একাদশ ও দ্বাদশ শ্রেণীর বাংলা
বিষয়ের সেমেস্টারের প্রস্তাবিত নম্বর বিভাজন

একাদশ শ্রেণী
সেমেস্টার (১)

সময়ঃ ২ ঘন্টা **পূর্ণমানঃ ৪০**

- ছোটগল্পঃ (১৫)
  অতিসংক্ষিপ্ত প্রশ্ন (mcq): ৫
  সংক্ষিপ্ত প্রশ্নঃ (২+৩)=৫
  বড় প্রশ্নঃ ৫ (এটিকে বিভাজিত করা যাবে না)
- কবিতাঃ(২০)
  অতি সংক্ষিপ্ত প্রশ্ন (mcq) :৫
  সংক্ষিপ্ত প্রশ্নঃ (২+৩)=৫
  বড় প্রশ্নঃ ১০ (এক্ষেত্রে সর্বনিম্ন ১ নম্বর রেখে সর্বোচ্চ অবিভাজিত ৫ নম্বর রাখতেই হবে)
- ভাবসম্প্রসারণ অথবা ভাবার্থঃ(৫)

একাদশ শ্রেণী
সেমেস্টার (২)

সময়ঃ ২ ঘন্টা **পূর্ণমানঃ ৪০**

- ব্যাকরণঃ(১৫)
  অতি সংক্ষিপ্ত প্রশ্ন (mcq): ৫
  সংক্ষিপ্ত প্রশ্ন (সংজ্ঞা ও পার্থক্য) : ২+৩=৫
  বড় প্রশ্নঃ ৫ (এক্ষেত্রে বিভাজনের ক্ষেত্রে সর্বনিম্ন ১ নম্বর রাখা যাবে)
- নাটক (অচলায়তন) : ২০
  অতি সংক্ষিপ্ত প্রশ্ন (mcq) : ১০
  সংক্ষিপ্ত প্রশ্নঃ ৫(২+৩)
  বড় প্রশ্নঃ ৫ (এক্ষেত্রে কোন বিভাজন থাকবে না)
- প্রবন্ধঃ ৫
- প্রসঙ্গ উল্লেখসহ ব্যাখ্যা থাকবে (এক্ষেত্রেও কোন বিভাজন থাকবে না)

দ্বাদশ শ্রেণী

প্রথম সেমেস্টারঃ পূর্ণমানঃ৪০

- ছোটগল্পঃ ১৫ (একাদশ শ্রেণীর অনুরূপ নম্বর বিভাজন হবে)
- কবিতাঃ ২০ (")
- বঙ্গানুবাদঃ ৫

দ্বিতীয় সেমেস্টারঃ পূর্ণমানঃ ৪০

- সাহিত্যের ইতিহাসঃ ২০

  অতিসংক্ষিপ্ত প্রশ্ন (mcq): ১০

  বড় প্রশ্নঃ ১০(এক্ষেত্রে সর্বনিম্ন ২ ও সর্বোচ্চ ৫ নম্বরে বিভাজন হবে এবং ৫ নম্বরটি আর বিভাজিত হবে না। এই প্রকার প্রশ্ন দুটি দেওয়া হবে;একটি প্রাচীন যুগ থেকে অন্যটি আধুনিক যুগ থেকে। ছাত্রছাত্রীরা যে কোনো একটি করবে।) এই বড় প্রশ্নের সঙ্গে 'অথবা' হিসেবে দুটি টীকা (৫+৫) দেওয়া হবে। এক্ষেত্রে চারটি টীকা দেওয়া হবে। ছাত্রছাত্রীরা দুটি টীকা লিখবে।
- ব্যাকরণঃ১৫(একাদশ শ্রেণীর অনুরূপ নম্বর বিভাজন হবে)
- প্রবন্ধঃ৫(একাদশ শ্রেণীর অনুরূপ)

সর্বক্ষেত্রে (mcq)- এর কোন অপশন (option) থাকবে না। সংক্ষিপ্ত ও বড় প্রশ্নের ক্ষেত্রে দুইটি দেওয়া হবে ;একটি করতে হবে।

একাদশ শ্রেণি

ক. ব্যাকরণ : ~~১৬~~ ১৫ (২য় সেমেস্টার)

খ. কবিতা : ~~১৬~~ 20 (১ম সেমেস্টার)

গ. ছোটগল্প ও প্রবন্ধ : ~~১৬~~ ১৫+৫ (ছোটগল্প - ১ম সেমেস্টার, প্রবন্ধ - ২য় সেমেস্টার)

ঘ. নাটক : ~~১৬~~ 20 (২য় সেমেস্টার)

ঙ. ~~রচনা : ১৬~~ ভাবসম্প্রসারণ অথবা ভাবার্থ : ৫ (১ম সেমেস্টার)

পাঠ্যসূচি

ব্যাকরণ

ক. ণত্ব বিধান ও ষত্ব বিধান

খ. শব্দগঠন : ধাতু, ধাতুবিভক্তি, শব্দবিভক্তি, যঙন্ত, সনন্ত, নামধাতু, উপসর্গ

গ. সংস্কৃত কৃৎ প্রত্যয় : তব্য, অনীয়, শতৃ, শানচ্, ক্ত, ক্তবতু, ক্তিণ, ণক, তৃচ, তৃন্, ক্বিপ, ইষ্ণু, য, আলুচ্

সংস্কৃত তদ্ধিত প্রত্যয় : ষ্ণেয়, ষ্ণীয়, ষ্ণায়ন, ষ্ণিক, ইমন, ষ্ণ, ষ্ণি, ষ্ণ্য, তর, তম, ঈয়স্, মতুপ্, বতুপ্, ময়ট্, তা, ত্ব

ঘ. বাংলা কৃৎ প্রত্যয়, বাংলা তদ্ধিত প্রত্যয়, বিদেশী প্রত্যয়।

কবিতা

ক. মাথুর - বিদ্যাপতি

খ. রূপরাম চক্রবর্তীর আত্মকাহিনী

গ. লোহার ব্যথা - যতীন্দ্রনাথ সেনগুপ্ত

ঘ. আমি কবি যত কামারের - প্রেমেন্দ্র মিত্র

ঙ. ঘোড়সওয়ার - বিষ্ণু দে

ছোটগল্প ও প্রবন্ধ

ছোটগল্প:

ক. অপরিচিতা - রবীন্দ্রনাথ ঠাকুর

খ. দিদি - রবীন্দ্রনাথ ঠাকুর

গ. মহামায়া - রবীন্দ্রনাথ ঠাকুর

প্রবন্ধ:

ঘ. সীতার বনবাস (তৃতীয় পরিচ্ছেদ - রাম কিয়ৎক্ষণ মৌনাবলম্বন করিয়া ...রজনী যাপন হইল) - ঈশ্বরচন্দ্র বিদ্যাসাগর

ঙ. শিক্ষার নব আদর্শ - বীরবল

চ. আমাদের পরিচ্ছদ - রাজশেখর বসু

নাটক

অচলায়তন - রবীন্দ্রনাথ ঠাকুর

~~রচনা~~ ভাবসম্প্রসারণ অথবা ভাবার্থ

~~বিভিন্ন বিষয় থেকে প্রদত্ত চারটি রচনার একটি লিখতে হবে।~~

দ্বাদশ শ্রেণি

[ক. ব্যাকরণ - ১৬ খ. কবিতা - ১৬, গ. ছোটগল্প ও প্রবন্ধ ১৬ ঘ. সাহিত্যের ইতিহাস - ২০ ঙ. সংরচন - ৬ চ. অনুবাদ - ৮]

প্রথম পর্যায়:

- **ব্যাকরণ:**
  - ক. ধ্বনি পরিবর্তন:
    স্বরভক্তি, স্বরসঙ্গতি, অপিনিহিতি, অভিশ্রুতি, বর্ণ-বিপর্যয়, দ্বিমাত্রিকতা, স্বরাগম
  - খ. বাংলা বাগ্‌ধারা ও প্রবাদ বাক্য:
    অরণ্যে রোদন, আক্কেল সেলামি, উলুবনে মুক্তো ছড়ানো, কত ধানে কত চাল, গভীর জলের মাছ, চক্ষুদান করা, ঝোপ বুঝে কোপ মারা, ঢাক ঢাক গুড় গুড়, তালকানা, দু'মুখো সাপ, অর্ধচন্দ্রদান, আমড়া কাঠের ঢেঁকি, ইতর-বিশেষ, উভয় সংকট, একাদশে বৃহস্পতি, ওজন বুঝে চলা, কান ভারি করা, কুয়োর ব্যাঙ, খয়ের খাঁ, গতানুগতিক প্রবাহ, ঘোল খাওয়া, চোখের বালি, ছেলের হাতের মোওয়া, জিলিপির প্যাঁচ, টনক নড়া, ঢেঁড়ি কাটা, ডুমুরের ফুল, তুলসীবনের বাঘ, দু'কান কাটা, ধর্মের কল বাতাসে নড়ে, নেক নজরে পড়া, পুকুর চুরি, কাঁচের সর্দি, ভিজে বেড়াল, মিছরির ছুরি, শ্মশান বৈরাগ্য, শিরে সংক্রান্তি, সর্ষে ফুল দেখা, হাতটান, হাটে হাঁড়ি ভাঙা

- **কবিতা :**
  - ক. রূপানুরাগ
  - খ. চণ্ডীর নিকট পশুগণের দুঃখ বর্ণনা
  - গ. ছিনু মোরা সুলোচনে
  - ঘ. বলাকার ৩নং কবিতা 'আমরা চলি সমুখপানে'

- **ছোটগল্প ও প্রবন্ধ :**
  - ক. অনধিকার প্রবেশ
  - খ. অতিথি
  - গ. একা

- **সাহিত্যের ইতিহাস:**

১. **মধ্যযুগ :**

বৈষ্ণব পদাবলী সাহিত্য - বিদ্যাপতি, চণ্ডীদাস, জ্ঞানদাস, গোবিন্দদাস

অনুবাদ সাহিত্য - কৃত্তিবাস ও কাশীরাম দাস

মঙ্গল কাব্য - মুকুন্দরাম চক্রবর্তী, কেতকাদাস ক্ষেমানন্দ, ঘনরাম চক্রবর্তী

চরিত সাহিত্য - বৃন্দাবন দাস, কৃষ্ণদাস কবিরাজ

দ্বিতীয় পর্যায়:

- **ব্যাকরণ:**
  - ক. শব্দ:
    তৎসম, অর্ধতৎসম, তদ্ভব, দেশী, বিদেশী, মিশ্রশব্দ, যৌগিক, রূঢ় ও যোগরূঢ়
  - খ. প্রবাদ প্রবচন:
    অল্পবিদ্যা ভয়ঙ্করী, গাঁয়ে মানে না আপনি মোড়ল, চোরে চোরে মাসতুতো ভাই, ঢিলটি মারলে পাটকেলটি খেতে হয়, দশচক্রে ভগবান ভূত, নেড়া বেলতলায় যায় কবার, মশা মারতে কামান দাগা, যত দোষ নন্দ ঘোষ, রাখে হরি মারে কে, লোভে পাপ পাপে মৃত্যু

সংরচন :

- ক. ভাবার্থ, ভাবসম্প্রসারণ, সারসংক্ষেপ
- খ. অনুবাদ

- **কবিতা :**
  - ক. জীবনবন্দনা
  - খ. পাখিরা

- **ছোটগল্প ও প্রবন্ধ :**
  - ক. আপদ
  - খ. নবযুগ

- **সাহিত্যের ইতিহাস:**

২. **আধুনিক যুগ:**

গদ্য সাহিত্য (১৮৪৩ খ্রি: থেকে)

ক. **প্রবন্ধ :** ঈশ্বরচন্দ্র বিদ্যাসাগর, বঙ্কিমচন্দ্র চট্টোপাধ্যায়, রবীন্দ্রনাথ ঠাকুর

খ. **উপন্যাস :** প্যারীচাঁদ মিত্র, বঙ্কিমচন্দ্র, রবীন্দ্রনাথ

গ. **ছোটগল্প :** রবীন্দ্রনাথ ঠাকুর।

ঘ. **কাব্য:**
ঈশ্বর গুপ্ত, মধুসূদন দত্ত, বিহারীলাল চক্রবর্তী, রবীন্দ্রনাথ ঠাকুর

ঙ. **নাটক:**
মধুসূদন দত্ত, দীনবন্ধু মিত্র, রবীন্দ্রনাথ ঠাকুর

সংরচন

- অনুবাদ

সহায়ক গ্রন্থ :

১. বাংলা সাহিত্যের কথা - সুকুমার সেন

২. বাংলা সাহিত্যের সংক্ষিপ্ত ইতিহাস - ভূদেব চৌধুরী

৩. বালা সাহিত্যের সম্পূর্ণ ইতিবৃত্ত - অসিতকুমার বন্দ্যোপাধ্যায়

Visva-Bharati

Programme: **Pre-Degree** (Class XI and Class XII)

Subject: **English (Core)**

The new syllabus of **English (Core)** for **Pre-Degree (Class XI and Class XII) programme** has been framed following **National Education Policy 2020 (NEP 2020)** and **National Curriculum Framework for School Education 2023 (NCF-SE 2023)** guidelines.

The entire syllabus of classes XI and XII has more or less equally spread over four semesters and evaluation/ assessment procedure in accordance with NEP 2020 guidelines.

NEP 2020 and NCF-SE 2023 lay particular emphasis on the development of the creative potential of each individual. It is based on the principle that education must develop not only cognitive capacities - both the 'foundational capacities' of literacy and numeracy and 'higher-order' cognitive capacities, such as critical thinking and problem solving– but also social, ethical, and emotional capacities and dispositions.

The rich heritage of ancient and eternal Indian knowledge and thought has been a guiding light for this policy. The pursuit of knowledge (*Jnan*), wisdom (*Pragyaa*), and truth (*Satya*) was always considered in Indian thought and philosophy as the highest human goal.

Reduction of curriculum content to enhance essential learning and critical thinking

Curriculum content has been reduced in each subject to its core essentials, to make space for critical thinking and more holistic, inquiry-based, discovery-based, discussion-based, and analysis-based learning. The mandated content will focus on key concepts, ideas, applications, and problem-solving. Teaching and learning will be conducted in a more interactive manner; questions will be encouraged, and classroom sessions will regularly contain more fun, creative, collaborative, and exploratory activities for students for deeper and more experiential learning.

Principles for Designing Courses in English Language

The aims of English Language Teaching in the Secondary Stage are to develop communicative competence and build language proficiency. Students will build capacities for enhanced language use in real-life contexts and develop cultural awareness and appreciation for the diversity of English-speaking societies.

The courses for English Language have been designed keeping the following in mind:

a. Students will explore and understand the history and evolution of the English language in India and abroad.

b. They will develop the ability to communicate effectively in a variety of contexts, including formal and informal settings.

c. They will widen their language base for personal, academic, creative, and vocational pursuits.

d. They will develop the ability to comprehend and evaluate texts, and explore rhetoric, reading, and writing in different real-life contexts.

e. They will be able to nurture and promote humane qualities and values.

Department of English
विश्वभारती, शान्तिनिकेतन-७३१२३५ / Visva-Bharati, Santiniketan-731

Principles for Designing Courses in English Literature

Teaching literature serves multiple aims and objectives that contribute to the overall development of students. Here are some key aims and objectives:

1. **Cultural Understanding**: Literature exposes students to diverse cultures, perspectives, and historical contexts, helping them appreciate the richness of human experience.
2. **Critical Thinking**: Analyzing literary texts encourages students to think critically, evaluate different viewpoints, and develop their own interpretations.
3. **Emotional Intelligence**: Literature often explores complex human emotions and relationships, fostering empathy and emotional understanding in students.
4. **Language Development**: Engaging with literature enhances vocabulary, grammar, and language skills, contributing to overall literacy.

5. **Experiential Reflection**: Literature provides a mirror for students to reflect on their own lives, beliefs, and values, promoting personal growth.

Pedagogical Objectives:

1. **Enhancing Analytical Skills**: Students learn to analyze themes, characters, and narrative techniques, which sharpens their analytical abilities.
2. **Encouraging Creative Expression**: Literature can inspire students to express their thoughts and feelings creatively through writing and discussion.
3. **Fostering Discussion**: Literature classes often involve discussions that help students articulate their ideas and engage in respectful debate.
4. **Building Knowledge of Literary Forms**: Students gain familiarity with various literary genres, styles, and historical movements, enriching their understanding of literature as an art form.
5. **Promoting Lifelong Reading Habits**: By exposing students to a variety of texts, teachers aim to instill a love for reading that continues beyond the classroom.
6. **Developing Research Skills**: Studying literature often involves research into historical, cultural, and biographical contexts, enhancing students' research and critical inquiry skills.
7. **Encouraging Interdisciplinary Connections**: Literature often intersects with history, philosophy, psychology, and other fields, encouraging students to make connections across disciplines.

