BHARTIYA SHIKSHA BOARD
SAMPLE QUESTION PAPER 2025-26
CLASS - XII
BIOLOGY (152)

Time allowed : 3 hours *Maximum marks : 70*

निर्धारित समय : 3 घंटे *अधिकतम अंक : 70*

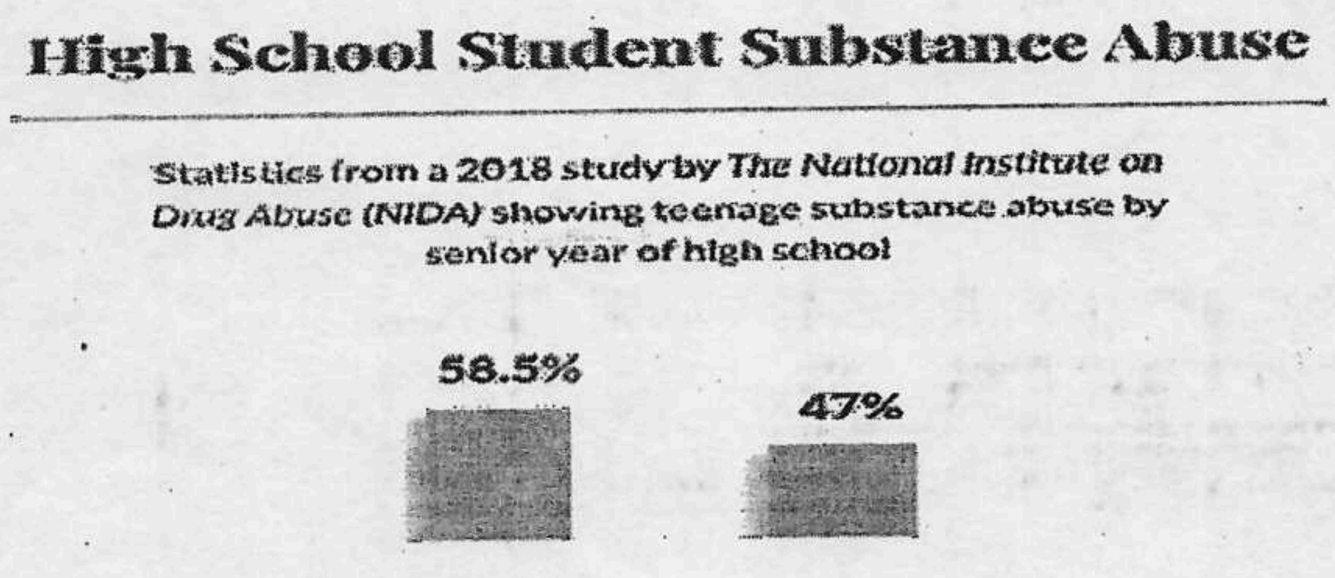
General Instructions:

(i) All questions are compulsory.
(ii) The question paper has five sections and 33 questions. All questions are compulsory.
(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. 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	**QUESTIONS**	**M**
1	Which of the following correctly lists the stages of spermatogenesis in the correct sequence? a) Spermatogonia → Primary Spermatocytes → Secondary Spermatocytes → Spermatids → Spermatozoa b) Spermatogonia → Spermatids → Primary Spermatocytes → Secondary Spermatocytes → Spermatozoa c) Primary Spermatocytes → Spermatogonia → Secondary Spermatocytes → Spermatids → Spermatozoa d) Spermatids → Spermatogonia → Primary Spermatocytes → Secondary Spermatocytes → Spermatozoa	1
2	Out of the following which best describes lactation amenorrhea? a) It is a condition where menstruation resumes immediately after childbirth due to hormonal changes. b) It is the absence of menstruation during the first few months after delivery, primarily due to high levels of prolactin from breastfeeding. c) It refers to the use of medications to induce menstruation after delivery d) It is a period of irregular menstruation that occurs before pregnancy.	1
3	In the context of evolution which of the following concepts is most closely associated with Hugo de Vries?	1

