PREBOARD EXAMINATION JANUARY -2020
BIOLOGY

Class : XII | Max. Marks: 70
Date : 9/1/2020 | Duration : 3 Hrs

General Instructions:

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

SECTION-A (1-mark)

1. ZIFT is transfer of :
   a) Embryo in to the uterus.
   b) A mixture of sperms and ova in to the uterus.
   c) A mixture of sperms and ova in to the fallopian tube.
   d) Zygote in to the fallopian tube.

   OR

   Which of the following is hormone releasing IUDs?
   a) Multiload 375 b) LNG-20 c) Lippes loop d) Cu 7
2. The DNA polymerase enzyme used in PCR is obtained from:
   a) Thermus aquaticus b) Escherichia coli c) Agrobacterium tumifaciens d) Salmonella typhimurium
3. In the immune system, interferons are a part of:
   a) Physiological barriers b) Cellular barriers c) Physical barriers d) Cytokine barriers

   OR

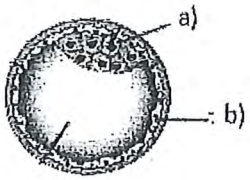
   The disease chikungunya is transmitted by:
   a) House flies b) Aedes mosquitoes c) Cockroach d) Female Anopheles
4. The RNA i , genes are silenced using:
   a) ss DNA b) ds DNA c) ds RNA d) ss RNA
5. Which of the following is not a major characteristic feature of biodiversity hot spots?
   a) Large number of species b) Abundance of endemic species c) Large number of exotic species
   d) Destruction of habitat

SECTION –B (2-marks)

6. Mosses and frogs both need water as a medium for fertilization. Where does syngamy occur and how is it assured in both these organisms?

   OR

   Name any two organisms and the phenomenon involved where the female gamete undergoes development to form new organism without fertilization.
7. In Snapdragon a cross between true breeding red flowered (RR) and true breeding white flowered plants (rr) showed a progeny of plants with all pink flowers.
   a) The appearance of pink flowers is not known as blending. Why?
   b) What is this phenomenon known as?
8. Name the human embryonic stage shown below. Identify a) and b) in it.



9. Write the full form of VNTR. How is VNTR different from probe.
10. MOET is a programme for herd improvement. Write the steps in correct sequence that are carried in the programme.
11. a) Mention the cause and the body system affected by ADA deficiency in humans.?
    b) Name the vector used for transferring ADA DNA in to the recipient cell in the humans. Name the recipient cells.
12. How does Monarch butterfly defend itself from predation? Explain.

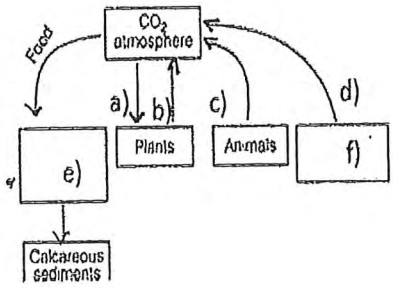
SECTION –C (3-marks)

13. Draw a T.S of a young anther of an angiosperm. Label the different layers of the wall and write their functions.
14. a) What do 'Y' and 'B' stand for in 'YAC' and 'BAC' used in Human Genome Project (HGP). Mention their role in the project.
    b) Write the percentage of total human genome that codes for proteins and the percentage of discovered genes, whose functions are known as observed during HGP.
    c) Expand 'SNPs' identified by scientists in HGP.

    OR

    How do initiation and termination of translation processes occur in bacteria? Where are untranslated regions located in an mRNA? Mention their role.
15. Spermatogenesis in human male is a hormone regulated process. Justify.
16. With the help of any two suitable examples explain the effect of anthropogenic actions on organic evolution.
17. How did the plant breeders produce suitable varieties of sugarcane for cultivation in North India? Why did they do it?

18. Name and explain the technique that helps in separation of DNA fragments for recombinant DNA technology experiments. How can these separated DNA fragments be visualised?
19. Name the source and the types of cry genes isolated from it for incorporation into crops by biotechnologists. Explain how these genes have brought beneficial changes in the genetically modifies crops?
20. Draw and complete the following model of carbon cycle by filling a, b, c, d, e and f.



OR

What is meant by 'alien species' invasion? Name one plant and one animal alien species that are a threat to our Indian native species.

21. A pea plant homozygous for axial flowers and constricted pods is crossed with the pea plant homozygous for terminal flowers having inflated pods. Work out the cross up to F_1 generation. Show the genotype of parents and phenotype and genotype of the progeny.
    b) Write the type sex determination mechanisms the following crosses show. Give an example of each type.
    (i) Female XX with male XO
    (ii) Female ZW with male ZZ

SECTION-D (3-marks)

22. Presently, cultivation of hybrid varieties of our food and vegetable crops has increases due to their higher productivity. Still, many of our farmers are not cultivating such varieties because of some problems.
    a) Mention any two problems associated while sowing of the seeds of hybrid varieties of crops.
    b) How can we overcome such problems?
23. Ishita argued with her sister Nishita that microbes are our foes, because they cause a number of diseases and spoil our food items and domestic things. But Nishita was against her view. She told her sister Ishita that microbes are more useful than harmful.
    a) Support Nishits's view by describing uses of microbes in the preparation of two house hold products.
    b) Name the microbe which help in the production of biogas from the cattle dung.
    c) Why are these microbes useful in the production of biogas?
24. In Arcata, the town's people have created an integrated waste water treatment process within a natural system. A citizen group called FOAM helps in upkeep of this project.
    a) What are the main steps in waste water management done in this way?
    b) Ecosan in Kerala and Sri Lanka is also an initiative for water conservation. How?

SECTION –E (5-marks)

25. A) Why are thalassemia and haemophilia categorised as Mendilan disorder? Write the symptoms of these diseases. Explain their patterns of inheritance in humans.
b) A colour blind child is borne to a normal couple. Work out a cross to show how it is possible. Mention the sex of this child.

OR

Describe Meselson and Stahl's experiment that was carried in 1958 on E coli. Write the conclusion they arrived at after the experiment.

26. a) Write the specific name of the genus Plasmodium that causes one of the most serious types of diseases in humans. Name the disease.
b) Describe the events in the life cycle of plasmodium which take place in the female Anopheles.
c) Explain what happens in the RBCs of the humans when Plasmodium gains entry into them. How does the human body get affected.

OR

a) Name the technology that has helped the scientists to propogate on large scale desired crops in short duration. List the steps carried out to propagate the crops by the said technique.
b) How are somatic hybrids obtained?

27. a) Name the two growth models that represent population growth and draw the respective growth curves they represent.
b) State the basis for the difference in the shape of these curves.
c) Which one of the curves represents the human population growth at present ? Do you think such a curve is sustainable. Give reason in support of your answer.

OR

a) What is algal bloom? State its causes and any two harmful effects.
b) Mention how e-waste is disposed off. Write the solution for its treatment.

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