

1. Triploid tissue in angiosperms is: [1]
 - a) Endothecium
 - b) Nucellus
 - c) Tapetum
 - d) Endosperm
 2. A bacterium that is genetically modified to control pollution is: [1]
 - a) Rhizobium
 - b) Pseudomonas
 - c) Nitrosomonas
 - d) Nitrobacter
 3. A biologist studied the population of rats in a barn. He found that average natality was 250 , average mortality 240 , immigration 20 and emigration 30. The net increase in population is: [1]
 - a) 15
 - b) 05
 - c) Zero
 - d) 10
 4. In hybridoma technology: [1]
 - a) T-cells are fused with myeloma cells.
 - b) B-cells are fused with myeloma cells.
 - c) C-cells are fused with T-cells.
 - d) B-cells are fused with T-cells.
 5. _____ is not generally seen in biodiversity hotspots. [1]
 - a) Lesser interspecific competition
 - b) Species richness
 - c) Loss of diversity
 - d) Endemism
 6. Grey crescent is present in: [1]
 - a) Eye of frog
 - b) Fertilized egg of frog

c) Brain of rabbit

d) Retina of cockroach

7. A technology which has found immense use in solving cases of disputed parentage is: [1]

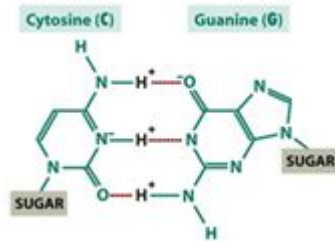
a) Recombinant DNA technology

b) Polymerase chain reaction

c) Monoclonal antibody production

d) DNA fingerprinting

8. H-bonds between Cytosine and Guanine are [1]



a) 2

b) 3

c) 4

d) 1

9. Which of these is a condition that makes flowers invariably autogamous? [1]

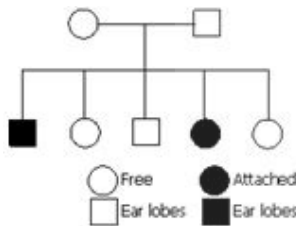
a) Xenogamy

b) Self-incompatibility

c) Dioecy

d) Cleistogamy

10. Given below is a pedigree chart of a family with five children. It shows the inheritance of attached ear lobes as opposed to the free ones. The squares represent the male individuals and circles the female individuals. Which one of the following conclusions drawn is correct? [1]



a) The parents are homozygous dominant

b) The parents are heterozygous

c) The parents are homozygous recessive

d) The trait is Y-linked

11. In lac operon, lactose is the substrate for enzyme beta-galactocidase and its regulates: [1]

a) Only switching ON of the operon

b) Neither switching ON or OFF of operon

c) Only switching of OFF of the operon

d) Switching ON and OFF of the operon

12. In gel Electrophoresis, DNA bands are separated on the basis of [1]



a) Molecular size

b) Molecular weight

c) Charge

d) Molecular size and Molecular weight

13. **Assertion (A):** Mutations are discontinuous variations. [1]

Reason (R): Mutations occur suddenly.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.

14. **Assertion:** Sometimes the change in allele frequency is so different in the new sample of the population that they become a different species. [1]

Reason: When the migration of a section of the population to another place occurs by chance, it is called genetic drift.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c) Assertion is correct statement but reason is wrong statement.

d) Assertion is wrong statement but reason is correct statement.

15. **Assertion:** DNA is more stable than RNA. [1]

Reason: DNA being double stranded and having complementary strand further resists changes by evolving a process of repair.

a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

c) Assertion is correct statement but reason is wrong statement.

d) Assertion is wrong statement but reason is correct statement.

16. **Assertion (A):** Health is not only mean 'absence of disease' or 'physical fitness'. [1]

Reason (R): It is a state of complete physical, mental, and social well-being.

a) Both A and R are true and R is the correct explanation of A.

b) Both A and R are true but R is not the correct explanation of A.

c) A is true but R is false.

d) A is false but R is true.



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CONCEPT
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Section B

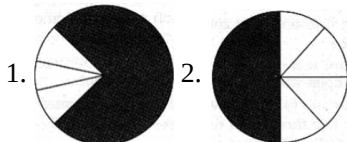
PERFORMANCE
FOCUSED



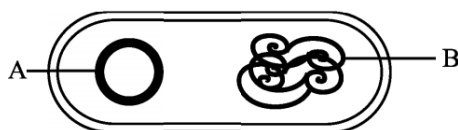
EXCELLENCE
DRIVEN

17. Name two acid producing bacteria. [2]

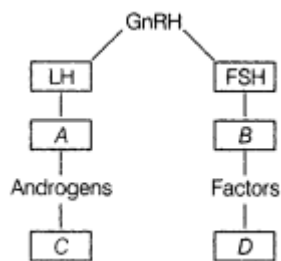
18. In the pie chart (a) and (b) drawn below to show the global animal diversity, which group of animals would you name and write on the areas shaded back in (a) and (b). In which kind of habitat would you find these groups of animals? [2]



