

KENDRIYA VIDYALAYA SANGATHAN, TINSUKIA REGION

PRE-BOARD EXAMINATION 2024-25

CLASS: XII

SUBJECT: BIOLOGY (044)

Maximum Marks: 70

Time: 3 hours

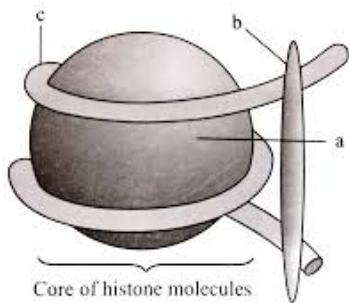
General Instructions:-

- 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 6 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 labelled 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	At which stage of spermatogenesis, sperms acquire their structural maturity and contain a haploid nucleus and other organelles? a) Spermiogenesis b) Maturation phase c) Multiplication phase d) Growth phase	1
2	If the number of chromosomes in egg cell is 8, then what is the number of chromosomes in endosperm? a) 8 b) 24 c) 12 d) 16	1
3	Choose the statements that are correct about Griffith's experiment. I. S- Strain have capsule. II. Mouse will die if injected with living S-strain. III. Mouse will die if injected with living R-strain. IV. Transforming principle is associated with capsule of S-Strain. V. Transformation of R-strain into S-Strain can take place in a test tube. a) I and II b) III and IV c) I, II and V d) III, IV and V	1
4	In the given diagram, identify a, b and c.	1



- a) a-DNA, b-H1 histone, c-Histone octamer  
 b) a-histone octamer, b-DNA, c-H1 histone  
 c) a-histone octamer, b-H1 histone, c-DNA  
 d) a-H1 histone, b-Histone octamer, c-DNA

5	<p>If two people with 'AB' blood group marry and have sufficiently large number of children. These children could be classified as 'A' blood group; 'AB' blood group; 'B' blood group in 1:2:1 ratio. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type proteins in 'AB' blood group individuals. This is an example of</p> <p>a) incomplete dominance          b) partial dominance          c) complete dominance          d) codominance</p>	1										
6	<p>If there are 999 bases in an RNA that codes for a protein with 333 amino acids and base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will be altered?</p> <p>a) 1          b) 11          c) 33          d) 333</p>	1										
7	<p>Given below is the list of the commercially important products and their source organisms. Select the option that gives the correct matches:</p> <table border="1"> <thead> <tr> <th>Column A</th> <th>Column B</th> </tr> </thead> <tbody> <tr> <td>A. Cyclosporin A</td> <td><i>Streptococcus</i></td> </tr> <tr> <td>B. Statins</td> <td><i>Trichoderma polysporum</i></td> </tr> <tr> <td>C. Streptokinase</td> <td><i>Penicillium notatum</i></td> </tr> <tr> <td>D. Penicillin</td> <td><i>Monascus purpureus</i></td> </tr> </tbody> </table> <p>a) A-i, B-ii, C-iii, D-iv          b) A-iii, B-ii, C-iv, D-i          c) A-vi, B-iii, C-iv, D-i          d) A-ii, B-iv, C-i, D-iii</p>	Column A	Column B	A. Cyclosporin A	<i>Streptococcus</i>	B. Statins	<i>Trichoderma polysporum</i>	C. Streptokinase	<i>Penicillium notatum</i>	D. Penicillin	<i>Monascus purpureus</i>	1
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8	<p>The following diagram shows a fragment of DNA which is going to be transcribed, the upper strand with polarity 3' to 5' is the template strand:          3' GGACTAACCA 5'          5' CCTGATTGGT 3'</p> <p>After transcription the mRNA can be represented by:mall, round head</p> <p>a) 5' CCUGAUUGGU 3'          b) 5' CCTGATTGGT 3'          c) 5' CCACGGAAU 3'          d) 5' UUAGGCACC 3'</p>	1										
9	<p>Conversion of milk to curd improves its nutritional value by increasing the amount of</p> <p>a) Vitamin- D          b) Vitamin-E</p>	1										

