Bhavan's Tripura Vidyamandir

Pre-Board Test : (2024-2025)

Class:- 12 **Subject:- Biology**

Time:- 3 Hours Total :- 70 Marks

Name of the student : Roll: Section:

General Instructions:

1. All questions are compulsory.

2. The question paper has five sections and 33 questions. All questions are compulsory.

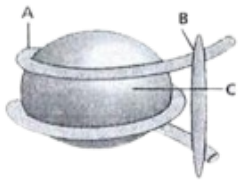
3. Section-A has 16 questions of 1 mark each; Section-B has 5 questions of 2 marks each; Section-C has 7 questions of 3 marks each; Section-D has 2 case-based questions of 4 marks each; and Section-E has 3 questions of 5 marks each.

4. 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.

5. Whenever necessary, neat and properly labelled diagrams should be drawn.

SECTION-A

1. The inner lining of the uterus, where the fertilised egg implants and develops, is called the:
   A. Endometrium B. Myometrium C. Perimetrium D. Cervix
2. Functional megaspore in a flowering plant develops into
   A. Endosperm B. Ovule C. Embryo-sac D. Embryo
3. The human chromosome with the highest and least number of genes in them are respectively
   A. chromosome 21 and Y B. chromosome 1 and X
   C. chromosome 1 and Y D. chromosome X and Y.
4. Control of gene expression in prokaryotes takes place at the level of
   A. DNA-replication B. transcription C. translation D. none of the above.
5. In sickle cell anaemia glutamic acid is replaced by valine. Which one of the following triplets codes for valine?
   A. GGG B. AAG C. GAA D. GUG
6. What is the smallest part of a DNA molecule that can be changed by a point mutation?
   A. Oligonucleotide B. Codon C. Gene D. Nucleotide
7. Which one of the following is a sex-linked disorder?
   A. Sickle cell anaemia B. Turner's syndrome
   C. Phenylketonuria D. Colour blindness



8. Identify A, B and C in the given diagram.
   A. A. DNA, B. H1 histone, C. Histone octamer B. A. Histone octamer, B. DNA, C.H1 histone
   C. A. DNA, B. Histone octamer, C. H1 histone D. A. Histone octamer, B. H1 histone, C. DNA
9. Which microorganism is commonly used in the production of alcohol through fermentation?
   A. Saccharomyces cerevisiae B. Aspergillus niger
   C. Penicillium notatum D. Escherichia coli
10. The phenomenon where unrelated species evolve similar traits due to similar environmental pressures is called:
   A. Convergent evolution B. Divergent evolution
   C. Coevolution D. Adaptive radiation

11. If the plasmid and the foreign DNA are cut by the same restriction endonuclease, recombinant DNA can be formed by joining both by

A. Polymerase III B. EcoRI C. Ligase D. Taq polymerase

12. Which of the following alcoholic drinks is produced without distillation?

A. Wine B. Rum
C. Whisky D. Brandy

These questions consist of two statements each, printed as Assertion and Reason. While answering these Questions you are required to choose any one of the following four responses.

A. If both Assertion & Reason are True & the Reason is a correct explanation of the Assertion.
B. If both Assertion & Reason are True but Reason is not a correct explanation of the Assertion.
C. If Assertion is True but the Reason is False.
D. If both Assertion & Reason are false.

13. **Assertion:** Exine of a pollen grain is made up of sporopollenin which is resistant to high temperature, strong acid or alkali as well as enzymatic degradation.
Reason: Sporopollenin is absent in the region of germ pores.

14. **Assertion:** The two chains of DNA have anti-polarity.
Reason: In one chain of DNA, ribose sugar at 5′ end consists of a free phosphate moiety while at the other end the ribose has a free 3′ OH group.

15. **Assertion:** Bottled fruit juices bought from the market are clearer as compared to those made at home.
Reason: Bottled juices are clarified by the use of pectinases and proteases.

16. **Assertion:** E.coli having pBR322 with DNA insert at BamHI site cannot grow in medium containing tetracycline.
Reason: Recognition site for Bam HI is present in ter R region of pBR22.

SECTION-B

17. What stimulates pituitary to release the hormone responsible for parturition? Name the hormone.

Or

Where is acrosome present in humans? Write its functions.

18. Explain the process of post transcriptional modification.

Or

Explain frame shift mutation with proper example.

19. Causative agents of Typhoid, Dysentry and Filariasis. Write their mode of transmission.
20. Name the source organism from which Ti plasmid is isolated. Explain the use of this plasmid in biotechnology.
21. What does secondary productivity in an ecosystem indicate? List any two factors by which productivity is limited in aquatic system.