19. (A) bacterial cell is shown in the figure given below. Label the part (A) and (B). Also mention the use of part 'A' in rDNA technology. [2]



20. Identify A, B, C and D with reference to gametogenesis in humans, in the flow chart given below. [2]



21. Given below an equation describing the growth pattern of a population: [2]

$$dN/dt = rN$$

- Mention the type of growth model or growth pattern of population described by the given equation.
- What does r in the equation signify?
- Mention the type of growth curve that will be obtained if the population density (N) is plotted against time (t).
- According to you, will the resource availability be limited or unlimited for this type of growth in a given population?

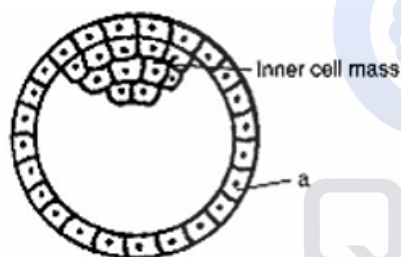
OR

Why are predators considered to be **prudent** in nature? Explain.

Section C

22. What are the drawbacks of use of enzymes in biotechnology as compared to inorganic catalyst? [3]

23. Study the below figure and answer the question that follows: [3]



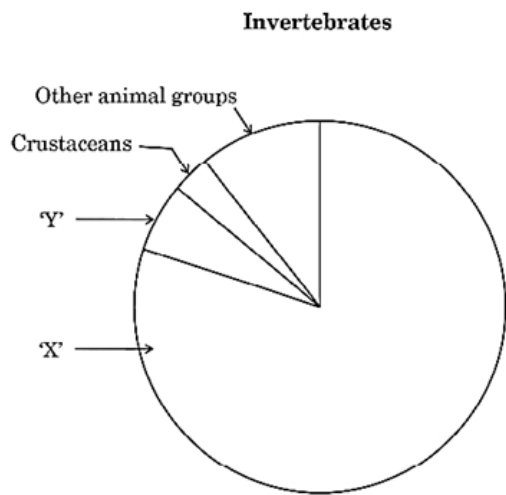
- Identify 'a' and which part of the placenta is formed by 'a'?
- Mention the fate of the inner cell mass after implantation in the uterus.
- Where are the stem cells located in this embryo?

24. Brijmohan angrily says to his daughter not to marry Rajiv since their family is known to inherit Haemophilia. [3]

The daughter objected to her father's order. Brijmohan was adamant and threatened Rajiv also. Brijmohan's daughter explained the biological interpretation of his fear and convinced her father. a) Rajiv was not haemophilic. Why was Brijmohan so worried? b) What values do you identify from the role played by Brijmohan's daughter? c) What explanation must have convinced Brijmohan? d) Is there any fear of haemophilia if Brijmohan's daughter marries Rajiv?

25. Study the pie chart given below, representing the global diversity: [3]

proportionate number of species of major taxa and answer the following questions based on it.



a. Identify **X** and **Y** in the given pie chart.

b. Which one of the two, **X** or **Y**, is the most species-rich taxonomic group and by what percentage?

26. Draw a schematic transverse section of a mature anther of an angiosperm. Label its epidermis, middle layers, tapetum, endothecium, sporogenous tissue and the connective. [3]

OR

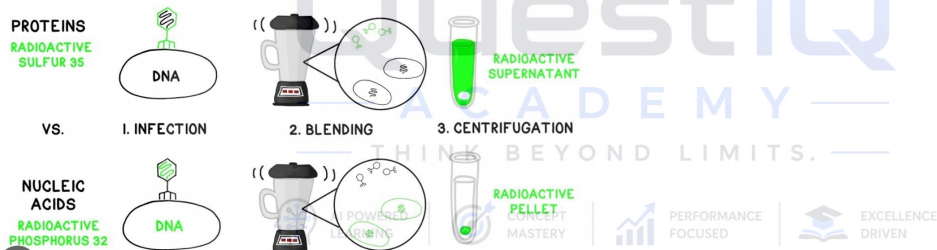
In a developing embryo, analyse the consequences if cell divisions are not followed by cell differentiation.

27. Describe the process of decomposition of detritus under the following heads Fragmentation, Leaching, Catabolism, Humification and Mineralization. [3]
28. Differentiate between in vitro and in vivo fertilisation. [3]

Section D

29. Read the following text carefully and answer the questions that follow: [4]

In 1952, Alfred Hershey and Martha Chase took an effort to find the genetic material in organisms. Their experiments led to an unequivocal proof to DNA as genetic material.