	a) Natural selection and the survival of the fittest b) The theory of acquired characteristics c) The concept of mutations as a source of new variations d) The idea of uniformitarianism in geological processes	
4	What is the role of RNA polymerase III in the process of transcription in eukaryotes? a) Transcribes precursor of mRNA b) Transcribes only snRNAs c)Transcribes rRNAs (28S, 185 and 5.8S) d) Transcribes tRNA, 5s rRNA and snRNA	1
5	Identify the statement which is true. a) Wings to birds and insects are homologous organs. b) Human hands and bird's wings are analogous organs. c) Human hands and bat's wings are analogous organs. d) Flipper of penguin and dolphin are analogous organs.	1
6	If the base sequence of a codon in mRNA is 5' – AUG – 3' the sequence of tRNA pairing with it must be a) 5' – UAC – 3' b) 5' – CAU – 3' c) 5'-AUG – 3' d) 5' – GUA – 3'	1
7	The primary purpose of performing a test cross in genetics is a) To determine the genotype of an individual with a dominant phenotype b) To identify the phenotypic ratio of offspring c) To predict the genetic outcome of a cross between two heterozygous individuals d) To determine the presence of linked genes on a chromosome	1
8	In a cross between a person with blood type AB and a person with blood type O, what are the possible blood types of their offspring? a) A, B, and AB b) A, B, and O c) A and B only d) AB only	1
9	One of the following statements correctly distinguishes between primary and secondary lymphoid organs, select the correct statement. a) The primary lymphoid organs are where immune cells are activated, while the secondary lymphoid organs are where immune cells mature. b) The primary lymphoid organs include the thymus and bone marrow, which are involved in the maturation of immune cells, whereas the secondary lymphoid organs include the lymph nodes and spleen, which are involved in the activation and coordination of immune responses.	1

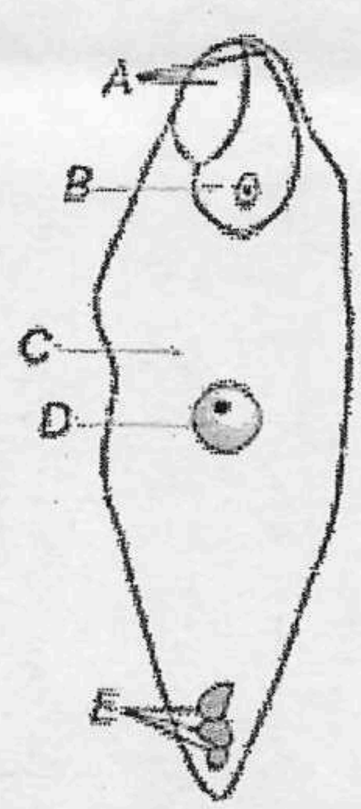
	c) The secondary lymphoid organs include the thymus and bone marrow, while the primary lymphoid organs include the lymph nodes and spleen. d) The primary lymphoid organs are responsible for phagocytosis of pathogens, while the secondary lymphoid organs are responsible for producing antibodies.	
10	At a particular locus, frequency of allele A is 0.6 and that of allele a is 0.4. What would be the frequency of heterozygotes in a random mating population at equilibrium? a) 0.36 b) 0.16 c) 0.24 d) 0.48	1
11	Some of the steps involved in the production of human insulin are given below. Choose the correct sequence- i)Synthesis of insulin gene artificially ii) Culturing recombinant E.coli in bioreactor iii)Purification of human insulin iv)Insertion of human insulin gene into plasmid v) Introduction of recombinant plasmid into E.coli vi)Extraction of recombinant gene product from E.coli a) i ,iii , v ,vi , ii , iv b) iii, v, ii, I, vi, iv c) i, iv, v ,ii, vi, iii d) ii, I, iv, iii, vi, v	1
12	With respect to the structure of a typical antibody molecule find out the statement which describes it correctly? a) It consists of two heavy chains and two light chains arranged in a single linear chain. b) It is composed of two heavy chains and two light chains, forming a Y-shaped structure with variable and constant regions. c) It consists of four identical light chains and a single heavy chain. d) It has a ring-like structure composed of multiple subunits of heavy and light chains.	1
	Question No. 13 to 16 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 and R are true and R is not the correct explanation of A.** **c) A is true but R is false.**	

