PRE-BOARD EXAMINATION II (2019-20)

Time: 3 hrs.

CLASS: XII **BIOLOGY (044)** **Mark : 70**

General instructions :

- *There are a total of 27 questions and five sections in the question paper. All questions are compulsory*
- *Section A contains question numbers 1 to 5; multiple choice questions of one mark each.*
- *Section B contains questions number 6 to 12; short answer type I questions of 2 marks each.*
- *Section C contains questions number 13 to 21; short answer type II questions of 3 marks each.*
- *Section D contains questions number 22 to 24case based short answer type questions of 3 marks each.*
- *Section E contains questions number 25 to 27 long answer type questions of 5 marks each.*
- *There is no overall choice in the question paper. However; internal choices are provided in two questions of one mark, one question of 2 marks, two questions of 3 marks and all the three questions of 5 five marks. An examinee is to attempt one of the questions out of the two given in the question paper with the same question number.*

SECTION A

1. Which of the following situations correctly describe the similarity between an angiosperm egg and a human egg? (1)
   1. Eggs of both are formed only once in a lifetime
   2. Both the angiosperm egg and human egg are stationary
   3. Both the angiosperm egg and human egg are motile transported
   4. Syngamy in both results in the formation of zygote

   Choose the correct answer from the options given below:

   a. ii and iv
   b. iv only
   c. iii and iv
   d. i and iv

   OR

   A multicellular, filamentous alga exhibits a type of sexual life cycle in which the meiotic division occurs after the formation of zygote. The adult filament of this alga has
   a. Haploid vegetative cells and diploid gametangia
   b. Diploid vegetative cells and diploid gametangia
   c. Diploid vegetative cells and haploid gametangia
   d. Haploid vegetative cells and haploid gametangia.

2. Which is to be used in production of Swiss cheese? (1)
   a. Monoscus purpureus
   b. Clostridium bacterium
   c. Lacto Bacillus
   d. Saccharomyces cerevisiae

   OR

Which of the following is an ART?

1. PID 2. AI 3. IUT 4. ET

a. 1 only
b. 1, 2, 3 only
c. 2, 3 , 4 only
d. All the above

3. There is no natural death in single celled organisms like Amoeba and bacteria because: (1)
   a. They cannot reproduce sexually
   b. They reproduce by binary fission
   c. Parental body is distributed among the offspring
   d. They are microscopic

4. Out of megaspore tetrad, the functional megaspore is (1)
   a. Any megaspore
   b. Middle megaspore
   c. Micropylar megaspore
   d. Chalazal megaspore

5. For which amino acids maize is bio fortified. (1)
   1. Lysine and Tryptophan
   2. Tryptophan and Valine
   3. Lysine and Valine
   4. Tryptophan and Phenyl alanine

   a. 1 only
   b. 2 only
   c. 4 only
   d. 3 only

SECTION B

6. In MOET technology, two 'mothers' are needed to produce one calf. Justify. (2)

OR

Interspecific crosses are rare in nature and intergeneric crosses almost unknown. Why?

7. How is Darwin's concept of evolution different from that of De Vries concept? Mention one significant difference between ontogeny and phylogeny. (2)

8. Where does peptide bond formation occur in a bacterial ribosome and how? (2)

9. How did Hershey and Chase differentiate between DNA and protein in their experiment while proving that DNA is the genetic material? (2)

10. a. What is biochemical oxygen demand (BOD) test? At what stage of Sewage treatment this test is performed? (1)

    b. BOD level of three samples of water labelled as A, B and C are 30 mg/L, 10mg/L and 500 mg/L respectively. Which sample of water is most polluted? (1)

11. How do Marsupials and Australian placental mammals exhibit convergent evolution? Explain. (2)

12. a. What for Nucleopolyhydro viruses are being used now a days? (1)
    b. Why cyanobacteria are considered useful in paddy fields? (1)

SECTION C

13. Explain the stages involved in the maturation of a microspore into a pollen grain. What is self-incompatibility? Why does self-pollination not lead to seed formation in self-incompatible species? (3)

14. A sperm has just fertilized a human egg in the fallopian tube. Trace the events that the fertilized eggs will undergoes up to implantation of blastocyst in the uterus. (3)

OR

What are the changes in the Oogonia during the transition of a primary follicle to Graafian follicle?

15. What is the significance of progesterone-estrogen combination as a contraceptive measure? Mention any four objectives of RCHC. (3)

16. Prior to a sports event blood & urine samples of sportspersons are collected for drug tests. (3)
    a. Why is there a need to conduct such tests?
    b. Name the drugs the authorities usually look for.
    c. Write the generic names of two plants from which these drugs are obtained.