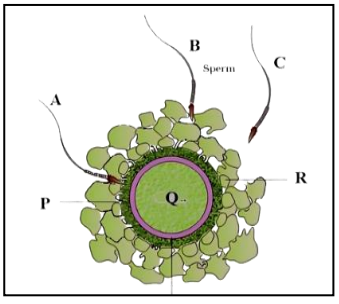
SECTION-C

22. Draw a Diagram of a T.S. of a young anther of an angiosperm. Level the different layers of the wall and Write their Function. (1+2)

23. The figure given below shows 3 sperms A, B and C.

a) Which one of the three sperms will gain entry into the ovum?

b) Describe the associated changes induced by it on P and Q. (1+2)



Perivitelline Space

24. A. what Okazaki fragments?
B. Differentiate between leading & lagging strand. (1+2)

25. Name the insect pest that is killed by the product of cry I Ac gene. Explain how the gene makes the plant resistant to the insect pest. (1+2)

26. Given below is the Flow chart of Sewage treatment. Fill in the blank spaces marked 'a' to 'f.

Sewage treatment is done in step, subjected to filtration and sedimentation, called ----(a)

↓

Supernatant is shifted to separate tanks and air is pumped mechanically, called ----(b)

↓

Microbes grow into masses, called----(c)

↓

There is reduction in ----(d)

↓

Bacterial flocs are allowed to settle, the sedimentation is called----(e)

↓

After Secondary treatment, the water is released into ----(f) (0.5X6)

27. Describe the role of (a) High Temperature (b) Primers (c) Bacterium, Thermus aquaticus in carrying the process of polymerase chain reaction. (1+1+1)

28. Describe the different defence mechanism evolved in each of the following cases as protection against predators. (1+1+1)

(a) Frogs (b) Monarch butterfly (c) Plants

SECTION-D

[Q NO. 29 & 30 are cased based questions. Each question has 3 sub-parts with internal choice in 1 sub-part]

29. According to Hardy-Weinberg principle, the allele frequencies in a population are stable and remain constant through generations. When the frequency differs from the expected values, the difference indicates the extent (direction) of evolutionary change. Disturbance in the genetic equilibrium or Hardy-Weinberg equilibrium in a population can be interpreted as resulting in evolution.

(a) Write the algebraic equation representing Hardy-Weinberg equilibrium.

(b) List the five factors that affect the genetic equilibrium.

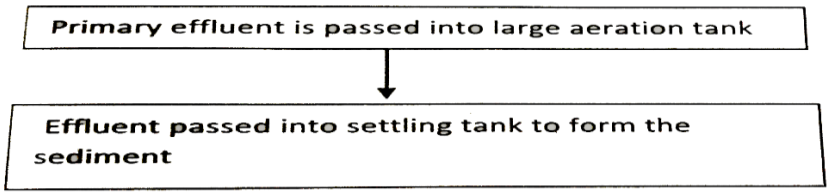
Or

Write the significance of the Hardy-Weinberg Principle?

(c) What Population is most likely to be in Hardy-Weinberg equilibrium?

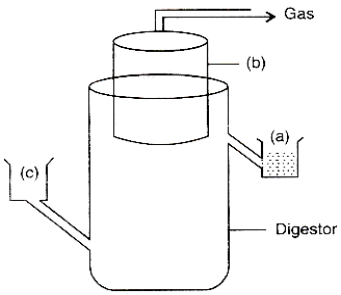
I. Population of New Delhi
II. Population of North Sentinel Island
III. Population of San Francisco
IV. Population of Jerusalem (1+2+1)

30. Large quantities of sewage is generated everyday in cities and towns, which is treated in Sewage Treatment Plants (STPs) to make it less polluted. Given below is the flow diagram of one of the stages of STP. Observe the given flow diagram and answer the questions accordingly.



(a) Why is the primary effluent passed into large aeration tanks?
(b) Write the technical term used for the sediment formed.
(c) Explain the final step that results in the formation of biogas in the large tank before the treated effluent is released into water bodies.

Or



Name the parts (a), (b), (c), (d) of a Biogas Plant.

SECTION-E

31. During reproductive cycle of human female, when, where and how does placenta develop? What is the function of placenta during pregnancy and embryo development? (3+2)

Or

Give reasons why
(i) Most zygotes in angiosperms divide only after certain amount of endosperm is formed.
(ii) Groundnut seeds are exalbuminous and Caster seeds are albuminous.
(iii) Micropyle remains as a small pore in the seed coat of a seed.
(iv) Integuments of an ovule harden and the water content is highly reduced as the seed matures.
(v) Apple and Cashew are not called true fruits. (1+1+1+1+1)

32. (a) Write the scientific name of the nematode that infests the tobacco plants and the part that it infects
(b) How is Agrobacterium used to protect tobacco plants from this attack? (2+3)

Or

Answer the Following Question
(a) Why do farmers prefer to grow Bt Cotton crop than genetically unmodified cotton crop?
(b) Name any two insects that are killed by Bt toxin.
(c) Explain the mechanism by which Bt toxin killed the insects, but not the bacterium, which possesses the toxin. (1+2+2)

33. A. (i) Why is there a need to conserve biodiversity? (Any two reasons) (ii) Name and explain any three causes that are responsible for the loss of biodiversity. (2+3)

Or

B. (i) Name the two types of desirable approaches to conserve biodiversity? Explain with examples bringing out the difference between the two types.
(ii) State the features of a stable biological community? (1+2+2)