PART – A

I. Select the correct alternative from the choices given below: **1 × 15 = 15**

1. Which of the following organism exhibits menstrual cycle?
   (a) Apes   (b) Humans   (c) Both   (d) None

2. The protective coverings of the ovule are called
   (a) Integuments   (b) Nucellus   (c) Chalaza   (d) All

3. Heart is observed during which month of pregnancy?
   (a) After Ist month   (b) Second month
   (c) Fifth month   (d) Sixth month

4. Syphilis is caused by
   (a) Treponema pallidum   (b) Plasmodium
   (c) Neisseria gonorrhoeae   (d) None

5. Point mutation results in
   (a) Sickel cell anaemia   (b) Down's
   (c) Klinefelter's   (d) Turner's

6. The infective stage of Plasmodium is
   (a) Cryptozoite   (b) Trophozoite   (c) Sporozoite   (d) metacryptozoite

7. Golden rice is a transgenic crop of future with which one of the following improved trait
   (a) Insect resistance   (b) High lysine content
   (c) High protein content   (d) High vitamin A content

8. MOET is a method of
   (a) Fish cultivation   (b) birth control in Humans
   (c) cloning in sheep   (d) hybridization in cattle

9. For transformation, micro particles coated with DNA to be bombarded with gene gun are made up of
   (a) silver or platinum   (b) platinum or zinc
   (c) silicon or platinum   (d) gold or tungsten

10. In the equation GPP = NPP, the letter "R" denotes
    (a) Respiratory quotient   (b) Respiratory loss
    (c) Intrinsic rate of natural increase   (d) Regression co-efficient

11. Ovulation takes place on
    (a) 14th day of menstrual cycle   (b) 5th day of menstrual cycle
    (c) 10th day of menstrual cycle   (d) 28th day of menstrual cycle

12. A disorder characterized by trisomy of 21 is
    (a) Sickel cell anaemia   (b) Down's
    (c) Klinefelter's   (d) Turner's

13. Parasite capable of living without a host are called
    (a) facultative   (b) permanent   (c) obligate   (d) None

14. Photochemical smog pollution does not contain
    (a) PAN   (b) ozone   (c) nitrogen dioxide   (d) carbon dioxide

15. Each trophic level has certain amount of mineral nutrients at a particular time called as
    (a) Standing state   (b) standing crop   (c) Biomass   (d) productivity

II. Fill in the blanks by choosing the appropriate word from those given below:

[*Agrobacterum tumefaciens*, pioneer species, Tapetum, permease, saltation]

16. The commonly used vector for transformation in plant cell is …………
17. The species that invade bare areas are called………
18. The tissue that nourishes the developing pollen grain is ………
19. In lac operon, 'y' gene codes for ……….
20. A single step large mutation that causes speciation is…………

PART-B

III. Answer any five of the following questions in 3-5 sentences each, wherever applicable 2 × 5 = 10

21. Name the four recent extinct organisms as per IUCN Red list.
22. Draw a neat labeled diagram of a typical agarose gel electrophoresis.
23. What are the features of an ideal contraceptive?
24. How does pollination achieved in Vallisneria?
25. Mention the reason for selecting D. melanogaster by T. H. Morgan.
26. What is cross breeding? Name a breed developed by crossing Bikaneri ewes and Marino rams.
27. Define incomplete dominance. Give an example.
28. Draw a neat labeled diagram of a transcription unit.

PART-C

IV. Answer any five of the following questions in 40-80 words each, wherever applicable: 3 × 5 = 15

29. Differentiate in-situ and ex-situ conservation.
30. Draw a neat labelled diagram of a typical biogas plant.
31. Explain Griffith's experiment.
32. Mention biodiversity hotspots in India.
33. Define the following
    a] Explant   b] Totipotency   c] Somaclones.
34. Name the vegetative propagules in ginger, Eicchornia and agave.
35. Briefly explain sex determination in human being.
36. Give the schematic representation of PCR technique.

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PART-D [SECTION – I]

V. Answer any four of the following questions in 200-250 words each.   5 × 4 = 20

37. Explain the regulation of lac operon in absence and presence of lactose as an inducer.
38. Name the diseases caused by
    a] Rhino virus   b] Epidermophyton   c] Salmonella typhi
    d] Wuchereria bancrofti   e] Plasmodium vivax.

39. Give the diagrammatic representation of replication of retrovirus inside an animal cell.

40. Explain Mendel's second law with an example.

41. Define RNA interference. Explain how this resistance was achieved in tobacco plant.

42. Draw a neat labelled diagram of Sectional view of female reproductive system.

VI. Answer any Two of the following questions in 200-250 words each.   **5 × 2 = 10**

43. Explain the important steps involved in the process of sewage treatment.

44. Give the schematic representation of phosphorus cycle.

45. Draw a neat labelled diagram of pBR 322.

46. Explain any 5 types of assisted reproductive technology.

47. Explain the structure of Watson and Crick model of DNA.

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