17. How does the process of natural selection affect Hardy- Weinberg equilibrium? Explain. List four factors that disturb the equilibrium. (3)

18. a. Describe the technique that can help a healthy married woman who is unable to produce viable ova but wants to bear a child. (1)
    b. Draw a labelled diagram of a human ovum. (1)
    c. How is polyspermy prevented in humans? (1)

19. a. Describe the process of syngamy and triple fusion in angiosperms. Where is it taking place? Why is it important in angiosperms? (2)
    b. Explain the development of a fertilized egg up to a mature embryo in a dicot plant. (1)

20. Define aneuploidy. How is it different from polyploidy? Describe the individuals having following chromosomal abnormalities. a. Trisomy of 21st Chromosome b. XXY c. XO. (3)

OR

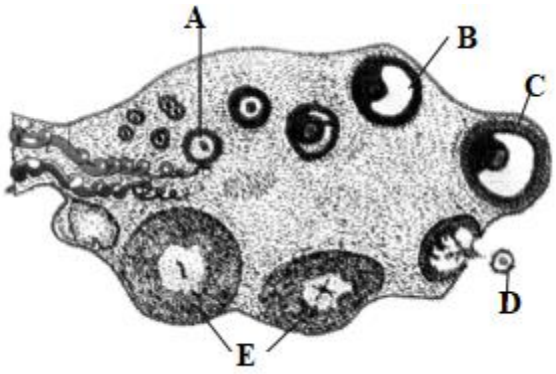
Continued self-pollination lead to inbreeding depression. List three devices, which flowering plant have developed to discourage self-pollination.

21. a. What are the functions of (i) methylated guanosine cap, (ii) poly-A "tail" in a mature on RNA? (1)

b. Define a cistron. Giving examples differentiate between monocistronic and polycistronic transcription unit. (2)

SECTION D

22. Given below is the TS of human ovary. Observe the diagram and answer the questions that follows. (3)

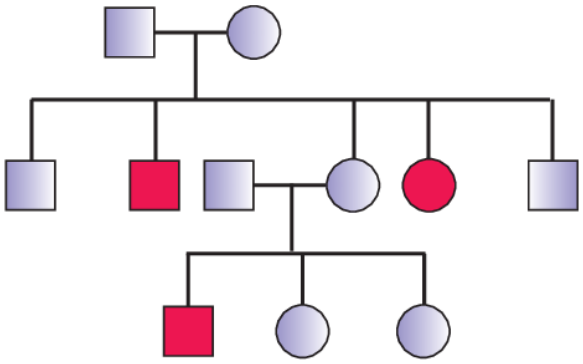


a. Identify A, B, C, E.

b. How is A gets modified into B? Name the hormone responsible for the formation of A.

c. State the chromosomal configuration of D.

23. Study the given pedigree chart and answer the questions that follows. (3)

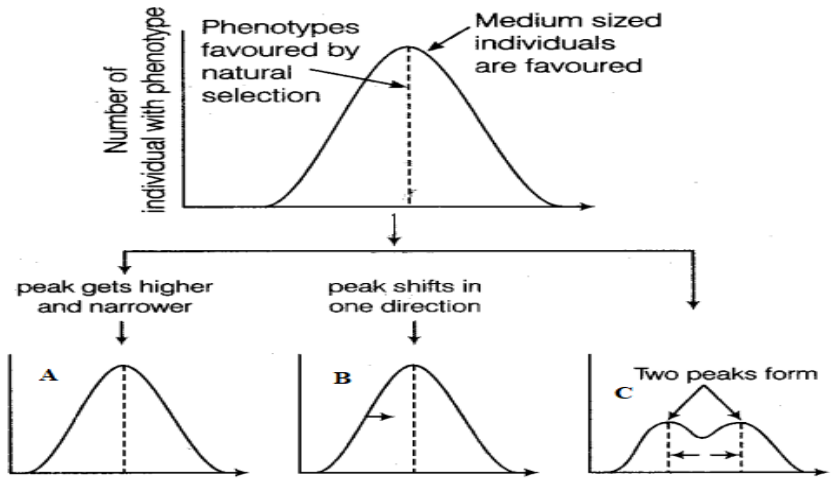


a. Is the trait recessive or dominant?

b. Is the trait sex-linked or autosomal?

c. Give the genotype of the parents in generation I and of their third and fourth child in generation II.

24. Given below is the diagrammatic representation of the operation of natural selection on different traits. Observe the diagram and answer the following questions. (3)



a. The graph C shows a marked difference from graph A. why?
b. What is the evolutionary significance of directional selection?
c. Mention the factors affecting gene frequency.
d. What is meant by founder effect?

SECTION E

25. a. In Antirrhinum majus, a plant with red flowers was crossed with a plant with white flowers. Work out all the possible genotypes & phenotypes of F1 & F2 generations comment on the pattern of inheritance in this case? (2)
b. The map distance in certain organism between genes A & B is 4 units, between B & C is 2 units, & between C & D is 8 units which one of these gene paves will show more recombination frequency? Give reason. (2)
c. Name one trait each in humans & in drosophila whose genes are located on sex chromosome. (1)

OR

A dihybrid heterozygous round, yellow seeded garden pea (*Pisum sativum*) was crossed with a double recessive plant. a. What type of cross is this? b. Work out the genotype and phenotype of the progeny. c. What principle of Mendel is illustrated through the result of this cross?

26. a. What does Oparin – Haldane hypothesis about origin of life suggests? (2)
b. What is Biogenetic law? How comparative embryology does provide evidences for evolution? (2)
c. Give reasons why both the strands of DNA are not copied during DNA transcription. (1)

OR

a. Where do transcription & translation takes place in a prokaryotic cell? Describe the three steps involved in translation.

b. What are the three types of RNA & Mention their role in protein Synthesis?

27. a. Why should we conserve biodiversity? How can we do it? (3)

b. Explain the importance of biodiversity hot-spots and sacred groves. (2)

OR

a. Represent diagrammatically three kinds of age-pyramids for human populations.

b. How does an age pyramid for human population at given point of time helps the policy-makers in planning for future.