Overall, the teaching of literature aims to cultivate well-rounded individuals who can think critically, empathize with others, and appreciate the complexities of human experience.

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The following items have been selected for preparation of syllabus of English (Core) for Pre-Degree programme (Class 11 and Class 12):

POEMS

William Shakespeare (1564- 1616), English poet:

a) *All the World's a Stage* (The Seven Ages of Man)/

b) *That time of year thou mayst in me behold* (Sonnet No. 73)

John Milton (1608- 1674), English poet: *When I consider how my light is spent* (On His Blindness)

William Wordsworth (1770- 1850), English poet: *Solitary Reaper*

Percy Bysshe Shelley (1792- 1822), English poet: *To Night*

John Keats (1795- 1821), British poet: *Ode to Autumn*

Alfred, Lord Tennyson (1809- 1892), English poet: *Crossing the Bar*

Rabindranath Tagore (1861- 1941), Indian poet: *Separation* (from *Gitanjali*, No. 18)

W B Yeats (1865- 1939), Irish poet: *The Lake Isle of Innisfree*

Robert Frost (1874- 1963), American poet: *The Road Not Taken*

Wilfred Owen (1893- 1918), British poet: *The Send-off*

Pablo Neruda (1904-1973), Chilean poet: *Tonight I Can Write...* (translated by W S Mervin, 1969, published by Penguin Books)

Nissim Ezekiel (1924- 2004), Indian poet: *Night of the Scorpion*

Kamala Das (1934- 2009), Indian author: *The Freaks*

Margaret Atwood (b. 1939), Canadian author: *This Is a Photograph of Me*

Maya Angelou (1928- 2014), American poet: a) *Still I Rise*

b) *Human Family*

A K Ramanujan (1929- 1993), Indian poet: *A River*

Mary Oliver (1935- 2019), American poet: *Wild Geese*

Gieve Patel (1940- 2023), Indian poet: *On Killing a Tree*

PLAY

Lady Gregory (1852- 1932), Irish playwright: *The Rising of the Moon*

John Galsworthy (1867- 1933), English playwright and novelist: *Justice*

J M Synge (1871- 1909), Irish playwright: *Riders to the Sea*

Stanley Houghton (1881- 1913), English playwright: *The Dear Departed*, a comedy in one-act

Fritz Karinthy (1887- 1938), Hungerian playwright: *Refund*, a farcical one-act play

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PROSE

Francis Bacon (1561- 1626), British author: *Of Studies*

Charles Lamb (1775- 1834), British author: *Dream Children*

Oscar Wilde (1854- 1900), Irish author: *The Nightingale and the Rose*

O Henry (1862- 1910), American author: *The Last Leaf*

G B Shaw (1856- 1950), Irish author: *Spoken English and Broken English*

A G Gardiner (1865- 1946), British author: *On Saying 'Please'*

C V Raman (1888- 1970), Indian physicist: *The Elixir of Life*

R K Narayan (1906- 2001), Indian author: *A Snake in the Grass*

Khushwant Singh (1915- 2014), Indian author: *The Portrait of a Lady*

Doris Lessing (1919- 2013), British author: *Through the Tunnel*

Ruskin Bond (b. 1934), Indian author: *The Meeting Pool*

Alice Walker (b.1944), American author: *Am I Blue?*

Sarah Joseph (b. 1948), Indian author: *Mazha* (Rain), translated from Malayalam by Anitha Devasia

GRAMMAR

Parts of Speech

Articles

Prepositions

Finite and Nonfinite Verbs

Phrasal Verbs

Modal Auxiliaries

Tenses

Clauses

Simple, Compound and Complex Sentences

Active and Passive Voice

Direct Speech and Indirect Speech

Degrees of Comparison

Question Tags

Nb: One or two grammatical items to be tested among the list given.

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READING COMPREHENSION

Unseen Passage

COMPOSITION

Formal Letter Writing

Cover Letter and CV (Curriculum Vitae)

Email (Formal/ Business Correspondence)

Filling in Forms

Paragraph Writing

Dialogue Writing

Newspaper Report

Writing Speech

NOTE: Specific items for a particular academic session will be selected from the above-mentioned list of items, by the teachers of English of Patha-Bhavana and Siksha-Satra before the commencement of that particular session as and when required following the pattern of selection and marks distribution as specified in the format for the academic session 2025- 26. Changes have to be communicated to the Examination Section, Visva-Bharati for the smooth conduct of examinations.

- The students have to answer one out of two given alternatives. Word limit of a composition should not be more than 120 words.

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ENGLISH (Core) Syllabus for **Pre-Degree** programme to be effective from **2025-26**

SEMESTER- I (CLASS - XI)

Full Marks: 40 + 10 (Internal Assessment)

Unit A

Prose 1: **Ruskin Bond** (b. 1934), Indian author: *The Meeting Pool*

Objective Type Questions (1 X 3) + Short Answer Type Questions (2 X 2) = 7 Marks

Prose 2: **R K Narayan** (1906- 2001), Indian author: *A Snake in the Grass*

Objective Type Questions (1 X 4) + Long Answer Type Question (3 X 1) = 7 Marks

Unit B

Poem 1: **William Wordsworth** (1770- 1850), English poet: *Solitary Reaper*

Objective Type Questions (1 X 3) + Short Answer Type Questions (2 X 1) = 5 Marks

Poem 2: **John Milton** (1608- 1674), English poet: *When I consider how my light is spent* (On His Blindness)

Objective Type Questions (1 X 2) + Long Answer Type Questions (3 X 1) = 5 Marks

Unit C

Reading Comprehension

Objective Type Questions (1 X 4) + Short Answer Type Questions (2 X 1) = 6 Marks

Unit D

Non-Textual Grammar — 5 Marks

Articles

Tenses

Unit E

Writing — 5 Marks

Formal Letter Writing

Email (Formal/ Business Correspondence)

Internal Assessment — 10 Marks

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SEMESTER- II (CLASS- XI)

Full Marks: 40 + 10 (Internal Assessment)

Unit A

Prose: **Oscar Wilde** (1854- 1900), Irish author: *The Nightingale and the Rose*

Objective Type Questions (1 X 3) + Short Answer Type Questions (2 X 1) + Long Answer Type Question (3 X 1) = 8 Marks

Play: **Stanley Houghton** (1881- 1913), English playwright: *The Dear Departed*, a comedy in one-act

Objective Type Questions (1 X 3) + Short Answer Type Questions (2 X 3) + Long Answer Type Question (3 X 1) = 12 Marks

Unit B

Poem 1: **Rabindranath Tagore** (1861- 1941), Indian poet: Separation (from *Gitanjali,* No. 18)

Objective Type Questions (1 X 3) + Short Answer Type Questions (2 X 1) = 5 Marks

Poem 2: **Robert Frost** (1874- 1963), American poet: *The Road Not Taken*

Objective Type Questions (1 X 2) + Long Answer Type Questions (3 X 1) = 5 Marks

Unit C

Non-Textual Grammar — 5 Marks

Prepositions

Finite and Nonfinite Verbs

Active and Passive Voice

Unit D

Writing — 5 Marks

Filling in Forms

Cover Letter and CV (*Curriculum Vitae*)

Internal Assessment — 10 Marks

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SEMESTER- I (CLASS- XII)

Full Marks: 40 + 10 (Internal Assessment)

Unit A

Prose 1: **Sarah Joseph** (b. 1948), Indian author: *Mazha* (Rain), translated from Malayalam by Anitha Devasia

Objective Type Questions (1 X 3) + Short Answer Type Questions (2 X 2) = 7 Marks

Prose 2: **Charles Lamb** (1775- 1834), British author: *Dream Children*

Objective Type Questions (1 X 4) + Long Answer Type Question (3 X 1) = 7 Marks

Unit B

Poem 1: **Wilfred Owen** (1893- 1918), British poet: *The Send-off*

Objective Type Questions (1 X 3) + Short Answer Type Questions (2 X 1) = 5 Marks

Poem 2: **Gieve Patel** (1940- 2023), Indian poet: *On Killing a Tree*

Objective Type Questions (1 X 2) + Long Answer Type Questions (3 X 1) = 5 Marks

Unit C

Reading Comprehension

Objective Type Questions (1 X 4) + Short Answer Type Questions (2 X 1) = 6 Marks

Unit D

Non-Textual Grammar — 5 Marks

Direct Speech and Indirect Speech

Degrees of Comparison

Unit E

Writing — 5 Marks

Dialogue Writing

Paragraph Writing

Internal Assessment — 10 Marks

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SEMESTER- II (CLASS- XII)

Full Marks: 40 + 10 (Internal Assessment)

Unit A

Prose 1: **Alice Walker** (b.1944), American author: *Am I Blue?*

Objective Type Questions (1 X 3) + Short Answer Type Questions (2 X 2) = 7 Marks

Prose 2: **Doris Lessing** (1919- 2013), British author: *Through the Tunnel*

Objective Type Questions (1 X 4) + Long Answer Type Question (3 X 1) = 7 Marks

Unit B

Poem 1: **Maya Angelou** (1928- 2014), American poet: *Human Family*

Objective Type Questions (1 X 3) + Short Answer Type Questions (2 X 1) = 5 Marks

Poem 2: **John Keats** (1795- 1821), British poet: *Ode to Autumn*

Objective Type Questions (1 X 2) + Long Answer Type Questions (3 X 1) = 5 Marks

Unit C

Reading Comprehension

Objective Type Questions (1 X 4) + Short Answer Type Questions (2 X 1) = 6 Marks

Unit D

Non-Textual Grammar — 5 Marks

Clauses

Simple, Compound and Complex Sentences

Question Tags

Unit E — 5 Marks

Writing

Newspaper Report

Writing Speech

10 Marks

Inernal Assessment

To test communicative competence, language proficiency and capacities for enhanced language use in real-life contexts, Internal Assessment has to be conducted through listening and speaking activities in the final Semester. Such activities may include oral presentation, interview, viva, etc.

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Read the passage carefully and answer the questions that follow:

A new snake species (Anguiculus dicapriol) has been named after Hollywood actor and producer Leonardo DiCaprio in honour for his contribution towards conservation and climate change. As part of their ongoing project, a team of researchers was visiting mountainous regions in western Himalayas located in Himachal Pradesh when they found some brown coloured snakes on a mud road. "The snakes were seen basking and remained motionless until caught and made no attempts to bite," the study mentioned. Study of these snakes, their DNA analysis and comparison with other snakes led to the discovery of the new species. "Besides being found in areas of Himachal Pradesh like Chamba and Kullu, the new species has also been found in Nainital in Uttarakhand and Chitwan National Park in Nepal," said HT Lalremsanga, a professor in the department of zoology in Mizoram University, and member of the team of researchers. According to the study, the new species with dozens of teeth is "small sized", growing to around 22 inches, having a "broad collar with small dark brown spots". They live at heights of around 6,000 feet above sea level.

A) Write (any four) the following information about the new snake species: **1×4=4**

i) Name:
ii) Named after:
iii) First found in:
iv) Size:
v) Body colour:
vi) Living at the heights:

Or

A) Write (any four) True or False correctly. Quote relevant words in support of your answer: **1×4=4**

i) Leonardo DiCaprio works in Bollywood. _____
ii) The snakes bit the researchers. __
iii) The new snake is not found outside India. _____
iv) Lalremsanga is a zoologist. ____
v) The snake has only a few teeth. __

Or

A) Fill in the gaps (any four) with suitable information from the text: **1×4=4**

i) The new snake species was named after _____.
ii) The new variety of snake was first spotted _____.
iii) The places the new snake may be found are _____.
iv) One characteristic of the new snake is that _____.
v) The new snake species lives at the heights of _____.

C) Answer the following questions in short: **2×1=2**

i) How could the researchers tell that it was a new species of snake?

Or

i) Why was the snake species named after the famous person?

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A. Choose the right answer. Put a tick mark beside your choice. (1×3=3)

1. Somi planned to meet with the other boys in 1944/1954/1964.

2. Somi Anil and Rusty were neighbours/friends/brothers.

3. Complete the following sentence.

   10 years near a pool Rusty actually saw .....

B. Answer the following questions in short. (any two) (2×2=4)

1. Write down the activities that the boys used to do at the pool.
2. Write about the differences between Somi and Anil .
3. Why does the author think that he hasn't really grown up ?

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Head
Department of English

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A Snake in the Grass by R K Narayan

A. Choose the correct choice: (1X4 =4)

a. 'when the inmates... were at their siesta'. 'siesta' means

i) short nap ii) family get together iii) rest iv) short discussion

b. 'you could not think of buying any article made of iron' because

i) there was Govt ban on it. ii) iron was scarce iii) the price was very high iv) none of these

c. 'Mother was in hearty agreement' because

i) mother realised the search hunt was futile ii) mother was religious. iii) mother believed in the words of the beggar. iv) mother believed snake to be manifestation of God

d. 'They... seized every available knife and crow bar' to

i. help the gardener clear off the garden. ii) to hunt down the snake iii) to ensure the tiniest of insect coming to the garden to have no cover iv) none of these

B. Answer the question briefly: (3 X 1= 3)

a) Why do you think that the college boy murmur 'I wish I had taken the risk and knocked the water-pot from Dasa's hand'?

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"The Solitary Reaper" by

William Wordsworth

A) Fill in the gaps (any three) correctly: **1×3=3**

i) The solitary reaper ____ grain.

ii) The tune of the song of the solitary reaper seemed to be _____ to the listener.

iii) The song of the solitary reaper seemed to be more welcoming than _____.

iv) The song of the solitary reaper seemed to be more thrilling than _____.

A) Answer the following questions (any one) in short: **2×1=2**

i) What, according to the listener, may be the theme of the reaper's song?

ii) How does the song of the solitary reaper impact/impress the listener?

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On His Blindness

John Milton

Fill in the blanks: (Any 3) 1x3=3

A.1.They also serve who stand and ....

2.According to the poet those who serve God best are those who bear his .... patiently.

3.It feels like a sort of death to the poet to be unable to express his ....

4.The poet's attitude shifts from sorrow to ....

B.Answer the following question: (Any one) 2x1=2

1.Despite his blindness,how does Milton express his unwavering faith on God?

2.What does the poet mean by 'mild yoke'?

Articles

0.5 x number of questions

Complete the gaps in the text with 'a', 'an', 'the' or 'nothing [O]'.

Example:
(a) ***O*** London is (b) ***a*** big city. (c) ***The*** centre is very busy.

(d) _____ Oxford Street is (e) _____ good place for shopping. You can also go to (f) _____ department store, like 'Harrods', (g) _____ very famous shop.

If (h) _____weather is nice, you can go in (i) _____ boat on (j) _____ Thames, or walk in (k) _____ park.

It is difficult to find (l) _____ cheap hotel in (m) _____ London but, if you are rich you can stay in (n) _____ expensive hotel like the Park Lane Hilton- with (o) _____ restaurant on (p) _____ top floor of (q) _____ hotel.

Answers

(a) O
(b) a
(c) the
(d) O
(e) a
(f) a
(g) a
(h) the
(i) a
(j) the
(k) a
(l) a
(m) O
(n) an
(o) a
(p) the
(q) the

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0.5 x number of questions

Tenses

Complete the news report. Put each verb into the correct form.

The actress Vanessa Kemp (0) <u>*has disappeared*</u> (disappear). Yesterday she (1) __________ (fail) to arrive at the Prince Charles Theatre in London's West End for her leading role in the comedy 'Don't look now!'. Ms Kemp, who (2) __________ (live) in Hampstead, (3) __________ (leave) home at four o'clock yesterday afternoon for the theatre, a journey she (4) __________ (make) several times the week before. Two people who (5) __________ (walk) past her home at the time (6) __________ (see) her leave. But no one (7) __________ (see) her since then. At half past seven she still (8) __________ (not / arrive) at the theatre. At eight o'clock the theatre manager had to break the news to the audience, who (9) __________ (wait) patiently for the play to start. Since yesterday, theatre staff and friends (10) __________ (try) to contact Ms Kemp, but they (11) __________ (have) no success so far. The police (12) __________ (take) the matter seriously, but they (13) __________ (believe) that she is unlikely to be in any danger. Her friends all (14) __________ (want) to hear from her soon.

Answers:

1. failed
2. lives
3. left
4. had made
5. were walking
6. saw
7. has seen
8. hadn't arrived
9. had been waiting / were waiting
10. have been trying / have tried
11. have had
12. are taking
13. believe
14. want

Class XI

Semester I

Writing (5 Marks)

Marking Scheme

Content: 3 marks

Format: 1 mark

Accuracy: 1 mark

Under content, credit should be given for the candidate's creativity in presenting ideas.

