CLASS :- HSP II **SUBJECT: CHEMISTRY**

M. MARKS: 70 **TIME : 3 HOURS**

General Instuctions :-

1.	There are total four sections in the question paper. All questions are compulsory.	Marks
2.	Section –A Contains 10 Objective type questions / Multiple choice questions of 1 mark each.	1*10 =10 marks
3.	Section – B Contains 9 Very Short Answer type Questions of 2 marks each to be answered in 20 to 30 words.	2*9 = 18 marks
4	Section – C Contains 9 Short Answer Type Questions of 3 marks each to be answered in 100 to 150 words	3*9 = 27 marks
5.	Section – D Contains 3 Long Answer Type Questions of 5 marks each to be answered in 150 to 200 words.	5*3 = 15 marks
6.	Use Log tables, if necesssary, use of scientific calculators is not allowed.	

SECTION A

Q1. Select the correct one.

(i) The molarity of pure water is :

(a) 5.556 mol/litre (b) 55.56 mol/litre (c) 18 mol/litre (d) 0.18 mol/litre

(ii) Which of the following conditions is correct for an ideal solution ?

(a) $\Delta H_{mix} = 0$ & $\Delta V_{mix} = 0$

(b) $\Delta H_{mix} > 0$ & $\Delta V_{mix} > 0$

(c) $\Delta H_{mix} < 0$ & $\Delta V_{mix} < 0$

(d) $\Delta H_{mix} > 0$ & $\Delta V_{mix} < 0$

(iii) Which of the following is not a good conductor of electricity ?

(a) CH_3COONa

(b) C_2H_5OH

(c) NaCl

(d) KOH

(iv) The units of rate contant for Second Order Reaction is

(a) mol $litre^{-1}$ sec^{-1}.

(b) litre mol^{-1} sec^{-1}

(c) $litre^2 mol^{-2} sec^{-1}$

(d) sec^{-1}

(v) Which of the following Oxidation state is common for all Lanthanoids ?

(a) +3

(b) +2

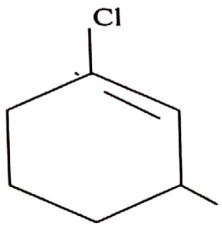
(c) +4

(d) +5

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(vi) The IUPAC name of the compound shown below



is

(a) 2- Bromo -6 – chlorocyclohex -1 – ene

(b) 6 – Bromo -2 – cyclochlorohexene

(c) 3 – Bromo -1 – chlorocyclohexene

(d) 1 – Bromo – 3 – chlorocyclohexene

(vii) Which of the following is most acidic ?

(a) Benzyl alcohol

(b) Cyclohexanol

(c) Phenol

(d) m – Chlorophenol

(viii) The product of the following reaction is $CH_3CN \xrightarrow{Na(Hg) + C_2H_5OH} X$

(a) CH_3CONH_2

(b) $CH_3\text{-}CH_2\text{-}NH_2$

(c) C_2H_6

(d) $CH_3\text{-}NH\text{-}CH_3$

(ix) Hydrolysis products of Lactose are

(a) glucose and glucose

(b) glucose and fructose

(c) glucose and galactose

(d) none of these

(x) Vitamin A is

(a) Ascorbic acid

(b) Thiamine

(c) Calciferol

(d) Retinol

SECTION B

Q2. Short Answer Type Questions

(i) Define the terms

a) Coordination number

(b) Ligands

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(ii) Write the IUPAC names of

(a) $[Cu(NH_3)_4SO_4]$ (b) $[Ni(CN)_6]^{2-}$

(iii) What is Markovnikov's Rule.

(iv) Distinguish between Primary, Secondary and Tertiary alchols by Lucas test.

(v) What is Carbylamine reaction?

(vi) Give sources and deficency diseases of Vitamin C & D.

(vii) Define Rate of a Reaction . Give one example of Zero Order Reaction.

(viii) Define Activation energy and write Arrhenius equation.

(ix) Give elementary idea of Collision theory.

SECTION C

Q3. Short Answer Type Questions

(i) State & Explain Faraday's 2nd Law of electrolysis.

(ii) Explain Denaturation of Proteins.

(iii) Write three methods of Preparation of Amines.

(iv) Give three oxidising properties of $K_2Cr_2O_7$.

(v) What is Lanthanide Contraction ? What are the causes of Lanthanide Contraction ?

(vi) What is meant by unidentate, bidentate and hexadentate ligands ? Give examples.

(vii) What are the effects caused by Freons and DDT on the environment ?

(viii) Discuss :

(a) Reimer – Tiemann's Reaction

(b) Kolbe's Reaction

(ix) What is :

(a) Gattermann – Koch Reaction

(b) Fries Rearrangement .

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SECTION D

Q4. Long Answer Type Questions

(i) Define Molality & Normality . Calculate the molarity and normality of a solution of H_2SO_4 having 0.49 gm of it dissolved in 450 ml of solution.

OR

Define depression in freezing point . How can you calculate the molecular mass of a non – volatile solute with it .

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(ii) Define Corrossion of a metal. Explain the mechanism of rusting of iron.

OR

What is Kohlrausch's Law ? Explain its application for calculation of molar conductivity at infinite dilution for weak electrolytes.

(iii) Write five methods of preparation of Ketones.

OR

Discuss :-

(a) Wolf – Kishner's Reduction

(b) Rosenmund's Reduction

(c) Stephen Reduction

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SUBJECT: PHYSICS

MAXIMUM MARKS: 70

CLASS: 12th

TIME: 3 HRS

S. No	General Instructions	Marks
	There are total of four sections in the question paper. All questions are compulsory.	
	Section- A contains 10 Very Very Short Answer Type Question of 1 Mark each	1x10 = 10 marks
	Section-B contains 9 Very Short Answer Type Question of 2 Marks each to be answered in 20 to 30 words.	2x9 = 18 marks
	Section-C contains 9 Short Answer Type Questions of 3 Marks each to be answered in 50 to 70 words	3x9 = 27 marks
	Section-D contains 3 Long Answer Type Questions of 5 Marks each to be answered in 100 to 150 words.	5X3 =15 marks
2	Use log table, if necessary. Use of scientific calculator is not allowed	

SECTION A

Q.1.