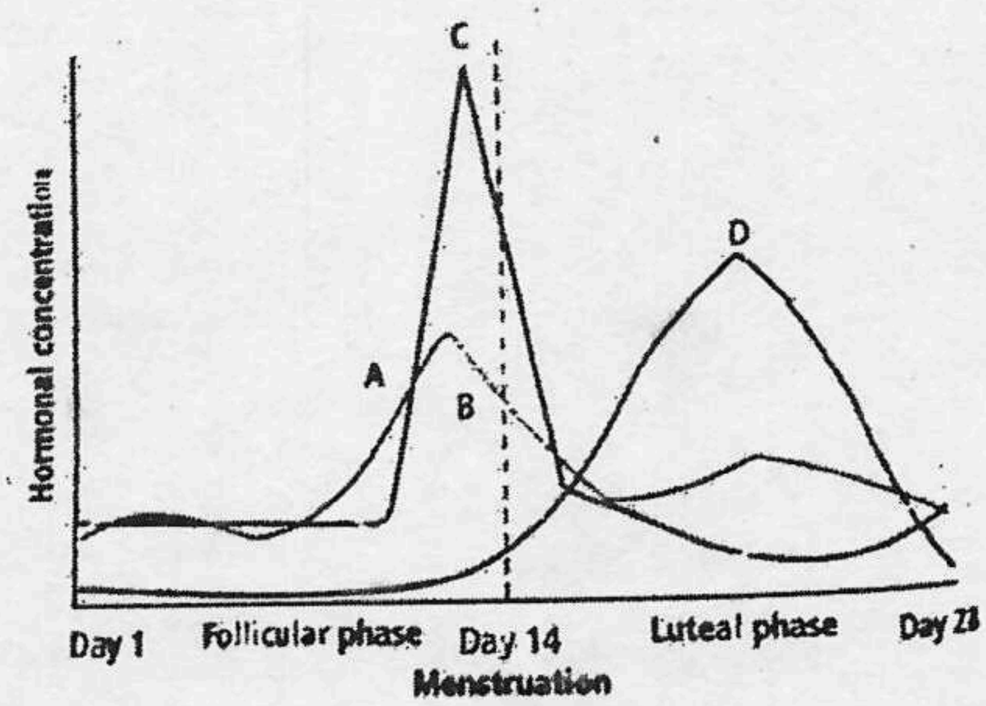
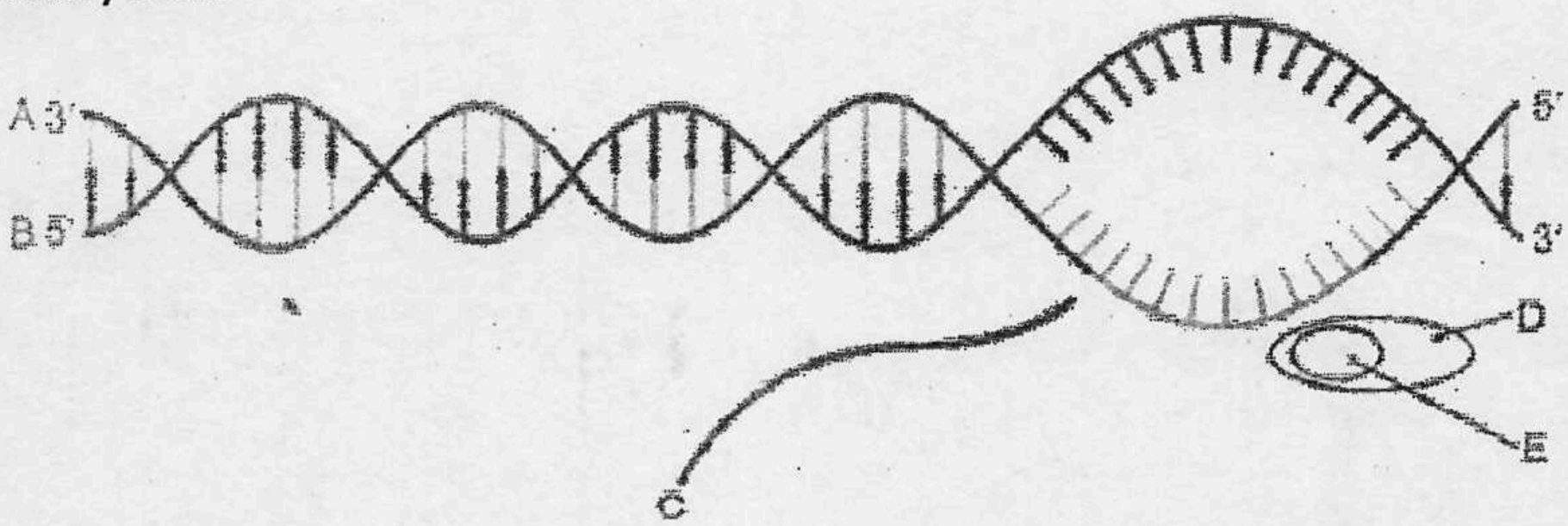
	d) A is false but R is true.	
13	**Assertion (A):** Chasmogamous flowers are those that open and expose their reproductive organs to facilitate cross-pollination. **Reason (R):** Cleistogamous flowers remain closed and self-pollinate, ensuring pollination without external agents.	1
14	**Assertion (A):** Translation is the process by which mRNA is used as a template to synthesize proteins. **Reason (R):** During translation, ribosomes read the sequence of tRNA in sets of three nucleotides, called codons, to assemble a corresponding chain of amino acids.	1
15	**Assertion (A):** Biogas production involves the aerobic digestion of organic waste by microorganisms to produce methane and other gases. **Reason (R):** The process of anaerobic digestion facilitates the breakdown of organic materials into biogas.	1
16	**Assertion (A):** Restriction enzymes are molecular scissors that cut DNA at specific sequences, creating fragments that can be used in genetic engineering. **Reason (R):** Restriction enzymes recognize and cut DNA sequences that are palindromic, which means the sequences read the same in both directions.	1
	SECTION -B	
17	State the key adaptations of wind-pollinated flowers that facilitate efficient pollen transfer.	2
18	In Snapdragon when a plant bearing red flowers is crossed with a plant bearing white flowers, an intermediate phenotype, Pink flower is observed in the F1. What is the reason for this observation? Workout the cross for F2 generation .What is your observation with respect to its phenotypic and genotypic ratio.	2
19	This is the data of a study conducted on adolescents from a primary cross-sectional survey in selected schools.  a) List the common methods of drug consumption seen in adolescents b) What are the factors that can contribute to adolescents falling into drug addiction?	2
20	A recombinant vector with a gene of interest inserted within the gene of β-galactosidase enzyme is introduced into a bacterium. Explain the method that would help in selection of recombinant colonies from non-recombinants ones.	2

