KENDRIYA VIDYALAYA SANGATHAN REGIONAL OFFICE, BHOPAL REGION

PRE BOARD- 1 SET- 1

CLASS – XII (2025-26)

MaximumMarks:70 **Time:3hours**

General Instructions:

(i) All questions are compulsory.

(ii) The question paper has five sections and 33 questions.

(iii) Section–A has 16 questions of 1 mark each;
Section–B has 5 questions of 2 marks each;
Section– C has 7 questions of 3 marks each;
Section– D has 2 case-based questions of 4 marks each; and
Section–E has 3 questions of 5 marks each.

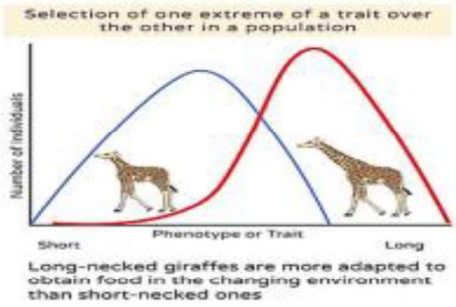
(iv) There is no overall choice. Answer all 33 questions. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.

(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

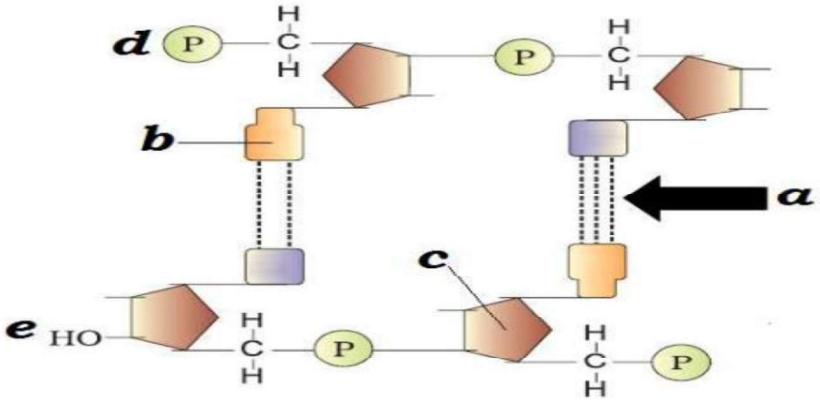
Section–A

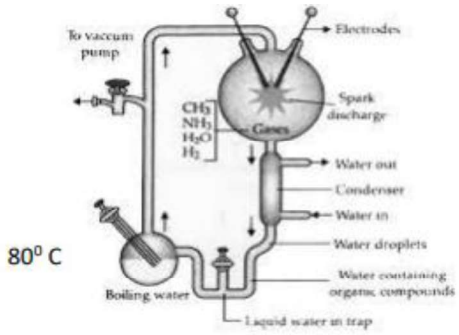
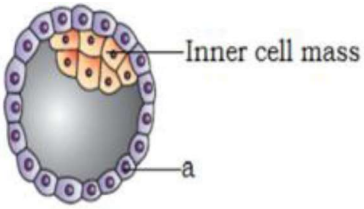
Q. No. 1 to 12 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.

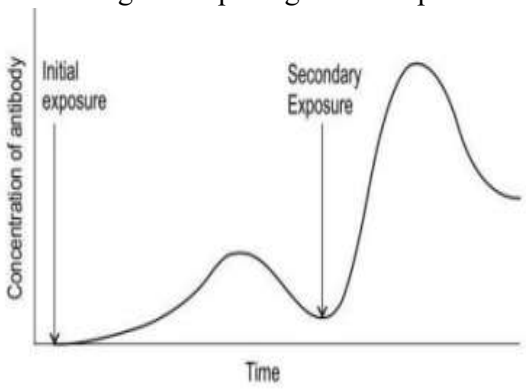
Q. No	Question	Marks
1	**Identify the correct statements regarding the structure of an angiospermic microsporangium and select the correct option.** **i. In a transverse section, a typical microsporangium appears nearly circular in outline** **ii. Each microsporangium is surrounded by four wall layers-epidermis, endothecium, middle layers and tapetum** **iii. The outer three layers, epidermis, endothecium and middle layers are protective and also help in the dehiscence of anthers.** **iv. In a young anther, the centre of the microsporangium is occupied by a group of compactly arranged homogenous cells, which forms microspores by mitosis. v. The cells of tapetum undergo meiosis.** a) i,ii & iii b) i, iii & v c) ii, iii & iv d) ii, iii & v	1
2	**The ploidy of the integument of female gametophytes is:** a)Multiploid b)Tetraploid c)Diploid d)Haploid	1
3	**Which of the following is not a function of placenta in a pregnant woman** a) facilitate the supply of oxygen nutrients to embryo b) facilitate the removal of carbon dioxide and other metabolic waste from the embryo c) secretion of hormones like HCG progesterone that are needed for maintaining pregnancy d) secretion of oxytocin for parturition	1

