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INDIAN SCHOOL SALALAH
FIRST TERM EXAMINATION – SEPTEMBER 2024



Class: XII

BIOLOGY (044)

Date: 22.9.24

Time: 3hrs


Maximum Marks: 70

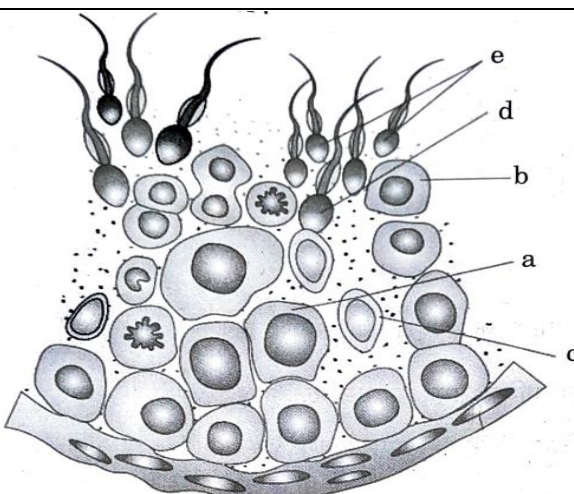
General Instructions

1. This question paper has five sections and 33 questions.
 2. Section A has 16 questions of 1 mark each
 3. Section B has 5 questions of 2 marks each
 4. Section C has 7 questions of 3 marks each
 5. Section D has 2 case-based questions of 4marks each
 6. Section E has 3 questions of 5 marks each.
 7. All questions are compulsory. 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.
 8. Wherever necessary, neat and properly labelled diagrams should be drawn.
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SECTION A		
1	From among the situations given below, choose the one that prevents both autogamy and geitonogamy (a) Monoecious plant bearing unisexual flowers (b) Dioecious plant bearing only male or female flowers (c) Monoecious plant with bisexual flowers (d) Dioecious plant with bisexual flow	1
2	RNA is labile due to presence of (a) Hydrogen at 2' C in Ribose sugar (b)OH at 2' C in Ribose sugar (c)OH at 2'C in De oxy ribose sugar (d) None of the above.	1

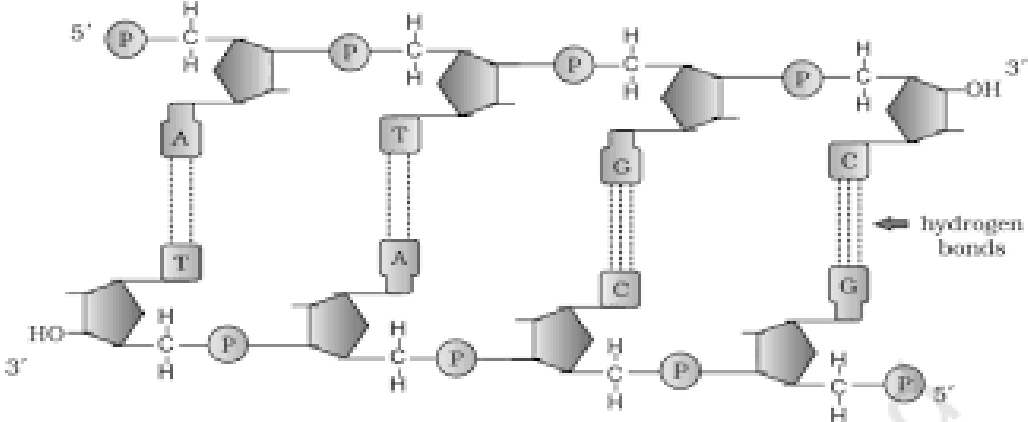
3	In albuminous seeds, food is stored in _____ and in non-albuminous seeds, it is stored in _____. (a) endosperm, cotyledons (b) cotyledons, endosperm (c) nucellus, cotyledons (d) endosperm, radicle	1
4	The outermost and innermost wall layers of microsporangium in an anther are respectively (a) endothecium and tapetum (b) epidermis and endodermis (c) epidermis and middle layer (d) epidermis and tapetum.	1
5	Mature Graafian follicle is generally present in the ovary of a healthy human female around (a) 5-8 day of menstrual cycle (b) 11-17 day of menstrual cycle (c) 18-23 day of menstrual cycle (d) 24-28 day of menstrual cycle.	1
6	Morula is a developmental stage (a) between the zygote and blastocyst (b) between the blastocyst and gastrula (c) after the implantation (d) between implantation and parturition.	1
7	Which of the following is a test cross? (a) $TT \times TT$ (b) $Tt \times Tt$ (c) $tt \times tt$ (d) $Tt \times tt$	1
8	Which of the following will not result in variations among siblings? (a) Independent assortment of genes (b) Crossing over (c) Linkage (d) Mutation	1
9	If the sequence of nitrogen bases of the coding strand of DNA in a transcription unit is: 5' – ATGAATG – 3', the sequence of bases in its RNA transcript would be	1

