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बेंगलुरु क्षेत्र
BENGALURU REGION
प्रथम प्री-बोर्ड परीक्षा (सत्र 2025-26)
FIRST PRE-BOARD EXAM (SESSION 2025- 26)

CLASS: XII **MAX MARKS:70**

SUBJECT: BIOLOGY (044) **TIME: 3HRS**

General Instructions:

(i) All questions are compulsory.

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

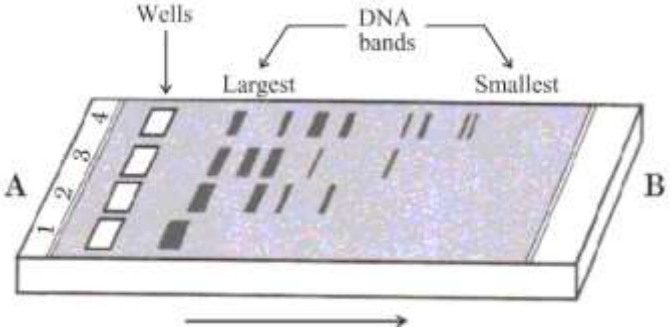
(iii) Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case-based questions of 4marks each; and Section–E has 3 questions of 5 marks each.

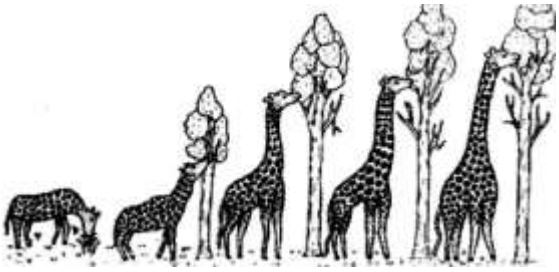
(iv) There is no overall choice. However, internal choices have been provided in somequestions. A student has to attempt only one of the alternatives in such questions.

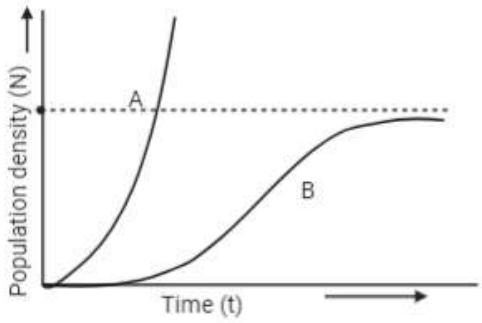
(v) Wherever necessary, neat and properly labeled diagrams should be drawn.

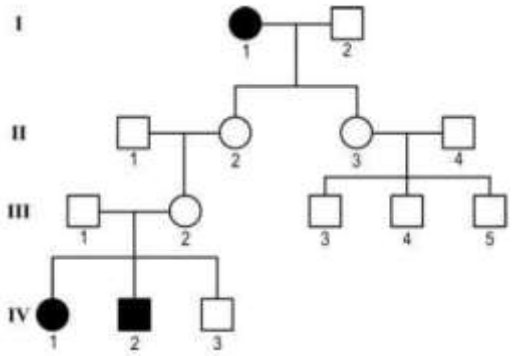
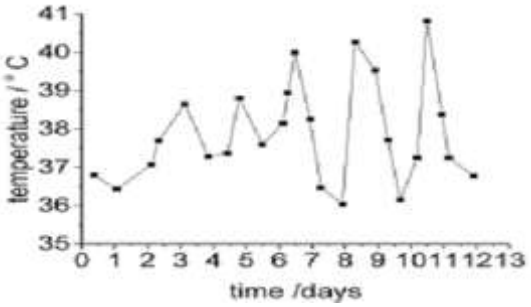
	SECTION A	M
1	Flowers which have single ovule in the ovary and are packed into inflorescence are usually pollinated by a) Wind b) Bee c) Water d) Bats	1
2	A patient was advised to have a kidney transplant. To suppress the immune reaction, the doctor would administer him: a) statins produced from Monascus purpureus b) statins produced from Streptococcus thermophilus c) cyclosporin A produced from Trichoderma polysporum d) cyclosporin A produced from Clostridium butylicum	1
3	Assisted reproductive technology, IVF involves a) transfer of ovum into the Fallopian tube b) embryo upto 8-celled stage into the Fallopian tube c) embryo upto 8-celled stage into the uterus d) embryo with 16 blastomeres into the Fallopian tube	1
4	A cloning vector has two antibiotic resistance genes- for tetracycline and ampicillin. A foreign DNA was inserted into the tetracycline gene. Non-recombinants would survive on the medium containing: a) ampicillin but not tetracycline b) tetracycline but not ampicillin c) both tetracycline and ampicillin d) neither tetracycline nor ampicillin	1

