Infertility and Assisted reproductive technologies-IVF,ZIFT,GIFT(elementary idea for general awareness). | 3 | |
| UNIT-VII (GENETICS AND EVOLUTION) | Chapter 4: Principles of Inheritance and variation.<br>Heredity and Variation: Mendelian inheritance, Deviations from Mendelism-Incomplete dominance, Co-dominance, Multiple alleles and inheritance of blood groups, Pleiotropy; Elementary idea of polygenic inheritance; Chromosome theory of inheritance; Chromosomes and genes, sex determination in humans, birds and honeybees; Linkage and crossing over; Sex linked inheritance-hemophilia,colour blindness; Mendelian disorders in humans-Thalassemia; Pedigree Analysis; chromosomal disorders in humans; Down's syndrome, Turner's syndrome and Klinefelter's syndrome. | 20 | 57 |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| | Chapter 5: Molecular basis of inheritance<br>Search for genetic material and DNA as genetic material(experiments on bacterial transformation by F. Griffith; Avery, MacLeod and McCarty; Experiment by Hershey and Chase; Structure of DNA and RNA, DNA packaging, DNA replication; Central Dogma; Genetic Code, Translation, gene expression and regulation-lac operon; Genome, Human and Rice genome projects; DNA fingerprinting. | 25 | |
| | Chapter 6: Evolution<br>Origin of life;Biological evolution and evidences for biological evolution(Palaeontology, Embryology and molecular evidence); Darwin's contribution, modern synthetic theory; Mechanism of evolution – Variation (Mutation and Recombination) and Natural selection with examples, types of natural selection; Gene flow and genetic drift; Hardy-Weinberg Principle; Adaptive radiation; Human evolution. | 12 | |

# CLASS - XII

## SEMESTER – IV

## SUBJECT : BIOLOGICAL SCIENCE ( BIOS )

**FULL MARKS : 35** **CONTACT HOURS : 58 Hours**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| UNIT-VIII (BIOLOGY AND HUMAN WELFARE) | Chapter 7: Human health and diseases<br>Basic concept of immunology.-Immune system, Antigen, Antibody, antigen-antibody reaction, Types of immunity - vaccine and vaccinations; Pathogens: Parasites causing human diseases: Malaria, Filariasis, Chikungunya, Dengue, Ascariasis, Typhoid, Pneumonia, Common Cold, Amoebiasis, Ringworm, SARS (COVID), Allergy and Autoimmune disorders –Symptoms of disease, Name of causative agents, Mode of transmission. Preventive measures. Cancer, HIV and AIDS — Symptoms of diseases; Causative agents, Mode of transmissions, Preventive measures. Adolescence: Drug and alcohol abuse. | 13 | 20 |
| | Chapter 8.Improvement In food production<br>Plant breeding, Tissue culture, Single cell Protein. | 2 | |
| | Chapter 9: Microbes in Human Welfare<br>Microbes in food processing, Industrial production, Sewage treatment, Energy generation, Microbes as bio-control agents and biofertilizers, Antibiotics: Production and judicious use. | 5 | |
| UNIT –IX (BIOTECHNO-LOGY AND ITS APPLICATION) | Chapter 10: Biotechnology and its applications<br>Principle, Process of genetic engineering. (Recombinant DNA technology), Application of biotechnology in health and agriculture, Human Insulin and vaccine production, Stem cell therapy, Gene therapy; Genetically modified organisms: Bt Crops; Transgenic animals. Biosafety issues, Biopiracy and patents. | 15 | 15 |
| UNIT- X (ECOLOGY AND ENVIRON-MENT) | Chapter 11: Organisms and Populations<br>Meaning of Environment. Habitat and niche, Population interactions – Mutualism; Competition; Predation; Parasitism.<br>Population attributes – Growth, birth rate and death rate, age distribution. | 10 | 23 |
| | Chapter 12: Ecosystem.<br>Ecosystem and its pattern; Components of ecosystem. Productivity and Decomposition. Energy flow, Pyramids of number, Biomass and energy, Ecological succession. | 5 | |
| | Chapter 13: Biodiversity and its conservation<br>Biodiversity — concept, Patterns, Importance; Loss of biodiversity; Biodiversity conservation; Hotspots, Endangered organisms, Extinction, Red Data book. Sacred Groves, Biosphere reserves, National Parks, Wildlife Sanctuaries and Ramsar sites. | 4 | |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| | Chapter 14: Environmental issues<br>Solid waste management; Radioactive waste management; Success stories addressing environmental issues-Chipko movement, Dasholi Gram Swarajya Mandal movement (DGSM) Silent Valley movement, Amrita Devi Bishnoi (Jaipur)Movement. | 4 | |

# CLASS : XII

## SUBJECT : BIOLOGICAL SCIENCE ( BIOS )

## COURSE CODE : PRACTICAL

**FULL MARKS : 30** **CONTACT HOURS : 30 HOURS**

**Time allowed : 3 hours.** **Max. Marks : 30**

| EVALUATION SCHEME. | MARKS |
|---|---|
| One major experiment. 5. | 6 |
| One minor experiment. 2 and 3. | 5 |
| Slide preparation. 1 and 4. (Any one) | 3 |
| Spotting. (three) | 6(2x3) |
| Practical record+Viva voce | 5(3+2) |
| Investigatory project viva voce | 5(3+2) |
| Total : SEM-I= 12 PRACTICAL CLASSES + SEM-II = 10 PRACTICAL CLASSES ( 14.66 HRS). | 30 |

**A. List of experiments.**

1. Prepare a temporary mount to observe pollen germination.
2. Study the plant population density by quadrat method.
3. Study the plant population frequency by quadrat method.
4. Prepare a temporary mount on onion root tip to study mitosis.
5. Isolate DNA from available plant material, such as Spinach, Green pea seeds, Papaya or any other suitable materials.

**B. Study and observe the following. (Spotting)**

1. Flowers adapted to pollination by different agencies (Wind, Insects, Birds,etc.).
2. Pollen germination on stigma through a permanent slide.
3. Identification of stages of gamete development i.e.,T.S. of Mammalian Testis and TS of Mammalian Ovary through permanent slides.

4. Meiosis in Onion Bud cell or Grasshopper testis through permanent slides.
5. TS of Blastula through permanent slides (Mammalian.)
6. Prepare pedigree charts of any one of the genetic traits, such as rolling of tongue, blood groups, ear lobes, Widow's peak and colour blindness.
7. Common disease causing organisms like *Ascaris, Entamoeba, Plasmodium* , any fungus causing ringworm through Permanent slides/Models or virtual images or specimens, Comment on symptoms of diseases that they cause
8. Models, specimen showing symbolic association in root nodules of leguminous plants, Cuscuta on host, Lichens.
9. Flash card models showing examples of homologous and analogous organs.

[Note:*22 **Hours** reserved for Remedial classes, Tutorials and Home Assignments.]

# WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION
# SYLLABUS FOR CLASSES XI AND XII

## SUBJECT : EDUCATION (EDCN)

**EDUCATION (EDCN)**

**SYLLABUS**

**Class – XI**

**Semester – I**

**Full Marks: 50**

**Theory –40 Marks &Internal Assessment –10 Marks**

**Objectives:**

- To understand the meaning, concept and aims of education
- To become aware of different forms and agencies of education and their roles
- To understand the meaning and scope of educational philosophy and its different schools
- To understand the meaning, nature and scope of educational sociology
- To understand the concept of culture, dynamics of social organizations and its role in education

**Group – A (20 Marks)**

**Introduction to Education**

**Unit-I: Meaning Concept & Aims of Education (20 Contact Hours)**

a) Meaning of Education: Meaning, Concept and Definition of Education.Nature and Scope of Education, Narrow and Wider Concept of Education.

b) Aims of Education: Individualistic and Socialistic Aims of Education, Specific Aims of Education: Constitutional Values (Democracy and Secularism).

c) Factors of Education: Learner, Teacher, Curriculum and Environment.

**Unit-II: Forms & Agencies of Education (20 Contact Hours)**

a) Forms of Education: Formal, Informal, Non-formal (Meaning, Concept, Characteristics, Need, Role, Limitation).

b) Agencies of Education: School, Family, Mass Media, Newspaper, TV, Radio, Cinema, Internet, Library, Religious Institutions, Open School, Open University (Role only).

c) Guiding Agencies of Education: NCERT, SCERT, DIET, NCTE, UGC, UNESCO (Mention only).

**Group – B (20Marks)**

**Philosophical & Sociological Perspective in Education**

**Unit – I: Education & Philosophy (24 Contact Hours)**

a) Meaning of Educational Philosophy: Needs for Educational Philosophy, Relationship between Education and Philosophy.

b) Schools of Indian Philosophy:Astika and Nastika - Naya, Vedanta,Buddhism and Islam - Basic Principles and Educational Implications (With Special Reference to Metaphysics, Epistemology, Axiology).

c) Western Schools of Philosophy: Idealism, Realism, Naturalism and Pragmatism (Basic Principles and Educational Implications).

**Unit-II: Education & Society (16 Contact Hours)**

a) Meaning of Educational Sociology: Needs for Educational Sociology, Relationship between Education and Sociology.

b) Social Organization and Social Structure: Folkways, Mores and Social Groups & Social Mobility.

c) Culture and Education:Social and Cultural Change, Role of Education regarding these.

**Internal Assessment: 10 Marks (20 Contact Hours)**

(Teacher must keep records of the attendance and remarks)

1. **Demonstration on a Topic** (Teacher will assign a topic from the courses taught and inform students prior to the assessment. Students will demonstrate in front of class. The teacher must give remarkson basis of content knowledge, presentation skill, interaction, body language) **5 Marks**

2. **Group Discussion: (Brain Storming)**

Or

**Debate/Discussion on a Topic** (Teacher will assign topic prior to the assessment)

For Sl. No. 2, The teacher will assign students onto groups based on situation and class size. Topic of group discussion will be informed to the students prior to the assessment. **5 Marks**

# EDUCATION (EDCN)

## SYLLABUS

## Class – XI

## Semester - II

**Full Marks: 50**

**Theory –40 Marks &Internal Assessment –10 Marks**

**Objectives:**

- To comprehend a synoptic view of educational psychology and its different schools
- To understand human growth and development, associated factors and dimensions
- To know the historical development of Indian education along with different committees and discourses
- To know the contributions of Indian social reformers on education

**Group – C (20 Marks)**

**Psychological Perspective in Education**

**Unit – I: Education &Psychology (20 Contact Hours)**

a) Meaning of Educational Psychology:Needs of Educational Psychology, Relationship between Education and Psychology and Bases oh Human Behavior (Sensation, Perception & Conception).

b) Schools of Educational Psychology: Behaviourism, Gestalt and Psycho-analysis.

c) Method of Inquiry in Psychology: Observation, Experimentation, Case Study, Survey, Correlation, etc.