	c) Vitamin- B12 d) Vitamin A	
10	The source organism of the Taq polymerase is a) <i>Escherichia coli</i> b) <i>Agrobacterium tumefaciens</i> c) <i>Thermus aquaticus</i> d) <i>Bacillus thuringiensis</i>	1
11	In gel electrophoresis separated DNA fragments can be visualised with the help of a) Ethidium bromide in UV radiation b) Acetocarmine in UV radiation c) Ethidium bromide in infrared radiation d) Acetocarmine in bright blue light.	1
12	The most common fungal partner of mycorrhiza belongs to genus a) Azotobacter b) Glomus c) Azolla d) Frankia	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 correct explanation of A. C. A is true but R is false. D. A is False but R is true.		
13	<b>Assertion (A)</b> : Megaspore mother cell undergoes meiosis to produce four haploid gametes. <b>Reason (R)</b> : Megaspore mother cell is 2n, meiosis gives haploid structure.	1
14	<b>Assertion (A)</b> : RNA still acts as genetic material in some organisms such as viruses. <b>Reason (R)</b> : Viruses also follow central dogma proposed by Francis Crick.	1
15	<b>Assertion (A)</b> : Synthetic oligonucleotide polymers are used during Annealing in a PCR. <b>Reason (R)</b> : The primers bind to the double stranded DNA at their complementary regions.	1
16	<b>Assertion (A)</b> : Releasing dragonflies in areas where there is an outbreak of malarial diseases can be an environment friendly method of control. <b>Reason (R)</b> : Dragon flies are dominant species and will not allow mosquitoes to reproduce.	1

<b>SECTION-B</b>		
17.	Attempt either option A or B A. i) Where do the signals for parturition originate in humans? ii) Why is it important to feed the newborn babies on colostrums? <b>OR</b> B.i) Write one advantage and one disadvantage of cleistogamy to flowering plants. ii) Why do the pollen grains of <i>Vallisneria</i> have a mucilaginous covering?	2
18.	In a typical nucleus, some regions of chromatin are stained light and other dark. Explain why it is so and what is its significance?	2
19.	A patient showed symptoms of sustained high fever, stomach pain and constipation, but no blood clot in stools. Name the disease and its pathogen. Write the diagnostic test for the disease. How does the disease transmitted?	2
20.	In snapdragon, a cross between true breeding red flowered (RR) plants and true breeding white flowered (rr) plants, showed a progeny of plants, all with pink flowers a) The appearance of pink flowers is not known as blending. Why? b) What is this phenomenon known as?	2


21.	<p>Attempt either option A or B.</p> <p>A.</p> <div style="text-align: center;"> <pre> graph TD     I[I] -- "+" --&gt; N[Population Density (N)]     B((B)) -- "+" --&gt; N     N -- "-" --&gt; D((D))     E[E] -- "-" --&gt; N           </pre> </div> <p>Observe the schematic representation given and answer the following questions.</p> <ol style="list-style-type: none"> <li>Identify B and D.</li> <li>What will happen to the population density when a group of peoples suddenly immigrated?</li> </ol> <p style="text-align: center;"><b>OR</b></p> <p>B. 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?</p> <ol style="list-style-type: none"> <li>Will the pyramid of energy be also of the same shape in this situation? Give reason for your response.</li> </ol>	2
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**SECTION-C**

22.	<ol style="list-style-type: none"> <li>Draw a L S of pistil showing pollen tube entering into embryo sac. Label the following:               <ol style="list-style-type: none"> <li>Nucellus</li> <li>Antipodals</li> <li>Synergids</li> <li>Micropyle.</li> </ol> </li> <li>Write the functions of the following:               <ol style="list-style-type: none"> <li>Synergids</li> <li>Micropyle</li> </ol> </li> </ol>	3
23.	<ol style="list-style-type: none"> <li>How is placenta formed in human female?</li> <li>Name any two hormones which are secreted by it and are also present in a non-pregnant woman.</li> </ol>	3
24.	<ol style="list-style-type: none"> <li>Expand VNTR and describe its role in DNA fingerprinting.</li> <li>List any two applications of DNA fingerprinting technique.</li> </ol>	3
25.	<p>Explain how trisomy of 21<sup>st</sup> chromosome occurs in humans. List any four characteristics features in an individual suffering from it.</p>	3
26.	<ol style="list-style-type: none"> <li>Organic farmers prefer biological control of diseases and pests to the use of chemicals for the same purpose. Justify.</li> <li>Give an example of a bacterium, a fungus and an insect that are used as bio control agents.</li> </ol>	3
27.	<p>How does Beta- galactosidase coding sequence act as a selectable marker? Why is it a preferred selectable marker to antibiotic resistance genes? Explain.</p>	3
28.	<p>Name the type of interaction seen in each of the following examples:</p> <ol style="list-style-type: none"> <li>Ascaris worm living in the intestine of human.</li> <li>Wasp pollinating fig's inflorescence.</li> <li>Clown fish living among the tentacles of sea anemone.</li> <li>Mycorrhizae living on the roots of higher plants.</li> <li>Orchid growing on the branch of mango tree.</li> <li>Disappearance of smaller barnacles when Balanus dominated in the coast of Scotland.</li> </ol>	3