5	Match the terms in column I with their description in column II and choose the correct option. Column I: A. Dominance; B. Co-dominance; C. Pleiotropy; D. Polygenic inheritance Column II: (i) Many genes govern a single character; (ii) In a heterozygous organism only one allele expresses itself; (iii) In a heterozygous organism both alleles express themselves fully; (iv) A single gene inheritance influences many characters a) (iv) (i) (ii) (iii) b) (iv) (iii) (i) (ii) c) (ii) (i) (iv) (iii) d) (ii) (iii) (iv) (i)	1
6	Identify the correct statements A. Detritivores perform fragmentation. B. The humus is further degraded by some microbes during mineralization. C. Water soluble inorganic nutrients go down into the soil and get precipitated by a process called leaching. D. The detritus food chain begins with living organisms. E. Earthworms break down detritus into smaller particles by a process called catabolism. Choose the correct answer from the options given below: a) B, C, D only b) C, D, E only c) D, E, A only d) A, B, C only	1
7	In general, which of the following is not an adaptation seen in parasites in accordance with their life style? a) Loss of unnecessary sense organs b) Presence of adhesive organs c) Low reproductive capacity d) Loss of digestive system	
8	Select the correct option of haploid cells from the following groups: a) Primary oocyte, Secondary oocyte, Spermatid b) Secondary spermatocyte, First polar body, Ovum c) Spermatogonia, Primary spermatocyte, Spermatid d) Primary spermatocyte, Secondary spermatocyte, Second polar body	1
9	A colour blind girl is rare because she will be born only when a) Her mother and maternal grandfather were colour blind b) Her father and maternal grandfather were colour blind c) Her mother is colour blind and father has normal vision d) Parents have normal vision but grandparents were colour blind.	1
10.	A research team working on a rapid diagnostic test to detect Haemophilus influenzae is in search of appropriate candidates to obtain patient samples. Patients with which of the following symptoms would serve as suitable candidates to obtain samples? a) Abdominal pain, fatigue, nausea and fever	1

	b) Cough, chest pain, and fever c) A history of asthma d) Swelling in the legs	
11	The hotspots of biodiversity are characterized by a) High endemicity and high threat of extinction b) Low endemicity and high threat of extinction c) High endemicity and low threat of extinction d) Low endemicity and low threat of extinction	1
12.	In RNA interference technology, double-stranded RNA is used to: a) Increase transcription of a gene b) Silence expression of a target gene c) Enhance protein production d) Mutate the target gene	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**: Divergent evolution leads to the development of homologous organs **Reason**: Homologous organs are different in their anatomy and origin, but similar in function	1
14	**Assertion**: Smoking can raise blood pressure and increase heart rate. **Reason:** Nicotine stimulates adrenal glands to release adrenaline and noradrenaline into the blood circulation, both of which raise blood pressure and increase heart rate.	1
15	**Assertion** : A population is considered stable when the pre-reproductive age group and the reproductive age group are approximately equal in size. **Reason** : When these two age groups are nearly equal, the birth rate is balanced by the death rate, leading to a zero or near-zero population growth rate	1
16	**Assertion**: Genes that are close together on the same chromosome tend to be inherited together. **Reason**: The chance of recombination between closely placed genes is very high.	1
	SECTION B	
17	***Attempt either option A or B.*** **A.** Given below is the diagram representing the observation made for separating DNA fragments by gel electrophoresis. Observe the illustration and answer the questions that follow :  a) DNA fragments move in the direction A→B. Explain.	2

	b) Name the matrix used and its role in gel electrophoresis. c) Mention how the separated fragments can be visualized for further technical use **OR** **B**. Given below is a schematic representation of a mRNA strand 5' mRNA 3' A G G A G G U A U G A U C U C G U A A A A U A A A i) In the above sequence identify the translational unit in mRNA. ii) Where are UTRs found and what is their significance?	
18	***Attempt either option A or B.*** **A.** Observe the picture given below. Name the naturalist and write the explanation given by him that evolution of life forms had occurred on the basis of this example  **OR** **B.** A student claims that evolution is just a theory and not based on scientific evidence. a) Explain any two kinds of evidences that refute this misconception.	2
19	A group of youth were having a 'party' in an isolated area and were raided by police. Packets of 'smack' and syringes with needles were found littered around. (a) Write the chemical name of 'smack' and the name of its source plant. (b) Syringes and needles used by the youth for taking the drug could prove to be very fatal. Why ?	2
20	***Attempt either option A or B.*** **A** a) An autoimmune condition in a male causes the body's immune system to attack the Leydig cells present in the testes. What would be the immediate effect of the condition? b) What is the site of action of GnRH and FSH in the male reproductive system? **OR** **B** a) Mention the stage at which the process of oogenesis temporarily gets arrested? b) When does the arrested primary oocyte resume meiosis and what are the products of the first meiotic division?	2
21	By using Punnett square depict the genotypes and phenotypes of test crosses [where green pod colour (G) is dominant over yellow pod colour (g)] in Garden pea with unknown genotype.	2
	SECTION C	
22	Explain the processing of heterogeneous nuclear RNA (hnRNA) into a fully functional mRNA in eukaryotes.	3
23	A scientific group aims to compare the quality of water from various water bodies. They collected samples from 3 water bodies and calculated their BOD amongst other parameters and tabulated them as follows.	3