(i) The magnitude of elementary charge is

(a) 2×10^{-19} C (b) 1.6×10^{-19} C

(C) Zero (d) infinity

(ii) The resistance of a wire is R if the length of the wire is doubled, then its resistance will be

(a) 2R (b) 4R

(c) R (d) 0.25 R

(iii) Tesla is the unit of

(a) electric flux (b) magnetic flux

(c) electric field (d) magnetic field

(iv) The frequency of house hold supply of AC in India is

(a) 60 Hz (b) 100 Hz

(c) 50 Hz (d) 70 Hz

(v) The speed of electromagnetic waves is independent of

(a) wavelength (b) frequency

(c) intensity (d) medium, in which they travel

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(vi) In the diffraction pattern due to the single slit of width 'a' with incident light of wavelength λ with angle of diffraction θ, the condition for the first minimum is

(a) $\lambda \sin\theta = a$ (b) $a \cos\theta = \lambda$

(c) $a \sin\theta = \lambda$ (d) $\lambda \cos\theta = a$

(vii) The minimum energy required to remove an electron is called

(a) work function (b) kinetic energy

(c) stopping potential (d) potential energy

(viii) The momentum of a photon is p. The corresponding wavelength is

(a) h/p (b) hp

(c) hc/λ (d) $hc\bar{v}$

(ix) The source of energy of stars is

(a) chemical reaction (b) nuclear fission

(c) nuclear fusion (d) None of these

(x) In forward bias, the width of depletion layer in a p-n junction

(a) decreases (b) remains unchanged

(c) increases (d) first increases then decreases

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SECTION B

Answer the following questions:

Q2. Calculate the Coulomb force between two α-particles separated by a distance of 3.2×10^{-15}m.

Q3. The range of the wavelength of visible light is 390 nm. Calculate the corresponding frequency range. Given $c = 3 \times 10^8$ m

Q4. What do you mean by the diffraction of light?

Q5. An electron is accelerated through a potential difference of 1000 volt. What is the velocity of the electron?

Q6. Draw binding energy curve and discuss its significance?

Q7. What are the drawbacks of Rutherford's atomic model?

Q8. What is meant by the term doping of an intrinsic semiconductor? How does it affect the conductivity of a semiconductor?

Q9. Draw a circuit diagram for p-n junction in a forward bias. Sketch the voltage versus current graph for the same.

Q10. Differentiate between P-type and N-type semiconductor.

SECTION C

Answer the following questions:

Q11. A sphere of radius 10 cm has an unknown charge. If the electric field, 10 cm from the center of the sphere is 2.0×10^4 N/C and points radially inward, what is the net charge on the sphere?

Q12. No two electric lines of force can cross each other. Explain with diagram.

Q13. State Ohm's law and derive the relation $J = \sigma E$

Q14. With the help of Kirchhoff's rule, obtain the condition for balancing of a Wheatstone Bridge.

Q15. State Biot-Savart law. Derive an expression for the magnetic field at a point on the axis of a circular coil.

Q16. What is a.c. generator? State its principle and name the main components of a.c. generator.

Q17. What are coherent sources? Why two independent sources cannot be coherent?

Q18. Derive relationship for magnifying power of a telescope in normal adjustment?

Q19. What is nuclear fission? Give an example to illustrate it. What is the importance of fission phenomenon?

SECTION D

Answer the following questions:

Q20. What are dia, para, and ferromagnetic materials? Discuss their important properties.

OR

Using Ampere's circuit law, derive an expression for magnetic field due to infinitely long straight conductor.

Q21. State and explain Faraday's laws of electromagnetic induction. Show that $E = -d\phi/dt$

OR

At a power plant, the water head is at a height of 100 m and water flow available is 300 m^3/s. If the efficiency is 60%, find the electric power available from the plant.

Q22. What is optical fiber? Discuss how it is used to transmit light beam from one place to another without the loss in intensity of light? What are its other uses?

OR

State Huygens's principle. With the help of this principle derive the laws of refraction.

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Subject: Botany **Class: XII**

Time: 1½ Hours **Max Marks: 35**

GENERAL INSTRUCTIONS:

This question paper contains four sections:

i. Section –A contains 5 Very Very Short Answer Type Questions of 1 mark each. 1x5= 5 marks

ii. Section- B contains 5 Very Short Answer Type Questions of 2 marks each to be answered in 20 to 30 words. 2 x 5 = 10 marks

iii. Section – C contains 5 Short Answer Type Questions of 3 marks each to be answered in 100 to 150 words. 3 x 5 = 15 marks

iv. Section - D contains 1 Long Answer Type Questions of 5 marks each to be answered in 150 to 200 words. 5 x 1 = 5 marks

Section A

1. Fruits have:
   a) Pericarp and flesh
   b) Pericarp and seeds
   c) Pericarp, mesocarp and endocarp
   d) Pericarp and ovule

2. _____ incompatibility prevents cross pollination.
   a) Intraspecific
   b) Self
   c) Interspecific
   d) Out breeding

3. Nitrogen base not found in DNA is:
   a) Uracil
   b) Adenine
   c) Guanine
   d) Thymine

4. The term Ecosystem was coined by:
   a) Warming
   b) Odum
   c) Tansley
   d) Ernst Haeckel

5. Conversion of nitrates to nitrogen is called:
   a) Ammonification
   b) Nitrification
   c) Nitrogen fixation
   c) Denitrification

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Section B

6. Difference between Autogamy and Geitonogamy.

7. What is pleiotropic gene?

8. What are ecological pyramids? Draw pyramid of energy.

9. Name any two Bio-fertilizers.

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10. What is red data book?

Section C

11. Differentiate between Apomixes and Parthenogenesis.

12. Write a brief account on incomplete dominance.

13. Distinguish between DNA and RNA.

14. What are Bt. Crops? List any two.

15. What are somatic hybrids? Give an example.

Section D

16. Define hotspots of biodiversity. Name hotspots found in Indian sub-continent.

OR

Define Ecological pyramid. Explain different types of Pyramids.