Some Samples

1. **Formal Letter**

a) You live in Bolpur, Birbhum. In your locality, the street lights are not well functioning and thus it gets really dark in the evening. Write a letter to the Chairman of the Municipality of your town regarding this problem. (100-120 words)

b) Suppose you are ABC. Write a letter to the Principal of your school requesting him/her for organizing Educational Trip after your Semester Examinations. (100-120 words)

c) Write a letter to the Editor of an English daily expressing your concern over pollution caused during Pous Mela every year. (100-120 words)

d) Write a letter to the Branch Manager, State Bank of India, Santiniketan Branch, requesting him/her to issue a cheque book in favour of you. (100-120 words)

2. **E-mail Writing**

a) Suppose you are the secretary of the cultural activities (*Anusthan Sampadak/Sampadika*) of your school. Now, write an e-mail to the Principal of the school requesting him/her to arrange a quiz competition for the students.

b) Being the General Secretary (*Sadharan Sampadak*) of your school, write an email to the Co-ordinator, *Career Hub*, a career Counselling organization, requesting him/her to arrange a career counselling programme in your institution.

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Syllabus of Food And Nutrition

class XII

1st Semestar

Full Marks

Theory : 30 + 7.5

Practical : 10 + ~~2.5~~ 3

Time 1½ hour

Theory

A. Utilization of food by the body (digestion and absorption) (20 hours)

B. Nutrition for the community :- The common deficiency diseases in India : Protein Calorie Malnutrition Anaemia, Goiter, Xeropthalmia (Ricket, Osteomalacia, Scurvey etc.) (16 hours 40 minutes)

C. Supplementary feeding for the vulnerable groups (~~8 hours~~) (6 hours 40 minutes)

D. Nutrition Education for the community (8 hours)

Practical

1. Preparation of a liquid diet to alleviate diarrhoea
2. Preparation of nutritious snacks for school tiffin (at least two) (6 hours 40 minutes)

5 Questions are marks value – 1 = 5

" " " – 2 = 10

" " " – 3 = 15 (may have split questions)

30

Sparsha Roy 20/8/24

Ghosh 20/8/24

Anjali Das (Pal) 20.8.24

[signature] 20.8.24

A Roy 20/08/2024

Syllabus of Food And Nutrition

class XII

2nd Semester

Full Marks

Theory : 30 + 7 ~~5~~

Practical : 10 + ~~2~~ 5 3

Time : 1½ hour

1. Utilization of food by the body - (metabolism) (16 hours 40 mins)
2. Therapeutic diets : Fever / Tuberculosis, Diarrhoea, Constipation, Hypertension, Atherosclerosis, Jaundice, ~~Nephritis~~ Nephritis, Diabetes Mallitus, Gout, Peptic ulcer (16 hours 40 minutes)
3. ~~Nutrition Education for the community~~
3. Diet survey : Various methods (10 hours)
4. Elementary idea about the current National Nutrition Programmes in India. (10 hours)

Practical

1. Preparation of Therapeutic Diet (at least two) 4 hours
2. Preparation of nutritious snacks for the pregnant and lactating mother (at least three) ~~6~~ 6 hours

5 questions are marks value - 1 = 5
" " " - 2 = 10
" " " - 3 = 15
30

May have split question

Sporsha Roy 20/8/24

Anjalika Roy 20/08/2024

Dhruba 20.8.24

Anjali Das (Pal) 20.8.24

Ghosh 20/8/24

Syllabus of Food and Nutrition

class XI

1st Semestar

Full Marks
Theory : 30 + 7
Practical : 10 + 3
Time : 1.30 hours

Theory

A. An introduction to Nutrition
   i) Basic concepts about Food, Nutrition and Health (4 hours 40 minutes)

B. Different Nutrients of food and concept of calorie:
   i) Carbohydrates – Monosaccharide (Glucose, fructose, galactose, ~~maltose~~) (8 hours 40 minutes)
   Polysaccharide (Starch, dextrine, glycogen, cellulose)
   ii) Protein and Amino acid – Functions and Requirements, classification (Simple protein, conjugated and derived protein) quality of food protein, animal vs veg proteins. Essential amino acid content of foods. (10 hours 40 minutes)
   iii) Fats and Oils – Properties of fats, classifications (simple, compound, waxes derived) (8 hours 40 minutes)
   iv) Vitamins – classification (Fat soluble and water soluble) functions. Requirements. Source. (14 hours)
   v) Minerals – Calcium, phosphorus, iron, iodine (functions, requirements, Sources. (8 hours 40 minutes)
   vi) Water Balance (2 hours 40 minutes)

Practical

1. Preparation of cereals, milk & eggs (two dishes)
2. Preparation of weaning (6 hours 40 minutes)
3. Practical Note Book

5 questions are marks value – 1 = 5
" " " value – 2 = 10
" " " " – 3 = 15
Total 30

may have split questions

20.8.24

Anjalika Roy
20/8/24

Sneha Roy
20/8/24

Anjali Das (Pal)
20.8.24

Syllabus of Food And Nutrition

Class XI

2nd Semester

Full Marks

Theory: 30+7·5

Practical 10+2·5

Theory

A. Energy requirements during rest, different physical activities and different physiological conditions eg. Growth, pregnancy and Lactation (4 hours 40 minutes)

B. Cookery and Kitchen Sanitation — Methods of cooking and their effects on nutritive value of foods — measures for the prevention of loss of nutrients. (13 hours 20 minutes)

C. Basic food groups — i) Study of different foods: cereals, pulses and legumes roots and tubers, leafy and other vegetables, meet, fish and egg, milk and milk products fats and oils, sugar and jaggery (12 hours)

D. Balanced diet for different age groups and occupations, Balanced diet for pregnant and lactating mother. (12 hours)

E. Feeding of infants — Breast feeding vs artificial feeding, weaning food, defects in feeding infants. Nutritional allowances for Indians. (14 hours 40 minutes)

Practical

1. Preparation of cereals, milk and egg (four dishes) (6 hours 40 minutes)
2. Practical notebook

5 questions are marks value — 1 = 5
" " " " — 2 = 10
" " " " — 3 = 15
30

may have split question

Anjalika Roy 20/8/2024

Sporika Ray 20/8/24

Anjali Das (Pal) 20.8.24

20.8.24

20/8/24

Model Questions

1st Semester

Class - XI

Food And Nutrition

Model Question

F.M : 30

ক - বিভাগ

নিম্নলিখিত যে কোন পাঁচটি প্রশ্নের উত্তর দাও:- 1X5 = 5

1. দেহ পরিপোষক খাদ্য কাকে বলে? উদাহরণ দাও।
2. 1 কিলোক্যালরি = কত জুল?
3. দুটি একশর্করা ও দুটি দ্বিশর্করার- উদাহরণ দাও।
4. প্রোটিনের দুটি পুষ্টিগত গুরুত্ব লেখ।
5. খাদ্যে প্রোটিনের অভাবজনিত দুটি রোগের নাম লেখ।
6. দুটি ক্ষারীয় অ্যামাইনো অ্যাসিড ও দুটি আম্লিক অ্যামাইনো অ্যাসিডের নাম লেখ।
7. যৌগিক লিপিড কাকে বলে? উদাহরণ দাও।

খ - বিভাগ

নিম্নলিখিত যে কোন পাঁচটি প্রশ্নের উত্তর দাও — 2X5 = 10

1. ভিটামিন-র দুটি শারীরবৃত্তীয় কার্যাবলী লেখ।
2. অপরিহার্য অ্যামাইনো অ্যাসিড কাকে বলে? তাদের নাম লেখ।
3. স্নেহপদার্থে দ্রবণীয় ভিটামিনের চারটি বৈশিষ্ট্য লেখ।
4. গ্লুকোজ ও সুক্রোজের চারটি পার্থক্য লেখ।
5. জলের চারটি কাজ লেখ।
6. ধনাত্মক জলসাম্য ও ঋণাত্মক জলসাম্য কাকে বলে?
7. আয়োডিন ও ফসফরাসের দুটি উৎস ও কাজ লেখ।

Anjalika Roy 20/8/2024

Sparika Roy 20/8/24

Ghosh 20/8/24

[illegible] 20-8-24

Anjali Das (Pal) 20.8.24

গ - বিভাগ

নিম্নলিখিত যে কোন পাঁচটি প্রশ্নের উত্তর দাও:- 3×5=15

1. অপরিহার্য ফ্যাটি অ্যাসিডের তিনটি কাজ লেখ। (3)

2. ভিটামিন D-এর রাসায়নিক নাম লেখ। এই ভিটামিনের চারটি কাজ লেখ। (1+2)

3. কোন ভিটামিনকে পেলেগ্রা-প্রিভেনটিভ ফ্যাক্টর বলা হয়? এই ভিটামিনের দুটি অভাবজনিত লক্ষণ লেখ। (1+2)

4. ক্যালসিয়ামের তিনটি শারীরবৃত্তীয় কার্যাবলী লেখ। (3)

5. লোহার চারটি উৎসের নাম লেখ। এই খনিজ লবণটির দুটি পুষ্টিগত গুরুত্ব লেখ।

6. দেহে জলের অভাব ও আধিক্য ঘটলে কী ঘটে? $(1\frac{1}{2} + 1\frac{1}{2})$

7. ভিটামিন B_{12} এর রাসায়নিক নাম কী? এই ভিটামিনের চারটি শারীরবৃত্তীয় কার্যাবলী লেখ। (1+2)

20.8.24

Anjalika Roy
20/8/2024

Sporsha Roy
20/8/24

20/8/24

Anjali (Pal)
20.8.24

Modern Questions

2nd Semester

Model Question

Class - XI

Food And Nutrition

F.M : 30

ক - বিভাগ

নিম্নলিখিত যে কোন **পাঁচটি** প্রশ্নের উত্তর দাও :- 1X5

1. BMI বলতে কী বোঝো?
2. 10-12 বছরের শিশুদের শক্তির চাহিদা কত?
3. গর্ভবতী মহিলার অতিরিক্ত কত শক্তিমূল্যের খাদ্যের প্রয়োজন?
4. রক্তাল্পতার দুটি উদ্দেশ্য লেখ।
5. ফুটন পদ্ধতিতে রান্না করলে কোন কোন ভিটামিনের অভাব লক্ষ করা যায়?
6. রক্তাল্পতার দুটি লক্ষণের উল্লেখ কর।
7. রক্তাল্পতা হলে ভিটামিন B6 - এর অভাবের কারণ লেখ।

খ - বিভাগ

নিম্নলিখিত যে কোন **পাঁচটি** প্রশ্নের উত্তর লেখ। 2X5=10

1. খাদ্যের পুষ্টিমূল্য বৃদ্ধির দুটি পদ্ধতির বর্ণনা দাও
2. ঝলসানো এবং ভাঁতলানো এই দুটি পদ্ধতির উপযোগিতা উল্লেখ কর।
3. ICMR 2010 অনুসারে খাদ্যের চারটি বিভাগ উল্লেখ কর।
4. ডিমের সাদা অংশে কোন কোন ভিটামিন ও খনিজ থাকে?
5. প্রসাধনের দুটি সুবিধাজনক ও ক্ষতিকর উল্লেখ কর।
6. সিদ্ধ চাল ও আতপচালের দুটি পার্থক্য উল্লেখ কর।
7. শিশুর বয়সি খাদ্য কাকে বলে? দুটি উদাহরণ দাও

Anjalika Roy 20/8/2024

Sneha Roy 20/8/24

20/8/24

20.8.24

Anjali Das (Pal) 20.8.24

গ- বিভাগ

নিম্নলিখিত যে কোন ৫টি প্রশ্নের উত্তর দাও :- 3×5 = 15

1. কোলেস্টেরল কী? সাধুদুগ্ধ ও গোদুগ্ধের চারটি পার্থক্য উল্লেখ কর। 1+2

2. খাদ্যের মূল ৫টি বিভাগের উদাহরণসহ বর্ণনা দাও। (3)

3. মুদ্গ খাদ্যের তিনটি গুরুত্বপূর্ণ বৈশিষ্ট্য লেখ।

4. সাধুদুগ্ধ পানের তিনটি উপকারিতা লেখ। (3)

5. মুদ্গ মূল খাদ্যতালিকা প্রস্তুতি তিনটি নিয়ম উল্লেখ কর। (3)

6. দানাশস্যের তিনটি পুষ্টিগত উপাদানের গুরুত্ব উল্লেখ কর।

7. ভিটামিন C সমৃদ্ধের তিনটি কারণ লেখ।

20.8.24

Anjalika Roy
20/8/2024

Sparsha Roy
20/8/24

Anjali Das (Pal)
20.8.24

20/8/24

Model Questions

F.M → 30

Class XII

Semester - I

A. এক কথায় উত্তর দাও (যে কোনও 5 টি) 5×1=5

i) পিত্তরসে উপস্থিত লবণগুলি কী কী?

ii) অগ্ন্যাশয়ের দ্বীপপুঞ্জ কোথায় দেখতে পাওয়া যায়?

iii) পরিপাকে ইরেপসিনের কাজ কী?

iv) দুটি পুষ্টি মিশ্রণ সহায়ক সামগ্রীর নাম লেখ।

v) আয়রন বা লৌহের অভাবে কী ধরনের অ্যানিমিয়া হয়?

vi) গর্ভাবস্থায় রক্তচাপ বেড়ে গেলে কী হয়?

vii) মাতৃদুগ্ধে উপস্থিত দুটি রোগ-প্রতিরোধকারী উপাদানের নাম কর।

~~viii)~~

B. দু-চার কথায় উত্তর দাও (যে কোনও 5 টি) 5×2=10

i) পুষ্টি মিশ্রণ কাদের দেওয়া যেতে পারে?

ii) "অরক্ষিত শ্রেণী" বলতে কাদের বোঝায়?

iii) টায়ালিনের ক্রিয়াপদ্ধতি ছকের সাহায্যে দেখাও।

iv) মুখগহ্বর থেকে কোন কোন পদার্থের বিশোষণ ঘটে?

v) কোলোস্ট্রাম কী?

vi) পরিপূরক খাদ্য কাকে বলে?

vii) কালাজ্বর কী?

~~viii) কোলোস্ট্রাম দুধের লক্ষণগুলি কী কী?~~

Ghosh 20/8/24

Anjalika Roy 20/8/2024

Sporika Roy 20/8/24

Anjali Das (Pal) 20.8.24

D. Kundu 20.8.24

(Page - 2)

আংশিক

C) প্রশ্ন অনুযায়ী উত্তর দাও (যে কোনো 5টি) 5 X 3 = 15

i) শিশুর ত্রুটিপূর্ণ আচরণ জনিত সমস্যাগুলি অতি সংক্ষেপে ব্যক্ত কর। (3)

ii) শিশুর অপুষ্টিজনিত রোগগুলির প্রধান কারণগুলি উল্লেখ কর। (3)

~~iii) প্রো-ভিটামিন, অ্যান্টি ভিটামিন এবং ইমার্জেন্সি ভিটামিন কাকে বলে উদাহরণ সহ লেখ। (3)~~

iii) গো-দুগ্ধ ও মাতৃদুগ্ধের তুলনা কর। (3)

iv) অন্নপ্রাশনের বয়সে উপস্থিত উৎসেচকগুলি প্রোটিন জাতীয় খাদ্যকে কী ভাবে ভেঙে দেয়। (3)

v) প্রো-এনজাইম, অ্যাপো এনজাইম এবং কো-এনজাইম কাকে বলে উদাহরণ সহ লেখ। (3)

vi) পিত্তরসের প্রধান কাজগুলির উল্লেখ কর। (3)

vii) সুসংহত শিক্ষার মূল উপাদানগুলি কী কী অতি সংক্ষেপে লেখ। (3)

Gheosha 20/8/24

Srishka Roy. 20/8/24

Anjali Das (Pal) 20.8.24

Anjalika Roy 20/8/2024

[illegible] 20.8.24

Model Question

2nd Semester

Class - XII

Model Question

F.M : 30

ক- বিভাগ

নিম্নলিখিত যে কোন পাঁচটি প্রশ্নের উত্তর দাও:- 1×5=5

1. গ্লাইকোজেনোলাইসিস ও গ্লুকোনিওজেনেসিস কাকে বলে?
2. গ্লাইকোসুরিয়া ও হাইপোগ্লাইসিমিয়া বলতে কী বোঝ?
3. খাদ্যের দুটি প্রয়োজনীয়তা লেখ।
4. কোষ্ঠকাঠিন্য নিবারণের দুটি উপায় লেখ।
5. যক্ষ্মা রোগের জন্য দায়ী ব্যাকটেরিয়াটির নাম লেখ।
6. ORS কাকে বলে?
7. খাদ্য সমীক্ষার আধুনিক দুটি পদ্ধতির নাম লেখ।

খ- বিভাগ

নিম্নলিখিত যে কোন পাঁচটি প্রশ্নের উত্তর দাও:- 2×5=10

1. উপচিতি বিপাক ও অপচিতি বিপাকের চারটি পার্থক্য লেখ।
2. ট্রান্সঅ্যামাইনেশন ও ডি-অ্যামাইনেশন কাকে বলে?
3. উদাহরণসহ ইউরিওটেলিক প্রাণী ও ইউরিকোটেলিক প্রাণী কাকে বলে লেখ।
4. জন্ডিস প্রধানত কয় প্রকার ও কী কী?
5. অ্যাথেরোস্ক্লেরোসিস ও থ্রম্বোসিস কাকে বলে?
6. গোদ রোগ কী? এই রোগের জন্য দায়ী উৎসেচকটির নাম লেখ।
7. ডায়াবেটিসের দুটি কারণ লেখ।

20/8/24

Anjalika Roy 20/08/2024

20/8/24

20.8.24

20.8.24

গ – বিভাগ

নিম্নলিখিত যে কোন তিনটি প্রশ্নের উত্তর দাও :- 3 × 5 = 15

1. ডায়াবেটিস রোগের তিনটি সমস্যা লেখ।
2. ক্রেবস চক্র কাকে বলে?
3. গ্লাইকোজেনোলাইসিস পদ্ধতিটি লেখ।
4. খাদ্য সমীক্ষার প্রশ্নসূচক পদ্ধতিটির বর্ণনা দাও।
5. জাতীয় পুষ্টি প্রকল্প রূপায়নের ক্ষেত্রে দুটি প্রতিষ্ঠানের নাম লেখ।
6. মধ্যাহ্নকালীন আহার প্রকল্পের তিনটি উদ্দেশ্য লেখ।
7. ICDS প্রকল্পের কাজগুলি কী কী?