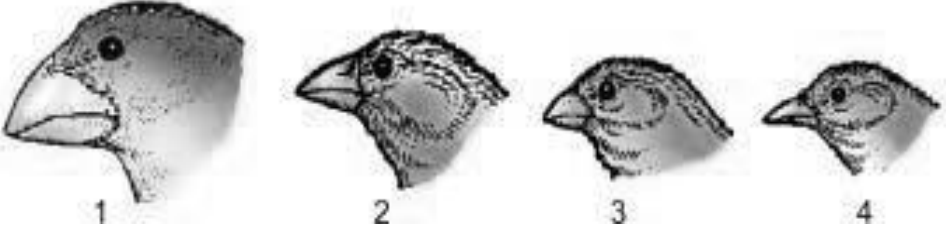
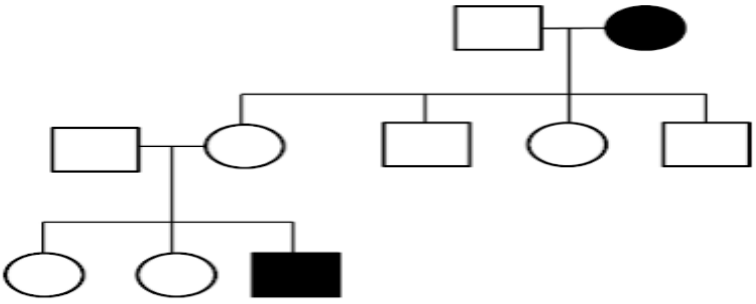
	<p>(a) 5' – AUG A AUG – 3'</p> <p>(b) 5' – UACUU AC – 3'</p> <p>(c) 5' – CAUUCAU – 3'</p> <p>(d) 5' – GUAAGUA – 3'.</p>	
10	<p>Transcription unit is represented in the diagram given below.</p>  <p>Identify site (i), factor (ii) and Enzyme (iii) responsible for carrying out the process.</p> <p>(a) (i) Promoter Site, (ii) Rho factor (iii) RNA polymerase</p> <p>(b) (i) Terminator Site, (ii) Sigma factor (iii) RNA polymerase</p> <p>(c) (i) Promoter Site, (ii) Sigma factor (iii) RNA polymerase</p> <p>(d) (i) Promoter Site, (ii) Sigma factor (iii) DNA polymerase.</p>	1
11	<p>The enzyme DNA dependent RNA polymerase catalyses the polymerisation reaction in _____ direction.</p> <p>(a) only 5' → 3'</p> <p>(b) only 3' → 5'</p> <p>(c) both (a) and (b)</p> <p>(d) none of these.</p>	1
12	<p>Polycistronic messenger RNA (mRNA) usually occurs in</p> <p>(a) bacteria</p> <p>(b) prokaryotes</p> <p>(c) eukaryotes</p> <p>(d) both (a) and (b)</p>	1
	<p>Question No. 13 to 16 consist of two statements Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:</p> <p>a) Both A and R are true and R is the correct explanation of A.</p> <p>b) Both A and R are true and R is not the correct explanation of A.</p> <p>c) A is true but R is false.</p> <p>d) A is false but R is true.</p>	

13	<p>Assertion: Pasteur's experiment supported the theory of abiogenesis.</p> <p>Reason: Theory of Abiogenesis states that first form of life arose from nonliving molecules.</p>	1
14	<p>Assertion: Allergens cause excessive immune response in human.</p> <p>Reason: Allergy involves IgA antibodies and interferons.</p>	1
15	<p>Assertion: Saccharomyces cerevisiae is used for making bread.</p> <p>Reason: Fermentation carried out by Yeast enzymes produces CO₂</p>	1
16	<p>Assertion- Virus infected cells secrete proteins called interferons which protect non -infected cells from further viral infection.</p> <p>Reason- It is a case of physiological barriers.</p>	1
SECTION B		
17	<p>a) What is hn RNA?</p> <p>b) What are the processes it goes through to form a functional mRNA?</p>	2
18	<p>a) All human beings have cellular oncogenes but only a few suffer from cancerdiseases. Give reason.</p> <p>b) How is malignant tumour different from benign tumour?</p>	2
19	 <p>a) Label the part marked as C. What are they also called as?</p> <p>b) State its importance.</p>	2
20	Write the similarity between the wing of a butterfly/cockroach and the wing of a bat. What do you infer from the above with reference to evolution?	2
21	<p>a) What is seed production without fertilisation called?</p> <p>b) How is this technique useful in hybrid seed industry?</p> <p style="text-align: center;">OR</p> <p>A person shows the condition of chronic inflammation of the lower limbs.</p> <p>a) What is the above disease called as?</p>	2

	b) Name the organism and the vector responsible for it.	
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SECTION C