	<table><tr><th>Sample Name</th><th>BOD Value (ppm)</th></tr><tr><td>A</td><td>100</td></tr><tr><td>B</td><td>2</td></tr><tr><td>C</td><td>11</td></tr></table> a) Arrange the sample names with respect to their level of pollution (highest to lowest). (b) Explain how BOD can indicate the level of pollution in water and hence the water quality.	
24	(a) What are transgenic animals? (b) Name the first transgenic cow and state its importance	3
25	Analyse the given situations and suggest suitable contraceptive devices along with mode of action. <table><tr><th>Situation</th><th>Requirement of contraceptive for</th><th>Name of the contraceptive device</th><th>Mode of action</th></tr><tr><td>1</td><td>Blocking the entry of sperms through cervix</td><td></td><td></td></tr><tr><td>2</td><td>Effective emergency contraceptive</td><td></td><td></td></tr><tr><td>3</td><td>Ideal contraceptive for the females to space between the children</td><td></td><td></td></tr></table>	3
26	i) Draw a pyramid of numbers where a large number of insects are feeding on the leaves of a tree. What is the shape of this pyramid? ii) Will the pyramid of energy also be of the same shape in this situation? Give reason for your response. iii) If 10,000 units of energy is available at the producer level, how much energy will be available to secondary consumers?	3
27	Study the graph and answer the questions that follow  i)Write the status of resources in the curves A and B. ii)In the absence of predators, which one of the two curves would appropriately depict the prey population? iii)Time has been shown on X axis and there is a parallel dotted line above it. Give the significance of this dotted line	3
28	Draw a neat labelled diagram structure of a mature pollen grain. a) Name the layers of the pollen wall and their chemical composition b) What would happen if the tapetum is nonfunctional in the anther.	3

	SECTION D	
29	Cystic fibrosis is a condition in which a defective cf gene (consider allele c) that produces faulty transport channels causing mucus to build up in the ducts of different organs leading to vitamin deficiency diseases, respiratory infections and excessive loss of salt through sweat. Given below is a pedigree chart for a family. The great-grandmother, represented as I- 1, suffers from cystic fibrosis.  a) From the pedigree, deduce the pattern of inheritance exhibited by the gene. b) How can cystic fibrosis can be considered as an example for pleiotropy? ***Attempt either subpart c or d*** c) Identify the genotypes of II-2 and III-2. **OR** d) State whether cystic fibrosis and Klinefelter's syndrome arise due to the same type of genetic cause. Justify.	4
30	Given below is the pattern of temperature in a person suffering from a non-viral disease transmitted by mosquitoes. Study the graph and answer the questions that follow:  a) Explain the factor(s) responsible for this pattern of temperature. b) How is this infection transmitted to humans? ***Attempt either subpart c or d.*** c) How does this pathogen multiply in the human body? **OR** d) Which stages of the life cycle of this pathogen are completed in the mosquito?	4
	SECTION E	
31	(a) (i) Explain any four devices that flowering plants have developed to encourage cross-pollination. (ii) Why do plants discourage self- pollination? State any one reason. **OR** (b) Explain the ovarian and uterine events taking place along with the role of pituitary and ovarian hormones, during menstrual cycle in a normal human female under the following phases : (i) Follicular phase/proliferative phase (ii) Luteal phase/secretory phase	5

	(iii) Menstrual phase	
32	i) Compare the pattern of inheritance of flower colour in garden pea plant (violet/white) with snapdragon plant (red/white) on the basis of the following : a) F1 phenotypic expression; b) expected phenotypic and genotypic expression of F2 generation; c) the conclusion you reached at the end of the comparison made. (ii) List any two characteristics of pattern of inheritance of human blood group ABO. **OR** (i) Draw a schematic, self-explanatory labelled diagram of lac operon in 'switched on condition'. (ii) Why is regulation of lac operon referred to as negative regulation?	5
33	a) How can gene therapy be used to treat Adenosine Deaminase (ADA) deficiency? b) Mention two conventional methods of treatment that were used before the development of gene therapy. c) How can a permanent cure for ADA deficiency be achieved using modern biotechnology? **OR** a) Draw a simple stirred-tank bioreactor. b) Highlight any one difference between a bacterial culture flask in a laboratory and a bioreactor that allows cells to grow in a continuous culture system. c) Explain the significance of downstream processing in obtaining the final gene product.	5