20.8.24

Anjalika Roy
20/08/2024

Spriha Roy
20/8/24

20/8/24

20.8.24

SYLLABUS OF PATHA BHAVANA AND SIKSHA SATRA, VISVA-BHARATI

WITH EFFECT FROM 2025

CLASS – XI

SEMESTER – I

SUBJECT: MATHEMATICS NUMBER OF CLASS-90

UNIT-I: SETS AND FUNCTIONS [Full Marks: 20] **Number of Class-40**

1. Sets Sets and their representations, Empty set, Finite and Infinite sets, Equal sets, Subsets, Subsets of the set of real numbers especially intervals (with notations). Power set. Universal set. Venn diagrams. Union and Intersection of sets. Difference of sets. Complement of a set. Properties of Complement sets.

2. Relations and Functions 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. Sums, difference, product and quotients of functions.

3. Trigonometric Functions 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 $sin^2A + cos^2A = 1$, for all A. Signs of trigonometric functions, domain, range and sketch their graphs.

Expressing $sin(A \pm B)$ and $cos(A \pm B)$ in terms of $sin\, A$, $cos\, A$, $sin\, B$ and $cos\, B$.

Deducing identities like the following:

$$tan(A+B) = \frac{tan\, A + tan\, B}{1 - tan\, A\, tan\, B} \qquad tan(A-B) = \frac{tan\, A - tan\, B}{1 + tan\, A\, tan\, B}$$

$$sin\, A + sin\, B = 2\, sin\frac{A+B}{2}\, cos\frac{A-B}{2}. \quad cosA + cos\, B = 2\, cos\frac{A+B}{2}\, cos\frac{A-B}{2}.$$

$$sin\, A - sin\, B = 2\, cos\frac{A+B}{2}\, sin\frac{A-B}{2}. \quad cosA - cos\, B = -2\, sin\frac{A+B}{2}\, sin\frac{A-B}{2}$$

Identities related to $sin2A, cos2A, tan2A, sin3A, cos3A$ and $tan3A$.

General solutions of trigonometric equations of the type $sin\, \theta = sin\, \alpha, cos\, \theta = cos\, \alpha$ and $tan\, \theta = tan\, \alpha$.

Gopinath Mandal 9/4/25
9.4.25
Bhattacharyya 09/04/25
P. Sookoor 09/09/25
Sutapa Saha 09/04
Tarak nath Saha 9/04/25
M. Mondal 9/4/25
T. N. Rout 4/04/25
Subhangshu Sen 09/04/25
Banibrata Mondal 09.04.2025
Tapas Raymahapatra 09.04.2025

UNIT-II: ALGEBRA [Full Marks: 12] **Number of Class : 24**

1. **Complex Numbers and Quadratic Equations** 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.

2. **Linear Inequalities** 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.

3. **Permutations and Combinations** Fundamental principle of counting. Factorial n ($n!$). Permutations and combinations, derivation of formulae for ${}_{n}P_{r}$ $(n \geq r)$ and ${}_{n}C_{r}$ $(n \geq r)$ their connections, simple applications.

UNIT-III: CALCULUS [Full Marks: 8] **Number of Class: 16**

1. **Limits and Derivatives** 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, exponential and trigonometric functions

Number of Remedial Class: 10

Gopinath Mandal 9/4/25
9/4/25
Sutapa Saha 09/04/25
Taraknath Saha 09/04/25
P. Sarkar 09/09/25
T. N. Raul 09/4/25
Subhangshu Sen 09/04/25
M. Mandal 09/04/25
Banibrata Mondal 09.04.25
Tapas Roymahapatra 09.04.2025
N. Bhattacharyya 09.04.25

CLASS – XI

SEMESTER – II

SUBJECT: MATHEMATICS NUMBER OF CLASS-90

UNIT-I: ALGEBRA [Full Marks: 20] **Number of Class: 40**

1. **Principle of Mathematical Induction** 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.

2. **Binomial theorem** History, Statement, and proof of the binomial theorem for positive integral indices. Pascal's Triangle, General and middle term in Binomial expansion, Simple applications.

3. **Sequence and series** 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, Summation of first n-terms of series $\sum n$, $\sum n^2$ and $\sum n^3$.

Unit-II COORDINATE GEOMETRY (2D) [Full Marks: 14] **Number of Class: 28**

1. **Straight lines** 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.

2. **Conic sections** 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.

UNIT-III PROBABILITY AND STATISTICS [Full Marks: 6] **Number of Class: 12**

1. **Statistics** Measures of dispersion: Range, mean deviation, variance and standard deviation of ungrouped/ grouped data

2. **Probability** 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.

Number of Remedial Class: 10

DISTRIBUTION OF MARKS

CLASS-XI SUBJECT: MATHEMATICS SEMESTER – I

FULL MARKS: 40+10(INTERNAL ASSESMENT)

GROUP-A (FULL MARKS-20)			
UNIT	TOPICS	MARKS	DISTRIBUTION OF MARKS
UNIT-I SETS AND FUNCTIONS	1. SETS 2. RELATIONS AND FUNCTIONS 3. TRIGONOMETRIC FUNCTIONS	20	$MCQ - 4 \times 1 = 4$ $SATQ - 4 \times 2 = 8$ $LATQ - 2 \times 4 = 8$
GROUP-B (FULL MARKS-20)			
UNIT-II ALGEBRA	1. COMPLEX NUMBERS AND QUADRATIC EQUATIONS 2. LINEAR INEQUALITIES 3. PERMUTATIONS AND COMBINATIONS	12	$MCQ - 2 \times 1 = 2$ $SATQ - 3 \times 2 = 6$ $LATQ - 1 \times 4 = 4$
UNIT-III CALCULUS	1. LIMITS AND DERIVATIVES	8	$MCQ - 2 \times 1 = 2$ $SATQ - 1 \times 2 = 2$ $LATQ - 1 \times 4 = 4$

CLASS-XI SUBJECT: MATHEMATICS SEMESTER – II

FULL MARKS: 40+10(INTERNAL ASSESMENT)

GROUP-A (FULL MARKS-20)			
UNIT	TOPICS	MARKS	DISTRIBUTION OF MARKS
UNIT-I ALGEBRA	1. PRINCIPLE OF MATHEMATICAL INDUCTION 2. BINOMIAL THEOREM 3. SEQUENCE AND SERIES	20	$MCQ - 4 \times 1 = 4$ $SATQ - 4 \times 2 = 8$ $LATQ - 2 \times 4 = 8$
GROUP-B (FULL MARKS-20)			
UNIT-II COORDINATE GEOMETRY (2D)	1. STRAIGHT LINES 2. CONIC SECTIONS	14	$MCQ - 2 \times 1 = 2$ $SATQ - 4 \times 2 = 8$ $LATQ - 1 \times 4 = 4$
UNIT-III PROBABILITY AND STATISTICS	1. PROBABILITY 2. STATISTICS	6	$MCQ - 2 \times 1 = 2$ $LATQ - 1 \times 4 = 4$

Gopendra Mandal 9/4/25 Banibrata Mondal 09.04.2025
9.4.25 Tapas Roymahapatra 09.04.2025
Taraknath Saha 09/04/25
P Sarkar 09/04/25 N Bhattacharyya 09.04.25
J. N. Raul 09/04/25
Sutapa Saha 09/04 Subhrangsu Sen 09/04/25 M. Mandal 09/04/25

SYLLABUS OF PRE-DEGREE EXAMINATION, VISVA BHARATI

CLASS – XII

SEMESTER – I

SUBJECT: MATHEMATICS **NUMBER OF CLASS-90**

UNIT-I: RELATIONS AND FUNCTIONS [Full Marks: 8] Number of Class: 16

1. Relations and functions Types of relations: reflexive, symmetric, transitive and equivalence relations. One to one and onto functions. Composite functions; Inverse of a function. Binary Operations

2. Inverse Trigonometric Functions Definition, range, domain, principal value branches. Graphs of inverse trigonometric functions Elementary properties of inverse trigonometric functions.

UNIT-II: ALGEBRA [Full Marks:12] Number of Class: 24

1. Matrices Concept, notation, order, equality, types of matrices, zero matrix, transpose of a matrix, symmetric and skew symmetric matrices. Addition, multiplication, and scalar multiplication of matrices. Simple properties of addition, multiplication, and scalar multiplication. Non- commutativity of multiplication of matrices and existence of non-zero matrices whose product is the zero matrix (restrict to square matrices of order 2). Concept of elementary row and column operations. Invertible matrices and proof of the uniqueness of inverse, if it exists; (Here all matrices will have real entries). Consistency, inconsistency, and number of solutions of system of linear equations by examples; Solving system of linear equations in two or three variables (having unique solution) using inverse of a matrix.

2. Determinants Determinant of a square matrix (up to 3 x 3 matrices), properties of determinants, minors, cofactors, and applications of determinants in finding the area of a triangle. Adjoint and inverse of a square matrix. Cramer's Rule and its applications.

UNIT-III: CALCULUS [Full Marks: 14] Number of Class: 28

1. Continuity and Differentiability Continuity and differentiability, derivative of composite functions, chain rule, derivates of inverse trigonometric functions, derivate of implicit functions, concept of exponential and logarithmic functions to the base e. Logarithmic functions as inverse of exponential functions.

Derivatives of logarithmic and exponential functions. Logarithmic differentiation, derivative of functions expressed in parametric forms. L' Hospital's rule (statement only) and applications. Second order derivatives.

Taraknath Saha 09/04/25 Tapas Raymahapatra 09.04.2025
P. Sarkar 09/04/25
T. N. Roy 09/04/25
Sutapa Saha 09/04/25
M. Mandal 09/04/25

Rolle's Theorem and Lagrange's Mean Value Theorem (statement only). Their geometric interpretation and elementary applications.

2. Applications of Derivatives Applications of derivatives, Rate of Change; increasing/ decreasing functions, tangents and normals, approximation, maxima and minima (first derivative test motivated geometrically and second derivative test given as a provable tool). Simple problems (that illustrate basic principles and understanding of the subject as well as real-life situations).

UNIT-IV: PROBABILITY [Full Marks: 6] **Number of Class:12**

Probability Multiplication theorem on probability, conditional probability, independent events, total probability, Bayes' theorem, Random variable, and its probability distribution, mean and variance of random variable

Number of Remedial Class: 10

Taraknath Saha 09/04/25
M. Mandal 09/4/25 Tapas Raymahapatra 09.04.2025
P. Sarkar 09/04/25
09.04.25

CLASS – XII

SEMESTER – II

SUBJECT: MATHEMATICS

UNIT-I: VECTORS AND THREE-DIMENSIONAL GEOMETRY [Full Marks: 16] Number of Class:32

I. Vectors Vectors and scalars, magnitude, and direction of a vector. Direction Cosines/ratios of vectors. 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.

Scalar (dot) product of vectors, projection of a vector on a line. Vector (cross) product of vectors. Scalar triple product. vector equation of a line, vector equation of a plane

2. Three - dimensional Geometry Direction cosines/ ratios of a line joining two points. Cartesian equation of a line, coplanar and skew lines, cartesian equation of a plane. Angle between (i) two lines, (ii) two planes, (iii) a line and a plane. Distance of a point from a plane.

UNIT-II: LINEAR PROGRAMMING PROBLEMS [Full Marks: 4] Number of Class: 8

1. Linear Programming Introduction, definition of related terminology such as constraints, objective function, optimization, different types of linear programming (L.P.) problems, mathematical formulation of L.P. problems, graphical method of solution for problems in two variables, feasible and infeasible regions, feasible and infeasible solutions, optimal feasible solutions (up to three non-trivial constraints).

UNIT-III INTEGRAL CALCULUS [Full Marks: 20] Number of Class: 40

1. Integrals Integration as inverse process of differentiation. Integration of a variety of functions by substitution, by partial fractions and by parts, only simple integrals of the type to be evaluated.

$\int \frac{dx}{x^2 \pm a^2}$; $\int \frac{dx}{\sqrt{x^2 \pm a^2}}$; $\int \frac{dx}{\sqrt{a^2 - x^2}}$;

$\int \frac{dx}{ax^2+bx+c}$; $\int \frac{dx}{\sqrt{ax^2+bx+c}}$; $\int \frac{px+q}{ax^2+bx+c}\,dx$;

$\int \frac{px+q}{\sqrt{ax^2+bx+c}}dx$; $\int \sqrt{a^2 \pm x^2}\,dx$; $\int \sqrt{x^2 - a^2}\,dx$;

$\int \sqrt{ax^2+bx+c}\,dx$; $\int (px+q)\sqrt{ax^2+bx+c}\,dx$; $\int \frac{dx}{a+b\cos x}$; $\int \frac{dx}{a+b\sin x}$

Definite integrals as a limit of a sum, Fundamental Theorem of Calculus (without proof). Basic properties of definite integrals and evaluation of definite integrals.

Taraknath Saha 09/04/25 M. Mandal 9/4/25 Bamdeb 09.04.2025 Gopinath Mandal 9/4/25 P. Sasmal 09/04/25 Tapas Raymahapatra 09.04.2025 Sutapa Saha 09/04/25 D. N. Paul 09/04/25 Subhangshu Sa 09/04/25 N. Bhattacharyya 09.04.25

2. Applications of the Integrals Applications in finding the area under simple curves, especially lines, areas of circles/ parabolas/ellipses (in standard form only). Area under the curve $y = sinx$, $y = cosx$, area between the two above said curves (the region should be clearly identifiable).

3. Differential Equations Definition, order and degree, general and particular solutions of a differential equation. Formation of differential equation whose general solution is given. Solution of differential equations by method of separation of variables, homogeneous differential equations of first order and first degree. Exact equation and solution by inspection. Idea of integrating factors. Solutions of linear differential equation of the type:

$\frac{dy}{dx} + Py = Q$ where P and Q are functions of x and

$\frac{dx}{dy} + Px = Q$, where P and Q are functions of y.