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Subject: Zoology

Time: 1½ Hours **Class: XII**

Max Marks: 35

GENERAL INSTRUCTIONS:

This question paper contains four sections:

i. Section –A contains 5 Very Very Short Answer Type Questions of 1 mark each. 1x5= 5 marks

ii. Section- B contains 5 Very Short Answer Type Questions of 2 marks each to be answered in 20 to 30 words. 2 x 5 = 10 marks

iii. Section – C contains 5 Short Answer Type Questions of 3 marks each to be answered in 100 to 150 words. 3 x 5 = 15 marks

iv. Section - D contains 1 Long Answer Type Questions of 5 marks each to be answered in 150 to 200 words. 5 x 1 = 5 marks

Section A

Q1. Acrosome in sperm is a modified:

A. Golgi Complex

B. Endoplasmic reticulum

C. Mitochondria

D. Vacuoles.

Q2. Turner syndrome is represented by genotype:

A. 45, XY

B. 45, XO

C.47, XXY

D. 47, +21

Q3. Which of the following is known as Bleeder's disease?

A. Sickle cell anemia

B. Night Blindness

C. Hemophilia

D. Thalassemia

Q4. The infective stage of malaria causing parasite in human:

A. Plasmodium

B. Sporozoite

C. Gametocyte

D. Vermiculus

Q5. Replacement of defective gene with normal one is called:

A. Gene cloning

B. Gene banking

C. Gene therapy

D. None of these.

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Section B

Q6. Draw a well labeled diagram of structure of human sperm.

Q7. What are analogous organ. Give some example.

Q8.Write a short note on application of DNA fingerprinting.

Q9. What is Biopiracy?

Q10. What do you mean by clone? Give a suitable example of it.

Section C

Q11. Define Polyspermy and differentiate between fast block and slow block polyspermy.

Q12. Write a brief account on adaptive radiation. Give some suitable examples.

Q13. What do you mean by survival of the fittest as propounded by Darwin?

Q14. What are the changes that take place during the period of adolescence?

Q15. Name one plant and the addictive drug extracted from its latex. How doesthis drug affect the human body?

Section D

Q16. Define Gametogenesis. Describe in detail Oogenesis.

OR

Define placentation. Describe the types and role of placenta.

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MODEL QUESTION PAPER

CLASS: XII
SUB: GENERAL ENGLISH

TIME: 3 Hrs
MAX MARKS: 80

SECTION A: READING COMPREHENSION		
1	**Read the following passage. Make notes (5 marks), write a summary (4 marks) with a suitable title (1 mark).** Artificial intelligence (AI) is making a difference to how legal work is done, but it isn't the threat it is made out to be. AI is making impressive progress and shaking up things all over the world today. The assumption that advancements in technology and artificial intelligence will render any profession defunct is just that, an assumption and a false one. The only purpose this assumption serves is creating mass panic and hostility towards embracing technology that is meant to make our lives easier. Let us understand what this means explicitly for the legal world. The ambit of AI includes recognizing human speech and objects, making decisions based on data, and translating languages. Tasks that can be defined as 'search-and-find' type can be performed by AI. Introducing AI to this profession will primarily be for the purpose of automating mundane, tedious tasks that require negligible human intelligence. The kind of artificial intelligence that is employed by industries in the current scene, when extended to the law will enable quicker services at a lower price. AI is meant to automate a number of tasks that take up precious working hours lawyers could be devoted to tasks that require discerning, empathy, and trust- qualities that cannot be replicated by even the most sophisticated form of AI. The legal profession is one of the oldest professions in the world. Thriving over 1000 years; trust, judgement, and diligence are the pillars of this profession. The most important pillar is the relationship of trust between a lawyer and clients, which can only be achieved through human connection and interaction. While artificial intelligence can be useful in scanning and organizing documents pertaining to a case, it cannot perform higher-level tasks such as sharp decision making, relationship-building with valuable clients and writing legal briefs, advising clients, and appearing in court. These are over and above the realm of computerization. The smooth proceeding of a case is not possible without sound legal research. While presenting cases lawyers need to assimilate information in the form of legal research by referring to a number of relevant cases to find those that will favour their client's motion. Lawyers are even required to thoroughly know the opposing stand and supporting legal arguments they can expect to prepare a watertight defence strategy. AI, software that operates on natural language enables electronic discovery of information relevant to a case, contract reviews, and automation generation of legal documents. AI utilizes big-data analytics which enables visualization of case data. It also allows for creation of a map of the cases which were cited in previous cases	10 Marks

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	and their resulting verdicts, as per the website Towards Data Science. The probability of a positive outcome of a case can be predicted by leveraging predictive analytics with machine learning. This is advantageous to firms as they can determine the return on investment in litigation and whether an agreement or arbitration should be considered.	
2	**Read the passage carefully and answer the questions that follow.** I got posted in Srinagar in the 1980s. Its rugged mountains, gushing rivers and vast meadows reminded me of the landscapes of my native place – the Jibhi Valley in Himachal Pradesh. Unlike Srinagar that saw numerous tourists, Jibhi Valley remained clouded in anonymity. That's when the seed of starting tourism in Jibhi was planted. I decided to leave my service in the Indian Army and follow the urge to return home. We had two houses – a family house and a traditional house, which we often rented out. I pleaded with my father to ask the tenant to vacate the house so that I could convert it into a guesthouse. When my family finally relented, I renovated the house keeping its originality intact, just adding windows for sunlight. I still remember the summer of 1992 when I put a signboard outside my first guesthouse in Jibhi Valley! The village residents, however, were sceptical about my success. My business kept growing but it took years for tourism to take off in Jibhi Valley. Things changed significantly after 2008 when the government launched a home stay scheme. People built home stays and with rapid tourism growth, the region changed rapidly. Villages turned into towns with many concrete buildings. Local businesses and tourists continued putting a burden on nature. Then, with the 2020-21 pandemic and lockdown, tourism came to a complete standstill in Jibhi Valley. Local people, who were employed at over a hundred home stays and guesthouses, returned to their villages. Some went back to farming; some took up pottery and some got involved in government work schemes. Now, all ardently hope that normalcy and tourism will return to the valley soon. In a way, the pandemic has given us an opportunity to introspect, go back to our roots and look for sustainable solutions. For me, tourism has been my greatest teacher. It brought people from many countries and all states of India to my guesthouse. It gave me exposure to different cultures and countless opportunities to learn new things. Most people who stayed at my guesthouse became my repeat clients and good friends. When I look back, I feel proud, yet humbled at the thought that I was not only able to fulfill my dream despite all the challenges, but also play a role in establishing tourism in the beautiful valley that I call home. **1. The scenic beauty of Srinagar makes the writer feel** A. awestruck B. nostalgic C. cheerful D. confused	1x10 = 10 Marks