**Unit – II: Growth & Development (20 Contact Hours)**

a) Meaning of Growth and Development: Principles of Growth and Development, and its Educational Implication.

b) Factors of Development: Heredity and Environment; Role of Education on its.

c) Stages of Development: Infancy, Childhood, Adolescence.

Dimension of Development: Physical, Mental (Cognitive), Emotional, Social

With Reference to Different Levels of Education.

**Group – D (20 Marks)**

**Historical Development of Indian Education**

**Unit – I: Ancient,Medieval & Pre-Independent Period of Indian Education System (10 Contact Hours)**

a) Ancient Period: Vedic and Buddhist Education System (Synoptic Views).

b) Medieval Period: Islamic Education System (SynopticViews).

c) Pre-Independent Period: Charter Act-1813, Macaulay Minute, Woods Dispatch-1854,Hunter Commission- 1882, Curzon Educational Policy& National Educational Movement-1905,Sadler Commission-1917, Hartog Committee-1929, Sargent Plan- 1944 (Brief Study).

**Unit-II: Contribution of Indian Social Reformer towards the Development of Education in India (10 Contact Hours)**

a) Raja Ram Mohon Roy

b) Ishwar Chandra Vidyasagar

c) Begum Rokeya

d) Savitribai Phule

**Internal Assessment: 10 Marks (20 Contact Hours)**

(Teacher must keep records of the attendance and remarks)

3. **Demonstration on a Topic** (Teacher will assign a topic from the courses taught and inform students prior to the assessment. Students will demonstrate in front of class. The teacher must give remarks on basis of content knowledge, presentation skill, interaction, body language) **5 Marks**

4. **Group Discussion: (Brain Storming)**

Or

**Debate / Discussion on a Topic** (Teacher will assign topic prior to the assessment)

For Sl. No. 2, The teacher will assign students onto groups based on situation and class size. Topic of group discussion will be informed to the students prior to the assessment. **5 Marks**

**Project [ 20 marks ] – Marks to be awarded as the cumulative marks of the two Internal assessments awarded in Class XI**

# EDUCATION (EDCN)

## SYLLABUS

## Class – XII

## Semester – III

**Full Marks: 50**

**Theory – 40 Marks & Internal Assessment – 10 Marks**

**Objectives:**

- To know the post-independence developments of Indian education system
- To be aware of the recent changes in the Indian education system
- To comprehend the challenges in educational opportunities
- To develop an understanding of the contributions made by great educators
- To understand the concept of inclusive education and know the differently abled children
- To get a synoptic view of global perspectives on education
- To understand the role of positive psychology

**Group – A (20 Marks)**

**Education in Modern India**

**Unit – I: Post-Independent Period of Indian Education System (24 Contact Hours)**

a) University Education Commission (1948-49), Secondary Education Commission (1952-53), Indian Education Commission (1964-66) (Major Recommendations).

b) National Education Policy 1986 & 2020 – Salient Features.

c) Problems of Women Education, SC, ST, OBC, EWS, Equal Opportunity.

**Unit – II: Great Educators and their Contributions in Education (16 Contact Hours)**

a) Rabindranath Tagore
b) Swami Vivekananda
c) Mahatma Gandhi
d) Jean-Jacques Rousseau
e) John Dewey

**Group – B (20 Marks)**

**Recent Trends & Issues in Modern Education**

**Unit – I: Inclusive Education (20 Contact Hours)**

a) Education for Differently Abled Children: Meaning, Concept & Classification of Differently Abled (Children with Special Needs).

b) Visually Impaired, Hearing Impaired, Autism, Leaning Disability, Intellectual Disability (Characteristics & Educational Programme).

c) Meaning, Importance, and Barries of Inclusive Education, Role of Formal & Informal Agencies in Building an Inclusive Society.

**Unit – II: Education for All (20 Contact Hours)**

a) Education for 21st Century: Global Vision for Education- Delors Commission (4 Pillers of Education), International Commission on the Futures of Education.

b) Education for All: Universalization of Elementary Education in India.

c) Role of Positive Psychology in Modern Education.

**Internal Assessment: 10 Marks (20 Contact Hours)**

(Teacher must keep records of the attendance and remarks)

5. **Demonstration on a Topic** (Teacher will assign a topic from the courses taught and inform students prior to the assessment. Students will demonstrate in front of class. The teacher must give remarks on basis of content knowledge, presentation skill, interaction, body language) **5 Marks**

6. **Group Discussion: (Brainstorming)**

Or

**Debate / Discussion on a Topic** (Teacher will assign topic prior to the assessment)

For Sl. No. 2, The teacher will assign students onto groups based on situation and class size. Topic of group discussion will be informed to the students prior to the assessment. **5 Marks**

# EDUCATION (EDCN)
# SYLLABUS
# Class – XII

**Semester – IV**
**Full Marks: 50**
**Theory – 40 Marks & Internal Assessment – 10 Marks**

**Objectives:**

- To comprehend a synoptic view of learning mechanism and its different theories
- To understand learning, factors of learning and role of education
- To understand a synoptic view of mental health & wellbeing
- To develop an understanding of educational technology
- To develop an understanding of the use of computer and internet in education and communication
- To develop an understanding of ICT and e-learning
- To develop the concept of statistics and to develop skill in analyzing descriptive measures

**Group – C (20 Marks)**

**Psychology of Learning & Wellbeing**

**Unit – I: Learning & Learning Mechanism (24 Contact Hours)**

a) Learning: Meaning, Characteristics, and Factors affecting Learning - Maturation, Motivation, Memory, Imagination, Attention & Interest (Basic Concept).

b) Learning Mechanism: Classifications & Basic Characteristics including, Description of Experiment and Educational Implications of

- Conditioning (Pavlov, Skinner)
- Problem Solving (Thorndike & Gestalt)
- Synoptic Views of other Major Learning Approaches, e.g. Brunner, Ausubel, Vygotsky, Bandura.

c) Intelligence, Creativity & Personality: Basic Concept.

**Unit – II: Mental Health & Wellbeing (16 Contact Hours)**

a) Mental Health: Concept of Health & Mental Health as Prescribed by WHO, Means of Identify of Mental Health Problems, Common Mental Health Problems among Adolescence

(Anxiety, Stress related, Depression related & Behavioural Problem – Major Symptoms).

b) Wellbeing: Concept of Psychological Wellbeing, some Strategies for Promotion of Psychological Wellbeing – Mindfulness, Meditation & other Relaxation Techniques (Evidence Based)

c) Life Skills for Promotion of Mental Health & Wellbeing (Basic Concepts of Ten Core Life Skills as Prescribed by WHO)

**Group – D (20 Marks)**

**Educational Technology& Statistics in Education**

**Unit – I: Educational Technology (10 Contact Hours)**

a) Educational Technology: Concept, Need & Scope of Educational Technology, Differences between Technology in Education and Technology of Education.

b) Components of Educational Technology: Hardware and Software, System Approach (Concept).

c) Information & Communication Technology (ICT): Concept & Uses of ICT in Education, Digital Revolution in Education.

**Unit – II: Statistics in Education (10 Contact Hours)**

a) Statistics in Education: Concept, Applications andStatistical Methods (Data,Frequency Distribution, Graphical Representations)

b) Measures of Central Tendency and Standard Deviation (Concept, Applications, and Method of Calculation).

c) Correlation: Concept, Types and Methods of Computing Correlation Co-efficient (Product Moment and Rank Difference).

**Internal Assessment: 10 Marks (20 Contact Hours)**

(Teacher must keep records of the attendance and remarks)

7. **Demonstration on a Topic** (Teacher will assign a topic from the courses taught and inform students prior to the assessment. Students will demonstrate in front of class. The teacher must give remarks on basis of content knowledge, presentation skill, interaction, body language) **5 Marks**

**8. Group Discussion: (Brainstorming)**

Or

**Debate / Discussion on a Topic** (Teacher will assign topic prior to the assessment)

For Sl. No. 2, The teacher will assign students onto groups based on situation and class size. Topic of group discussion will be informed to the students prior to the assessment. **5 Marks**

**Project [ 20 marks ] – Marks to be awarded as the cumulative marks of the two Internal assessments awarded in Class XII**

# WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION
# SYLLABUS FOR CLASSES XI AND XII
# SUBJECT : POLITICAL SCIENCE ( POLS )

## Overview and Objective :

Political Science as a discipline deals with understanding the social structures and methods used to understand a government or a State. It also deals with the historical, philosophical, constitutional, and legal foundation of the political society. It further provides scope to identify the political values and ideas, governing institutions and their policy making processes. The subject enhances the ability to address the functions and processes of government and politics both at the National and International level.

The present WBCHSE curriculum of Political Science is framed in a systematic manner to facilitate students to have an understanding of political ideas, ideologies, institutions, policies, processes, and behaviour. The contents enrich student's writing, communication, data analysis skills and also develop knowledge about current and past political events across the world.