Number of Remedial Class: 10

Banibrata Mondal 09.04.2025

Taraknath Saha 09/04/25 Tapas Ray Mahapatra 09.04.2025

M. Mandal 09/04/25

P. Sarkar 09/09/25

Gopinath Mandal 9/4/25

T. Nikam 09/04/25

N. Bhattacharyya 09.04.25

9/9/25

Sutapa Saha 09/04/25

09/04/25

DISTRIBUTION OF MARKS

CLASS – XII SEMESTER – I SUBJECT: MATHEMATICS

FULL MARKS: 40+10(INTERNAL ASSESMENT)

GROUP-A (FULL MARKS-20)			
UNITS		MARKS	DISTRIBUTION OF MARKS
UNIT-I: RELATIONS AND FUNCTIONS	1. RELATIONS AND FUNCTIONS 2. INVERSE TRIGONOMETRIC FUNCTIONS	8	$MCQ - 2 \times 1 = 2$ $SATQ - 1 \times 2 = 2$ $LATQ - 1 \times 4 = 4$
UNIT-II: ALGEBRA	1. MATRICES 2. DETERMINANTS	12	$MCQ - 2 \times 1 = 2$ $SATQ - 3 \times 2 = 6$ $LATQ - 1 \times 4 = 4$
GROUP-B (FULL MARKS-20)			
UNIT-III: CALCULUS	1.CONTINUITY AND DIFFERENTIABILITY 2. APPLICATIONS OF DERIVATIVES	14	$MCQ - 2 \times 1 = 2$ $SATQ - 4 \times 2 = 8$ $LATQ - 1 \times 4 = 4$
UNIT-IV: PROBABILITY	PROBABILITY	6	$MCQ - 2 \times 1 = 2$ $LATQ - 1 \times 4 = 4$

CLASS – XII SEMESTER – II SUBJECT: MATHEMATICS

FULL MARKS: 40+10(INTERNAL ASSESMENT)

GROUP-A (FULL MARKS-20)			
UNIT	TOPICS	MARKS	DISTRIBUTION OF MARKS
UNIT-I: VECTORS AND THREE- DIMENSIONAL GEOMETRY	I. VECTORS 2. THREE - DIMENSIONAL GEOMETRY	16	$MCQ - 4 \times 1 = 4$ $SATQ - 4 \times 2 = 8$ $LATQ - 1 \times 4 = 4$
UNIT-II	LINEAR PROGRAMMING PROBLEMS	4	$LATQ - 1 \times 4 = 4$
GROUP-B (FULL MARKS-20)			
UNIT-III INTEGRAL CALCULUS	1. INTEGRALS: 2. APPLICATIONS OF THE INTEGRALS 3. DIFFERENTIAL EQUATIONS	20	$MCQ - 4 \times 1 = 4$ $SATQ - 4 \times 2 = 8$ $LATQ - 2 \times 4 = 8$

Tarak nath Saha 09/04/25
M. Mandal 9/4/25
Tapas Raymahapatra 09.04.2025
P. Sarkar 09/04/25
T. N. Roul 09/04/25
N. Bhattacharyya 09.04.25
Sutapa Saha 09/04/25

Proposed semester wise syllabus of Statistics

Visva-Bharati

Class-XI

SEMESTER-I

SUBJECT-STATISTICS

FULL MARKS:40 **CONTACT HOURS :60**

COURSE CODE : THEORY

Unit No.	TOPICS	CONTACT HOURS
UNIT 1	Introduction: Meaning of statistics, Nature of statistics, importance of statistics, Relation with some allied subjects, Uses of statistics, Misuses of statistics	03
	Types of Data: Primary and Secondary data, Qualitative data and quantitative data, Discrete data and continuous data, Time series, Spatial series data and cross sectional data, ordinal data and nominal data, illustration with examples.	06
UNIT-2	Collection of Data: Questionnaire and its basic characteristics, Definition of schedule and pilot survey, Designing a questionnaire and schedule, concept of outliers.	05
	Scrutiny of data: checking internal consistency and detection of error in collection and in recording.	04
UNIT-3	Presentation of data: Textual representation, Tabular representation, Diagrammatic representation (line diagram and multiple line diagram), Bar diagram (Horizontal and vertical bar diagrams, multiple and divided bar diagrams), pie diagram	09
UNIT-4	Frequency distribution, Cumulative frequency distribution and their graphical representation (Column diagram, step diagram, ogive, Histogram, frequency curve of different types, stem and leaf diagram)	09
UNIT-5	Official Statistics: Structure and activities of some organizations (NSSO, CSO, DGCSIR, Labour Borough, Agricultural Statistics, MOSPI)	04
UNIT-6	Concept of Central Tendency and its measures with properties	13
UNIT-7	Index No: Definition of Index Number, Types of Index No. (Price Index, Quantity Index, Value Index), Construction of Price Index No. and its uses, Various Price Index formulae (Laspeyres', Paasche's Edgeworth-Marshall and Fisher), Tests of consistency (Time reversal test and Factor reversal test)	07
	Total	**60 Hours**

Proposed semester wise syllabus of Statistics

Visva-Bharati

Class-XI

SEMESTER-II

SUBJECT-STATISTICS

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

COURSE CODE : THEORY

Unit No.	TOPICS	CONTACT HOURS
UNIT 1	Introduction of Quintile and percentile Absolute measures of Dispersion: Range Mean deviation, Standard deviation, Quartile deviation, their properties and relations between different measures. Relative measures of Dispersion: Coefficient of variation, coefficient of Quartile deviation.	10
UNIT-2	Raw and central moments up to fourth order and their conversions, Cauchy-Schwartz Inequality. Measures of Skewness and Kurtosis: Different measures based on moments and Quartiles (associated inequalities involving b_1 and b_2 coefficients)	07
UNIT-3	Random experiment: Sample Space, Notion of events and operations with events. Definition of Probability: Classical and Relative frequency approach to probability with limitations. Axiomatic Definition of Probability (Statement only) Theorem of Total Probability, Bonferroni's inequality, Boole's inequality. Compound Probability, Conditional Probability and Bayes's theorem, Statistical independence of events (No. of events not more than three) and related problems.	12
UNIT-4	Concept of polynomials, Different forms of *n*-th degree polynomials relating to two different interpolation formulae, Remainder theorem. Concept of Interpolation, $\triangle$ and E operators and their relation. Simple Interpolation: Newton's forward and Backward Interpolation. Formulae (without Derivation)	05
UNIT-5	Population Statistics: Introduction: Vital events, Sources of data on Vital events, Rates and Ratio of vital events. Measurement of Mortality: CRD, SDR, STDR Measurement of Fertility: CBR, GFR, ASFR, TFR Measurement of Population growth: Crude rate of Nature increase and Vital index.	06
	Total	**40 Hours**

Proposed semester wise syllabus of Statistics

Visva-Bharati

Class-XII

SEMESTER-I

SUBJECT-STATISTICS

FULL MARKS:40 **CONTACT HOURS :60**

COURSE CODE : THEORY

Unit No.	TOPICS	CONTACT HOURS
UNIT 1	Mathematics: Binomial Theorem with negative and/or fractional power. Concept of series and sequence, Concept of convergence and divergence and related sums. Infinite series, e-series and log series and related sums. Concept of Maximum and Minimum, Concept of Partial derivative, Concept of Infinite Integral (Gamma integral and Beta integral and their relation with factorial)	16
UNIT-2	Probability Distributions Random variables and its probability distributions, Cumulative distribution function, Probability Mass Function, Probability density function, Expectation. Variance	15
UNIT-3	Some Discrete Distribution Uniform distribution, Binomial distribution, Poisson distribution, Geometric distribution and their properties with related problems. Fitting of above distributions.	16
UNIT-4	Least square method and curve fitting (linear and exponential)	04
UNIT-5	Time series analysis Introduction, Different components of time series, Different models of time series, Trend determination by method of simple moving averages and by fitting mathematical curves (straight line and exponential curve) using least square principle.	09
	Total	**60 Hours**

Proposed semester wise syllabus of Statistics

Visva-Bharati

Class-XII

SEMESTER-II

SUBJECT-STATISTICS

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

COURSE CODE : THEORY

Unit No.	TOPICS	CONTACT HOURS
UNIT 1	Bivariate Data Analysis: Bivariate Data, Scatter diagram, Two-way frequency distribution, Marginal and conditional distribution. Simple correlation and its properties. Simple regression analysis and its related results, Rank data and rank correlation. (Spearman's Rank Correlation coefficient –case of no tie)	09
UNIT-2	Some Continuous Distribution Rectangular distribution and normal distribution, their properties with related problems. Fitting of above distributions.	07
UNIT-3	Sampling theory and sampling distribution Population and Sample, parameter and statistic, Complete Enumeration and sample surveys, Basic principles of sample survey, Advantages of Sample survey over complete enumeration. Concept of probability sampling, Practical methods of drawing a random sample using a random Number Table, SRSWR and SRSWOR , Concept of Sampling distribution of sample mean and sample proportion, and their standard errors.	06
UNIT-4	The p.d.f and shape of x^2, t and F with expectation and variance. (without derivation)	03
UNIT-5	Estimation Idea of inference, Point estimation, Interval estimation, Estimator, and estimate. Four basic criteria of Estimator, Concept of bias. Idea of unbiasedness and minimum variance unbiasedness. Point estimation of binomial proportion, Poission mean, normal mean and variance (using method of moments).	05
UNIT-6	Testing of Hypothesis : Statistical test of Hypothesis-Null and Alternative hypothesis, Simple and Composite hypothesis Type I and Type II error, Critical region, level of significance, Power of a test, One sided and Two sided tests. Critical Value. Tests of Significance related to a single Binomial Proportion and Poission Mean (using Large sample approximation), Mean and variance of a single univariate normal distribution.	06

UNIT-7	Statistical Quality Control Introduction, Idea of Quality and Quality Control, advantages of Statistical Quality control, process and Lot control, Control chart technique Construction of control charts by variables, *X* and *R*	04
	Total	**40 Hours**

VISVA-BHARATI

SYLLABUS FOR PRE-DEGREE EXAMINATION, 2027 UNDER SEMESTER SYSTEM
WITH EFFECT FROM:-
CLASS XI (2025-26)
CLASS XII (2026-27)

SUBJECT: CHEMISTRY (Elective)

Marks division for each semester: Full Marks - 50
Theory (Hall): 30 marks, Theory (Internal): 07 marks
Practical(Hall): 10 marks, Practical(Internal): 03 marks

CLASS-XI

SEMESTER-I

SUBJECT: CHEMISTRY

FULL MARKS: 30

THEORY

Sub-topics

UNIT No.	TOPICS	MARKS
Unit-1	**Some Basic Concepts of Chemistry:** 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.	**2**

Unit-2	**Structure of Atom:** 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.	**5**
Unit-3	**Classification of Elements and Periodicity in Properties:** 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.	**5**
Unit-4	**Chemical Bonding and Molecular Structure:** 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)	**6**
Unit-5	**States of Matter — Solids and Gases:** 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. 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.	**5**
Unit-6	**Organic Chemistry: Some basic principles:** General introduction, classification and IUPAC nomenclature of organic compounds. 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.	**7**

CLASS-XI

SEMESTER – II

SUBJECT: CHEMISTRY

FULL MARKS: 30

COURSE CODE: THEORY

Sub-topics

UNIT No.	TOPICS	MARKS
Unit-1	**Thermodynamics:** 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. 2nd law of thermodynamics, the introduction of entropy as a state function, Gibbs energy change for Spontaneous and non-spontaneous processes, criteria for equilibrium.	**5**
Unit-2	**Equilibrium:** 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).	**5**
Unit-3	**Redox Reactions:** 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	**4**
Unit-4	***s*-Block Elements (Group 1 and Group 2 elements):** 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.	**3**

Unit-5	***p*-Block Elements (Group 13 and Group 14 elements):** 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. **Group 13**: Boron: physical and chemical properties of compounds of Boron: Boron oxides, boric acid, borates and B_2H_6 Aluminium: Reactions of Al with acid and alkali, uses of Al, Preparation and uses of $LiAlH_4$ and Al_2O_3. **Group14:** Carbon: catenation, allotropic forms, nano carbon, graphene, physical and chemical properties of two oxides of carbon- CO and CO_2, Silicon: some compounds of silicon and their important uses – Silicon tetrachloride (Structure, preparation, hydrolysis and reduction reaction only), silicates [structure of open chain silicates constructing of $(SiO_3)^{2n-}{}_n$ ions], use of zeolites,	**3**
Unit-6	**Hydrocarbons: Classification of hydrocarbons** Alkanes – Nomenclature, isomerism, conformations (ethane only), physical properties (up to 6 carbons) and chemical reactions including halogenations, free radical mechanism, combustion and pyrolysis. 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. 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. Aromatic hydrocarbons; Introduction, IUPAC nomenclature; Benzene; resonance aromaticity; chemical properties; mechanism of electrophilic substitution– nitration,sulphonation,halogenations,Friedel-Craftsalkylation And acylation, carcinogenicity and toxicity.	**7**
Unit-7	**Environmental Chemistry:** 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.	**3**

CLASS-XII

SUBJECT: CHEMISTRY

SEMESTER – I

FULL MARKS : 30

COURSE CODE : THEORY

Sub-topics

UNIT No.	TOPICS	MARKS
Unit-1	**Liquid State** 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-molecularcolloids;propertiesofcolloids;Tyndal effect, Brownian movement, electrophoresis, coagulation, emulsions and types of emulsions.	**5**

Unit-2	***p*-Block Elements (Groups 15, 16, 17 and 18)** **Group 15 elements:** general introduction, electronic configuration, occurrence, oxidation states, Structure and reaction ofNH_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) **Group 16 elements:** General introduction, electronic configuration, occurrence, oxidation states; Oxygen:classification of oxides. Preparation and properties of Ozone. Sulphur: allotropic forms (rhombic and monoclinic). Properties and uses of oxides, oxoacids and peracids of sulphur. **Group 17 elements:** General introduction, electronic configuration, oxidation states, occurrence, trends in physical and chemical properties; Compounds of halogen; preparation, structure and uses of oxides, oxoacids of halogens, interhalogen compounds. Elementary idea of pseudohalogens and polyhalides. **Group18 elements:** 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, $XeOF_2$.	**6**
Unit-3	**Haloalkanes and Haloarenes** **Haloalkanes:** 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, **Haloarenes:** Natureof 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.	**5**
Unit-4	**Alcohols,Phenols and Ethers** **Alcohols:** 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. **Phenols:** Nomenclature, methods of preparation, physical and chemical properties, acidic nature of phenol, electrophilic substitution reaction, uses of phenol. **Ethers:** Nomenclature,methodsofpreparation,physicalandchemicalproperties, uses.	**5**

Unit-5	**Biomolecules:** **Carbohydrates** Classification (aldoses and ketoses), monosaccharides (glucose and fructose), D/L configuration, oligosaccharides (sucrose), polysaccharides (starch, cellulose) **Proteins** Elementary idea of α-amino acids, peptidebonds, polypeptides, structure of proteins (primary structure only), denaturation of proteins; enzymes. **Nucleic Acids:** DNA & RNA (introduction and basic concept)	**5**
Unit-6	**Polymers:** 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	**4**

CLASS-XII

SUBJECT: CHEMISTRY

SEMESTER-II

FULL MARKS : 30

COURSE CODE : THEORY

Sub-topics

UNIT No.	TOPICS	MARKS
Unit-1	**Electrochemistry** 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.	**5**

Unit-2	**Chemical Kinetics** 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 Catalysis, homogeneous and heterogeneous catalysis, enzyme catalysis.	**5**
Unit-3	**d and f Block elements** 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 K2Cr2O7 and KMnO4. Lanthanoids Electronic configuration, oxidationstates, chemical reactivity, lanthanoid contraction and its consequences, uses. Actinoids Electronic configuration, oxidation states, comparison with lanthanoids, uses.	**5**
Unit-4	**Coordination compounds** 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)	**5**
Unit-5	**Aldehydes, Ketones and Carboxylic Acids** **Aldehydes and Ketones:** Nomenclature, nature of carbonyl group, methods of preparation, physical and chemical properties, mechanism of nucleophilic addition, reactivity of alpha hydrogen in aldehydes; uses. **Carboxylic Acids:** Nomenclature, acidic nature, methods of preparation, physical and chemical properties, uses	**5**
Unit-6	**Organic compounds containing Nitrogen** **Nitro compounds:** General methods of preparation and reduction reactions. **Amines:** Nomenclature, classification, structure, methods of preparation, physical and chemical properties, uses, identification of primary, secondary and tertiary amines. **Cyanides and Isocyanides–** Nomenclature, structure, methods of preparation, chemical reactions (hydrolysis and reduction reactions only). **Diazonium salts:** Preparations, chemical reactions and importance in synthetic organic chemistry	**5**

Question Pattern

For all Semester

SUBJECT: CHEMISTRY

Full Marks: 30

Group- A (Short Question) **1 x 5 = 5**

Answer any five questions out of eight questions

Each question carries 01 marks.

Group - B (Broad questions) **5 x 5 = 25**

Answer any five questions out of eight questions

Each questions carries 05 marks.