4	**The experimental proof on the thermal stability of genetic material was first provided by experiments of** a) Hershey and Chase b) Meselson and Stahl c) Frederick Griffith d) Jacob and Monod	1
5	**Which of the following is prepared by acetylation of morphine?** a) Cocaine b) Heroin c) Hashish d) Marijuana	1
6	**What does p^2 in the below mentioned Hardy-Weinberg equation indicate?** **$(p+q)^2 = p^2 + 2pq + q^2$** (a) individuals that are heterozygous dominant (b) individuals having a lethal allele (c) individuals that are homozygous dominant (d) individuals that are homozygous recessive	1
7	**If both parents are carriers for an autosomal recessive disorder, what is the probability that their child will be a carrier?** a) 25% b) 50% c) 75% d) 100%	1
8	**Ancestral population of giraffes consisted of giraffes of short, medium and long necked ones but present day only long necked giraffes are found. Which type of natural selection does the following graph represent?**  Long-necked giraffes are more adapted to obtain food in the changing environment than short-necked ones a) Stabilising selection b) Disruptive selection c) Directional selection d) None of the above	1
9	**The microbial biocontrol agent a bacterium whose dried spores are used to kill the insect larvae eating brassicas, is** a) Agrobacterium tumefaciens b) Bacillus thuringiensis c) Salmonella typhimurium d) Methanobaterium sp	1

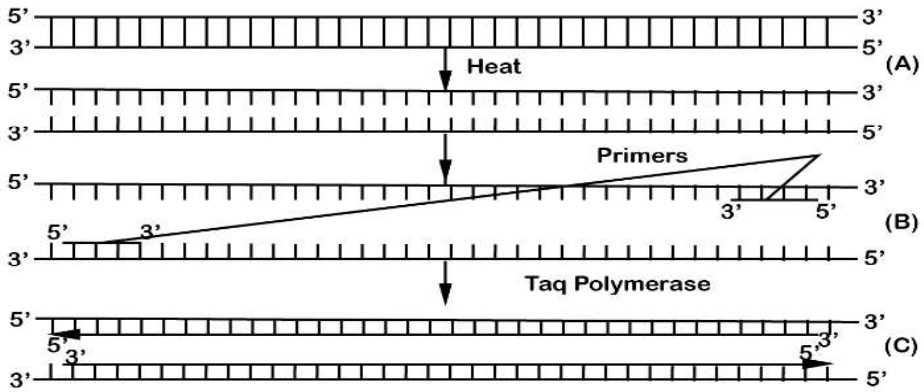
10	**Which mRNA will be translated to a polypeptide chain containing 8 amino acids?** a) AUGUUAAUAGACGAGUAGCGACGAUGU b) AUGAGACGGACUGCAUUCCCAACCUGA c) AUGCCCAACCGUUAUUCAUGCUAG d) AUGUCGACAGUCUAAAACAGCGGG	1
11	**Match the organisms with its use in biotechnology** **Column I** **Column II** **A. Bacillus thuringiensis** **1. Cloning vector** **B. Thermus aquaticus** **2. Construction of first rDNA** **C. Agrobacterium tumefaciens** **3. Cry proteins** **D. Salmonella typhimurium** **4. DNA polymerase** a) A-4, B-3, C-1, D-2 b) A-3, B-2, C-4, D-1 c) A-3, B-4, C-1, D-2 d) A-4, B-1, C-2, D-3 .	1
12	**Insertion of recombinant DNA within the gene encoding for β–galactosidase leads to** _____ a) amplification b) transformation c) insertional inactivation d) cloning	1
QuestionNo.13to16 consist of two statements– Assertion(A) and Reason(R).Answer these questions selecting the appropriate option given below: A. **Both A and R are true and R is the correct explanation of A.** B. **Both A nd R are true and R is not the correct explanation of A.** C. **A is true but R is false.** D. **A is False but R is true.**		
13	**Assertion-** An angiosperm flower represents the modified condensed shoot which performs the function of sexual reproduction. **Reason-** The fertile leaves of the shoot become modified into microsporophylls and megasporophylls which bear ovules and anthers respectively	1
14	**Assertion -** The greater the BOD of wastewater, the less is its polluting potential. **Reason -**High biological oxygen demand means low activity of bacteria in water.	1
15	**Assertion-** Cocaine acts as a depressant and slows down the activity of the brain. **Reason-** Cocaine is a powerful stimulant that increases alertness and produces a feeling of euphoria.	1
16	**Assertion-** Bacterial cells are made competent by treating them with specific concentration of a divalent cation. **Reason-** Treatment of bacterial cell with a divalent cation increases the efficiency with which DNA enters the bacterium through pores in its cell wall.	1