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	2. A collocation is a group of words that often occur together. The writer says that Jibhi valley remained clouded in anonymity. Select the word from the options that correctly collocates with clouded in. A. disgust B. anger C. doubt D. joy **3. The author was posted in Srinagar in 1991. (true/false)** **4. The phrase 'seed of starting journalism' refers to** A. initiation B. growth C. termination D. follow-up **5. What was the effect of local businesses and tourists on nature?** **6. Which word in paragraph 4 means 'to examine one's own thoughts and feelings'?** **7. Before the lockdown_____was a source of employment for local people?** **8. How did the author manage to keep the originality of the house intact?** **9. What did the author do in the summer of 1992?** **10. The antonym of skeptical is_____.**	
SECTION B: WRITING SKILLS AND GRAMMAR		
3	You are Rohini Rajan. You want a dance teacher for your younger sister. Write an advertisement to be published in the classified columns of a local newspaper in 40-50 words. OR Your grandparents are celebrating 50 years of their marriage next week. Invite your friend to a party at your home in 40-50words.	4 Marks
4	As Manager of M/s Sharma & Co, 124 Pacca Danga, Jammu, write a letter to M/s Hindustan Furnishers, Gangyal, Jammu, asking for quotation of prices of furniture items for offices and homes. Also inquire about the discount, billing process and credit facilities. OR Write a letter to the Mayor of your city complaining about the excess flow of traffic outside your school gate and give suggestions for resolving the issue. You are Showkat Hussain, Head Boy of GAV Public School, Srinagar.	6 Marks
5	You see a classified advertisement in the newspaper inviting applications for the post of teacher in High Dale School, Jammu. Write your resume and cover letter (120-150) to the Principal applying for the job. Resume: 4 marks Cover letter: 2 marks	6 Marks
6	The 21st century has been called the century of women's equality. Young Women are breaking barriers and creating new models of achievement andleadership. Arunima Sinha, despite losing her leg in a horrific train accident.	6 Marks

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	scaled Mount Everest and several other peaks across the world. Write a personality profile of any woman achiever you admire or consider a role model. (200-250 words) OR People encounter many obstacles and suffer through many failures in life. Such experiences strengthen their character and equip them with abilities to face challenges confidently and successfully. Recount a real experience you had that changed your perspective and turned out to be a lifelong lesson. (200-250 words)	
7	**Edit the following passage:** I was lucky to have so good teachers, said Gurudev. I remained silent. Then he continued, 'I made me work on the path they laid before me, from getting on before the crack of dawn to cleaning the dirtiest places on the premises. If I stand before you today and offer my teachings to you, it is because of my gurus.' I was feeling relaxed as he spoke in his placid tone and peaceful voice that seemed to come from some serene grove where a brook babbled in tranquility. I was about to go for a trance when Gurudev lifts his hands above his head, joined them together and said, 'we are merely puppets! Our strings are held by Him, the Everlasting, the Ever-knowing.'	8 Marks
SECTION C: LITERATURE		
8	**a. Read the extract and answer the questions that follow (1 mark each):** *When Aunt is dead, her terrified hands will lie* *Still 'ringed with ordeals she was mastered by.* *The tigers in the panel that she made* *Will go on prancing, proud and unafraid.* 1. Name the poem and the poet. 2. Who is the aunt afraid of? 3. What do the tigers represent here? 4. Name the figure of speech used in line 2. **b. Answer any two of the following questions in 40-50 words each (3 marks each):** i. What were the poet's feelings on her way to the airport? ii. What is the sadness the poet refers to in 'Keeping Quiet'? iii. Write about the image the poet uses to describe the beautiful bounty of the earth in 'A Thing of Beauty'.	4 x 6 = 10 Marks
9	**Answer any three of the following questions in 40-50 words each:** a) Describe the background in which 'The Last Lesson' has been set. b) Mention some of the hazards of working in the glass bangles industry. c) How does Douglas overcome his fear of water? d) What made the peddler think that he had indeed fallen into a rattrap? e) Why did Gandhi consider the Champaran episode to be a turning point in his life?	3x3= 9 Marks

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10	**Answer the following question in 150-200 words:** Apparent illogicality sometimes turns out to be a futuristic projection. Discuss with reference to 'The Third Level'. OR Do you agree that 'The Enemy' teaches us we have to make hard choices between our roles as private individuals and as citizens with a sense of National loyalty? Justify your answer.	6 Marks
11	**Answer the following question in 120–150 words:** The theme of 'On the Face of It' is that optimism in one's attitude helps deal with all challenges in life. Discuss. OR The actual pain or inconvenience caused by a physical impairment is often much less than the sense of alienation felt by the person with disabilities. Discuss in light of 'On the Face of It'.	5 Marks

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MODEL QUESTION PAPER

CLASS: XII **TIME: 3 Hrs**

SUB: GEOGRAPHY **MAX MARKS: 70**

GENERAL INSTRUCTIONS	
I.	There are 31 questions in all four sections.
II.	Section -A- Q1-Q10 are very very short answer type questions carrying 1 mark each. 1 x 10 = 10 marks
III.	Sections -B- Q11-Q19 are very short answer questions carrying 2 marks each (Having 9 Very short answer type questions to be answered in 20-30 words) 2 x 9= 18 marks
IV.	Section -C- Q20-Q28 are Short answer questions carrying 3 marks each. (Having 9 short answer type questions to be answered in 100-150 words) 3 x 9= 27 marks
V.	Section -D- Q29-Q31 are Long answer type questions carrying 5 marks each. (Having Long answer type questions to be answered in 150-300 words) 5 x 3= 15 marks

Section A

10 x 1 = 10 Marks

1. Which of the following approaches to the study of human geography was proposed by international labour organization?
   a) Income approach
   b) Welcome approach
   c) Basic needs approach
   d) Capability approach

2. Shifting agriculture is also known as:
   a) Slash and Burn agriculture
   b) Jhuming
   c) Milpa
   d) All of the above.