# CLASS - XI

## SEMESTER – I

## SUBJECT : POLITICAL SCIENCE ( POLS )

**TOPIC : 1. POLITICAL SCIENCE: THEORIES AND CONCEPTS**

**2. INDIAN CONSTITUTION**

**FULL MARKS: 40** **CONTACT HOURS: 100 Hours**

**COURSE CODE : THEORY**

**Sub Topic :**

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| UNIT 1 | **Nature and Scope of Political Science as a Discipline**<br>Definition<br>Nature of Political Science<br>Scope of Political Science | 15 | 04 |
| UNIT 2 | **State: Definition and Characteristics**<br>Definition of State<br>Characteristics of State | 10 | 05 |
| UNIT 3 | **Citizenship**<br>Meaning and Definition of Citizenship<br>Methods of Acquisition of Citizenship<br>Reasons of Loss of Citizenship<br>Citizenship in the Constitution of India | 15 | 07 |
| UNIT 4 | **Understanding Constitutions: Definition and types**<br>Definition of Constitution<br>Types of Constitution- Written, Unwritten, Rigid, Flexible- Merits and Demerits | 20 | 06 |
| UNIT 5 | **Making and the Philosophy of the Constitution**<br>Functions of the Constitution<br>Framing of the Constitution :<br>Demand for the establishment of a Constituent Assembly,<br>Composition of the Assembly,<br>Methods of deliberation,<br>Role of Dr. B.R. Ambedkar<br>Preamble – ideals and significance<br>Incorporating features of the constitutions of the different countries of the world | 25 | 08 |

| | | | |
|---|---|---|---|
| UNIT 6 | **Salient Features of the Constitution of India**<br>Largest Constitution<br>Written Constitution<br>Partly Rigid and Partly Flexible<br>Parliamentary System<br>Federalism- Quasi-Federal Structure<br>Fundamental Rights and Duties and<br>Directive Principles<br>Independence of the Judiciary<br>Single Citizenship<br>Anti-Defection Law<br>Reservation<br>Minority Rights<br>Secularism<br>Universal Adult Suffrage<br>Supremacy of the Constitution | 15 | 10 |
| | **TOTAL** | **100 Hours** | **40** |

# CLASS - XI

## SEMESTER – II

## SUBJECT : POLITICAL SCIENCE ( POLS )

**TOPIC : 1. POLITICAL SCIENCE: THEORIES AND CONCEPTS**

**2. INDIAN CONSTITUTION**

**FULL MARKS: 40** **CONTACT HOURS: 80 Hours**

**COURSE CODE : THEORY**

**Sub Topic :**

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| UNIT 1 | **Key Concepts of Political Theory:**<br>Law – Source and Classification<br>Liberty – Meaning, Classification, Safeguards<br>Equality- Meaning and Nature, Different forms (Social, political, legal, economic, culture, gender equality)<br>Justice – Meaning, Forms<br>Separation of Powers - Definition, Arguments for and against the notion | 15 | 08 |
| UNIT 2 | **Nation and Nationalism**<br>Meaning of Nation and Nationalism<br>Elements of Nationality<br>National Self- Determination<br>Tagore's views of Nationalism | 10 | 06 |
| UNIT 3 | **Forms of Government**<br>Definition and Basic Features –<br>Democracy, Authoritarianism, Totalitarianism | 15 | 08 |
| UNIT 4 | **Contemporary Indian Political Thought: Selected thinkers**<br>Mahatma Gandhi:<br>*Satyagraha, Non-Violence and Trusteeship*<br>Vivekananda: *Socio-Political reforms*<br>Netaji Subhas Chandra Bose: *Freedom and Nationalism*<br>Maulana Abul Kalam Azad: *Freedom and Education* | 15 | 06 |
| UNIT 5 | **Fundamental Rights:**<br>Meaning and Types<br>Directive Principles<br>Fundamental Duties of Indian Citizens | 10 | 06 |
| UNIT 6 | **Election and Representation**:<br>First Past the Post-System<br>Election Commission of India - Composition and Functions | 15 | 06 |
| | **TOTAL** | **80 Hours** | **40** |

**[Note:20 Hours reserved for Remedial classes, Tutorials and Home Assignments.]**

# CLASS: XI

## SUBJECT : POLITICAL SCIENCE ( POLS )

**COURSE CODE: PROJECT**

**FULL MARKS: 20**

**Sub Topic :**

| | |
|---|---|
| 1. | Success and Problems of the Application of Universal Adult Franchise (local area studies) |
| 2. | Right to Education and its Actual Implementation- Problem of Dropouts<br>(Local Area Studies) |
| 3. | Role of Media in Democracy |
| 4. | Fundamental Rights in the Indian Constitution and Two Case Studies Indicating Violation of any of these Fundamental Rights |

# CLASS - XII

## SEMESTER – III

## SUBJECT : POLITICAL SCIENCE ( POLS )

**TOPIC : 1. CONTEMPORARY WORLD POLITICS**

**2. INDIAN GOVERNMENT AND CONTEMPORARY POLITICS**

**FULL MARKS: 40** **CONTACT HOURS: 100 Hours**

## COURSE CODE : THEORY

**Sub Topic :**

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| UNIT 1 | **International Relations in the Post Second World War Period**<br>Cold War Era<br>Bipolarity and<br>End of Bipolarity<br>Non-Aligned Movement | 20 | 08 |
| UNIT 2 | **International Organizations and Institutions**<br>United Nations- Aims and Principles<br>General Assembly – Composition and Functions<br>Security Council -Composition and Functions<br>ECOSOC - Composition and Functions<br>International Court of Justice<br>Agencies- UNICEF, UNESCO, WHO<br>World Bank and International Monetary Fund (IMF) | 20 | 08 |
| UNIT 3 | **Security in the Contemporary World**:<br>Traditional Security – Internal and External<br>Non-traditional Security – Human Security, Terrorism, Migration, Poverty, Epidemics<br>Environmental Security | 10 | 07 |
| UNIT 4 | **Challenges of Nation-Building**<br>Partition of India<br>Refugee problem<br>Integration of Princely States<br>Linguistic Re-organization of States | 20 | 05 |
| UNIT 5 | **Political Parties and Party System**<br>Definition and Features of Political Parties<br>Functions of Political Parties<br>Election Process of India and Electoral Reforms | 20 | 05 |
| UNIT 6 | **India's Foreign Policy**<br>India and her Neighbours - Sri Lanka, Pakistan, Bangladesh, Nepal, Bhutan, Maldives<br>Major Powers-US, Russia and China<br>India's Nuclear Policy - Pokhran 1, Pokhran 2, PTBT, CTBT,NPT | 10 | 07 |
| | **TOTAL** | **100 Hours** | **40** |

# CLASS - XII

## SEMESTER – IV

## SUBJECT : POLITICAL SCIENCE ( POLS )

**TOPIC : 1. CONTEMPORARY WORLD POLITICS**

**2. INDIAN GOVERNMENT AND CONTEMPORARY POLITICS**

**FULL MARKS: 40** **CONTACT HOURS: 80 Hours**

## COURSE CODE : THEORY

**Sub Topic :**

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| UNIT 1 | **International Relations -Key Concepts and Political Doctrines**<br>Evolution of IR as a Discipline<br>Realism, Idealism, Liberalism, Marxism- Brief Outline | 18 | 08 |
| UNIT 2 | **Major Regional and Sub-regional Organisations**<br>European Union<br>SAARC<br>ASEAN<br>BIMSTEC | 10 | 06 |
| UNIT 3 | **Globalisation**<br>Economic, Political and Cultural consequences,<br>India and Globalisation<br>Globalization- Critical Analysis | 08 | 06 |
| UNIT 4 | **Organs of the Indian Government:**<br>Executive - Powers and Functions (President, PM, Governor, CM,Bureaucracy)<br>Legislature - Composition and Functions (Lok Sabha, Rajya Sabha, Vidhan Sabha, Vidhan Parishad, Speaker- Power and Functions)<br>Judiciary- Importance and Independence (Supreme Court, High Court, PILs, Consumer Courts, Lok Adalat), | 24 | 08 |
| UNIT 5 | **Contemporary Civil Society Movements in India**<br>Brief Outline : Bhoodan Movement<br>CSR Acts and Roles<br>Right to Information: Act 2005 | 08 | 06 |
| UNIT 6 | **Constitutional Amendments and Local Self-Government**<br>Methods of Amendments (Article 368)<br>73rd Amendment -Rural Local Self-Governemnt – 3 tier panchayat system- Composition, Functions and Source of Income<br>74th Amendment -Urban Local Self-Government- Municipality and Corporation – Composition and Functions and Source of Income | 12 | 06 |
| | **TOTAL** | **80 Hours** | **40** |

# [Note:20 Hours reserved for Remedial classes, Tutorials and Home Assignments.]

# CLASS: XII

## SUBJECT : POLITICAL SCIENCE ( POLS )

## COURSE CODE: PROJECT

## FULL MARKS : 20

**Sub Topic :**

| | |
|---|---|
| 1. | Survey and observation on the functioning of Gram Panchayat/Panchayat Samiti /Zilla Parishad/ Municipality/ Borough Committee/ Ward Committee etc. |
| 2. | Women's Participation in Local Level Politics |
| 3. | Major Initiatives to Empower Women- *Kanyashree (2013)/ Beti Bachao, Beti Padao (2015)* |
| 4. | Indian Foreign Policy- Analyses of India's relation with any one major power/ South Asian Neighbour |
| 5. | Globalisation– Its impact on India |

# WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION
# SYLLABUS FOR CLASSES XI AND XII
# SUBJECT : HISTORY ( HIST )

## CLASS - XI

### SUBJECT : HISTORY ( HIST )

### SEMESTER – I

**FULL MARKS : 40** **CONTACT HOURS : 90 HOURS**

### COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| Unit1:<br>Learning History | Understanding History:<br>Pre-History, Proto-History. Early Sources and their nature. Forms of Recorded History. Facts and interpretation. Indo- Persian tradition of History writing in Medieval India.<br>Concept of time in History.<br>Linear and cyclical periodisation of History and chronology. | 24 | 10 |
| Unit2:<br>Empires | Empires Across the three Continents<br>1300BCE TO 100BCE<br>Introducing the age of Empires. Dynamics of the Roman Empire. Implications of the Contact of the Romans with the sub-continental empires – the importance of slavery in the economy-Cultural transformation and impact on the slave economy | 33 | 15 |
| Unit3:<br>Comparative Studies | Concept of Governance<br>3.1. Citystates : Classical Governments<br>3.2. Monarchies from *janapadas* to *Mahajanapadas* (Chiefdoms to kingdoms)<br>3.3. Empires. Definition, Difference with Monarchy-Comparative history of Empires<br>a) The Mauryan empire and the Macedonian empire<br>b) Chola administration<br>c) Roman Empire and the Gupta Empire<br>d) The Mughal Empire and the Ottoman Empire | 33 | 15 |