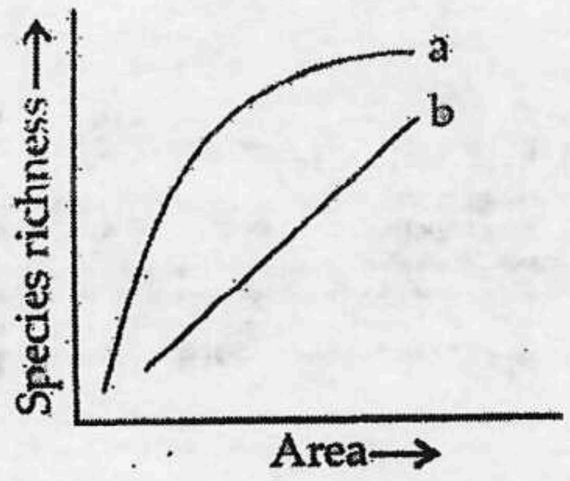
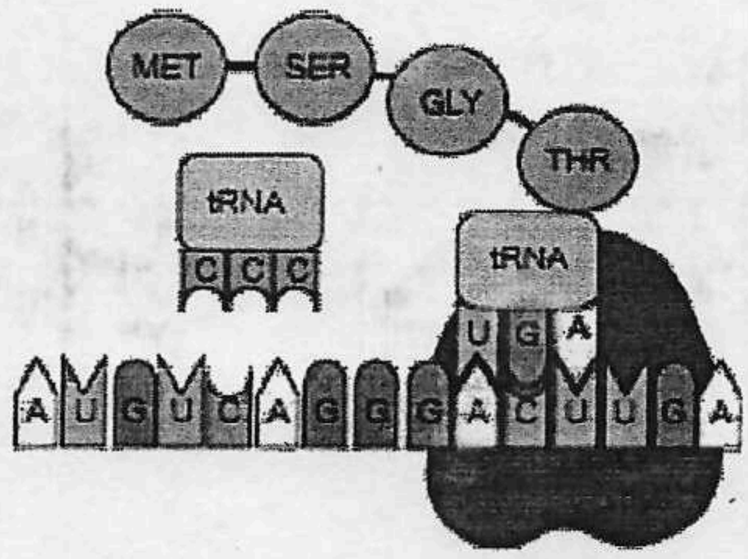
21	There has been five episodes of mass extinction of organisms in the past .The sixth episode is presently in progress. a. How is the sixth extinction different from the earlier episodes? b. Alien species are highly invasive are a threat to indigenous species. Substantiate this statement with any two examples. OR With respect to interspecific population interaction completes the table.	2