**SECTION-D**

29.	<p>Read the following passage and answer the questions given below:</p> <p>On a visit to museum, Riya was stunned to see that forelimbs of human and whale possess same structure. She also found that wings of butterfly and birds are not anatomically similar. Being confused, Riya asked the museum guide to comprehend this unusual fact to her.</p> <ol style="list-style-type: none"> <li>What type of structure does forelimbs of human and whale called? How they are developed?</li> <li>Why wings of butterfly and birds are not similar?</li> <li>Give an example of structures in plants similar to wings of butterfly and birds.</li> <li>Do plants contain structure similar to forelimbs of human and whale? If yes, give example. OR</li> <li>How does the Linnaean system of classification group organisms into the same category?</li> </ol>	4
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30.	<p>Observe the type of plant shown below and answer any four questions from the followings:</p>  <p>i) A type of drug is obtained from the plant whose one flowering branch is shown above. Choose the correct statement(s) regarding the figure.</p> <p>I. It is a hallucinogen  II. It is a stimulant  III. It produce euphoria and increase energy  IV. It induced behavioural abnormalities by changing thoughts, feelings and perception.</p> <p>Codes</p> <p>a) I and III  b) I, II and IV  c) I and IV  d) I, II, III and IV.</p> <p>ii) The diagram shown above represents the flowering branch of which plants?</p> <p>a) <i>Cannabis sativa</i>  b) <i>Datura</i>  c) <i>Opium poppy</i>  d) None of the above.</p> <p>iii) Which of the following is generally taken via oral route?</p> <p>a) Heroin  b) Marijuana  c) Smack  d) Both a) and b)</p> <p>iv) Drugs that are normally used as medicines to help the patients cope with mental illness are</p> <p>a) Barbiturates  b) Amphetamines  c) Benzodiazepines  d) All the above</p> <p>v) Nicotine intake stimulates the release of hormones known as-----</p> <p>a) Adrenaline and nor-adrenaline  b) Thyroxine and parathyroxine  c) Oestrogen and progesterone  d) All the above.</p>	4
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**SECTION-E**

31.	<p>Attempt either option A or B</p> <p>A. i) List any four characteristics of an ideal contraceptive.  ii) Name two intra uterine contraceptive devices that affect the motility of sperms.  iii) Explain the mode of action of Cu<sup>++</sup> releasing IUDs as a good contraceptive. How is hormone releasing IUD different from it?</p> <p style="text-align: center;"><b>OR</b></p> <p>B. i) Explain menstrual cycle in human females.  ii) How can the scientific understanding of the menstrual cycle of human females help as a contraceptive measure?</p>	5
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32.	Attempt either option A or B A. i) Write the difference between proinsulin and mature insulin. ii) How did American company Eli Lilly produce human insulin using rDNA technique? <b>OR</b> B. 'Specific Bt toxin gene is incorporated into cotton plant so as to control infestation of bollworm'. Mention the organism from which the gene was isolated and explain its mode of action.	5
33.	Attempt either option A or B A. State any two criteria for determining biodiversity hotspots. Name any two hotspots designated in India. Differentiate between in situ and ex situ approaches for conserving biodiversity. <b>OR</b> B. In situ conservation can help endangered/threatened species. Justify the statement. Why should biodiversity be conserved? Explain giving three reasons.	5