



IDEAL INDIAN SCHOOL, DOHA-QATAR
PRE BOARD I EXAMINATION, DECEMBER 2023

BIOLOGY (044)

SET:1

Class: XII
Date:07/12/2023

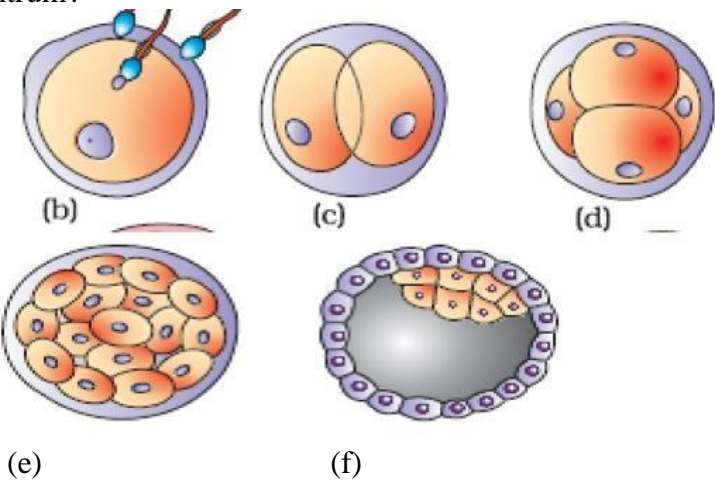
Max Marks: 70
Duration: 3 hours

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. | Question | Marks |
| 1. | Nucellar polyembryony is reported in species of a) Brassica b) Apple c) Strawberry d) Citrus | 1 |
| 2. | Which of the following statement is incorrect about emasculation? a) During emasculation process, stigma is removed. b) Emasculated flowers are bagged in order to prevent contamination of stigma. c) Emasculation is the removal of stamens before the maturation of selected bisexual flowers. d) It is one of the steps for artificial hybridization. | 1 |
| 3. | Which industrial products are synthesized from microbes? I. Antibiotics II. Fermented beverages III. Enzymes and chemicals IV. Bioactive molecules a) I, III, IV b) I, II, III, IV c) I, III d) I, II, III | 1 |
| 4. | In enzyme EcoRI, the letter R indicate – a) Indicates species of bacteria b) Indicates genus of bacteria c) Indicates strain of bacteria d) Order in which the enzymes were isolated from bacteria | 1 |

| | | |
|-----|---|---|
| 5. | Observation of species on _____ heavily inspired Darwin's theory of evolution. a) Marshall Island b) Guatemala c) Faroe Islands d) Galapagos Islands | 1 |
| 6. | Panspermia come on an idea that is still a favorite for some astronomers, means: a) Creation of life from dead and decaying matter b) Creation of life from chemicals c) Origin of spore in human testis d) Transfer spores as a unit of life from other planets of earth | 1 |
| 7. | Rate of production of organic matter by producers per unit time and area is: a) GPP b) NPP c) NPP-R d) More than one option is correct | 1 |
| 8. | In Bt cotton, the Bt toxin present in plant tissue as pro-toxin is converted into active toxin due to _____ a) Acidic pH of the insect gut b) Alkaline pH of the insect gut c) Presence of conversion factors in insect gut d) Action of gut microorganisms | 1 |
| 9. | If a double stranded DNA has 20% of cytosine, what will be the percentage of adenine in it? a) 20% b) 40% c) 30% d) 60% | 1 |
| 10. | The enzyme DNA dependent RNA polymerase catalyses the polymerisation reaction in _____ direction. a) only 5' → 3' b) only 3' → 5' c) both (a) and (b) d) none of these | 1 |
| 11. | A cross between two tall plants resulted in offspring having few dwarf plants. What would be the genotypes of both the parents? a) TT and Tt b) Tt and Tt c) TT and TT d) Tt and It | 1 |

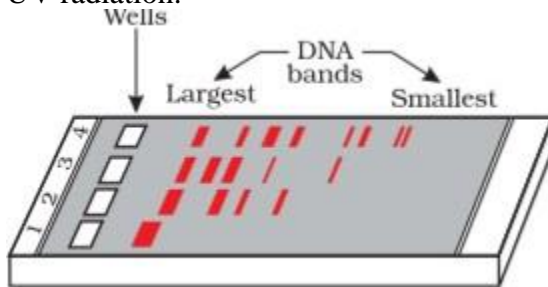
| | | |
|------------------|--|---|
| 12. | Occasionally, a single gene may express more than one effect. The phenomenon is called a) multiple allelism b) mosaicism c) pleiotropy d) polygeny | 1 |
| | Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions 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: Translation refers to the process of polymerization of amino acids to form a polypeptide. Reason: The order and sequence of amino acids are defined by the sequence of bases in the mRNA. | 1 |
| 14. | Assertion: The recombinant therapeutics do not induce unwanted immunological responses. Reason: About 50 recombinant therapeutics have been proved for human use the worldwide. | 1 |
| 15. | Assertion: Chasmogamous flowers require pollinating agents. Reason: Chasmogamous flowers have exposed anthers and stigma. | 1 |
| 16. | Assertion: Spleen is a primary lymphoid organ. Reason: Spleen act as filter of the blood by trapping blood borne microorganisms. | 1 |
| Section-B | | |
| 17. | a) Identify the stage 'e' and 'f' of embryonic development by looking at the diagrams given below: b) Which structure in an ovary is characterized by a fluid filled cavity called antrum?  | 2 |