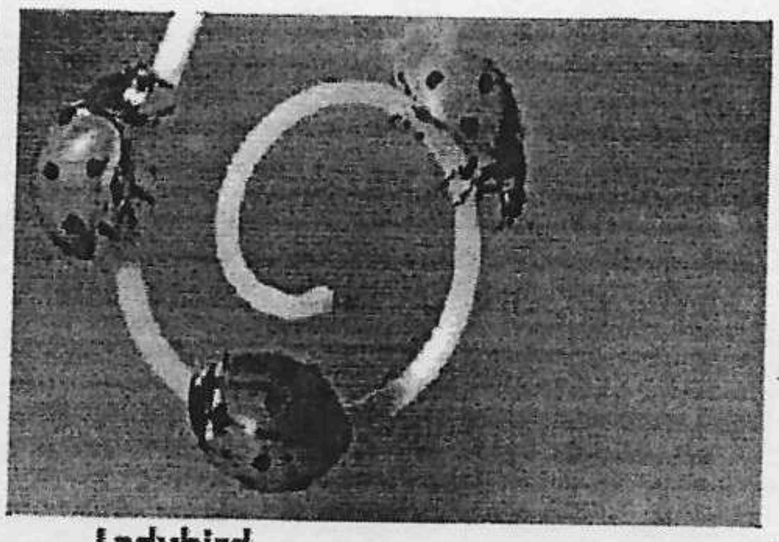
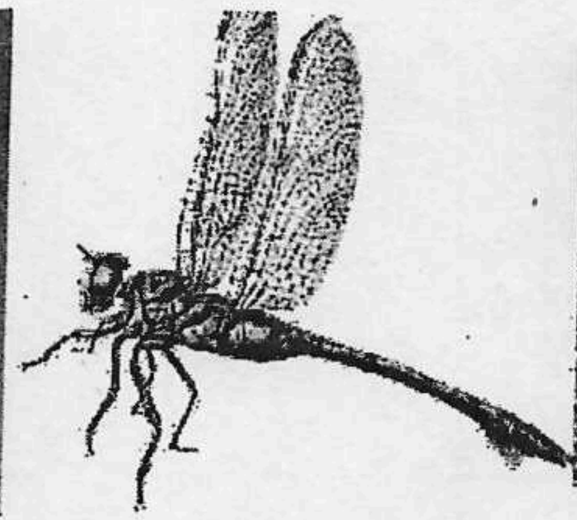
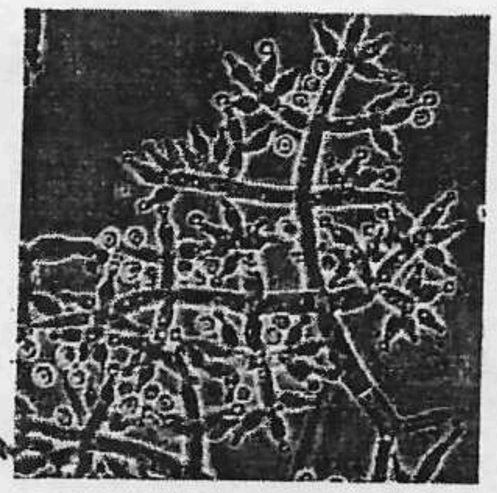
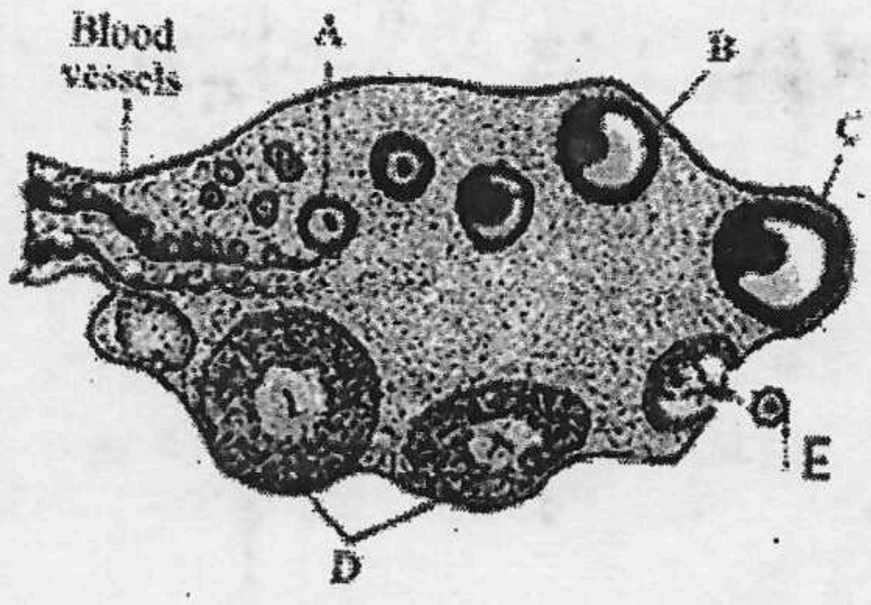
Species A	Species B	Name of the interaction
-	-	A
-	B	Amensalism
C	0	commensalism
+	+	D