Class - XI Semester - I

SL. No.	*Topics*	*Marks Allotted*	*Number of short questions*	*Number of broad questions*
1.	**Some Basic Concepts of Chemistry**	2	1	1
2.	**Structure of Atom**	5	1	1
3.	**Classification of Elements and Periodicity in Properties**	5	1	1
4.	**Chemical Bonding and Molecular Structure**	6	2	2
5.	**States of Matter — Solids and Gases**	5	1	1
6.	**Organic Chemistry: Some basic principles**	7	2	2

Class - XI Semester - II

SL. No.	*Topics*	*Marks Allotted*	*Number of short questions*	*Number of broad questions*
1.	**Thermodynamics**	5	1	1
2.	**Equilibrium**	5	1	1
3.	**Redox Reactions**	4	1	1
4.	***s*-Block Elements (Group 1 and Group 2 elements)**	3	1	1
5.	***p*-Block Elements (Group 13 and Group 14 elements)**	3	1	1
6.	**Hydrocarbons: Classification of hydrocarbons**	7	2	2
7.	**Environmental Chemistry**	3	1	1

Class XII Semester – I

SL. No.	*Topics*	*Marks Allotted*	*Number of short questions*	*Number of broad questions*	
1.	**Liquid State**	5	1	1	
2.	***p*-Block Elements (Groups 15, 16, 17 and 18)**	6	2	2	
3.	**Haloalkanes and Haloarenes**	5	1	1	
4.	**Alcohols,Phenols and Ethers**	5	1	1	01 mix question
5.	**Biomolecules**	5	2	1	
6.	**Polymers**	4	1	1	

Class XII Semester – II

SL. No.	*Topics*	*Marks Allotted*	*Number of short questions*	*Number of broad questions*	
1.	**Electrochemistry**	5	1	1	01 mix question
2.	**Chemical Kinetics**	5	1	1	
3.	**d and f Block elements**	5	1	1	
4.	**Coordination compounds**	5	2	1	
5.	**Aldehydes, Ketones and Carboxylic Acids**	5	2	2	
6.	**Organic compounds containing Nitrogen**	5	1	1	

VISVA-BHARATI

SYLLABUS FOR PRE-DEGREE PRACTICAL EXAMINATION, 2027 UNDER SEMESTER SYSTEM

WITH EFFECT FROM : -

CLASS XI (2025-26)

CLASS XII (2026-2027)

SUBJECT: CHEMISTRY (PRACTICAL)

CLASS – XI

FULL MARKS: 26

Evaluation Scheme for Examination

Volumetric analysis
Environment-related experiments
Characterization and purification of chemical substances
Class Record, Project and Viva

Practical Syllabus

A. Basic Laboratory Techniques

i. Cutting glass tube and glass rod
ii. Bending a glasstube
iii. Drawing out a glass jet
iv. Boringa 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 upto 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 sample soft tea leaves.
ii) Fruit and vegetable juices.

CLASS – XII

CHEMISTRY PRACTICAL

FULLMARKS: 26

Evaluation Scheme for Examination

Potentiometric Analysis

Salt Analysis

Detection of functional groups in Organic compounds

Content-Based Experiment (Chemical Kinetics / Thermochemistry / Preparation of Organic Compounds)

Class record, Viva and Project work

Practical Syllabus

A. Chemical kinetics

(i) Study of the rate of reaction of iodideions 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 -

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

(Note: Insoluble salts excluded)

Project work–where feasible may include

a. Model preparation

b. Investigatory project

c. Science exhibits

d. Participation in science fairs

e. Testing purity of food articles like butter, pulse, milk etc.

Visva-Bharati
Syllabus for class - XI
Subject – Physics (Elective)

Preamble:

1) The curriculum will bridge the gap between secondary and graduate level education.
2) The curriculum is structured in a variety of units, which are structured in such a way that the traditional curriculum is capable of gradually improve the understanding and scientific thinking of the students.
3) Modern and practical subjects are incorporated in the curriculum so that the students are exposed to appropriate science and technology concepts as per the needs of the society.
4) The curriculum has been developed in alignment with the national and international level curriculum.

Hope students will benefit from this course.

Outcome:

1) Student will learn the basic principles of Physics and able to solve various problems with that concept.
2) Student will able to analyze the basic relationship of natural and practical phenomenon.
3) Student will be able to apply practical knowledge and analysis to solve the problems.
4) Advance concepts in Physics will be cleared so that students are able to choose their preferred subjects in the next higher education.

Signature of the members

Kumar Vikrant Basak 28/8/24
Sucait Chakrabarty 28/08/24
Bulbul Konar 28.08.24
Sudeshna Mondal 28.08.24
Shampa Roy 28.08.24

Semester – I (Theory Part)

(Theory Part: Annual - 30 marks, Internal - 7 marks = 37)

Unit – 1(Physical world and measurement)
Unit – 2 (Kinematics)
Unit – 3 (Laws of motion)
Unit – 4 (Work, Energy and Power)
Unit – 5 (Motion of System of Particles and Rigid Body)
Unit – 6 (Gravitation)

Pattern of marks distribution

Question No. 1 is Compulsory
Short Answer Type Question: 1 mark x 10 = 10
Question No. (2 - 7) (Attempt any four questions) 5 marks x 4 = 20
Division of marks – (2+2+1=5) / (3+2=5)

Semester – I (Practical Part)

(Annual - 10 marks, Internal - 3 marks = 13)

Signature of the members

28/8/24

Kumar Vikrant Basak
28/8/24

Suvdit Chakrabarty 28/08/24

Bulbul Konar 28.08.24

Subhadeep Mondal 28.08.24

Shampa Roy 28.08.24

Semester – II (Theory Part)

(Theory Part: Annual - 30 marks, Internal - 7 marks = 37)

Group – A (Unit - 7)

Properties of solids and liquids (3 Questions)

Group B (Unit – 8 & Unit - 9)

Thermodynamics (2 Questions)

Kinetic Theory of Gases (1 question)

Group C (Unit - 10)

Oscillations and waves (3 Questions)

Pattern of mark distribution

Group A (questions to be attempt - 2) – 4x2 = 8

Distribution of marks – (2+2=4) / (2+1+1 =4) / (3+1 = 4)

Group B (questions to be attempt - 2) – 6x2 = 12

Distribution of marks – (2+2+2 =6) / (3+2+1=6) / (3+3 = 6)

Group C (questions to be attempt - 2) – 5x2 = 10

Distribution of marks – (3+2 = 5) / (3+1+1 = 5) / (2+2+1= 5)

Semester – II (Practical Part)

(Annual - 10 marks, Internal - 3 marks = 13)

Signature . of the members

Kumar Vikrant Basak 28/8/24

Suchit Chakraborty 28/08/24

Bulbul Konar 28.08.24

Sibsadeep Mondal 28.08.24

Sharmila Roy 28-08-24

Physics Theory Syllabus (Sem – I)

Unit I: Physical World and Measurement (Periods 4)

Physics - Scope and excitement; nature of physical laws; Physics, technology and society.

Need for measurement: Units of measurement; systems of units; SI units, fundamental and derived units. Length, mass and time measurements; accuracy and precision of measuring instruments; errors in measurement; significant figures.

Dimensions of physical quantities, dimensional analysis and its applications.

Unit II: Kinematics (Periods 12)

Frame of reference (inertial and non-inertial frames)., Motion in a straight line: Position-time graph, speed and velocity.

Elementary concepts of differentiation and integration for describing motion.

Uniform and non-uniform motion, average speed and instantaneous velocity.

Uniformly accelerated motion, velocity--time and position-time graphs, relations for uniformly accelerated motion (graphical treatment).

Scalar and vector quantities: Position and displacement vectors, general vectors and notation, equality of vectors, multiplication of vectors by a real number; addition and subtraction of vectors. Relative velocity. Unit vector; resolution of a vector in a plane - rectangular components. Scalar and Vector products of Vectors. Motion in a plane. Cases of uniform velocity and uniform acceleration - projectile motion. Uniform circular motion.

Unit Ill: Laws of Motion (Periods 12)

Intuitive concept of force. Inertia, Newton's first low of motion; momentum and Newton's second law of motion, impulse; Newton's third low of motion. Law of conservation of linear momentum and its applications. Equilibrium of concurrent forces. Static and kinetic friction, laws of friction, rolling friction.

Dynamics of uniform circular motion: Centripetal force, examples of circular motion (vehicle on level circular road, vehicle on banked road).

Unit IV: Work, Energy and Power (Periods 5)

Work done by a constant force and a variable force; kinetic energy, work-energy theorem, power.

Motion of potential energy, potential energy of a spring, conservative forces; conservation of mechanical energy (kinetic and potential energies): non-conservative forces; motion in a vertical circle, elastic and inelastic collisions in one and two dimensions.

Unit V: Motion of System of Particles and Rigid Body (Periods 12)

Centre of mass of a two-particle system, momentum conservation and centre of mass motion. Centre of mass of a rigid body; centre of mass of uniform rod.

Moment of a force, torque, angular momentum, conservation of angular momentum with some examples.

Equilibrium of rigid bodies, rigid body rotation and equation of rotational motion, comparison of linear and rotational motions; moment of inertia, radius of gyration.

Values of M.I. for simple geometrical objects (no derivation). Statement of parallel and perpendicular axes theorems and their applications.

Unit VI: Gravitation (Periods 10)

Kepler's laws of planetary motion. The universal law of gravitation.

Acceleration due to gravity and its variation with altitude, depth and rotation of earth. Gravitational potential energy; gravitational potential. Escape velocity, orbital velocity of a satellite. Geostationary satellites.

XI - Physics Practical Syllabus (Sem – I)

(Student should attempt any three)

1) To determine the volume of a wooden block by slide calipers.
2) To measure the diameter and area of cross section of a given glass rod by screw gauge.
3) To determine the thickness of a glass plate by spherometer.
4)To find the coefficient of friction using an inclined plane.

Signature of the members

Kumare Vikrant Basak 28/8/24

Suckit Chakrabarty 28/08/24

Bulbul Konar 28.08.24

Subhadeep Mondal 28.08.24

Shampa Roy 28.08.24

Physics Theory Syllabus (Sem – II)

Unit VII: Properties of Bulk Matter (Periods 14)

Elastic behavior, Stress-strain relationship, Hooke's law, Young's modulus, bulk modulus, shear, modulus of rigidity, Poisson's ratio; elastic energy.

Pressure due to a fluid column; Pascal's law and its applications (hydraulic lift and hydraulic brakes). Effect of gravity on fluid pressure.

Viscosity, Stokes' law, terminal velocity, Reynold's number, streamline and turbulent flow. Critical velocity, 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 and capillary rise.

Unit VIII: Heat & Thermodynamics (Periods 25)

Heat, temperature, thermal expansion; thermal expansion of solids, liquids, and gases. Ideal gas laws, isothermal and adiabatic processes; anomalous expansion and its effect, specific heat capacity: C_p, C_v - calorimetry; change of slate - specific latent heat capacity.

Heat transfer - conduction; convection and radiation, blackbody radiation Kirchoff's law, absorptive and emissive powers and green house effect, thermal conductivity, Newton's law of cooling, Wein's displacement law and Stefan's law.

Thermal equilibrium and definition of temperature (zeroth law of Thermodynamics). Heat, work and internal energy. First law of thermodynamics.

Second law of thermodynamics: Reversible and irreversible processes. Heat engines and refrigerators.

Equation of state of a perfect gas, work done on compressing a gas.

***Kinetic theory of* gases:** Assumptions, concept of pressure. Kinetic energy and temperature. speed of gas molecules; degrees of freedom, law of equipartition of energy (statement only) and application to specific heat of gases; concept of mean free path, Avogadro's number.

Unit IX: Oscillations and Waves (Periods 16)

Periodic motion - period, frequency, displacement as a function of Jime. Periodic functions. Simple harmonic motion (SHM) and its equation; phase; oscillations of a spring - restoring force and force constant; energy in SHM - kinetic and potential energies; simple pendulum - derivation of expression for its time period; free, forced and damped oscillations (qualitative ideas only)', resonance.

Wave motion. Longitudinal and transverse waves, speed of wave motion. Displacement relation for a progressive wave. Principle of superposition of waves, reflection of waves, standing waves in strings and organ pipes, fundamental mode and harmonics. Beats. Doppler effect.

XI - Physics Practical Syllabus (Sem – II)

(Student should attempt any three)

1) To determine the specific gravity of a liquid by Hare's apparatus (Graph also)
2) To find the value of acceleration due to gravity by using simple pendulum.

(by L-T^2 graph also)

3) To determine the density of a solid insoluble in water by hydrostatic balance.
4) To determine the centre of gravity of a laminar body with the help of a string.

Signature of the members

Kumare Vikrant Basak 28/8/24

Sucheit Chakraborty 28/08/24

Bulbul Konar 28.08.24

Subhadeep Mondal 28.08.24

Shampa Roy 28.08.24

Sample Question Paper
Visva-Bharati
Class – XI (Semester – I)
Subject – Physics (Elective)
Full Marks – 30, Time – 2 Hours
Group – A

Question No. 1 is compulsory **1 X 10 = 10**

1. a) The Avogadro number is 6.022×10^{23}. How many significant figures are there?
   b) The error in the measurement of radius of a sphere is 2%. What would be the percentage of error in the measurement of volume of the sphere?
   c) The equation of state of a real gas is $(P+\frac{a}{V^2})(V-b) = RT$, where P, V and T are pressure, volume and absolute temperature respectively. Find out the dimension of b.
   d) Draw the acceleration – time graph for a freely falling body.
   e) What is the basic difference between impulse of a force and impulsive force?
   f) What is the angular velocity of hour-hand of a clock?
   g) Which physical quantity is conserved during both the elastic and inelastic collision?
   h) When does the position of the centre of mass coincide with the position of the centre of gravity of an object?
   i) Why is it difficult to put a cycle into motion than to maintain its motion?
   j) Write down the value of escape velocity of a body projected from the surface of the earth?

Answer any four questions from question no. 2 to 7 **5 X 4 = 20**

2. a) The unit of t and x in the expression $y = A\cos(\frac{t}{P} - qx)$ are second and meter respectively. Find the units of P and q. **1**
   b)Plot the velocity- time graph for a particle i) moving with positive acceleration ii) moving with negative acceleration. **2**
   c) If the velocity of a particle represents by $V = At + Bt^2$, where A and B are constants and t is time. Find the distance traversed by it between 1 s and 2 s. **2**
3. a) Establish Newton's third law of motion from the law of conservation of linear momentum. **2**
   b) Find the condition for which $|\vec{A} + \vec{B}| = |\vec{A} - \vec{B}|$ **1**
   c) $3\hat{i} + 4\hat{j} + 12\hat{k}$ is a vector. Find the magnitude of the vector and the angles it makes with x, y and z axes. **2**
4. a) What is the condition for super weight–lessness, in a moving lift? **1**
   b) Establish the relation between angle of repose and coefficient of friction. **2**
   c) Two bodies of equal weight w are suspended exactly from the midpoint of two stretched horizontal strings. The two strings make angles α_1 and α_2 ($\alpha_1 > \alpha_2$) with the horizontal. In which of the string would the tension be higher? Explain. **2**
5. a) Define conservative force. **1**
   b) Two springs having force constant K_1 and K_2 ($K_1 > K_2$) respectively increases its length by same amount. On which spring work done will be more and why? **2**
   c) A cyclist, while taking a bend of radius r at a speed V, leans towards the centre of the bend and if his body inclines at an angle θ with the vertical line then show that $\tan\theta = \frac{V^2}{rg}$ (g= acceleration due to gravity) **2**
6. a) Define radius of gyration. **2**
   b) Write down the vector relation between linear momentum and angular momentum. **1**
   c) The distance between centres of carbon and oxygen atoms in the carbon monoxide gas molecule is 1.13Å. Locate the centre of mass of the gas molecule relative to the carbon atom. **2**
7. a) State Kepler's law of planetary motion. **3**
   b) At what depth below the surface of the earth will the acceleration due to gravity decreases by 1% with respect to that on the earth's surface? The earth can be taken as a uniform sphere of radius 6400 km. **2**

Sudeit Chakraborty 28/08/24
Kumar Vikrant Basak 28/8/24 Bulbul Konar 28.08.24 Sudhadeep Mondal 28.08.24

Sample Question Paper
Visva-Bharati
Class – XI (Semester – I)
Subject – Physics (Elective)
Full Marks – 30, Time – 2 Hours
Group – A

1নং প্রশ্ন আবশ্যিক **1 X 10 = 10**

a) অ্যাভোগাড্রো সংখ্যারমান 6.022×10^{23}। এখানে কটি সার্থক অঙ্ক সংখ্যা আছে?
b) কোন গোলকের ব্যাসার্ধ পরিমাপে 2% ত্রুটি হলে, ঐ গোলকের আয়তন পরিমাপের শতকরা ত্রুটি কী হবে?
c)বাস্তব গ্যাসের অবস্থার সমীকরণ $(P+\frac{a}{V^2})(V-b) = RT$, যেখানে P = গ্যাসের চাপ, V = গ্যাসের আয়তন, T = গ্যাসের পরম উষ্ণতা এবং a, b ও R হল ধ্রুবক। b এর মাত্রা নির্ণয় কর।
d) অবাধে পতনশীল বস্তুর ত্বরণ সময় লেখচিত্রটি আঁক।
e) বলের ঘাত ও ঘাত বলের মধ্যে মূল পার্থক্য কী?
f) ঘড়ির ঘন্টার কাঁটার কৌণিক বেগ কত?
g) স্থিতিস্থাপক এবং অস্থিতিস্থাপক সংঘর্ষে কোন ভৌত রাশিটি সংরক্ষিত থাকে?
h) কোন বস্তুর ভরকেন্দ্র এবং ভারকেন্দ্র কখন অভিন্ন হয়?
i) একটি সাইকেলের গতিশীল অবস্থা বজায় রাখার চেয়ে তাকে গতিশীল করা কঠিন কেন?
j) পৃথিবীপৃষ্ঠ থেকে উৎক্ষিপ্ত কোনো বস্তুর মুক্তিবেগের মান লেখ।