| | | |
|------------------|---|---|
| 18. | Diagrammatically represent the process of amplification of “gene of interest” using PCR technique. | 2 |
| 19. | Name the type of food chain responsible for the flow of large fraction of energy in an aquatic and a terrestrial ecosystem, respectively. Mention one difference between the two food chains. OR Write any two limitations of ecological pyramids. | 2 |
| 20. | List the symptoms of ascariasis. How does a healthy person acquire this infection? | 2 |
| 21. | How is hnRNA processed to form mRNA? | 2 |
| Section-C | | |
| 22. | Give reason for the following: a) The second half of the menstrual cycle is called luteal phase as well as secretory phase. b) The testes remain suspended in scrotum outside the abdomen. c) Both LH and FSH attain a peak level at the middle of cycle. | 3 |
| 23. | a) Explain the formation of placenta after the implantation in a human female. b) Draw a diagram showing human ovum surrounded by few sperms and label any two parts in it. | 3 |
| 24. | Certain specific bacterial spores are mixed in water and sprayed over <i>Brassica</i> crop to control butterfly caterpillars. Name this bacterium and its mode of action on the butterfly caterpillars. | 3 |
| 25. | a) Differentiate between analogous and homologous structures. b) Select and write analogous structures from the list given below: (i) Wings of butterfly and birds (ii) Vertebrate hearts (iii) Tendrils of bougainvillea and Cucurbita | 3 |
| 26. | a) India has greater ecosystem diversity than Norway. Do you agree with the statement? Give reasons in support of your answer. b) Write the difference between genetic biodiversity and species biodiversity that exists at all the levels of biological organization. | 3 |
| 27. | Describe the process of decomposition of detritus under the following heads fragmentation, leaching, catabolism. | 3 |
| 28. | How did Eli Lilly synthesis the human insulin? Mention one difference between this insulin and the one produced by the human pancreas. OR | 3 |

| | | |
|--|--|--|
| | How has RNAi technique helped to prevent the infestation of roots in tobacco plants by a nematode <i>Meloidegryne incognitia</i> ? | |
|--|--|--|

Section-D

Q.No. 29 and 30 are case- based questions. Each question has three subparts with internal choice in one subpart.

| | | |
|-----|---|---|
| 29. | <p>The DNA fragments can be separated by a technique known as gel electrophoresis. Since DNA fragments are negatively charged molecule, they can be separated by forcing them to move towards the anode under an electric field through a medium. Nowadays the most commonly used matrix is agarose which is a natural polymer extracted from seaweeds. The DNA fragment separates according to their size through sieving effect provided by the agarose gel. The separation of DNA fragments can be visualized only after staining the DNA with the compound known as ethidium bromide followed by exposure to UV radiation.</p>  <p>a) How are the separated DNA fragments visualised? OR a) What is the role of ethidium bromide during agarose gel-electrophoresis? b) What are the criteria for separation of DNA fragments in gel electrophoresis? c) What is elution?</p> | 4 |
|-----|---|---|

| | | |
|-----|--|---|
| 30. | <p>Mutualism is the interaction confers benefits on both the interacting species. In many species of fig trees, there is a tight one- to- one relationship with the pollinating species of wasp. It means that a given species can be pollinated only by its partner wasp species and no other species. The female wasp uses the fruit not only as an oviposition site but uses the developing seeds within the fruit for nurturing its larvae.</p>  | 4 |
|-----|--|---|

| | | |
|-----|--|---|
| | <p>a) Give a suitable example for mutualism? b) What is mycorrhiza? OR b) Egrets are often seen along with grazing cattle. How do you refer to this interaction? c) Name the kind of interaction present between the following: - (i) Nodulated roots & rhizobium (ii) Orchids & Mango tree</p> | |
| | Section-E | |
| 31. | <p>a) Cancer is one of the most dreaded diseases. Explain 'contact inhibition' and 'metastasis' with respect to disease. b) Name the group of genes that have been identified in normal cells that could lead to cancer. How do these genes cause cancer? c) Name any two techniques that are useful in detecting cancers of internal organs. d) Why are cancer patients given alpha-interferon as part of the treatment? OR How is innate immunity different from the immunity that you require through vaccines? Describe any three ways by which innate immunity can be accomplished?</p> | 5 |
| 32. | <p>(i) Mention the contributions of the following scientists: a) Maurice Wilkins and Rosalind Franklin b) Erwin Chargaff (ii) Draw a double-stranded dinucleotide chain with all the four nitrogen bases. Label the polarity and the components of the dinucleotide. OR a) A couple with blood group A and B, respectively have a child with blood group O. Work out a cross to show how it is possible and the probable blood groups that can be expected in their other offspring. b) Explain the genetic basis of blood groups in human population.</p> | 5 |
| 33. | <p>a) Intra Cytoplasmic Sperm Injection (ICSI) and Gamete Intra Fallopian Transfer (GIFT) are two assisted reproductive technologies. How is one different from the other? b) Name and explain the surgical method advised to human males and females as a means of birth control. Mention its one advantage and one disadvantage. OR a) Explain the process of double fertilization in angiosperms. b) Why does the development of endosperm precede that of embryo? c) Draw the diagram of a typical dicot embryo.</p> | 5 |