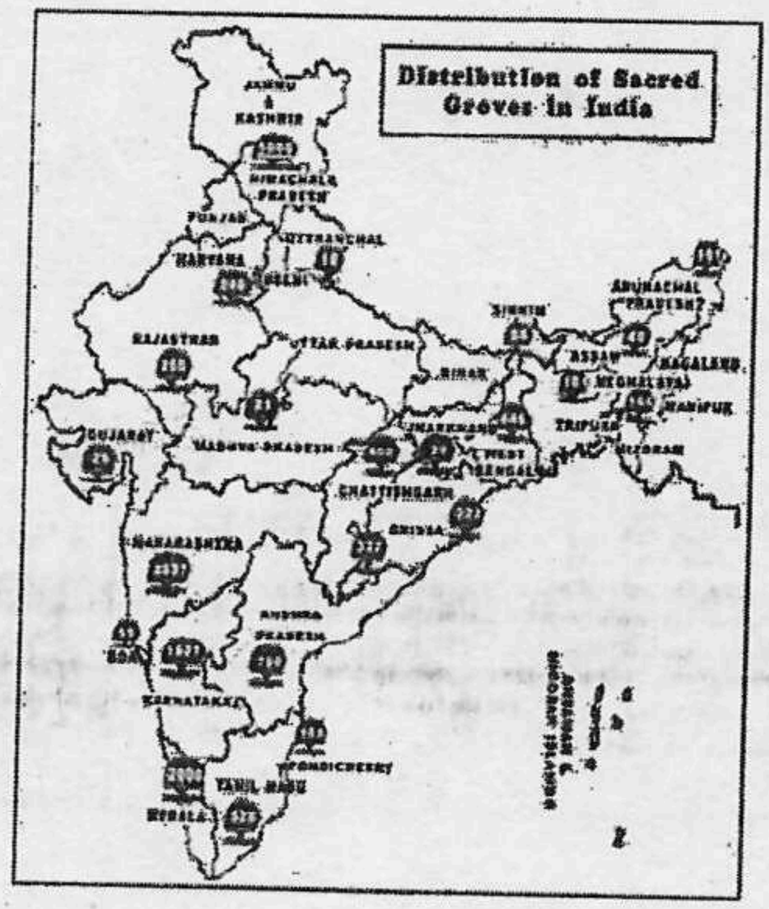
SECTION C

22	Given below is the diagram of fertilised embryo sac. Identify the part which transforms into an embryo and primary endosperm cell from the figure. Why is the endosperm formed prior to embryo formation?  Write the correct sequence of the stages of embryo development in a dicot.	3