	Section –B	
17	***Attempt either option A or B.*** A. Pollen grains are well preserved as fossils. Explain. ***OR*** B.Write any two ways, by which apomictic seeds may be developed in angiosperms	2
18	Study the given portion of double stranded polynucleotide chain carefully.Identify a, b, c and the 5'end of the chain.  	2
19	i) Which organ of the human body is initially affected when bitten by an infected female Anopheles. Name the stage of the parasite that infects this organ. (ii) Explain the events that are responsible for chill and high fever in the patient.	2
20	***Attempt either option A or B.*** A. (a) A coral reef can be regarded as an ecosystem. Mention any TWO reasons. (b) The net primary productivity (NPP) of a coral reef is approximately 2000 g C/m2/year and the gross primary productivity (GPP) is 4000 g C/m2/year. Calculate the respiration losses (R) of this ecosystem. ***OR*** B. (i) Labelling four trophic levels, Construct an ideal pyramid of energy when 10,00,000 J of sunlight is available in an ecosystem. (ii) In an aquatic ecosystem, what would be the nature of pyramid of energy Upright/Inverted?	2
21	***Attempt any one option.*** (a)Different genera or species of human evolution are provided below. Rearrange them in the sequence starting from the modern human. *Ramapithecus, Homo erectus, Homo sapiens, Homo habilis, Australopithecus.* (b) Name the common ancestor of apes and man. OR When a XX-egg is fertilised by Y-carrying sperm, what effects does this have on the child? What would you label this anomaly as?	2

