DEPARTMENT OF PRE-UNIVERSITY EDUCATION

MODEL QUESTION PAPER (2021-2022)

SUB:BIOLOGY(36)

TIME:3 HOUR15MINUTES **MAX. MARKS:70**

General instructions:

1. *The question paper contains four parts A,B,C and D. Part-D consists of twosections, Section-I& II.*
2. *All the parts arecompulsory.*
3. *Draw diagrams wherever necessary, unlabeled diagrams or illustrations do notattract anymarks.*

PART – A

Answer any <u>TEN</u> of the following questions in ONE word or ONEsentenceeach:

(10 x 1 = 10)

1. Mention the unique reproductive behaviour of*Strobilanthuskunthiana.*
2. Name the type of pollination that brings genetically different types of pollen to stigma.
3. State the function of filiform apparatus.
4. Give an example for non-medicated IUD.
5. With reference to the Mendelian laws of inheritance, state the meaning of 'dominance'.
6. Which autosome-linked disorder is associated with the reduced rate of synthesis of one of the globin chains of haemoglobin?
7. Name the pyrimidine present both in RNA and DNA.
8. Patients who have undergone surgery are treated with a very effective sedative and pain killer. Name this.
9. Mother's milk is considered very essential for new born infant. If so, how it provides immunity?
10. Mention the role of *Azospirillum* as biofertilizer.
11. How do statins function in our body as bioactive blood-cholesterol lowering agent?
12. Which is the source for agarose used as matrix in gel electrophoresis?
13. Give an example for the technique used in molecular diagnosis based on the principle of antigen-antibody interaction.
14. "India has more than 1,000 varieties of mango". Which level of diversity does this represent?
15. Define endemism.

PART – B

Answer any FIVE of the following questions in 3-5 sentences each, wherever applicable:

(5 x 2 = 10)

16. Name the vegetative propagules in:
    i) Potato ii) Water hyacinth
17. Differentiate between syngamy and triple fusion.
18. "GnRH and LH are absolutely necessary for the process of spermatogenesis". Justify this by giving one reason for each.
19. Give one example for:
    i) Codominant phenotype
    ii) Animal with XO type of sex determination.
20. Give reason for the occurrence of
    i) Polyploidy
    ii) Turner's syndrome.
21. "Evolution can also occur by anthropogenic action". Substantiate the statement by giving two examples.
22. List any two physiological barriers of innate immunity.
23. Even though inbreeding is disadvantageous in agriculture, still it is essential. Justify this by giving two reasons.
24. Mention one method for the introduction of recombinant DNA into
    i) animal cell ii) plant cell
25. State how does *ex situ* conservation help in protecting biodiversity.

PART – C

Answer any FIVE of the following questions in 40-80 words each, wherever applicable:

(5 x 3 = 15)

26. Write a note on external fertilization.
27. Explain any three outbreeding devices in flowering plants.
28. List the functions of placenta.
29. Why *Drosophila melanogaster*is consideredsuitable for genetic studies?
30. Mention the role ofi) Promoter ii) Terminator iii) Cistron in a transcription unit.
31. Enlist any three measures useful for prevention and control of alcohol and drug abuse among adolescents.

32. What is biofortification? Mention any two objectives.
33. Graphically represent Logistic growth curve.
34. Schematically represent simplified model of phosphorus cycling in terrestrial ecosystem.
35. Write a note on catalytic converters.

PART- D

Section-I

Answer any <u>FOUR</u> of the following questions in 200-250 words each, wherever applicable:

(4 x 5 = 20)

36. Explain the following:
    i) Pollination in *Vallisneria*. (3)
    ii) Wall of pollen grain. (2)
37. Sketch and label the sectional view of human female reproductive system.
38. Discuss various special techniques involved in ARTthat enable couples to have children.
39. Schematically represent incomplete dominance by taking the inheritance of flower colour in snapdragon plantas an example.
40. Explain the experiment that made Frederick Griffith to conclude that R strain of *Streptococcus pneumoniae* somehow been transformed by heat killed S strain.
41. State any five salient features of genetic code.
42. Answer the following:
    i) Differentiate between convergent and divergent evolution. (2)
    ii) Explain the views of Lamarck on the evolution of life forms. (3)
43. Schematically represent the life cycle of *Plasmodium*.

Section-II

Answer any <u>THREE</u> of the following questions in 200-250 words each, wherever applicable:

(3 x 5= 15)

44. Explain the steps involved in breeding a new genetic variety of a crop.
45. Name the following:
    i) Group of chemical substances produced by some microbes that can kill or retard the growth of other microbes.
    ii) Immunosuppressive agent used in organ transplant patient.
    iii) Viruses used as biocontrol agents having species-specific, narrow spectrum insecticidal application.
    iv) Nitrogen fixing cyanobacterium distributed in aquatic and terrestrial environment.

v) The fungal genus that form mycorrhiza with plants.

46. Describe the procedure involved in the isolation of genetic material (DNA) in different organisms.

47. Explain how ADA deficiency can be cured by gene therapy. Add a note on other types of therapies for curing ADA deficiency.

48. Answer the following:

i)List the advantages of predation for an ecosystem. (3)

ii) Name the types of interaction between thefollowing:

a) Sea anemone and Clown fish

b) Flower and pollinator species visiting it. (2)

49. Explain the steps involved in decomposition.

50. Write a note on:

i) Advantages of using CNG. (3)

ii) Joint forest management. (2)

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