# CLASS - XI

## SUBJECT : HISTORY ( HIST )

## SEMESTER – II

**FULL MARKS : 40** **CONTACT HOURS : 70 HOURS**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| Unit4:<br>Nature of State | State and its apparatus:<br>4.1. Nature of state, The ideal prototype<br>a) The Indian context -Kautilya, the Arthasastra and the state craft ;<br>Ziauddin Barani *: Fatwa-i-Jahandari* and the nature of the state under the Delhi sultans<br>b) The European context : Greek and the Roman world. Thomas Cromwell and the new Monarchy: intellectual basis of the early modern state.<br>4.2. Apparatus of Governance<br>a. Persian Satraps<br>b. Chinese Mandarins<br>c. Delhi Sultans : *Iqtadars*<br>d. Mughal *Mansabdars* | 25 | 15 |
| Unit 5:<br>Changing Traditions | The Crusades - Changing Cultural Traditions -<br>To appreciate the history of Cultural transformations with reference to paintings, art & architecture of the period. Renaissance periods.<br>Debate on Renaissance – positive and negative impact.<br>Roman Catholic Church & Protestant movements.<br>Bhakti, Sufi, Confucious, Tao, Shinto etc. | 20 | 10 |
| Unit 6 :<br>Expanding Horizons | Origins of Modern Science -From Witchcraft to Social emancipation- Astrology to Astronomy, Towards a solar centric universe. Geographical Explorations and new geographical knowledge -<br>Technological advancements.<br>Agricultural, Military and Shipbuilding technology-<br>Printing Revolution in Western Europe (With reference to the contributions of China, Japan and the Arab World to the art of Printing ) | 25 | 15 |

# CLASS - XI

## SUBJECT : HISTORY ( HIST )

## COURSE CODE : PROJECT

**FULL MARKS : 20**

| | |
|---|---|
| 1. | Prepare a time chart of Evolution |
| 2. | a. Map work : On a world map point out the places which were under the Roman Empire<br>b. Slavery and its impact on the contemporary world |
| 3. | Mapwork<br>a. On an outline map of Europe locate<br>i) Athens<br>ii) Sparta<br>b. On an outline map of India locate and name the sixteen *mahajanapadas*<br>c. Trade relation in the ancient times between Europe and India during 500BCE -500CE |
| 4. | Contributions of<br>a. Kautilya<br>b. Zia-ud-din Barani<br>c. Thomas Cromwell |
| 5. | Renaissance and its impact on the Human Life |
| 6. | Printing Revolution and its impact on the spread of education |

**[Note: 40 Hours reserved for Project , Remedial classes, Tutorials and Home Assignments.]**

# CLASS - XII

## SUBJECT : HISTORY ( HIST )

## SEMESTER – III

**FULL MARKS : 40** **CONTACT HOURS : 90 HOURS**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| Unit1:<br>1) Through the eyes of the travelers.<br>2) Cultural amalgamation<br>3) Imperial capital | 1. **Society and Polity of India (Between 10th and 17th Centuries) with reference to travelers' accounts :** Administrative Structure – Economic Life – Social and Religious Life–Literature, Art and Architecture<br>2. **Bhakti, Sufi, Nath, Yogi, Vaishnava, etc:** The Bhakti Cult– Shaivism–Vaishnavism -Bhakti Saints – Impact of Bhakti Ideology – Origins of Sufism–Sufi Orders in India– Impact of Sufism etc<br>3. Vijaynagara, Bahamani and others : Origins– Administrative Structure– Society and Economy–Religion and Culture – Art and Architecture – Literature– The Bahamani Successor States | 40 | 20 |
| Unit2:<br>1) Colonialism and Imperialism in the19th and 20th Centuries<br>2) Political basis of Colonialism<br>3) The levers of Colonial Control | **1. Brief overview of 17th and 18th Century Colonialisation in Asia and the New World :** Brief overview of Colonisation in Asia & the New World-Economic Dynamics of Imperialism and Colonialism; from Mercantile Capital to Industrial & Finance Capital<br>2. **Terminology of Imperialism, Colonialism, Neo-Imperialism** : The Political Basis of Colonialism- Political and Economic Domination and Subordination of the Colonies–Racism and Its Impact on Colonial Societies– Neo-imperialism<br>3. **The Levers of Colonial Control** : India- as a 'colonised' state – The instruments of control : Law/ Legislature / Bureaucracy/Police/Army - The subordination of the colonial economy | 50 | 20 |

# CLASS - XII

## SUBJECT : HISTORY ( HIST )

## SEMESTER – IV

**FULL MARKS : 40** **CONTACT HOURS : 70 HOURS**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| Unit3:<br>1) Rebels and Raj | 1. **Revolt of 1857 and its representations :**<br>Causes of the Revolt – Character – Causes of Failure – The impact of the Revolt | 70 | 07 |
| 2) Nationalism and Separatism | 1. **Aligarh Movement, Birth of Muslim League, Hindu Mahasabha:**<br>The Aligarh Movement – Sayyid Ahmed Khan – The 'two nation theory'-<br>Birth of the Muslim League – The Hindu Mahasabha – Politics of Separatism and the Pathway to Pakistan<br><br>2. **Pre-1917 and post-1917, till independence :**<br>The early Congress and the Moderate phase – Rise of Gandhi – Concept of Satyagraha – Gandhi in South Africa – Gandhi's popular appeal – Khadi, Charka, Village Reconstruction - Harijan Sampradaya Upliftment – Gandhian Philosophy of Non-Violence and its impact – The Quit India Movement (1942)- An Assessment of Gandhi in Indian and International Affairs.<br><br>**Contemporary Major Indian Freedom Movements** – Advent of Netaji Subhas Chandra Bose . Formation of Azad Hind Movement . Formation of INA and its background and impacts . Naval Mutiny. Other forms of revolutionary movements in Bengal , Punjab , Maharashtra. Transfer of Power and the related issues. | | 19 |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| 3) Framing of the Constitution | **The beginning of a New Era, India after 75 years of Independence :**<br>Making of the Indian Constitution – Salient Features of the Constitution with emphasis on social and economic empowerment and women empowerment – Five Year Plans – Liberalisation and the Opening up of the Indian Economy in the 1990s – Changing Foreign Policy with reference to the USA, Russia, China and Pakistan – Assessment of 75 years of Indian Independence | | 07 |
| 4) Partition , Nation Formation and related aspects | **The 1971 Indo-Pak War**<br>Formation of Bangladesh and its impact on India. | | 07 |

# CLASS - XII

## SUBJECT : HISTORY ( HIST )

## COURSE CODE : PROJECT

**FULL MARKS : 20**

| |
|---|
| Globalization |
| Women's Right Movement |
| Recent Political Crisis(International) |
| New Social Movement |
| Anti-Apartheid Movement |
| Environment And The World |
| Anti-Corruption Movement |
| Environmental Movement |
| World Peace Movement |

**[Note: 40 Hours reserved for Project , Remedial classes, Tutorials and Home Assignments.]**

# WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION
# SYLLABUS FOR CLASSES XI AND XII
# SUBJECT : PHILOSOPHY (PHIL)

## Aims and Objectives of the Proposed Curriculum

**General Objectives :**

- To prepare young minds to become constructive thinkers and responsible citizens.
- To impart an education that enables them to be capable of meaningfully contributing to a society that understands the environment and imbibes the ideals of sustainable development
- To impart an education that is not a mere collection of facts but is a tool that helps the student to find his or her status in society and life in general
- To impart an education that helps students in their character-building so that they embody empathetic social concerns and
- To ensure parity with the key ideals of NEP-2020, SEP-2023 as well as the CBSC curriculum
- To generate informative and intuitive knowledge as well as ensure skill development and analytical ability.
- To develop a mind oriented towards research and innovation.
- To develop social and ethical values in students
- To prepare students for the College /University entrance examination for higher education as well as different competitive exams

**Subject-specific Objectives :**

- Develop a foundational philosophical understanding of key issues relating to epistemology, metaphysics, logic, and ethics and take informed actions after identifying the assumptions that frame our thinking and actions
- Develop a foundational understanding of Classical Indian Philosophy as well as Western Philosophy
- Develop interest and basic knowledge of some key modern Indian philosophers
- Develop critical thinking abilities

# CLASS - XI

## SEMESTER – I

## SUBJECT : PHILOSOPHY (PHIL)

**FULL MARKS : 40** **CONTACT HOURS : 100 Hours**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| Unit – 1 Introduction to Indian Philosophy | 1. দর্শন শব্দের অর্থ (The meaning of the term *Darśana*) | 3 | 2 |
| | 2. ভারতীয় দর্শন সম্প্রদায়গুলির শ্রেণীবিভাগঃ সংক্ষেপে (Classification of Indian Philosophical System: in brief) | 8 | 3 |
| | 3. জ্ঞানলাভের ছয়টি পদ্ধতি – প্রমাণ সম্পর্কে ভারতীয় তত্ত্বসমূহ (Six ways of knowing – Indian theories of *pramāna*) | 10 | 3 |
| | 4. চার্বাক কর্তৃক অনুমান প্রমাণ খণ্ডন (Refutation of inference by *Cārvāka*) | 5 | 3 |
| | 5. ন্যায়সম্মত প্রত্যক্ষের লক্ষণ (*Nyāya* definition of *pratyakṣa* or perception) | 6 | 3 |
| | 6. নির্বিকল্পক ও সবিকল্পক প্রত্যক্ষের পার্থক্য (Distinction between determinate & indeterminate perception) | 6 | 3 |
| | 7. ন্যায় দর্শনের অনুমান সম্পর্কে বক্তব্য (*Nyāya* theory of inference): | 5 | 2 |
| | • অনুমিতির লক্ষণ (Definition of *anumiti*) | 9 | 2 |
| | • পক্ষ, সাধ্য ও হেতুর ধারণা (The concepts of *pakṣa, sādhya, hetu*) | 6 | 3 |
| | • ব্যাপ্তির স্বরূপ (The nature of *vyāpti*) | | |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| Unit – 2<br>Introduction to Western Philosophy | 1. দর্শনের স্বরূপ ও শাখাসমূহ (Nature and branches of Philosophy)<br>2. জ্ঞানের উৎসসমূহ (Sources of Knowledge)<br>a. অভিজ্ঞতাবাদ -লক, বার্কলে, হিউম (Empiricism -- Locke, Berkeley, Hume)<br>b. বুদ্ধিবাদ – ডেকার্ট, স্পিনোজা, লাইবনিজ (Rationalism -- Descartes, Leibnitz, Spinoza) | 10<br>16<br>16 | 6<br>5<br>5 |