3. Which of the following is not a plantation crop:
   a) Rice
   b) Rubber
   c) Coffee
   d) Oil Palm

4. A farming initiative in which Farmers pool their resources for profitable outcome:
   a) Truck farming
   b) Mixed farming
   c) Co-operative farming
   d) Collective farming

5. Which of the following statements are true for foot loose industries:
   a) Dependent on specific raw material.
   b) Generally Non-polluting industries
   c) Employ large labour force.
   d) Production in Large quantity

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6. Which of the following economic activities focus on creation & re-arrangement of new & existing ideas:
   a) Secondary economic activities.
   b) Tertiary economic activities
   c) Quaternary economic activities.
   d) Quinary economic activities.

7. The big inch pipeline transports:
   a) Milk
   b) Water
   c) LPG
   d) Petroleum

8. Panna and Para are examples of which type of settlements:
   a) Clustered
   b) Semi Clustered
   c) Hamletted
   d) Dispersed

9. Haryali and Neeru- Meeru are examples of:
   a) Water shed management
   b) Recycle and reuse of water
   c) Chemical Treatment of water
   d) Rain water harvesting

10. Which of the following minerals is known as brown diamond:
   a) Iron
   b) Manganese
   c) Lignite
   d) Mica

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Section B **9 x 2 = 18 Marks**

11. What are quaternary activities? Give two examples
12. Give two points of difference between subsistence and modern agriculture
13. Name any two major ocean routes of Europe.
14. What is Cyber space?
15. Name the most widely used non-conventional source of energy in India and why?
16. Why are common property resources important in rural areas in India?
17. Give reasons why market gardening is practised near urban centres?
18. Why is shifting agriculture detrimental to environment?
19. Enlist any two factors which give rise to international trade

Section- C **9 x 3 = 27 Marks**

20. What are the problems associated with urbanization in India?
21. Differentiate between small scale & Large-scale industries with examples.

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22. Explain briefly neo determinism as an effective approach to the study of human geography.
23. What is the significance of Cyber space in world economy?
24. How has internet revolutionized the global communication system?
25. How has technology impacted the stages of demographic transition?
26. How has good governance and people-oriented policies helped women in India to lead ameaningful life?
27. How does water shed management contribute towards resource management?
28. What is land degradation? Which factors are responsible for accelerating it?

Section D **3 x 5 = 15 Marks**

29. "World population is highly uneven". Elucidate any five factors which determine thisdistribution.

Or

Explain the theory of Demographic Transition with the help of a diagram.

30. Explain briefly the economic and political factors determining industrial location.

Or

On an outline map of the world, show the following:

i) Trans-Siberian Railway
ii) Cape Town
iii) Suez Canal
iv) Sydney (airport)
v) Panama Canal

31. Ports are the gateways of international trade. Elucidate the statement.

Or

On the given outline map of India, show the following;

i) Major jute producing area.
ii) Area of high population density.
iii) Bhilai (iron and steel plant)
iv) Bengaluru (software technology park)
v) Vishakhapatnam Port.

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Class: XII
Time Allowed: 3 Hours

Subject: Mathematics
Maximum Marks: 80

General Instructions:

1. **This Question paper contains - Four sections A, B, C and D. Each section is compulsory.**
2. **Section A-Question 1 to 10 comprises of 10 Very Very Short Answer type questions of 1 mark each**
3. **Section B-Question 11 to 20 comprises of 10 Very Short Answer (VSA)-type questions of 2 marks each.**
4. **Section C-Question 21 to 28 comprises of 8 Short Answer (SA)-type questions of 4 marks each.**
5. **Section D-Question 29 to 31 comprises of Long Answer (LA)-type questions of 6 marks each.**

SECTION A

Q.1) If $\begin{vmatrix} 2 & 4 \\ 5 & 1 \end{vmatrix} = \begin{vmatrix} 2x & 4 \\ 6 & x \end{vmatrix}$, *then the possible* value(s) of 'x' is/are

(a) 3 (b) $\sqrt{3}$ (c) $-\sqrt{3}$ (d) $\sqrt{3}, -\sqrt{3}$

Q.2) If A, B are non-singular square matrices of the same order, then $(AB^{-1})^{-1} =$

(a) $A^{-1}B$ (b) $A^{-1}B^{-1}$ (c) BA^{-1} (d) AB

Q.3) The degree of the differential equation $1 + \left(\frac{dy}{dx}\right)^2 = x$ is _____ .

Q.4) If $y = Ae^{5x} + Be^{-5x}$, then $\frac{d^2y}{dx^2}$ is equal to

(a) 25 y (b) 5 y (c) −25 y (d) 15 y

Q.5) If $f'(x) = x + \frac{1}{x}$, then $f(x)$ is

(a) $x^2 + \log|x| + C$ (b) $\frac{x^2}{2} + \log|x| + C$ (c) $\frac{x}{2} + \log|x| + C$ (d) $\frac{x}{2} - \log|x| + C$

Q.6) If the radius of the circle is increasing at the rate of 0·5 cm/s, then the rate of increase of its circumference is _____ .

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Q.7) $\int \frac{e^x(1+x)}{\cos^2(xe^x)}\,dx$ is equal to

(A) $\tan(xe^x) + c$

(B) $\cot(xe^x) + c$

(C) $\cot(e^x) + c$

(D) $\tan[e^x(1+x)] + c$

Q.8) The value of p for which $p(\hat{i} + \hat{j} + \hat{k})$ is a unit vector is

(A) 0

(B) $\frac{1}{\sqrt{3}}$

(C) 1

(D) $\sqrt{3}$

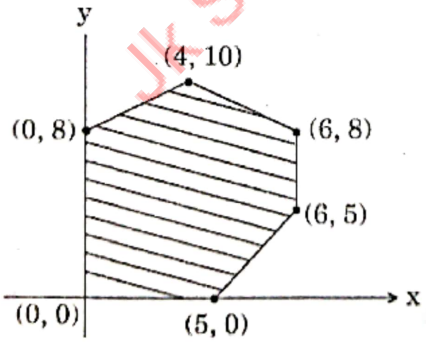
Q. 9) The vector equation of XY-plane is

(A) $\vec{r} \cdot \hat{k} = 0$

(B) $\vec{r} \cdot \hat{j} = 0$

(C) $\vec{r} \cdot \hat{i} = 0$

Q.10) The feasible region for an LPP is shown below :
Let $z = 3x - 4y$ be the objective function. Minimum of z occurs at



(A) (0, 0)

(B) (0, 8)

(C) (5, 0)

(D) (4, 10)

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SECTION B

Q.11) Check if the relation R on the set A = { 1, 2, 3, 4, 5, 6 } defined as R = { (x, y) : y is divisible by x } is (i) symmetric (ii) transitive

Q.12) Find the value of $sin^{-1}[sin\left(\frac{13\pi}{7}\right)]$

Q.13) Show that the function f defined by $f(x) = (x - 1)\, e^x + 1$ is an increasing function for all $x > 0$.