23	The figure shows the hormonal action during different stages of menstrual cycle. Based on the graph answer the following  a) Out of the three, name the hormone responsible for maintaining the thickness of the lining of endometrium. Which structure in the ovary secretes this hormone? b) Which peak represents LH surge? State its importance.	3
24	Analyse the concept of pleiotropy and its implications in genetics, using the example of a single gene affecting multiple phenotypic traits.	3
25	A student identifies the figure given as transcription in prokaryotes which has three stages. Which stage of transcription is shown in the figure and what do D and E represent. Is there any difference in the product formed in prokaryotes and eukaryotes?  	3
26	a) Compare and contrast benign and malignant tumors. Provide two key differences. b) What is metastasis in cancer? Why is it significant in the progression of the disease? c) Identify one major side effect of chemotherapy and discuss its impact on a patient's quality of life.	3

27	a) Discuss the purpose of creating a transgenic animal the Rosie cow. What specific traits were introduced, and why? b) State two other applications of transgenic animals. How do these applications benefit human health? **OR** A researcher is working with the plasmid pBR322. He inserted the desired gene in the tetracycline resistance gene. In which medium should he grow the bacteria to differentiate recombinant from non-recombinant? Name the restriction enzyme he would use to cut this region. Which region of the plasmid determines the number of copies formed?	3
28	The graph represents species richness to area. With respect to this answer the following question.  a) Who is credited with formulating the species-area relationship mathematically? b) Give the mathematical equations for a and b c) What role does habitat size play in determining species diversity?	3
	SECTION D	
29	The genetic code is a set of three-letter combinations of nucleotides called codons, each of which corresponds to a specific amino acid or stop signal. These codes are vital for the formation of protein during translation  a) Name the physicist who argued that if there are 4 bases coding for 20 amino acids then the codons have to be triplet.	4

	b) From the above figure state how many amino acids are coded and why? OR What would be the anticodon on the tRNA coding for serine? c) Write any two salient features of genetic code.	
30	The organisms shown above have been used in agriculture as biological control methods for pests.  Ladybird  Dragon fly  Trichoderma a) Mention the advantages of biocontrol methods over the conventional methods of pest control? b) State the role played by dragonfly as biocontrol of pests. OR Trichoderma is effectively used in treatment of plant diseases. Elaborate. c) Baculoviruses are excellent candidates for integrated pest management in very sensitive areas. Justify.	4
	SECTION E	
31	a) Given below is the T.S of human ovary. Identify A, B, C, D and E in the following in the diagram b) Explain the changes the primary oocyte undergoes while in different follicular stages before ovulation.  **OR** Explain the process of development of embryo sac in angiosperms. Why is the process of its development said to be monosporic?	5

32	Smita aged 3 years repeatedly visited a hospital for the treatment of a genetic disorder. She was provided with enzyme replacement therapy and was advised to revisit periodically for treatment. a) Name the ailment the girl was suffering from. b) How is the disorder caused? c) What were the conventional methods of treatment? d) Can she be permanently cured for her genetic disorder? Justify your answer **OR** Scientists have always been fascinated and learnt a lot of techniques from plants and animals. One such piece of information was transferring of genes by viruses into plants and animals which paved way for biotechnology. a) Name the bacterial and the gene when delivered cause tumor in several dicot plants. b) Which plasmid present in this bacterium which is effectively used as a vector to transfer genes in biotechnology? c) Similarly desirable genes are transferred into animals too. Which is the vector used? d) An enzyme is used to join the vector DNA and desired DNA. Name it.	5
33	a) What is the raw material for decomposition? Mention the important steps of decomposition? b) The rate of decomposition is controlled by the chemical composition of the raw material and the climatic factors. Justify. **OR**  a) The above map shows the sacred grooves in India .Name any four seen across India. b) There are 34 biodiversity hotspots in India. Analyze the significance of biodiversity hotspots in conservation efforts. How do these areas contribute to global biodiversity, and what challenges do they face?	5