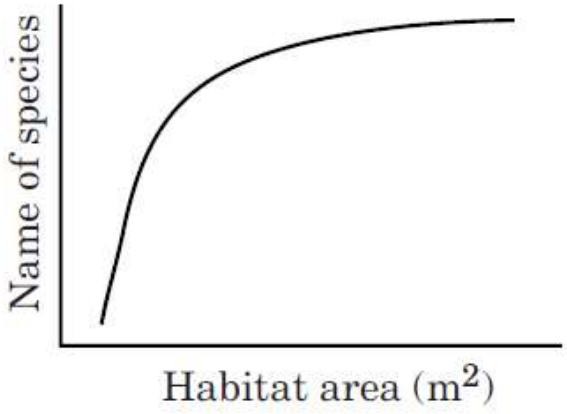
	Section -C	
22	a) List any four characteristics of an ideal contraceptive. b) Name two intrauterine contraceptive devices that affect the motility of sperms.	3
23	(A) Name the enzyme produced by Streptococcus. Also, mention its importance in medical sciences. (B) Explain, how the application of Glomus to the agricultural farms, increase the farm output.	3
24	A true breeding Pea plant homozygous for axial violet flowers is crossed with another Pea plant with terminal white flowers (aavv). Workout the cross.(a) What would be the phenotype and genotype of F1 and F2 generation? (b) Give the phenotypic ratio of F2 generation.	3
25	A student was stimulating Urey and Miller's experiment to prove the origin of life. The setup used by the student is given a) Find out the reasons why you could not get desired results. b) What conclusion was drawn by Urey and Miller through this experiment? c) Compare the conclusions with the theory of spontaneous generation. 	3
26	Study the figure below and answer the questions that follow: (a) Name the stage of human embryo the figure represents. (b) Identify 'a' in the figure and mention its function. (c) Mention the fate of the inner cell mass after implantation in the uterus.  (d) Where are the stem cells located in this embryo and what is their function?	3
27	How did the process of RNA interference help to control the nematode from infecting the roots of tobacco plants?	3
28	i. Name and explain the mechanism where two species competing for the same resource co-exist. ii. What does Gause's exclusion principle state? Does it apply in the above situation?	3
	Section –D	

29	Double fertilization and triple fusion are two important features observed in angiosperm plants. Flowers are the reproductive structures containing male and female reproductive structures called stamens and pistils respectively. Pollen grains are produced by the anthers of the stamens. After pollination, the pollen enters the embryosac and performs the process of fertilization. On the basis of the information provided above, answer the following questions with justification for each answer. a- what is triple fusion? b- Where does triple fusion take place in a flowering plant? ***Attempt either subpart C or D.*** c- Mention one significance of each of double fertilization and triple fusion? d- Why is it called triple fusion?	4
30	The graph given below shows the levels of antibodies against a pathogen over a period of 30 years in a person's body. a- What do the 2 peaks mean? b-Explain the reason behind the difference in the size of the 2 peaks.  ***Attempt either subpart C or D.*** c- How can the above shown phenomena be useful to human being? d- Name any one instance where performed antibodies are injected into the body of patients.	4

	Section –E	
31	What does the lac operon consist of? How is the operator switch turned on and off in the expression of genes in this operon? Explain with appropriate diagram. ***OR*** Where do transcription & translation take place in a prokaryotic cell? Describe the 3 steps involved in translation?	5

32	In the given figure, one cycle of polymerase chain reaction (PCR) is shown-  (a) Name the steps A and C. (b) Give the purpose of each of the steps A , B and C. (c) State the contribution of the bacterium Thermus Aquaticus in this process. ***OR*** Gene therapy is an experimental technique that uses genes to treat or prevent disease. In the future, this technique may allow doctors to treat a disorder by inserting a gene into a patient's cells instead of using drugs or surgery. Clinical gene crucial for the immune system to function therapy is given to a 4 years old patient for an enzyme that is . Observe the therapeutical flow chart and give the answer to the following: (A) Lymphocytes of the Patient. ↓ (B) _____ ↓ (C) Introduction of functional ADA cDNA into Lymphocytes. ↓ (D) _____ (a) Complete the missing steps (B) and (D) (b) Identify the disease to be cured. (c) Why the above method is not a complete solution to the problem? (d) Scientists have developed a method to cure this disease permanently. How	1+3+1 or 1+1+1 +2

33	Logistic growth is more reasonable for the animal population than exponential growth." Based on the given statement, answer the following questions: exponential growth." Based on the given statement, answer the following questions: (i) Explain the given statement with a suitable reason. (ii) Write the equation representing logistic growth of the animal population. (iii) Write and explain any three population attributes. OR Diversity is seen in the living world at various levels. The distribution of biodiversity shows specific patterns that account for the species richness or paucity across the globe.	5



(A) With reason, explain how species diversity changes with changing altitudes.
(B) Observe the given graph of the species-area relationship. What does such a graph signify?
(C) If the area of a habitat is doubled, how will it affect the species richness Explain with proper reasoning.