Q.14) Find the unit vector perpendicular to each of the vectors $\vec{a} = 4\hat{i} + 3\hat{j} + \hat{k}$ and $\vec{b} = 2\hat{i} - \hat{j} + 2\hat{k}$.

Q.15) Find $|\vec{x}|$ if $(\vec{x} - \vec{a}).(\vec{x} + \vec{a}) = 12$, where $\vec{a}$ is a unit vector.

Q.16) Evaluate the integral $\int(2x + 3)\, dx$

Q.17) Evaluate $\int_0^{2\pi} |\sin x|\, dx$

Q. 18) **Compute P (A ∩ B), Where P (A)=0.8, P(B)= 0.5 and P(A/B) =0.4**

Q. 19) **If P(A) =0.25 then find P(not A)**

Q.20) **If A is a symmetric Matric, then show that A-A' is a skew symmetric matrix.**

SECTION C

Q.21) Solve the differential equation: $ydx + (x - y^2)dy = 0$

Q.22) Evaluate: $\int_0^4 |x - 1|\, dx$

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Q.23) If $y = a \cos(\log x) + b \sin(\log x)$, show that $x^2 \frac{d^2y}{dx^2} + x \frac{dy}{dx} + y = 0$.

Q.24) **Find the shortest distance between the two lines:**

$$\vec{r} = 6\hat{i} + 2\hat{j} + 2\hat{k} + \lambda(\hat{i} - 2\hat{j} + 2\hat{k})$$

and $\vec{r} = -4\hat{i} - \hat{k} + \mu(3\hat{i} - 2\hat{j} - 2\hat{k})$.

Q.25) If $\vec{a} = \hat{i} - \hat{j} + 7\hat{k}$ and $\vec{b} = 5\hat{i} - \hat{j} + \lambda\hat{k}$, then find the value of λ so that the vectors $\vec{a} + \vec{b}$ and $\vec{a} - \vec{b}$ are orthogonal.

Q.26) Solve the following Linear Programming Problem graphically:

Maximize Z = 400x + 300y subject to $x + y \leq 200, x \leq 40, x \geq 20, y \geq 0$

Q.27) Show that the function $f : R \to R$ defined by $f(x) = \frac{x}{x^2 + 1}$, $\forall x \in R$ is neither one-one nor onto.

Q.28) The probability distribution of a random variable X, where k is a constant is given below :

$$P(X = x) = \begin{cases} 0.1, & \text{if } x = 0 \\ kx^2, & \text{if } x = 1 \\ kx, & \text{if } x = 2 \text{ or } 3 \\ 0, & \text{otherwise} \end{cases}$$

Determine

(a) the value of k

(b) $P(x \leq 2)$

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SECTION D

Q.29) Solve the following system of equations by matrix method :

$$x - y + 2z = 7$$
$$2x - y + 3z = 12$$
$$3x + 2y - z = 5$$

OR

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If $A = \begin{bmatrix} 1 & 3 & 2 \\ 2 & 0 & -1 \\ 1 & 2 & 3 \end{bmatrix}$, then show that $A^3 - 4A^2 - 3A + 11\,I = O$. Hence find A^{-1}.

Q. 30) Evaluate: $\int \frac{dx}{\sqrt{5 - 4x - x^2}}$

OR

Find $\int \frac{(x^3+x+1)}{(x^2-1)} dx$

Q. 31) If $y = (\tan^{-1} x)^2$ **, show that** $(x^2+1)^2 y_2 + 2x(x^2+1)y_1 = 2$

OR

Find $\frac{dy}{dx}$, if $x^y \cdot y^x = x^x$.

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12th

BIOCHEMISTRY

Time: 3 hrs **Maximum marks: 70**

(Very Short Answer Type Questions) 1 each

1. Define ATP.
2. Define respiration.
3. Phenylketonuria is caused by the deficiency of enzyme.....
4. Cholesterol is the precursor of
   A) progesterone
   B) estrogen
   C) testosterone
   D) all the above
5. Carbohydrate metabolism is mainly under the control of
   A) Insulin
   B) Glucagon
   C) Both
   D) none
6. Which of the following is a cell of immune system
   A) B cell
   B) T cell
   C) Memory cell
   D) All the three

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(Very Short Answer Type Questions) **2each**

7. What do you mean by deamination of amino acids?

   or

   Define Transamination?
8. Define amino acid metabolism?
9. Define decarboxyllation in amino acids?
10. Define Lesch Nyhan syndrome?
11. Define salvage pathway?
12. Define CAM pathway?
13. Give role of auxin?
14. Why beta oxidation of fatty acids is named so?

(Short Answer Type questions) **3 each**

15. Define Role of Vassopressin?

    Or

    Differentiate between Insulin and Glucagon?

16. What are the causes and symptoms of tyrosenemia?
17. Differentiate between humoral and cell mediated immunity?
18. What are the applications of genetic engineering?
19. Define communicable diseases?
20. Give the biochemical role of thyroxine?
21. What are the different types of DNA polymerases in prokaryotes?
22. Classify hormones on the basis of chemical nature?
23. Give biochemical role of testosterone?
24. Differentiate between different plant hormones?
25. Define activation of fatty acids?

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(Long Answer Type Questions) **5 each**

26. Describe the reactions of TCA cycle?

Or

Explain various types of photosystems in electron transport chain?

27. What is light phase of photosynthesis? Explain cyclic and non cyclic photophosphorylation?

Or

Elaborate the differences between C3 and C4 pathway?

28. Explain in detail Replication of DNA in Eukaryotes?

Or

Describe Transcription in prokaryotes?

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Biotechnology
Model paper 12th class

All questions are compulsory

70 marks

5 x 1mark

Q.No.1:- Given the following DNA strand: 5'-TCTAATGGAGCT, write down the complementary strand, ----------. Indicate the directions by properly labeling the 5' end.

Q.NO.2:- Which gene transfer method is most commonly used in plants?