2নং থেকে 7নং প্রশ্নের মধ্যে থেকে যে কোনো চারটি প্রশ্নের উত্তর দাও। **5 X 4 = 20**

2. a) $y = A\cos(\frac{t}{P} - qx)$ সমীকরণে t ও x এর একক যথাক্রমে সেকেন্ড ও মিটার হলে, p ও q এর একক নির্ণয় কর। 1
b) বেগ-সময় লেখচিত্র অঙ্কন কর, যখন কণাটি i) ধনাত্মক ত্বরণে গতিশীল ii) ঋণাত্মক ত্বরণে গতিশীল। 2
c) কোনো কণার বেগ $V = At + Bt^2$ সমীকরণ দ্বারা প্রকাশিত। যেখানে A ও B ধ্রুবক এবং t হল সময়। 1S থেকে 2S সময়ের মধ্যে কণাটির দ্বারা অতিক্রান্ত দূরত্ব নির্ণয় কর। 2
3. a) রৈখিক ভরবেগের সংরক্ষণ সূত্র থেকে নিউটনের তৃতীয় গতিসূত্র প্রতিষ্ঠা কর। 2
b) $|\vec{A} + \vec{B}| = |\vec{A} - \vec{B}|$ কী শর্তেহবে তা নির্ণয় কর। 1
c) $3\hat{i} + 4\hat{j} + 12\hat{k}$ ভেক্টরটির মান এবং x, y ও z অক্ষের সাথে উৎপন্ন কোণগুলির মান নির্ণয় কর। 2
4. a) চলন্ত লিফটে 'অতি ভারহীনতার' শর্ত কী ? 1
b) বিরাম কোণ ও ঘর্ষণ গুনাঙ্কের মধ্যে সম্পর্ক প্রতিষ্ঠা কর। 2
c) দুটি সমান ওজন w -এর প্রতিটি একটি করে টানটান করা সুতোর ঠিক মাঝখানে ঝোলানো আছে।ওজনের ফলে সুতো দুটি অনুভূমিকের সঙ্গে α_1 ও α_2 কোণ উৎপন্ন করলে $(\alpha_1 > \alpha_2)$ কোন সুতোটিতে বেশি টান পড়বে ? ব্যাখ্যা করো। 2
5. a) সংরক্ষী বলের সংজ্ঞা দাও। 1
b) দুটি স্প্রিং এর বলধ্রুবক যথাক্রমে K_1 এবং K_2 $(K_1 > K_2)$ । উভয় স্প্রিং এর সমান দৈর্ঘ্য বৃদ্ধি করা হলে কোন স্প্রিং এর উপর বেশী কার্য করতে হবে? 2
c) কোন সাইকেল আরোহী r ব্যাসার্ধ বিশিষ্ট বৃত্তপথে V রৈখিক বেগে বাঁক নেওয়ার সময় বৃত্তাকার পথের কেন্দ্রের দিকে ঝুঁকে পড়ে এবং তার দেহ উল্লম্ব রেখার সঙ্গে θ কোণে আনত হয়। দেখাও যে $\tan\theta = \frac{V^2}{rg}$ (g= অভিকর্ষজ ত্বরণ)। 2
6. a) চক্রগতির ব্যাসার্ধ কাকে বলে? 2
b) রৈখিক ভরবেগ ও কৌণিক ভরবেগের মধ্যে ভেক্টর সম্পর্কটি লেখ। 1
c) কার্বন মনোক্সাইড অনুতে কার্বন পরমানু ও অক্সিজেন পরমানুর কেন্দ্রদ্বয়ের দূরত্ব 1.13Å। কার্বন পরমানুর সাপেক্ষে গ্যাস অণুটির ভরকেন্দ্রের অবস্থান নির্ণয় কর। 2
7. a) গ্রহের গতি সংক্রান্ত কেপলারের সূত্রগুলি লেখ। 3
b) ভূপৃষ্ঠ থেকে কত গভীরতায় অভিকর্ষজ ত্বরণের মান ভূপৃষ্ঠের মানের সাপেক্ষে 1% হ্রাস পাবে? পৃথিবীকে 6400 km ব্যাসার্ধের সুষম গোলক হিসাবে ধরা যেতে পারে। 2

Sudipta Chakraborty 28/08/24
Kumar Vikrant Basak 28/8/24
Bulbul Konar 28.08.24
Sukhendeep Mondal 28.08.24

Sample Question Paper
Visva-Bharati
Class – XI (Semester – II)
Subject – Physics (Elective)
Full Marks – 30, Time – 2 Hours
Group – A

Answer any two questions **2X4=8**

1. a) Define Poisson's ratio. What are the limiting values? 1+1=2
   b) $\frac{1}{11}^{th}$ part of the volume of ice floating in the water remains above the water. What is the density of ice? 2
2. a) What do you mean by the centre of buoyancy? 1
   b) Surface tension of water at 27^0C is 65 dyn cm^{-1} and in case of water $\frac{dT}{d\theta} = 0.15$ dyn $cm^{-1}K^{-1}$. What is the surface energy of water? 2
   c) Write down the mathematical form of Stoke's Law. 1
3. a) Show how density of a liquid varies with temperature. 2
   b) Define water equivalent. 1
   c) "Latent heat of fusion of ice is 80 cal g^{-1}".What do you mean by this statement? 1

Group – B

Answer any two questions **2X6=12**

4. a) Prove that $C_P - C_V = R$ (Where C_P = molar specific heat at constant Pressure C_V = molar specific heat at constant volume, R = universal gas constant) 2
   b) Why do two isothermal curves not intersect each other? 2
   c) Find out the amount of work done to convert 100 g ice at 0^0 C to water at 100^0C (Latent heat of fusion of ice = 80 Cal g-1, mechanical equivalent of heat 4.2 $Jcal^{-1}$) 2
5. a) Deduce an expression for the efficiency of a Carnot engine. 2
   b) The efficiency of a Carnot engine is 50%. The temperature of the heat sink is 27^0C, find the temperature of the heat source. 2
   c) Write down the Clausius statement of second law of thermodynamics. 2
6. a) State the principle of Equipartition of Energy. 2
   b) How would the rms speed of an ideal gas change with the increase in the density of gas. 2
   c) At what temperature will the rms speed of a hydrogen molecule be equal to that of an oxygen molecule at 47^0C? 2

Group - C

Answer any two questions **2X5=10**

7. a) If a simple harmonic motion is represented by the differential equation $\frac{d^2x}{dt^2} + \alpha x = 0$, then find its time period. 1

   b) The maximum velocity of a particle, executing simple harmonic motion with amplitude 7 mm, is 4.4 m/sec, find the period of oscillation. 2

   c) Write down the equations of progressive wave. 2

8. a) Find the path differences between two waves

   $Y_1 = a_1 \text{ Sin } (\omega t - \frac{2\pi x}{\lambda})$ and $Y_2 = a_2 \text{ Cos } (\omega t - \frac{2\pi}{\lambda} + \emptyset)$ 2

   b) The length of a second pendulum is increased by 1%. Find the percentage increased in the time period of the pendulum of increased length. 2

   c) What is Doppler shift? 1

9. a) The displacement y of a particle in a medium can be expressed as

   $$y = 10^{-6} \text{ Sin } (100t + 20x + \frac{\pi}{4}) \text{ meter}$$

   where t is in seconds and x in meter. Find the speed of the wave. 2

   b) What is the difference between free vibration and forced vibration? (Specify any one reasons) 1

   c) All harmonics of the fundamental tone are formed due to vibration of air column in a pipe open at both ends. Prove it. (Draw relevant diagram) 2

Signature of the members

Kumare Vikrant Basak 28/8/24

Sudhit Chakrabarty 28/08/24

Bulbul Konar 28.08.24

Subhadeep Mondal 28.08.24

Shampa Roy 28.08.24

Sample Question Paper
Visva-Bharati
Class – XI (Semester – II)
Subject – Physics (Elective)
Full Marks – 30, Time – 2 Hours
Group – A

যে কোন দুটি প্রশ্নের উত্তর দাও: 2X4=8

1. ক) পয়সোঁর অনুপাতের সংজ্ঞা দাও। এর সীমাস্থ মানগুলি কী কী? 1+1=2

   খ) জলে ভাসমান বরফের আয়তনের $\frac{1}{11}$ ভাগের এক ভাগ জলের উপরে থাকে। বরফের ঘনত্ব কত? 2

2. ক) প্লবতা কেন্দ্র বলতে কী বোঝো? 1

   খ) 27^0C তাপমাত্রায় জলের পৃষ্ঠটান 65 dyn cm^{-1} এবং জলের ক্ষেত্রে $\frac{dT}{d\theta} = 0.15$ dyn $cm^{-1}K^{-1}$, জলের পৃষ্ঠশক্তি কত? 2

   গ) স্টোকের সূত্রের গাণিতিক রূপ লেখো। 1

3. ক) তাপমাত্রার সাথে তরলের ঘনত্ব কীভাবে পরিবর্তিত হয় তা দেখাও। 2

   খ) জলসমের সংজ্ঞা দাও। 1

   গ) "বরফ গলনের লীন তাপ 80 cal g^{-1}"। এই বক্তব্যের অর্থ কি? 1

Group – B

যে কোন দুটি প্রশ্নের উত্তর দাও: **2X6=12**

4. ক) প্রমাণ করো যে $C_P - C_V = R$ (যেখানে C_P = স্থির চাপে গ্যাসের মোলার আপেক্ষিক তাপ, C_V = স্থির আয়তনে গ্যাসের মোলার আপেক্ষিক তাপ, R=সর্বজনীন গ্যাস ধ্রুবক) 2

   খ) দুটি সমোষ্ণ লেখ পরস্পরকে ছেদ করে না কেন? 2

   গ) 0^0C তাপমাত্রার 100 গ্রাম বরফকে 100^0C তাপমাত্রার জলে রূপান্তর করতে কাজের পরিমাণ কত? (বরফ গলনের লীনতাপ = 80 cal g^{-1}, তাপের যান্ত্রিক তুল্যাঙ্ক = 4.2 $Jcal^{-1}$) 2

5. ক) একটি কার্নো ইঞ্জিনের কর্মদক্ষতার রাশিমালাটি প্রতিষ্ঠা করো। 2

   খ) কোনো একটি কার্নো ইঞ্জিনের দক্ষতা 50%, যদি তাপ সিঙ্কের (heat sink) তাপমাত্রা হল 27^0C, তাপ উৎসের তাপমাত্রা কত? 2

   গ) তাপগতিবিদ্যার দ্বিতীয় সূত্রের ক্লসিয়াস এর বিবৃতিটি লেখো। 2

6. ক) শক্তির সমবিভাজনের নীতিটি ব্যাখ্যা কর। 2

খ) গ্যাসের ঘনত্ব বৃদ্ধির সাথে সাথে একটি আদর্শ গ্যাসের rms গতি কীভাবে পরিবর্তিত হবে? 2

গ) কোন তাপমাত্রায় একটি হাইড্রোজেন অণুর rms গতি 47^0C অক্সিজেন অণুর rms গতির সমান হবে? 2

Group - C

যে কোন দুটি প্রশ্নের উত্তর দাওঃ **2X5=10**

7. ক) যদি একটি সরল দোলগতি অবকল সমীকরণ $\frac{d^2x}{dt^2} + \alpha x = 0$ হলে, এর দোলনকাল কত? 1

খ) 7 mm বিস্তার বিশিষ্ট একটি সরলদোলগতি যুক্ত কণার সর্বাধিক বেগ 4.4 ms^{-1} হলে দোলনকাল নির্ণয় কর। 2

গ) চল তরঙ্গের সমীকরণগুলি লেখ। 2

8. ক) দুটি তরঙ্গের মধ্যে পথ পার্থক্য নির্ণয় করো।

$Y_1 = a_1 \text{ Sin } (\omega t - \frac{2\pi x}{\lambda})$ এবং $Y_2 = a_2 \text{ Cos } (\omega t - \frac{2\pi x}{\lambda} + \emptyset)$ 2

খ) 2s দোলন কাল বিশিষ্ট একটি সরল দোলকের দৈর্ঘ্য 1% বৃদ্ধি পায়। বর্ধিত দৈর্ঘ্যের সরল দোলকটির সময়কালের শতকরা বৃদ্ধি কত? 2

গ) ডপলার বিচ্যুতি কি? 1

9. ক) একটি মাধ্যমের একটি কণার স্থানচ্যুতি y হিসাবে প্রকাশ করা হয়েছে।

$$y = 10^{-6} \text{ Sin } (100t + 20x + \frac{\pi}{4}) \text{ meter}$$

যেখানে t সেকেন্ডে এবং x মিটারে। তরঙ্গের গতি নির্ণয় করো। 2

খ) মুক্ত কম্পন এবং প্রণোদিত কম্পনের মধ্যে একটি পার্থক্য লেখ। 1

গ) দুমুখ খোলা নলে বায়ুস্তম্ভের কম্পনের দ্বারা মূল সুরের সবকটি সমমেলই গঠিত হয়। প্রমাণ করো। (ছবি আঁকবে) 2

Signature of the members

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VISVA BHARATI
CLASS – XI
SEMISTER – I
SUBJECT CODE- 044
BIOLOGY SYLLABUS (THEORY AND PRACTICAL)
FULL MARKS : 50

CREDIT: 3.5 (THEORY 2.5 + PRACTICAL 1) **CREDIT HOUR :105 (75+30)**

(THEORY: INTERNAL ASSESMENT:7 SEMESTER EXAM: 30, TIME: 2HRS.)
(PRACTICAL: INTERNAL ASSESMENT:3 SEMESTER EXAM :10, TIME: 3 HRS)

OBJECTIVES:

1. Enhance knowledge on biodiversity, classification systems and major plant and animal groups.
2. Learners will gain insights into taxonomy, biological classification and the distinguishing features of various life forms.
3. Explore cell structure and the processes of cell cycle.
4. Strengthen knowledge about key physiological process like photosynthesis in plants.
5. Emphasizes deep understanding on the human respiratory, endocrine systems and movements highlighting their structure, functions and related disorders.

COURSE CONTENTS :

GROUP	GROUP TITLE	UNIT NO.	UNIT TITLE	COURSE CONTENTS	MARKS ALLOTED
A	Diversity of living world	1	The living world	Definition and concept of 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 parks, Herbaria, Botanical gardens	14
		2	Biological classification	Five kingdom classification, Salient features and classification of Monera, Protista and Fungi into major groups; Lichens, Viruses and viroids	
		3	Plant Kingdom	classification of plants into major groups: Algae, Bryophyta , Pteridophyta, Gymnosperm and Angiosperms (Three to five salient and distinguishing features and examples of each category)	

		4	Animal kingdom	Salient features and classification of animals, Non chordates up to phylum level and chordates up to class level (three to five salient and distinguishing features and examples of each category)	
B	Unit of life and plant physiology	5	Cell - the unit of life	Cell theory and cell as the basic unit of life; Structure of prokaryotic and eukaryotic cells; Plant cell and animal cell; Cell envelope: Structure and function of cell membrane cell wall; Cell Organelles: Ultrastructure and function of endoplasmic reticulum, Golgi bodies, Lysosomes, Mitochondria, Plastid, Ribosomes, Microbodies, Cytoskeleton, Cilia, Flagella, Centrioles; Nucleus	8
		6	Cell cycle and cell division	Cell cycle, Mitosis and meiosis and their significance	
		7	Photosynthesis	Photosynthesis as a means of autotrophic Nutrition, Site of Photosynthesis, Pigments involved in Photosynthesis (elementary level); Photochemical and biosynthetic faces of photosynthesis, Cyclic and noncyclic for the photophosphorylation; Chemiosmotic hypothesis, Photo respiration, C3 and C4 pathways, CAM cycle (schematic pathway only), Factors affecting photosynthesis.	
C	Functional dynamism in man	8	Breathing and Respiration	Respiratory organs in animal (recall only); Respiratory system in human; Mechanism of breathing and its regulation in humans- exchange of gases, Transport of gases regulation of respiration, Respiratory volume; Disorders related to respiration- Asthma, Emphysema, Occupational respiratory disorders (in brief)	8
		9	Locomotion and Movement	Types of movement-Ciliary , Flagellar, Muscular; Skeletal muscle, Contractile protein and muscle contraction; Skeletal system and its functions; Joints; Disorders of muscular and Systems- - Myasthenia,	

				Gravis, Tetany, Muscular dystrophy, Arthritis, Osteoporosis, Gout.	
		10	Chemical coordination and regulation	Endocrine glands and hormones; Human endocrine system- Hypothylamus, Pituitary, Pineal, Thyroid parathyroid adrenal pancreas gonads; Mechanism of hormone action (elementary idea); Role of hormones as messengers and regulators, Hypo and hyper activity related disorders: Dwarfism acromegaly, Cretinism, Goiter, Exophthalmic goiter, Diabetes, Addision's disease	

PRACTICAL:

1. Herbarium sheet- Monocotyledonous and Dicotyledonous herbs. (any five)

2. Study of specimens/slides/models and identification with reasons- Fungi (Mucor/Rhizopus/ Yeast/Agaricus); Algae(Spirogyra/Chlamydomonas); Bryophyta (Pogonatum /Marchantia); Pteridophyta(Dryopteris/Marsilea); Gymnosperm(Pine with male and female cone); Angiosperm(one monocotyledonous and one dicotyledonous plant).