22	<p>Give reason for the following.</p> <p>a) Formation of polar bodies occur in oogenesis.</p> <p>b) In human oogenesis though starts in the ovary gets completed in the fallopian tube.</p> <p>c) Placenta acts as an endocrine tissue.</p>	3
23	<p>State the agent(s) which helps in pollinating in the following plants. Explain the adaptations in these plants to ensure pollination:</p> <p>a) Water lily</p> <p>b) Vallisneria</p> <p>c) Sea grasses</p>	3
24	<p>What is called as H₂L₂? Explain the type of immunity brought about by it.</p> <p style="text-align: center;">OR</p> <p>a) Name the cells invaded by a retrovirus during the time of infection and the special enzyme which makes it possible.</p> <p>b) Illustrate the various events which follow inside the above cell.</p>	3
25	 <p>a) What is central dogma in molecular biology? How can it be different in virus?</p> <p>b) There is uniform distance between the 2 helix strands. Give reason.</p> <p>c) How are the two chains of DNA anti parallel?</p>	3

26	 <p>(a) Mention the specific geographical area where these birds were found.</p> <p>(b) Name and explain the phenomenon that has resulted in the evolution of such diverse species in the region.</p> <p>(c) How did Darwin visit the particular geographical area?</p>	3
27	<p>Do you think that reproductive health in our country has improved in the past 50 years? If yes, mention some such areas of improvement.</p> <p style="text-align: center;">OR</p> <p>Give reason for the following:</p> <p>a) Viruses with RNA genome evolve faster.</p> <p>b) Both the strands of DNA are not copied during transcription.</p> <p>c) Mendel's work remained unrecognised till 1900.</p>	3
28	<p>i) State the 'central dogma' as proposed by Francis Crick.</p> <p>(ii) Explain, how the biochemical characterisation (nature) of 'Transforming Principle' was determined, which was not defined from Griffith's experiment.</p>	3
<p>SECTION D</p> <p>Q. No. 29 and 30 are case-based questions. Each question has 3 sub parts with internal choice in one subpart.</p>		
29	<p>Pedigree analysis is done to determine the mode of inheritance is recessive, dominant, partial dominant, autosomal, or sex-linked. Moreover, it also determines the probability of an individual or offspring being affected in the cross.</p> 	4

	<p>a) Identify the type of pedigree. Give one example</p> <p>b) Write the genotype of the affected individuals</p> <p>c) What will be the genotype of the father?</p> <p style="text-align: center;">OR</p> <p>c) What kind of disease is Myotonic dystrophy?</p>	
30	<p>Acquired immunity and Graft Rejection: Acquired immunity, on the other hand, is pathogen specific. It is characterised by memory. This means that our body when it encounters a pathogen for the first time produces a response called primary response which is of low intensity. Subsequent encounter with the same pathogen elicits a highly intensified secondary or anamnestic response. This is ascribed to the fact that our body appears to have memory of the first encounter. The primary and secondary immune responses are carried out with the help of two special types of lymphocytes present in our blood, i.e., B- lymphocytes and T- lymphocytes. The B- lymphocytes produce an army of proteins in response to pathogens into our blood to fight with them. These proteins are called antibodies. The T-cells themselves do not secrete antibodies but help B cells produce them. Each antibody molecule has four peptide chains, two small called light chains and two longer called heavy chains. Hence, an antibody is represented as H₂L₂. Different types of antibodies are produced in our body. IgA, IgM, IgE, IgG are some of them. Because these antibodies are found in the blood, the response is also called as humoral immune response. This is one of the two types of our acquired immune response - antibody mediated. The second type is called cell- mediated immune response or cell-mediated immunity (CMI). The T-lymphocytes mediate CMI. Grafts from just any source - an animal, another primate, or any human beings cannot be made since the grafts would be rejected sooner or later. Tissue matching, blood group matching are essential before undertaking any graft/transplant and even after this the patient has to take immuno-suppressants all his/her life. The body is able to differentiate 'self' and 'non-self' and the cell-mediated immune response is responsible for the graft rejection.</p> <p>(a) What type of response is mediated by antibodies?</p> <p>(b) Which cell is responsible for cell mediated immunity?</p> <p>(c) Mention the type of molecules which are most responsible for rejection of transplant?</p> <p style="text-align: center;">OR</p> <p>(c) Which immunoglobulin does constitute the largest percentage in human milk?</p>	4