Q.NO.3:- What is the IUPAC code for 'G' or 'C'?

Q.NO.4:- Write one therapeutic application of monoclonal antibody.

Q.NO.5:- Rapid multiplication of plants by tissue culture techniques is referred to as----------

7 x 2marks

Q.NO.6:- A DNA molecule is formed by linking the ----------of one nucleotide to the----------of the neighboring nucleotide.

Q.NO.7:- Which transformation method(s) uses (A) mechanical means of introducing DNA into cells? (B) Biological means?

Q.NO.8:-. What is the unique feature of the structure of DNA or protein that causes the macromolecules to migrate when an electrical field is applied to the gel?

Q.NO.9:-. An E. coli cell produces at least 2000 different proteins. One of these is our enzyme of interest produced at a level of 3000 molecules per cell under optimum conditions. If we have to purify 1g of this intra-cellular enzyme, estimate how many cells of bacteria will be required theoretically? It is given that the molecular weight of the enzyme of interest is 1,00,000.

Q.NO 10:- Can you suggest one reason why the sequences of bacterial replication origins are A-T rich?

Q.NO 11:- In what way Golden rice is different from the normal rice?

Q.NO 12:- Write two important features of cultured animal cells?

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Short Answer Questions **12 x 3marks**

Q.NO.13:-.Given the following DNA sequence. 5' ACGTGCCTCG 3' Coding strand

3' TGCACGGAGC 5'

(a) Which strand is the sense strand? Antisense strand?

(b) What is the sequence of mRNA after transcription?

(c) What is the sequence of the antisense RNA?

Q.NO 14:- Give examples of pairs of amino acids that form (A) electrostatic interactions, (B) hydrogen bonding, (C) hydrophobic interactions.

Q.NO 15:- Why is it that genomic libraries are used for isolating genes in bacteria? Why are cDNA libraries not used for prokaryotes?

Q.NO 16:- E. coli is a rod shaped bacteria about 2 µm long and 1 µm in diameter. The average density of a cell is 1 .28 g/ ml. Approximately 13.5% of the wet weight of E. coli is soluble protein. Estimate the number of molecules of a particular enzyme per cell if the enzyme has a molecular weight of 100,000 and represents 0.1 % of the total soluble protein.

Q.NO 17:- For hybridization, the DNA bound to the membrane is first denatured. What is denaturation? How do you denature DNA on a membrane?

Q.NO 18:- Briefly explain how the serine residue in some enzymes can become acidic (reactive).Also suggest how you can confirm that a serine residue is involved in the catalysis.

Q.NO 19:- Frozen cells should be thawed as rapidly as possible during their revival. Why? What is the role of DMSO in cryopreservation?

Q.NO 20:- Why is Agrobacterium described as 'natural genetic engineer of plants"?

Q.NO 21:- How are monoclonal antibodies different from polyclonal antibodies?

Q.NO 22:- What is the role of serum for culturing animal cells?

Q.NO 23:- Is the concept of hybridization applicable to Western blot? Explain your answer?

Q.NO 24:- What were the surprises revealed from genome sequencing?

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3 x 5marks

Q .No.25:- Define: primary structure, secondary structure, tertiary structure, and quaternary structure, of a protein. What are the major forces involved in the formation of each structural organization?

Or

What are the unique features and properties of a cosmid that make it desirable as a cloning vector?

Q .No.26:- What are the different types of molecules on which sequence data is obtained and deposited in the database?

Or

Describe the methods used for the measurement and quantitative evaluation of microbial growth?

Q. No.27:- How are plant cells converted to protoplasts? Why are protoplasts more amenable to produce somatic cell hybrids and cybrids?

Or

What are stem cells? Describe the application of embryonic stem cell technology?

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COMPUTER SCIENCE
SAMPLE QUESTION PAPER
CLASS-XII

Max. Marks: 70 **TIME: 3 hrs**

General Instructions:

- **All questions are compulsory.**
- **Question paper is divided into 8 sections pertaining to 8 units respectively.**

SECTION-1			
Q1.	(a)	What are the advantages of Object Oriented Programming? (OR) Write a program in C++ to implement concept of function overloading.	4
	(b)	Explain the concept of data hiding and data encapsulation.	3
	(c)	Explain the public and private access specifiers.	3
	(d)	Briefly explain the use of scope resolution operator.	2
	(e)	Define an object.	1
	(f)	The members of a class are by default private. (true/false)	1
	(h)	Private members of a class can be accessed by 1. Private member functions of the class 2. Public member functions of the class 3. Both 1 and 2 4. None of the above	1
SECTION-2			
Q2.	(a)	Write down the special characteristics of a constructor.	3
	(b)	Define a destructor.	1

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	(c)	A destructor is used to 1. Destroy the classes 2. Destroy the objects 3. Destroy the functions 4. None of the above	1
		SECTION-3	
Q3.	(a)	Explain the concept of multiple inheritance using a diagram.	3
	(b)	Define a base class.	1
	(c)	Inheritance is used to 1. Rename a class 2. Reuse a class 3. Hide the class members 4. Overload a function	1
		SECTION-4	
Q4.	(a)	Explain pointer initialization with an example.	3
	(b)	Define dynamic memory allocation.	1
	(c)	An integer pointer can store 1. An integer value 2. Address of an integer variable 3. Both 1 and 2 4. None of the above	1
		SECTION-5	
Q5.	(a)	Define an Array? Explain 1D and 2D arrays. (OR) Write a program in C++ to implement linear search.	4

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	(b)	Explain push and pop operations used on a stack.	3
	(c)	Define sorting.	2
	(d)	An enqueue operation means to 1. Insert an element into a stack 2. Delete an element from a stack 3. Insert an element into a queue 4. Delete an element from a queue	1
		SECTION-6	
Q6.	(a)	What is SQL? Write down the advantages of SQL. (OR) Explain the concept of relational data model.	4
	(b)	Define relation, tuple and primary key.	3
	(c)	Define degree of a relation.	2
	(d)	Alter command is used to: 1. Delete a table 2. Delete a record 3. To modify the data 4. To modify the table structure	1
		SECTION-7	
Q7.	(a)	What is a logic gate? Explain AND gate using truth table and logic diagram. (OR) Explain the functioning of the AND and OR operators using truth table.	4
	(b)	State and prove DeMorgan's law using truth table.	3