Hershey and Chases's experiments:

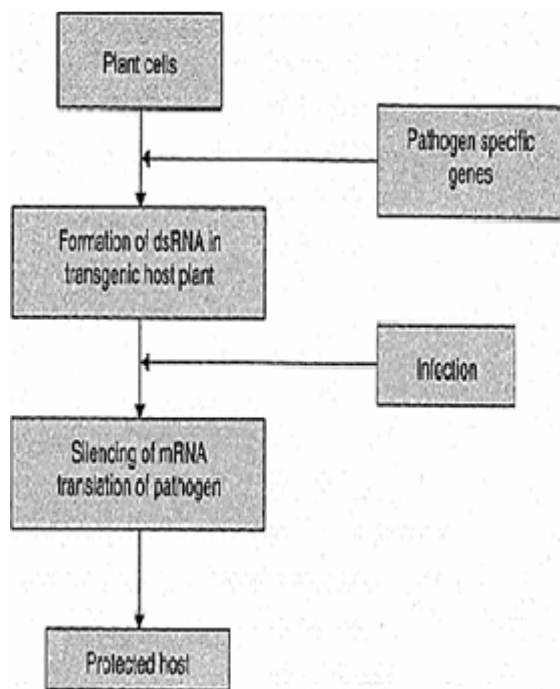
- Name the kind of virus they worked with and why? (1)
- Why did they use two types of culture media to grow viruses in? Explain. (1)
- What was the need for using a blender and later a centrifuge during their experiments? (2)

OR

State the conclusion drawn by them after the experiments. (2)

30. Read the following text carefully and answer the questions that follow: [4]

Study the given flow chart:



- i. Name the defence mechanism used. (1)
- ii. In which plant it has been done? (1)
- iii. Name the pathogen. (2)

OR

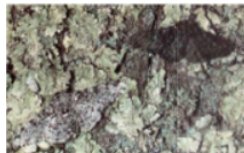
Name the vector used in this technique. (2)

Section E

31. How does industrial melanism support Darwin's theory of natural selection explain? [5]

OR

Observe the picture showing the industrial melanism and answer the following questions:



A



B

- i. What do these pictures A and B illustrate with reference to evolution?
- ii. Write the scientific name of the peppered moth.
- iii. Picture A and B is a classical example of which type of natural selection?

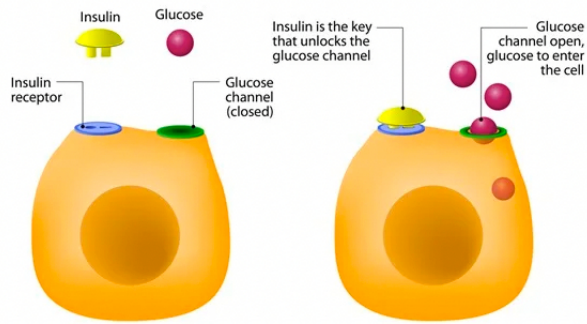
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32. Who was the first patient who was given gene therapy? Why was the given treatment recurrent in nature? [5]

OR

Insulin is a hormone created by your pancreas that controls the amount of glucose in your bloodstream at any given moment. It also helps store glucose in your liver, fat, and muscles. Finally, it regulates your body's metabolism of carbohydrates, fats, and proteins. Sound important? That's because it is.

HOW DOES INSULIN WORK?



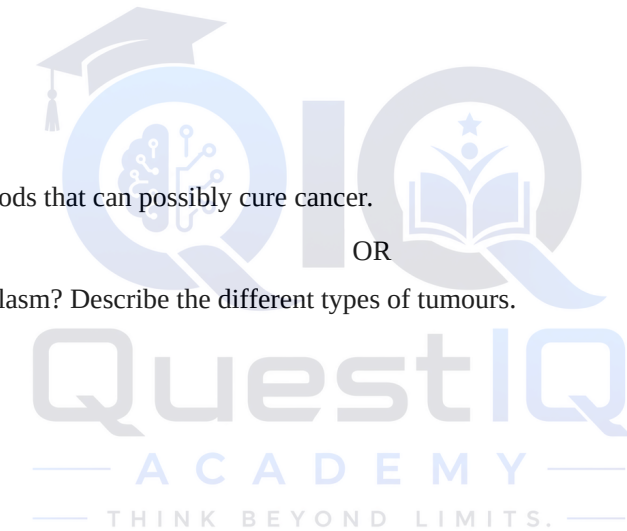
- Name the source from which insulin was extracted earlier. Why is this insulin no more in use by diabetic people?
- Explain the process of synthesis of insulin by Eli Lilly company. Name the technique used by the company.
- How is the insulin produced by human body different from the insulin produced by the above-mentioned company?

33.
 - How do normal cells become cancerous? [5]
 - Cancer can be treated successfully only if detected at an early stage. How do the following help in detecting cancer?
 - Biopsy
 - Histopathology
 - MRI

- Name any two methods that can possibly cure cancer.

OR

What is tumour or neoplasm? Describe the different types of tumours.



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