3. Study of specimens/slides/models and identification with reasons- Amoeba, Paramoecium, Sycon, Hydra, Liver fluke, Ascaris(male and female),Earthworm, Leech, Prawn, Honeybee, Apple snail, Unio, Star fish, Petromyzon, Shark, Rohu, Frog, Lizard, Pigeon and Rabbit.

4. Observation of dead and living cells from plant and animal samples.

5. Observation of cilia and flagella.

6. Identification of different stages of mitosis and meiosis through permanent slides.

7. Experiment to prove that sunlight is essential for photosynthesis.

8. Experiment showing presence of carbon dioxide in exhaled air.

9. Study of human skeleton and different types of joints with the help of virtual image and model.

10. Study of plasmolysis in epidermal peels. (eg. Rheo leaves)

Learning Outcomes :

1. Build foundational knowledge of living organisms and biological systems.
2. Strengthen classification, observation and diagrammatic skills.
3. Relate biological concepts to human physiology and health.
4. Apply scientific reasoning to understand biological structure and functions.
5. Develop observational and analytical skills through structured study of systems and cycles in living organisms.
6. Overall, it encourages scientific thinking and real-life applications of biological knowledge.

Reference books:

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2 Trueman's Elementary Biology- K.N. Bhatia and M.P. Tyagi.
3.S. Chand's Biology -Dr. P.S. Verma and Dr. B.P. Pandey
4. Biology, Author Gopal Chandra Guchayit, subhadeep Chakrabarty, Anindya Santra
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5. Essential Biology 11 Author: Dr.Ardhendu Sekhar Nandi, Dr.Trilochan Midya, Dr. Dulal Chandra Santra (publisher : Santra publication) Bengali & english version
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10.Practical Biology Class 11 published by Modern Publishers
Author V. K. Khosla Kanta Khosla
11.Arihant CBSE Laboratory Manual Biology Class 11

VISVA BHARATI
CLASS – XI
SEMISTER – II
SUBJECT CODE-044
BIOLOGY SYLLABUS (THEORY AND PRACTICAL)
FULL MARKS : 50

CREDIT : 3.5 (THEORY 2.5+PRACTICAL 1) **CREDIT HOUR :105 (75+30)**

(THEORY: INTERNAL ASSESMENT:7 SEMESTER EXAM : 30, TIME : 2HRS.)

(PRACTICAL: INTERNAL ASSESMENT:3 SEMESTER EXAM :10, TIME: 3 HRS)

OBJECTIVES:

1. Understand the morphology and modifications of flowering plant parts (root, stem, leaf, flower, fruit, seed).
2. Learn about plant and animal tissues, especially in dicots, monocots, frogs and cockroaches.
3. Explore the structure and function of biomolecules and enzymes.
4. Study the process of cellular respiration and energy production in plants and animals.
5. Examine plant growth, development and the role of hormones and environmental factors.
6. Understand the human circulatory and excretory systems including the functioning of related organs, their regulation and disorders.
7. Learn the basics of neural control, coordination and sensory systems in humans.

COURSE CONTENT

GROUP	GROUP TITLE	UNIT NO	UNIT TITLE	COURSE CONTENT	NUMBER ALLOTED
A	Structural organisation of plants and animals	**1**	Morphology of flowering plants	Morphology and modifications of different parts of flowering plants, Root – origin, structure, types and modification. Stem – Morphology and modification. Leaf, inflorescence, flower, fruit and seed.	**14**
		2	Anatomy of flowering plants	Anatomy and functions of tissue system in dicots and monocots.	
		3	Animal tissue in brief	Structure and functions of epithelial, connective, muscular and nervous tissue in bries.	
		4	Structural organisation in Animals	Morphology, anatomy and functions of different systems (digestive, circulation,	

				resperation, nervous and reproductive) of Cockroach and Frog	
B	Plant physiology	**5**	Biomolecules	Chemical constituents of living cells. Biomolecular structure and function of proteins, carbohydrates, lipids, nucleic acids. Enzymes – properties, naming, structure, types, mechanism of enzyme action.	**8**
		6	Respiration in plants	Respiration: 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	
		7	Plant growth and development	Plant growth and development: Seed germination; Phases of plant growth and plant growth rate; Conditions of growth; Differentiation , Dedifferentiation and redifferentiation; Sequence of developmental process in a plant cell. Growth regulation – Auxin, Gibberellins, Cytokinin, ABA; Seed dormancy; Vernalisation, Photoperiodism.	
C	Human physiology	**8**	Body fluid and circulation	Body fluid and circulation: 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(in brief)	**8**
		9	Excretory products and their elimination	Excretory products and their elimination : Modes of excretion – Ammonotelism, Ureotelism, Uricotelism; Human excretory	

				system – Structure and function; Urine formation, Osmoregulation; Regulation of kidney function – Rennin-angiotensin, Atrial natriuretic factor, ADH and diabetes insipidus; Role of other organs in excretion; Disorders- Uraemia, Renal failure, Renal calculi, Nephritis; Dialysis and artificial kidney (in brief)	
		10	Neural control and coordination	Neural control and coordination: Neuron and nerves. Nervous system in humans – Central nervous system; Peripheral nervous system and visceral nervous system. Generation and conduction of nerve impulse; Reflex action ; Sensory perception; Sense organs; Elementary structure and functions of eye and ear.	

PRACTICAL:

1. Study and describe locally available common flowering plants from family Malvaceae and Fabaceae including dissection and display of floral whorls, anther and ovary to show number of chambers (placentation). Floral formula and floral diagrams, type of root, type of stem, leaf. (arrangement, shape ,venation, simple and compound)
2. Preparation and study of transverse section of monocot root and stem.
3. Preparation and study of transverse section of dicot root and stem.
4. Study of different systems of cockroach.
5. Test for the presence of sugar (Benedict test) and proteins. (Biuret test).
6. Study of distribution of stomata in the upper and lower surface of leaves.
7. Experiment to show the role of auxin in root formation.
8. Test to determine blood group using proper kit.

Learning Outcomes:

1. Introduces students to the structure and function of plants and animals covering topics like morphology, anatomy and physiology.
2. Builds foundational knowledge of biomolecules, enzymes, respiration and plant growth.
3. Students also explore the structure and regulation of major human systems including circulatory, excretory and nervous systems.
4. Develops observational, analytical and diagrammatic skills through structured study of systems and processes in living organisms.
5. Overall learners will be able to relate biological concepts to functional processes in living organisms and understand their relevance in health and development**.**

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VISVA BHARATI
CLASS – XII
SEMISTER – I
SUBJECT CODE-044
BIOLOGY SYLLABUS (THEORY AND PRACTICAL)
FULL MARKS : 50

CREDIT: 3.5 (THEORY 2.5 +PRACTICAL 1) **CREDIT HOUR :105 (75+30)**

(THEORY: INTERNAL ASSESMENT:7 SEMESTER EXAM: 30, TIME: 2HRS.)

(PRACTICAL: INTERNAL ASSESMENT:3 SEMESTER EXAM :10, TIME: 3 HRS)

OBJECTIVES:

1. To develop conceptual understanding of reproductive structures and processes in both plants and humans.

2. To know key principles of heredity, gene expression and inheritance patterns.

3. Encourage scientific inquiry by connecting biological concepts to real-world applications in biotechnology, agriculture, and medicine.

4. Understand the basics of immunology and build awareness of common diseases and major health issues.

5. Explore agricultural techniques and practices related to food production and appreciate their scientific and economic relevance.

6. Learn core ecological terms and concepts and observe interactions such as mutualism and predation within ecosystems.

COURSE CONTENT

GROUP	GROUP NAME	UNIT NO	UNIT NAME	COURSE CONTENTS	ALLOTED MARKS
A	Reproduction and Genetics	**1**	Human reproduction	female reproduction systems; Microscopic anatomy of testis and ovary; Gametogenesis - Spermatogenesis and oogenesis ; Menstrual cycle ; Fertilization , Embryo development up to blastocyte formation, Implantation; pregnancy and placenta formation (elementary idea) ; Parturition (elementary idea); Lactation	**14**
		2	Sexual reproduction in flowering plants	**S**exual reproduction in flowering plant: 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 fruits; Special modes of reproduction Apomixis, Parthenocarpy, Polyembryony; Significance of seed dispersal and fruit formation	
		3	Heredity and variation	Heredity and variation : Mendelian inheritance ; Deviations from Mendelism – Incomplete dominance , Co- dominance, Multiple alleles and inheritance of blood groups, Pleotropy; Elementary idea of polygenic inheritance; Chromosome theory of inheritance ; Chromosomes and genes ; Sex determination – in humans , birds and honey bee ; Linkage and crossing over ; Sex linked inheritance – Haemophilia , Colour blindness ; Mendelian disorders in humans – Thalassemia ; Chromosomal disorders in humans; Down's syndrome, Turner's and Klinefelter's syndromes. Basic concept of mutation.	
B	Biology and human welfare	4	Human health and Diseases	Health and disease :(A) Basic concept of immunology – vaccines; (B) Pathogens; parasites causing human diseases Malaria, Filariasis, Taeniasis, Ascariasis , Amoebiasis (C) cancer and AIDS – Causes, symtoms , Effect and control; (d) Adolescens – Drug and alcohol abuse, Its reason , Stage , Early signs, Symptoms , Effect and rehabilitation ; Sexual transmitted diseases (STD) and its prevention.	**8**
		5	Improvement in food production	: Plant breeding, Tissue culture, Single cell protein, Biofortification, Apiculture and Animal husbandry (Scientific name and economic importance)	
C	Ecology and Environment	6	Organisms and Environment	Habitat and niche, Population and ecological adaptations; Population interactions – Mutualism,	**8**

				Competition, Predation, Parasitism; Population attributes – Growth, Birth rate and death rate , Age distribution.	
		7	Ecosystem	Patterns, Components; Productivity and decomposition ; Food chain and food web ; Energy flow ; Pyramids of numbers – Biomass and energy, Ecological succession	

Practical :

1.Study of flowers adapted to pollination by different agencies.

2. Study of in vivo and in vitro pollen germination.

3. Study of dominant and recessive characters in humans like rolling of tongue, ear

lobes etc.

4. Isolation of DNA from available plant material.

5. Slide preparation and observation of barr body from squamous epithelial cells.

6. Common disease causing organisms and their parasitic adaptation. *(Entamoeba ,*

Ascaris, Plasmodium, Taenia)

7. Study of population interactions. (commensalism, mutualism, parasitism,

competition and predation)

8. Observation of pond ecosystem.

9. Observe food chain in a grassland ecosystem.

Learning outcomes

1. Equips students with a strong foundation in genetics, molecular biology, reproduction and human health.

2. Enhances understanding of key biological processes such as pollination, inheritance patterns, gene expression, and immunity

3. Strengthen critical thinking by analyzing genetic data and exploring molecular mechanisms

4. Gain awareness of major human diseases, their prevention and the impact of lifestyle choices on health.

5. Explore the agricultural techniques and modern day practices related to food production and get introduced to biotechnological applications in that field.

6. Develop keen understanding about ecological principles governing organisms and ecosystems.

7. Promote analytical and observational skills through real-world examples and scientific reasoning.

8. Overall, the course fosters both conceptual clarity and practical understanding about plant reproduction, developmental biology, genetics and environmental biology.

Reference books :

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2 Trueman's Elementary Biology- K.N. Bhatia and M.P. Tyagi.
3.S. Chand's Biology -Dr. P.S. Verma and Dr. B.P. Pandey
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VISVA BHARATI
CLASS – XII
SEMISTER – II
SUBJECT CODE-044
BIOLOGY SYLLABUS (THEORY)
FULL MARKS: 50

CREDIT : 3.5 (2.5 THEORY +1 PRACTICAL) **CREDIT HOUR :105**

(THEORY: INTERNAL ASSESMENT:7 SEMESTER EXAM: 30, TIME: 2HRS.)
(PRACTICAL: INTERNAL ASSESMENT:3 SEMESTER EXAM :10, TIME: 3 HRS)

OBJECTIVES:

1. Provide a strong foundation and promote critical thinking in the field of genetics and molecular biology.

2. Gain a comprehensive understanding of reproductive health in humans and associated technologies.

3. Explore the fundamental principles of evolution, mechanisms of genetic change and human origins.

4. Comprehensive idea about the role of microbes in industry, health, agriculture and their practical applications.

5. To know the key concepts in biotechnology and its transformative impact on health and agriculture.

6. Reinforce environment awareness through topics on biodiversity, pollution and conservation efforts.

7. Overall, the course builds scientific awareness, critical thinking and responsible attitudes towards genetics, health, technology and the environment.

COURSE CONTENT

GROUP	GROUP TITLE	UNIT NO	UNIT NAME	COURSE CONTENT	MARKS ALLOTED
A	Genetics, reproductive health and evolution	1	Molecular basis of inheritance	Molecular basis of inheritance: Search for genetic material and DNA as genetic material; Structure of DNA and RNA; DNA packaging; DNA replication; Central Dogma; Transcription, Genetic code, Translation; Gene expression and regulation – Lac operon ; Genome , Human and rice genome projects ; DNA fingerprinting	14
		2	Reproductive health	Reproductive Health: Need for reproductive health ; 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	Evolution	Origin of life ; Biological evolution and evidences for biological evolution , Paleontology , Comparative anatomy, Embryology and molecular evidence ; Darwin's contribution, Modern synthetic theory of evolution; Mechanism of evolution – Variation, Mutation and recombination, Modern and natural selection with examples, Types of natural selection ; Gene flow and genetic drift; Hardy-Weinberg's principle ; Adaptive radiation ; Human evolution.	
B	Biology and human welfare	4	Microbes in Human Welfare	Microbes in food processing , Industrial production, Sewage treatment , Energy generation and microbes as bio-control agents and bio – fertilizers. Antibiotics; production and Judicious use.	8
		5	Principles and processes of biotechnology	Principles and processes of biotechnology ; Genetic Engineering (Recombinant DNA Technology)	
		6	Application of Biotechnology in health and agriculture	Application of Biotechnology in Health and Agriculture : Human insulin and vaccine production, Stem cell technology , Gene therapy; Genetically modified organism – Bt crops ; Transgenic animals; Biosafety issues , Biopiracy and Patents.	
C	Ecology and environment	7	Biodiversity and its conservation	Biodiversity– Concept , patterns, importance; loss of biodiversity; biodiversity conservation; hotspot, endangered organism, extinction, Red Data Book, Sacred Groves, biosphere reserves , national parks,	8

				Wildlife, sanctuaries and Ramsar sites.	
		8	Environmental issues	Air pollution and its control ; water pollution and its control ; agrochemicals and their effects; solid waste management; radioactive waste management ; greenhouse effect and global warming ; ozone depletion; deforestation ; any three case studies as success stories addressing environmental issues, - Chipko movement , Silent valley movement, Normada Bachoa Andolan	

PRACTICAL:

1. Study of blastula through permanent slide.

2. Observation of histology of mammalian testis and mammalian ovary through

permanent slide.

3. Study of homologous and analogous organs in plants and animals.

4. Study of plant fossils.

5. Transverse section and slide preparation of monocot and dicot leaves.

6. Study of sunken stomata in Nerium leaf.

7. Collection of blood and preparation of blood film staining and observation of blood

cells of human.

8. Study the structure of a typical complete flower and an incomplete flower.

(dissection, drawing labelling and description)

Learning Outcomes

1. Provide a strong foundation and promote critical thinking in the field of genetics and molecular biology.

2. Gain a comprehensive understanding of reproductive health in humans and associated technologies.

3. Explore the fundamental principles of evolution, mechanisms of genetic change and human origins.

4. Comprehensive idea about the role of microbes in industry, health and agriculture and their practical applications.

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