## CLASS - XI

## SEMESTER – II

## SUBJECT : PHILOSOPHY (PHIL)

**FULL MARKS : 40** **CONTACT HOURS : 80 Hours**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| Unit – 1<br>Introduction to Logic | 1. যুক্তিবিজ্ঞানের প্রকৃতি – অবরোহ এবং আরোহ (The nature of Logic – Deductive and Inductive) | 4 | 2 |
| | 2. পদ, বাক্য, বচন, পদের ব্যাপ্যতা, সত্যতা ও বৈধতা (Terms, sentences, propositions, distribution of terms, truth & validity) | 6 | 4 |
| | 3. বাক্য থেকে বচনে রূপান্তর (Changing sentences into logical forms) | 8 | 4 |
| | 4. বচনের বিরোধিতা (Opposition of proposition) | 4 | 3 |
| | 5. অমাধ্যম অনুমান – আবর্তন, বিবর্তন, সমবিবর্তন (Immediate Inferences: Conversion, Obversion, Contraposition) | 8<br>10 | 4<br>4 |
| | 6. নিরপেক্ষ ন্যায় – মূর্তি ও সংস্থান এবং বৈধতা বিচার (Categorical Syllogism: Figure & Mood)& validity testing | 6 | 3 |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| | 7. যৌগিক যুক্তিঃ প্রাকল্পিক ও বৈকল্পিক (Compound arguments: Hypothetical and Disjunctive) | | |
| Unit – 2 Introduction to Ethics | 1. ভারতীয় নীতিবিদ্যা (Indian Ethics):<br>a. পুরুষার্থ (*Purusartha*)<br>b. শ্রীমদ্‌ভগবৎ গীতা – নিষ্কাম কর্মের ধারণা (Srimadbhagavad Gita – The concept of *Niskama Karma*)<br>c. বৌদ্ধদের অষ্টাঙ্গিক মার্গের ধারণা (Buddhist concept of Eight-fold *Margas*)<br>d. চার্বাক সুখবাদ (Carvaka Hedonism)<br>2. পাশ্চাত্য নীতিবিদ্যা (Western Ethics):<br>a. নৈতিক প্রত্যয়সমূহ – নৈতিক, অনৈতিক, নীতি-বহির্ভূত; উদ্দেশ্য ও অভিপ্রায়; ঠিক ও ভুল; ভাল ও মন্দ; ন্যায়বিচার (Ethical concepts: moral, immoral, non-moral; motive and intention; right and wrong; good and bad; justice) | 4<br>4<br>6<br>4<br>8<br>8 | 2<br>2<br>2<br>2<br>4<br>4 |

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| | b. নৈতিক তত্ত্বসমূহ (Theories of Ethics): Teleological & deontological Theories | | |

## PROJECT

**Suggested Topics:**

1. **Distinction between Ordinary and Extra-ordinary Contact ( Laukika and Alaukika Sannikarsa)**
2. **Svarthanumiti and Pararthanumiti**
3. **Realism and Its Different Forms**
4. **Idealism – Subjective Idealism of Berkeley**

**Project Guideline:**

Project is a piece of planned work or an activity that is finished over a period and intended to achieve a particular purpose following some steps.

1. Topic or Title of the study
2. Purpose of the study
3. Method of the study
4. Analysis and findings of the study
5. Conclusions

Reference

Preliminary pages should contain-

i. Acknowledgement ii. Certificate iii. Content page

# CLASS - XII

## SEMESTER – III

## SUBJECT : PHILOSOPHY (PHIL)

**FULL MARKS : 40** **CONTACT HOURS : 100 Hours**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| Unit – 1<br>Introduction to Metaphysics | 1. Western Metaphysics:<br>• Substance: Descartes, Spinoza & Leibnitz – Locke, Berkeley & Hume<br>• Causality: Regularity Theory & Entailment Theory<br>• Mind-Body Problem: Interactionism & Parallelism<br>2. Indian Metaphysics:<br>• Vedanta<br>1. Dvaita and Advaita Vedanta<br>2. Brahman and Maya | 16<br>12<br>10<br>15 | 1x12=12<br>1x8=8 |
| Unit – 2<br>Ethics & Social and Political Philosophy | Ethics<br>1. Kant, Mill, Bentham<br>2. Environmental Ethics<br>Social and Political Philosophy<br>Basic Concept: Society, Community, Association, Institutions, State, Law | 15<br>12<br>20 | 1x10=10<br>1x10 =10 |

# CLASS - XII

## SEMESTER – IV

## SUBJECT : PHILOSOPHY (PHIL)

**FULL MARKS : 40** **CONTACT HOURS : 80 Hours**

## COURSE CODE : THEORY

| UNIT No. | TOPICS | CONTACT HOURS | MARKS |
|---|---|---|---|
| Unit – 1<br>**Western Logic** | 1. Symbolic Logic<br>• Truth-functions – Variables, Constants, Truth-functional propositions: Negation, Conjunction, Disjunction, Material Implication, Material Equivalence<br>• Boolean Interpretation of categorical propositions<br>• Venn Diagram of categorical propositions<br>• Truth-Table method of determining forms of proposition : Tautology, Self-Contradictory, Contingent<br>2. Inductive Logic<br>• Nature of Induction<br>• Causality<br>• Mill's Method of Experimental Enquiry | 6<br>6<br>8<br>8<br>6<br>6<br>10 | 3<br>2<br>7<br>4<br>6 |
| Unit – 2<br>**Contemporary Indian** Thoughts | • Rabindranath Tagore's Humanism<br>• Swami Vivekananda's Karma yoga<br>• Mahatma Gandhi's Ahimsa | 10<br>10<br>10 | 6<br>6<br>6 |

## PROJECT

**Project Topics:**

1. **Vaisesika Categories (padarthas)**
2. **Ontological Arguments for the Existence of God (Western Philosophy)**
3. **The Idea of Democracy**
4. **Science and Hypothesis**

**Project Guideline**

Project is a piece of planned work or an activity that is finished over a period and intended to achieve a particular purpose following some steps.

1. Topic or Title of the study
2. Purpose of the study
3. Method of the study
4. Analysis and findings of the study
5. Conclusions

Reference

Preliminary pages should contain-

i. Acknowledgement ii. Certificate iii. Content page

# WEST BENGAL COUNCIL OF HIGHER SECONDARY EDUCATION
# SYLLABUS FOR CLASSES XI AND XII
# SUBJECT : SANSKRIT (SNSK)

COURSE OVERVIEW :

Sanskrit has been an enlightening language since the dawn of Indian intellectual endeavour. It has the indomitable power to disseminate the pearls of wisdom along with its adorable potential to impel human spirit to undertake a rapturous journey to the abode of truth. In the contemporary times when the Artificial Intelligence (AI) is gaining a commanding influence on earth and almost taking over the human intelligence, this wonderful language has the ability to strengthen human intelligence and raise to a higher degree of perfection. Moreover, the spirit of Indian knowledge systems and culture is enshrined in this divine language. The vastness of Sanskrit literature, in innumerable fields of diversities, at once awakens awe and wonder. It encompasses varied disciplines like literature, grammar, linguistics, philosophy, mathematics, astronomy, *yoga*, *āyurveda*, law and ethics, polity, economics, sociology, fine arts, natural science and technology. Sanskrit is not merely a carrier of thought but is the cradle of profound ideas, throbbing emotions and ethical values permeated in Indian culture. Therefore, cultivation of this language is not only an intellectual pursuit but is a dynamic force in building a self-reliant, self-enabled, prosperous and awakened nation.

The new syllabus of the Sanskrit (SNSK) course, prepared for the students of Higher Secondary classes under the umbrella of the West Bengal Council of Higher Secondary Education, is offering a scope for acquiring a profound knowledge about several genres of Sanskrit literary heritage.

The new syllabus of the Sanskrit (SNSK) course has introduced texts and/or narratives from the *Rāmāyaṇa*, the *Mahābhārata* (including *Śrīmadbhagavadgītā*), the Buddhist *Avadānaśataka*, the *Carakasaṁhitā*, the works of Kālidāsa, Bhāsa, Bhavabhūti and two authors of modern Sanskrit literature also. Sanskrit grammar is always an essential part of Sanskrit learning. Therefore, the new syllabus also includes a few topics of Sanskrit grammar. A student of Sanskrit requires to develop a holistic idea about the Sanskrit literary heritage. So, a basic outline of the history of Sanskrit literature will be taught in this course.

A student having a basic knowledge of any of the Indian vernacular languages may opt for this course.

It aims to encourage the students of Sanskrit to continue with their higher studies and researches on several domains of Indian knowledge system.

OBJECTIVES OF THE COURSE :

The new syllabus of the Sanskrit (SNSK) course, prepared for the students of Higher Secondary classes under the umbrella of the West Bengal Council of Higher Secondary Education, aims to offer an intensive knowledge about several genres of Sanskrit literary heritage.

The following are the main objectives of the course:

- Develop the skill of reading and comprehending Sanskrit texts.
- Make the students acquainted with the fundamentals of Sanskrit grammar, which would help them analysing the grammatical applications of Sanskrit texts.
- Introduce the salient features of Vedic, Epic, Purāṇic and Classical Sanskrit literatures including the texts on Āyurveda and other scientific and technical literature through the lessons on History of Sanskrit Literature.
- Offer a general idea about the socio-cultural, socio-political and socio-economic conditions of the ancient, mediaeval and even contemporary India to boost their management skill and to inspire them to choose the areas of interdisciplinary studies and researches in future.
- Introduce the basics of health-awareness, human values and self-management through certain texts.
- Encourage the students of Sanskrit to continue with their higher studies and researches on several domains of Indian knowledge system.
- Inspire the students to utilise their acquired knowledge of ethics, values and self-management for building a self-reliant, self-enabled, prosperous and awakened nation.