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	(c)	Draw a circuit diagram for the following expression using AND, OR and NOT gates: f=A+(B.C)'+D'	2
	(d)	If an OR gate is given input as 1 and 0, the output will be 1. 1 2. 0 3. 2 4. None of the above	1
		SECTION-B	
Q8.	(a)	Define networking. Explain different types of networks. (OR) Define transmission medium. Write a note on optical fibre.	4
	(b)	Write down measures for safe social networking.	3
	(c)	Differentiate between bus topology and star topology.	2
	(d)	A network topology in which all the nodes are connected through a hub is known as 1. Star topology 2. Ring topology 3. Bus topology 4. None of the above	1

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SAMPLE PAPER FOR HSP-II FOR THE SESSION 2020 ONWARDS

CLASS HSP-II **M.MARKS 70**

SUBJECT ENVIRONMENTAL SCIENCES

Note:

All questions are compulsory

Questions 1 to 8 are objective and multiple choice based and carry 1 mark each.

Questions 9 to 18 are very short answer type and carry 2 marks each.

Questions 19 to 27 are short answer type and carry 3 marks each.

Questions 28 to 30 are Long answer type and carry 5 marks each with internal choice.

SECTION A (OBJECTIVE AND MULTIPLE CHOICE BASED QUESTIONS) (1×8=8)

Q1. Adsorption is the process of controlling which type of air pollutants:

a. **Gaseous Air Pollutants**
b. **Particulate Air Pollutants.**
c. **Vehicular Pollution**
d. **None of these**

Q2. When and where was the U.N. Framework Convention on Climate Change Signed?

Q3. Which step in the Process of EIA helps in determining the key and significant impacts of a developmental activity?

Q4. When was EPA enacted?

Q5. What is unit of measurement of Noise?

Q6. What is meant by 5R?

Q7. Which method helps to reduce erosion due to water?

a. **Contour farming**
b. **Monoculture**
c. **Tillage**
d. **None of these**

Q8. What is deep well injection?

SECTION B (VERY SHORT ANSWER TYPE QUESTIONS) (2×10=20)

Q9. What were the objectives of Montreal Protocol?

Q10. What are soil horizons?

Q11. What are the functions of Central Pollution Control Board?

Q12. Explain the concept of genetic diversity with examples.

Q13. How do sanitary landfills work?

Q14. What are the three pillars of Sustainable Development?

Q15. Explain the concept of Biomagnification.

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Q16. What are direct and indirect values of biodiversity?
Q17. What is Montreal Protocol?
Q18. Name some ozone depleting substances.

SECTION C (SHORT ANSWER TYPE QUESTIONS) (3×9=27)

Q19. Differentiate between in-situ and ex-situ conservation methods.
Q20. Explain the concept of Photochemical Smog. What are its impacts?
Q21. What are the different types of Soil found in India?
Q22. How does habitat fragmentation and invasion of exotic species affect the biodiversity?
Q23. How does Eutrophication affect the aquatic water bodies?
Q24. Explain in short the impact of Carbon monoxide on human health.
Q25. What are the causes and impacts of Soil pollution?
Q26. What are the key elements of EIA?
Q27. What is global warming? What are its causes?
Or
What is the impact of Acid rain on Environment?

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SECTION D (LONG ANSWER TYPE QUESTIONS) (5×3=15)

Q28. What are the different types of Particulate Matter found in the atmosphere? Explain in detail the methods of their control.
or
How does Noise pollution affect the living organisms? What are the different ways by which Noise Pollution can be controlled?

Q29. Explain in detail the methods of treatment of Sewage.
or
What is meant by Marine Pollution? What are the different types of marine Pollutants? What is the effect of Marine Pollution on aquatic organisms?

Q30. What are the characteristics of Hazardous Waste? How can Hazardous waste be effectively disposed of?
or
What are Solid wastes? What are their sources and impacts on Environment?

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MODEL QUESTION PAPER

CLASS 12TH JKBOSE ON CBSE PATTERN

SUB: GEOLOGY MAX. MARKS : 70 PASS MARKS: 23

TIME: 3 HRS

SECTION A (Objective Type Questions)

Q1 The satellite passes over any given point of the planet's surface at the same local time is known as

(a) Geosynchronous (b) Sun-synchronous

(c) Rocket (d) Aircraft 1

Q2 Bornite is an ore of:

(a) copper (b) iron

(c) aluminium (d) none of these 1

Q3 A diagonal fault is also known as

(a) Dip fault (b) bedding fault

(c) strike fault (d) oblique fault 1

Q4 A raised block of the earth's crust that has lifted ,or has remained stationary, while the land on either side has subsided.

(a) Graben (b) Horst

(c) fold (d) unconformity 1

SECTION B (Very Short Answer Type Questions)

Q5 What is seismograph? 1

Q6 Define P –wave. 1

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Q7 What is the composition of inner core? 1

Q8 What do you know about Sial? 1

Q9 What is the age of Cardita? 1

Q10 Define Remote Sensing. 1

Q11 Define Tethered balloons. 1

Q12 Give the physical properties of Bauxite. 1

Q13 Define Synclinorium. 1

Q14 What is strike slip fault? 1

SECTION C (Short Answer-1 Type Questions)

Q15 Write short notes on the following:

(I) Focus 1
(II) Epicenter 1

Q16 Write the various parts of volcano with neat diagram. 2

Q17 What is Half life period? 2

Q18 Define Pygidium. 2

Q19 Write short note on Gondwana coal. 2

Q20 Write short note on Tertiary coal. 2

Q21 What is a satellite? 2

Q22 Define aircraft. 2

Q23 Differentiate between Dome and Basin. 2

Q24 Define a reverse fault. 2

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SECTION D (Short Answer -II Type Questions)

Q25 Describe various products of volcano. 3

Q26 What are the causes of an earthquake? 3

Q27 Explain Carbon 14 method for determination of age of the Earth 3

Q28 Write the morphological features of Trilobite shell with diagram. 3

Q29 Write short note on aerial photography. 3

Q30 Describe the distribution of petroleum in India. 3

Q31 Define Unconformity. 3

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SECTION E (Eassy Type Questions)

Q32 Draw and describe interior of the earth based on seismic data. 5

Q33 Give morphological description of Brachiopoda. 5

Q34 write about the mineral wealth of J & K, UT. 5