# CLASS - XI

## SEMESTER – I

## SUBJECT: SANSKRIT ( SNSK )

**FULL MARKS : 40** **CONTACT HOURS : 100 Hours**

## COURSE CODE: THEORY

| UNIT NO. | TOPICS | CONTACT HOURS | MARKS [Question type: MCQ] |
|---|---|---|---|
| **Part I** | 1. **সংস্কৃত সাহিত্য (Sanskrit Literature)** | **40** | **15** |
| Unit - I | **গদ্য (Prose):**<br>উপমন্যুকথা (বৈয়াসিক-মহাভারতের আদিপর্বের নির্বাচিত অংশ অবলম্বনে)<br>[*Upamanyukathā* (narrative based on select portion from *Ādiparvam* of *Vaiyāsika-Mahābhāratam*] | | **05**<br>[ 1 × 5 = 5 ] |
| Unit - II | **পদ্য (Poetry/Verse) :**<br>বর্ষাবর্ণনম্ (বাল্মীকি-রামায়ণের কিষ্কিন্ধ্যাকাণ্ডের অংশ বিশেষ)<br>[*Varṣāvarṇanam* (select portion from *Kiṣkindhyākāṇḍam* of *Vālmīki-Rāmāyaṇam*)] | | **05**<br>[ 1 × 5 = 5 ] |
| Unit III : | **দৃশ্যকাব্য (Drama):**<br>কৃপণঃকপালী (শ্রীজীব ন্যায়তীর্থ-কৃত 'চিপিটকচর্বণম্'-এর নির্বাচিত অংশ)<br>[*KṛpaṇaḥKapālī* (select portion from *Cipiṭakacarvaṇam* of Srijeeb Nyayatirtha)] | | **05**<br>[ 1 × 5 = 5 ] |
| **Part II** | **সংস্কৃত ব্যাকরণ ও সংস্কৃত সাহিত্যের ইতিহাস (Sanskrit Grammar & History of Sanskrit Literature)** | **60**<br>**(40 + 20)** | **25** |
| Unit IV : | **ব্যাকরণ (Grammar):** | **40** | **15** |
| | 1. সন্ধি [Sandhi] -<br>➢ স্বরসন্ধি [Vowel sandhi] - সবর্ণদীর্ঘ, গুণ ও বৃদ্ধি (*savarṇadīrgha*, *guṇa* and *vṛddhi*)<br>➢ ব্যঞ্জনসন্ধি [Consonant sandhi] - শ্চুত্ব,ষ্টুত্ব ও জশ্ত্ব (*ścutva*, *ṣṭutva* and *jaśtva*) | | [ 1 × 3 = 3 ]<br>[ 1 × 3 = 3 ] |
| | 2. শব্দরূপ [Declension] -<br>➢ অজন্ত শব্দ- বালক, লতা, ফল, কবি, মতি, বারি, নদী [এবং এইগুলির সমতুল অন্যান্য শব্দ]<br>(Words ending with vowel: *bālaka,latā,phala,kavi,mati,vāri,nadī* and similar words)<br>➢ সংখ্যাবাচক শব্দ- এক, দ্বি (তিন লিঙ্গে)<br>(Numerals: *eka*, *dvi* in three genders)<br>➢ সর্বনাম শব্দ- অস্মদ্, যুষ্মদ্<br>(Pronouns: *asmad*, *yuṣmad*) | | [ 1 × 3 = 3 ] |

| UNIT NO. | TOPICS | CONTACT HOURS | MARKS [Question type: MCQ] |
|---|---|---|---|
| | 3. ধাতুরূপ [Conjugation] - লট্, লঙ্ ও লৃট্- এই তিন লকারে (in three tenses: present, past, future)<br>➢ পরস্মৈপদী - √ভূ, √গম্, √কৃ, √পূজ্<br>(*Parasmaipadī* - √*bhū*, √*gam*, √*kṛ*, √*pūj*) | | [ 1 × 3 = 3 ] |
| | 4. প্রত্যয় [Suffix]-<br>➢ ক্ত, ক্তবতু, ক্ত্বা, ল্যপ্, ক্তিন্<br>(*kta*, *ktavatu*, *ktvā*, *lyap*, *ktin*) | | [ 1 × 3 = 3 ] |
| Unit V : | **বৈদিক, জাতীয় মহাকাব্য ও লৌকিক সংস্কৃত সাহিত্যের ইতিহাস (History of Vedic, Epic & Classical Sanskrit Literature):** | **20** | **10** |
| | 1. বৈদিক সাহিত্য (সংক্ষিপ্ত পরিচয়)<br>[Brief Introduction to Vedic Literature] -<br>➢ ঋগ্বেদ, সামবেদ (*Ṛgveda*, *Sāmaveda*) | | [ 1 × 4 = 4 ] |
| | 2. বাল্মীকি-রামায়ণ (রচয়িতা ও বিষয়বস্তুর সংক্ষিপ্ত পরিচয়)<br>[Brief Introduction to the author and subject-matter of *Valmīki-Rāmāyaṇa*] | | [ 1 × 3 = 3 ] |
| | 3. সংস্কৃত গল্পসাহিত্য (রচয়িতা ও বিষয়বস্তুর সংক্ষিপ্ত পরিচয়)<br>[Brief Introduction to the author and subject-matter of Sanskrit Narrative Literature] -<br>➢ পঞ্চতন্ত্র, হিতোপদেশ, কথাসরিৎসাগর (*Pañcatantra*, *Hitopadeśa*, *Kathāsaritsāgara*) | | [ 1 × 3 = 3 ] |

# CLASS - XI

## SEMESTER – II

## SUBJECT: SANSKRIT ( SNSK )

**FULL MARKS : 40** **CONTACT HOURS : 80 HOURS**

## COURSE CODE: THEORY

| UNIT NO. | TOPICS | CONTACT HOURS | MARKS<br>[Question type: SAQ including DQ] |
|---|---|---|---|
| **Part I** | **সংস্কৃত সাহিত্য (Sanskrit Literature)** | **40** | **20** |
| Unit - I | **গদ্য (Prose):**<br>প্রতিজ্ঞাসাধনম্ (পণ্ডিত অম্বিকাদত্ত ব্যাস রচিত 'শিবরাজবিজয়ম্' এর অংশ বিশেষ)<br>[*Pratijñāsādhanam* (selected portion from *Śivarājavijayam* of Ambikadatta Vyasa] | | **20**<br>• SAQ: 06 Marks<br>3 questions out of 4 (covering all the given texts of this part) each containing 2 marks to be answered in Sanskrit<br>[সংক্ষিপ্ত উত্তরের প্রশ্ন: চারটি (এই অংশে প্রদত্ত সকল গ্রন্থ অবলম্বনে) ২ নং-এর প্রশ্নের মধ্যে যেকোনো তিনটির সংস্কৃত-তে উত্তর করতে হবে].<br>**[2×3=6]** |
| Unit - II | **পদ্য (Poetry/Verse):**<br>ঋতুচর্যা ('চরকসংহিতা'র নির্বাচিত অংশ)<br>[*Ṛtucaryā* (selected portion from *Carakasaṁhitā*)] | | • SAQ: 04 Marks<br>2 questions out of 3 (1+1+1) each containing 2 marks to be answered in Sanskrit/Bengali/ English/ Hindi<br>[সংক্ষিপ্ত উত্তরের প্রশ্ন: তিনটি (১+১+১) ২ নং-এর প্রশ্নের মধ্যে যেকোনো দু'টির সংস্কৃত / বাংলা / ইংরাজি / হিন্দি-তে উত্তর করতে হবে].<br>**[2×2=4]** |
| Unit III | **দৃশ্যকাব্য (Drama):**<br>দানবীরঃ কর্ণঃ (মহাকবি-ভাস-রচিত 'কর্ণভারম্' রূপকের অংশ)<br>[*Dānavīraḥ Karṇaḥ* (selected portion from Bhāsa's *Karṇabhāram*] | | • DQ: 10 Marks<br>2 questions out of 3 (1+1+1) each containing 5 marks to be answered in Sanskrit/Bengali/ English/ Hindi<br>[ব্যাখ্যামূলক উত্তরের প্রশ্ন: তিনটি (১+১+১) ৫ নং-এর প্রশ্নের মধ্যে যেকোনো দু'টির সংস্কৃত/বাংলা/ইংরাজি/ হিন্দি-তে উত্তর করতে হবে].<br>**[5×2=10]** |

| UNIT NO. | TOPICS | CONTACT HOURS | MARKS<br>[Question type: SAQ including DQ] |
|---|---|---|---|
| **Part II** | **সংস্কৃত ব্যাকরণ ও সংস্কৃত সাহিত্যের ইতিহাস (Sanskrit Grammar & History of Sanskrit Literature)** | **40 (20+20)** | **20** |
| Unit IV : | **ব্যাকরণ (Grammar):**<br>1. সন্ধি [Sandhi] -<br>➢ স্বরসন্ধি [Vowel sandhi] - যণ্, অয়াদি<br>(*yaṇ*, *ayetcetera*)<br>➢ ব্যঞ্জনসন্ধি [Consonant sandhi]-অনুস্বার, পরসবর্ণ<br>(*anusvāra*, *parasavarṇa*)<br>➢ বিসর্গসন্ধি [*Visarga*-sandhi] - উত্ব, রুত্ব, লোপ, বিসর্গস্থানেস্, শ্, ষ্<br>(*utva*, *rutva*, deletion, and replacement of *visarga* by *s*, *ś*, *ṣ*)<br>2. শব্দরূপ [Declension] -<br>➢ অজন্ত শব্দ - শিশু, ধেনু, মধু, মাতৃ, পিতৃও সমতুল অন্যান্য শব্দ<br>(Words ending with vowel: *śiśu*, *dhenu*, *madhu*, *mātṛ*, *pitṛ* and similar words)<br>➢ হলন্ত শব্দ - রাজন্, ভবৎ, কর্মন্, পথিন্, গুণিন্, দিশ্, আত্মন্ [এবং এইগুলির সমতুল অন্যান্য শব্দ]<br>(Words ending with consonant: *rājan*, *bhavat*, *karman*, *pathin*, *guṇin*, *diś*, *ātman* and similar words)<br>➢ সংখ্যাবাচক শব্দ- ত্রি, চতুঃ (তিন লিঙ্গে)<br>(Numerals: *tri*, *catuḥ* in three genders)<br>➢ সর্বনাম শব্দ- সর্ব, তদ্, ইদম্, কিম্ (তিন লিঙ্গে)<br>(Pronouns: *sarva*, *tat*, *idam*,*kim* in three genders) | **20** | **10**<br>SAQ: 10 Marks<br>5 questions out of 6/7(covering all the topics of this unit) each containing 2 marks to be answered as per given instructions<br>[সংক্ষিপ্ত উত্তরের প্রশ্ন: (এই অংশের সকল বিষয় অবলম্বনে প্রদত্ত) ছয়/সাতটি ২ নং-এর প্রশ্নের মধ্যে যেকোনো পাঁচটির প্রদত্ত নির্দেশানুসারে উত্তর করতে হবে].<br>**[2×5=10]** |

| UNIT NO. | TOPICS | CONTACT HOURS | MARKS<br>[Question type: SAQ including DQ] |
|---|---|---|---|
| | 3. ধাতুরূপ [Conjugation] - লট্, লঙ্ ও লৃট্- এই তিন লকারে (in three tenses: present, past, future)<br>➢ পরস্মৈপদী -√দা, √স্থা, √শ্রু, √দৃশ্<br>(*Parasmaipadī- √dā, √sthā, √śru, √dṛś*)<br>4. প্রত্যয় [Suffix] -<br>➢ তুমুন্, শতৃ, শানচ্, কৃত্য প্রত্যয় (*tumun, śatṛ, śānac, kṛtya* suffixes) | | |
| Unit V : | **বৈদিক, জাতীয় মহাকাব্য ও লৌকিক সংস্কৃত সাহিত্যের ইতিহাস (History of Vedic, Epic & Classical Sanskrit Literature):**<br>1. বৈদিক সাহিত্য (সংক্ষিপ্ত পরিচয়)<br>[Brief Introduction to Vedic Literature] -<br>➢ যজুর্বেদ, অথর্ববেদ ও বেদাঙ্গ [*Yajurveda, Atharvaveda* and *Vedāṅgas*]<br>2. বৈয়াসিক-মহাভারত (রচয়িতা ও বিষয়বস্তুর সংক্ষিপ্ত পরিচয়)<br>[Brief Introduction to the author and subject-matter of *Vaiyāsika-Mahābhārata*]<br>3. সংস্কৃত গীতিকাব্য (রচয়িতা ও বিষয়বস্তুর সংক্ষিপ্ত পরিচয়)<br>[Brief Introduction to the authors and subject-matters of Sanskrit lyrical poetries] -<br>➢ গীতগোবিন্দ ও মেঘদূত (*Gītagovinda* and *Meghadūta*) | **20** | **10**<br>• SAQ: 6 Marks<br>3 questions out of 4 (covering all the topics of this unit) each containing 2 marks to be answered in Sanskrit/Bengali/ English/ Hindi<br>[সংক্ষিপ্ত উত্তরের প্রশ্ন: (এই অংশের সকল বিষয় অবলম্বনে প্রদত্ত) চারটি ২ নং-এর প্রশ্নের মধ্যে যেকোনো তিনটির সংস্কৃত/বাংলা/ইংরাজি/হিন্দি-তে উত্তর করতে হবে].<br>**[2×3=6]**<br>• DQ: 4 Marks<br>1 question out of 2 each containing 4 marks to be answered in Sanskrit/Bengali/ English/ Hindi<br>[ব্যাখ্যামূলক উত্তরের প্রশ্ন: দুটি ৪ নং-এর প্রশ্নের মধ্যে যেকোনো একটির সংস্কৃত/বাংলা/ইংরাজি/হিন্দি-তে উত্তর করতে হবে].<br>**[4×1=4]** |

# CLASS: XI

## SUBJECT: SANSKRIT ( SNSK )

## COURSE CODE: PRACTICAL/PROJECT

**FULL MARKS : 20** **CONTACT HOURS : 20**

| | Sub Topic (Project) | Contact hours | Marks |
|---|---|---|---|
| 1. | প্রাচীন ভারতের জনপদ, পাহাড়, নদ-নদী থেকে একটি বিষয়<br>[Provinces, Mountains and Rivers of ancient India – any one topic] | **20** | Pictorial and Informative Project work in Sanskrit language with Devanāgarī script on any two topics<br>[ছবি ও তথ্যসহ সংস্কৃত ভাষায় দেবনাগরী লিপিতে যে কোনো দুটি বিষয় অবলম্বনে প্রকল্প-কর্ম]<br>**[10 + 10 = 20]** |
| 2. | প্রথম ও দ্বিতীয় সেমেস্টার-এর পাঠ্যান্তর্গত বিষয়সমূহ (সংস্কৃত সাহিত্য ও সাহিত্যের ইতিহাস) থেকে একটি বিষয়<br>[Any one topic from the syllabus of Semester I or II (Sanskrit Literature and History of Sanskrit Literature)] | | |
| 3. | অনুচ্ছেদ রচনা (প্রকৃতি-বিষয়ক, জীবনী-বিষয়ক, নীতি/শিক্ষা-বিষয়ক) –একটি<br>[Paragraph writing (Nature, Biography, Ethics/Morality/Education) – any one topic] | | |

# CLASS - XII

## SEMESTER – III

## SUBJECT: SANSKRIT ( SNSK )

**FULL MARKS : 40** **CONTACT HOURS : 100 Hours**

## COURSE CODE: THEORY

| UNIT NO. | TOPICS | CONTACT HOURS | MARKS [Question type: MCQ] |
|---|---|---|---|
| **Part I** | **সংস্কৃত সাহিত্য (Sanskrit Literature)** | **40** | **15** |
| Unit – 1 | **গদ্য (Prose):**<br>শ্রীমতী ('অবদানশতকম্'-এর অংশ বিশেষ)<br>[*Śrīmatī* (selected portion of *Avadānaśatakam*)] | | **05**<br>[1 × 5=5] |
| Unit – 2 | **পদ্য (Poetry/Verse):**<br>অভ্যাসবশগংমনঃ ('শ্রীমদ্ভগবদ্গীতা'-র নির্বাচিত অংশ)<br>[*Abhyāsavaśagaṁmanaḥ* (selected portion from *Śrīmadbhagavadgītā*)] | | **05**<br>[1 × 5=5] |
| Unit – 3 | **দৃশ্যকাব্য (Drama):**<br>বীরঃ সর্বদমনঃ (মহাকবি-কালিদাস-রচিত 'অভিজ্ঞান-শাকুন্তলম্' নাটকের অংশ বিশেষ)<br>[*Vīraḥ Sarvadamanaḥ* (select portion from Kālidāsa's *Abhijñāna-Śākuntalam*)] | | **05**<br>[1 × 5=5] |
| **Part II** | **সংস্কৃত ব্যাকরণ ও সংস্কৃত সাহিত্যের ইতিহাস (Sanskrit Grammar & History of Sanskrit Literature)** | **60 (40+20)** | **25** |
| Unit – 4 | **ব্যাকরণ (Grammar):** | **40** | **15** |
| | 1. প্রত্যয় [Suffix] -<br>➢ তদ্ধিত- অণ্, মতুপ্, তরপ্, ঈয়সুন্, তমপ্, ইষ্ঠন্<br>(*taddhita*: *aṇ*, *matup*, *tarap*, *īyasun*, *tamap*, *iṣṭhan*)<br>➢ নামধাতু-প্রত্যয়- কাম্যচ্, ক্যচ্, ক্যঙ্<br>(suffix for *nāmadhātu*: *kāmyac*,*kyac*, *kyaṅ*) | | [1 ×5=5] |
| | 2. কারক-বিভক্তি ও সমাস [Case-ending and Compound]-<br>➢ কারক-বিভক্তি- কর্তৃ, কর্ম, করণ<br>(Case-endings: *kartṛ*, *karma*, *karaṇa*)<br>➢ সমাস- অব্যয়ীভাব, তৎপুরুষ<br>(Compounds: *avyayībhāva*, *tatpuruṣa*) | | [1 × 5=5]<br>[1 × 5=5] |

| UNIT NO. | TOPICS | CONTACT HOURS | MARKS [Question type: MCQ] |
|---|---|---|---|
| Unit – 5 | **পৌরাণিক ও লৌকিক সংস্কৃত সাহিত্যের ইতিহাস (History of Purāṇic and Classical Sanskrit Literature):** | **20** | **10** |
| | 1. পুরাণের সংক্ষিপ্ত পরিচয়<br>[Brief Introduction to the *Purāṇas*] | | [1 ×3=3] |
| | 2. ভাস, কালিদাস ও ভবভূতির সাহিত্যকৃতির সংক্ষিপ্ত পরিচয়<br>[Brief Introduction to the literary works of Bhāsa, Kālidāsa and Bhavabhūti] | | [1 ×4=4] |
| | 3. আর্যভট ও বরাহমিহির [গ্রন্থকার ও গ্রন্থের সংক্ষিপ্ত পরিচয়]<br>[Brief Introduction to Āryabhaṭa and Varāhamihira and their works] | | [1 ×3=3] |

# CLASS - XII

## SEMESTER – IV

## SUBJECT: SANSKRIT ( SNSK )

**FULL MARKS : 40** **CONTACT HOURS : 80 Hours**

## COURSE CODE: THEORY

| UNIT NO. | TOPICS | CONTACT HOURS | MARKS [Question type: SAQ including DQ] |
|---|---|---|---|
| **Part I** | **সংস্কৃত সাহিত্য (Sanskrit Literature)** | **40** | **20** |
| Unit – 1 | **গদ্য (Prose):**<br>হাসবিদ্যকথা (কবি-বিদ্যাপতি-কৃত 'পুরুষপরীক্ষা'র অংশ বিশেষ)<br>[*Hāsavidyakathā* (selected portion from *Puruṣaparīkṣā* of Vidyāpati)] | | • SAQ: 06 Marks<br>3 questions out of 4 (covering all the given texts of this part) each containing 2 marks to be answered in Sanskrit<br>[সংক্ষিপ্ত উত্তরের প্রশ্ন: চারটি (এই অংশে প্রদত্ত সকল গ্রন্থ অবলম্বনে) ২ নং-এর প্রশ্নের মধ্যে যেকোনো তিনটির সংস্কৃত-তে উত্তর করতে হবে].<br>**[2×3=6]**<br>• SAQ: 04 Marks<br>2 questions out of 3 (1+1+1) each containing 2 marks to be answered in Sanskrit /Bengali / English/ Hindi<br>[সংক্ষিপ্ত উত্তরের প্রশ্ন: তিনটি (১+১+১) ২ নং-এর প্রশ্নের মধ্যে যেকোনো দু'টির সংস্কৃত/বাংলা/ইংরাজি/ হিন্দি-তে উত্তর করতে হবে].<br>**[2×2=4]**<br>• DQ: 10 Marks<br>2 questions out of 3 (1+1+1) each containing 5 marks to be answered in Sanskrit/Bengali/ English/ Hindi<br>[ব্যাখ্যামূলক উত্তরের প্রশ্ন: তিনটি (১+১+১) ৫ নং-এর প্রশ্নের মধ্যে যেকোনো দু'টির সংস্কৃত/বাংলা/ইংরাজি/ হিন্দি-তে উত্তর করতে হবে].<br>**[5×2=10]** |
| Unit – 2 | **পদ্য (Verse):**<br>বনেচরভাষণম্ (ভারবি-রচিত 'কিরাতার্জুনীয়ম্' মহাকাব্যের প্রথম সর্গের নির্বাচিত অংশ)<br>[*Vanecarabhāṣaṇam* (selected portion from the 1st canto of *Kirātārjunīyam* of Bhāravi)] | | |
| Unit – 3 | **দৃশ্যকাব্য (Drama):**<br>আত্রেয়ী-বনদেবতা-সংবাদঃ (মহাকবি-ভবভূতি-রচিত 'উত্তররামচরিতম্' এর দ্বিতীয় অঙ্কের প্রারম্ভে বিষ্কম্ভকের নির্বাচিত অংশ)<br>[*Ātreyī-vanadevatā-saṁvādaḥ* (selected portion from the *Viṣkambhaka* part of 2nd act of *Uttararāmacaritam* of Bhavabhūti)] | | |
| **Part II** | **সংস্কৃত ব্যাকরণ ও সংস্কৃত সাহিত্যের ইতিহাস (Sanskrit Grammar & History of Sanskrit Literature)** | **40 (20+20)** | **20** |

| UNIT NO. | TOPICS | CONTACT HOURS | MARKS<br>[Question type: SAQ including DQ] |
|---|---|---|---|
| Unit – 4 | **ব্যাকরণ (Grammar):**<br>1. প্রত্যয় [Suffix]-<br>➢ সনাদি - সন্, যঙ্, ণিচ্<br>(*san*, *yaṅ*, *ṇic*)<br>➢ স্ত্রী - টাপ্, ঙীপ্<br>(*strī*: *ṭāp*, *ṅīp*)<br>2. কারক-বিভক্তি ও সমাস[Case-ending and Compound] -<br>➢ কারক-বিভক্তি - সম্প্রদান, অপাদান, অধিকরণ ও সম্বন্ধপদ<br>(Case-endings: *sampradāna*, *apādāna* and *sambandhapada*)<br>➢ সমাস – সাধারণ-কর্মধারয়, দ্বিগু (সমাহার), দ্বন্দ্ব, বহুব্রীহি (সমানাধিকরণ, ব্যধিকরণ, নঞ্)<br>(Compounds: *sādhāraṇa-karmadhāraya*, *samāhāra-dvigu*, *dvandva*, *bahuvrihi* - *samānādhikaraṇa*, *vyadhikaraṇa*, *nañ*) | **20** | SAQ: 10 Marks<br>5 questions out of 6/7(covering all the topics of this unit) each containing 2 marks to be answered as per given instructions<br>[সংক্ষিপ্ত উত্তরের প্রশ্ন: (এই অংশের সকল বিষয় অবলম্বনে প্রদত্ত) ছয়/সাতটি ২ নং-এর প্রশ্নের মধ্যে যেকোনো পাঁচটির প্রদত্ত নির্দেশানুসারে উত্তর করতে হবে].<br>**[2×5=10]** |
| Unit – 5 | **লৌকিক ও আধুনিক সংস্কৃত সাহিত্যের ইতিহাস (History of Classical and Modern Sanskrit Literature):**<br>1. গদ্য - দণ্ডী ও বাণভট্টের সাহিত্যকৃতি (সংক্ষিপ্ত পরিচয়)<br>[Brief Introduction to Daṇḍī and Bāṇabhaṭṭa and their literary works]<br>2. চম্পূ - নলচম্পূ ও ভারতচম্পূ (সংক্ষিপ্ত ধারণা)<br>[Brief Introduction to *Nalacampū* and *Bhāratacampū*]<br>3. আয়ুর্বেদ - চরক ও সুশ্রুত (গ্রন্থকার ও গ্রন্থের সংক্ষিপ্ত পরিচয়)<br>[Brief Introduction to Caraka and Suśruta and their works]<br>4. আধুনিক বাঙালি সংস্কৃতসাধক ও সাহিত্যকৃতি (সংক্ষিপ্ত পরিচয়)<br>[Bengalee authors of Modern Sanskrit literary works: a brief Introduction] -<br>➢ সিদ্ধেশ্বর চট্টোপাধ্যায়, সীতানাথ আচার্য, তারাপদ ভট্টাচার্য, বীরেন্দ্রকুমার ভট্টাচার্য ও শ্রীজীব ন্যায়তীর্থ<br>(Siddheswar Chattopadhyay, Sitanath Acharya, Tarapada Bhattacharya, Birendrakumar Bhattacharya, Srijeeb Nyayatirtha) | **20** | • SAQ: 6 Marks<br>3 questions out of 4 (covering all the topics of this unit) each containing 2 marks to be answered in Sanskrit/Bengali/ English/ Hindi<br>[সংক্ষিপ্ত উত্তরের প্রশ্ন: (এই অংশের সকল বিষয় অবলম্বনে প্রদত্ত) চারটি ২ নং-এর প্রশ্নের মধ্যে যেকোনো তিনটির সংস্কৃত/বাংলা/ইংরাজি/ হিন্দি-তে উত্তর করতে হবে].<br>**[2×3=6]**<br>• DQ: 4 Marks<br>1 question out of 2 each containing 4 marks to be answered in Sanskrit/Bengali/ English/ Hindi<br>[ব্যাখ্যামূলক উত্তরের প্রশ্ন: দুটি ৪ নং-এর প্রশ্নের মধ্যে যেকোনো একটির সংস্কৃত/বাংলা/ইংরাজি/ হিন্দি-তে উত্তর করতে হবে].<br>**[4×1=4]** |

# CLASS: XII

## SUBJECT: SANSKRIT ( SNSK )

## COURSE CODE : PRACTICAL/PROJECT

**FULL MARKS : 20** **CONTACT HOURS : 20 HOURS**

| | Sub Topic (Project) | CONTACT HOURS | MARKS |
|---|---|---|---|
| 1. | সংস্কৃত মনীষায় বিজ্ঞানচেতনা<br>[Scientific thoughts in Sanskritic intellectual tradition] | **20** | 1. Pictorial and Informative Project work in Sanskrit language with Devanāgarī script on any one from first two topics<br>&<br>2. Dialogue/Debate in Sanskrit in any relevant topic<br>১. ছবি ও তথ্যসহ সংস্কৃত ভাষায় দেবনাগরী লিপিতে প্রথম দুটি বিষয়ের মধ্যে যে কোনো একটি বিষয় অবলম্বনে প্রকল্প-কর্ম<br>এবং<br>২. সংস্কৃত বার্তালাপ/বিতর্ক – যেকোনো প্রাসঙ্গিক বিষয়ে]<br>**[10 + 10 = 20]** |
| 2. | প্রথম ও দ্বিতীয় সেমেস্টার-এর পাঠ্যান্তর্গত বিষয়সমূহ (সংস্কৃত সাহিত্য ও সাহিত্যের ইতিহাস) থেকে একটি বিষয়<br>[Any one topic from the syllabus of Semester III or IV (Sanskrit Literature and History of Sanskrit Literature)] | | |
| 3. | বার্তালাপ/বিতর্ক – যেকোনো প্রাসঙ্গিক বিষয়ে<br>[Dialogue/Debate in any relevant topic] | | |

**SUGGESTED READING :**


| | |
|---|---|
| 1. | *Helps to the Study of Sanskrit*, Janakinatha Sastri, Kolkata: Sanskrit Book Depot. |
| 2. | *সংস্কৃত সাহিত্যের ইতিহাস ও সংস্কৃত ত্রিধারা,* শ্রীকৃষ্ণগোপাল গোস্বামী ও আলপনা গোস্বামী। কলকাতা : গোস্বামী প্রকাশনী। |
| 3. | *সমগ্র ব্যাকরণ কৌমুদী,* ঈশ্বরচন্দ্র বিদ্যাসাগর, হেমচন্দ্র ভট্টাচার্য্য বিদ্যাবিনোদ সম্পাদিত। কলকাতা : চলন্তিকা প্রকাশক। |
| 4. | *সমগ্র ব্যাকরণ কৌমুদী,* ঈশ্বরচন্দ্র বিদ্যাসাগর, দুর্গাচরণ সাংখ্য-বেদান্ততীর্থ সম্পাদিত। কলকাতা : দেব সাহিত্য কুটীর প্রাইভেট লিমিটেড। |
| 5. | *নবরূপে ব্যাকরণ কৌমুদী,* শ্রীকৃষ্ণগোপাল গোস্বামী ও আলপনা গোস্বামী। কলকাতা : গোস্বামী প্রকাশনী। |
| 6. | *সংস্কৃত সাহিত্যের ইতিহাস,* যুধিষ্ঠির গোপ। কলকাতা : সংস্কৃত বুকডিপো। |
| 7. | *বেদের পরিচয়।* যোগীরাজ বসু। কলকাতা : ফার্মা কেএলএম প্রাইভেট লিমিটেড। |
| 8. | *বৈদিক সাহিত্যের রূপরেখা।* শান্তি বন্দ্যোপাধায়। কলকাতা : সংস্কৃত পুস্তক ভাণ্ডার। |
| 9. | *সংস্কৃত সাহিত্যের ইতিহাস (বৈদিক ও লৌকিক),* জাহ্নবীচরণ ভৌমিক। কলকাতা : সংস্কৃত পুস্তক ভাণ্ডার। |