

PRACTICE Paper 03(2020-21)

Class 12

Biology

Maximum Marks: 70

Time Allowed: 3 hours

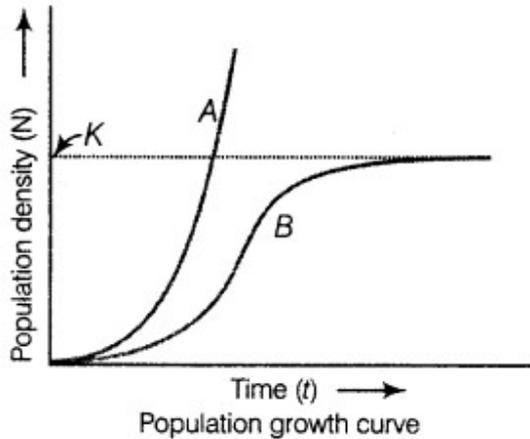
General Instructions:

- i. All questions are compulsory.
- ii. The question paper has four sections: Section A, Section B, Section C and Section D. There are 33 questions in the question paper.
- iii. Section—A has 14 questions of 1 mark each and 02 case-based questions. Section—B has 9 questions of 2 marks each. Section-C has 5 questions of 3 marks each and Section --D has 3 questions of 5 marks each.
- iv. There is no overall choice. However, internal choices have been provided in some questions. A student must attempt only one of the alternatives in such questions. Wherever necessary, neat and properly labeled diagrams should be drawn.

Section A

1. How many spermatozoa are formed from one secondary spermatocyte in testis of a human male?
2. Mention the site of origin of parturition signals in a pregnant human female.
3. Name the genetic cross performed to know the genotype of the F1 generation.

4. Why is tubectomy not considered a contraceptive method?
 5. Identify the curves 'a' and 'b' shown in the graph given below.



6. Mention the type of allele that expresses itself only in a homozygous state in an organism.
 7. Name the scientists who proposed the chromosomal theory of inheritance?
 8. Name a plant from which cannabinoids are obtained? Mention the part of the human body that is affected by consuming these substances?
 9. Name any one recombinant vaccine, currently being used in the vaccination programme ?
 10 Name any two Indian traditional foods prepared from wheat/ rice / bengal gram (or their products) with the help of microbes.

11. **Assertion:** Turner's syndrome is caused due to the absence of one X chromosome.

Reason: The female suffering from the turner's syndrome is sterile as ovaries are rudimentary along with other secondary sexual characters.

- Both assertion and reason are correct
- The assertion is incorrect, but the reason is correct
- Both assertion and reason are incorrect
- The assertion is correct, but the reason is incorrect

OR

Assertion: Duplicate genes are two or more genes found on different chromosomes that produce the same or nearly the same phenotypic effect in the dominant state.

Reason: Duplicate genes produces the same intensity of effect even when

present together.

- a. Both assertion and reason are correct
- b. The assertion is correct, but the reason is incorrect
- c. Both assertion and reason are incorrect
- d. The assertion is incorrect, but the reason is correct

12. **Assertion:** Mast cells in the human body release excessive amounts of inflammatory chemicals, which cause allergic reactions.

Reason: Allergens in the environment on reaching the human body stimulate mast cells in certain individuals.

- a. Both assertion and reason are true, and the reason is the correct explanation of the assertion
- b. Both assertion and reason are true, and the reason is not the correct explanation of the Assertion
- c. The assertion is a true statement, but the reason is false.
- d. Both assertion and reason are false.

13. **Assertion:** UAA codon is a termination codon.

Reason: If in an mRNA, a termination codon is present, the protein synthesis stops abruptly whether the protein synthesis is complete or not

- a. Both Assertion and Reason are true, and the reason is the correct explanation of the assertion.
- b. Both Assertion and Reason are true, and the reason is not the correct explanation of the Assertion
- c. The assertion is a true statement, but the reason is false.
- d. Both Assertion and Reason are false

14. **Assertion:** More genetically different strains of rice present in India.

Reason: A single species might show high diversity at the genetic level over its distributional range.

- 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 the correct statement, but reason is the wrong statement.
- d. Assertion is wrong statement, but reason is correct statement.

15. **Read the following and answer any four questions:**

The organism has various alterations for coping with extreme environments. Some are able to respond through certain physiological adjustments while others do so

behaviorally. These responses are their adaptations. Many adaptations have evolved over a long evolutionary time and are genetically fixed. Many desert plants have a thick cuticle on their leaf surfaces and have their stomata arranged in deep pits to minimize water loss through transpiration. In the polar seas, aquatic mammals like seals have a thick layer of fat (blubber) below their skin that acts as an insulator and reduces the loss of body heat. Some organisms possess adaptations that are physiological which allows them to respond quickly to a stressful situation.

i. Adaptation maybe

- a. behavioral
- b. morphological
- c. physiological
- d. all of these

ii. Opuntia has spine like leaves which help in

- a. reducing the rate of transpiration.
- b. increasing the rate of transpiration
- c. increasing the rate of photosynthesis
- d. reducing the rate of photosynthesis

iii. Mammals from colder climates generally have shorter ears and limbs to minimize

heat loss. This is called

- a. Allen's rule
- b. Berger's rule
- c. Borg's rule
- d. Powell's rule

iv. In the absence of an external source of water. the kangaroo rat in North American deserts can meet all its water requirements through

- a. its internal fat oxidation
- b. through concentrating its urine
- c. none of these
- d. both (a) and (b)

v. **Assertion-** People in high altitude places experience altitude sickness.

Reason- Altitude sickness is experienced due to low atmospheric pressure of high altitudes, the body does not get enough oxygen.

- a. Both Assertion and Reason are true, and Reason is the correct explanation of the Assertion
- b. Both Assertion and Reason are true, but Reason is not the correct explanation of the Assertion
- c. The Assertion is true, but the Reason is false
- d. Both the statements are false

16. Read the following and answer the four questions:

During fertilization in the plant, the pollen tube releases the two male gametes into the cytoplasm of synergid. One moves toward the egg and fuses to complete syngamy, other fuses with the central cell. It involves 3 haploid nuclei it is termed as triple fusion. The central cell develops into endosperm and the zygote develops into an embryo; the embryo develops at micropyle ends enclosed in an undifferentiated coleorhiza. Zygote gives rise to pro-embryo and subsequently to a globular. heart-shaped mature embryo. The embryo of monocotyledon possesses only one cotyledon called scutellum.

i. At the lower end, the embryonal axis has the radical and root cap, enclosed in an undifferentiated sheath called

- a. Coleoptile
- b. Coleorhiza
- c. integument
- d. All of these

ii. The male gamete which moves towards the two polar nuclei located in the cell and fuse with them to produce

- a. Zygote
- b. Embryo
- c. Primary endosperm nucleus
- d. None of these

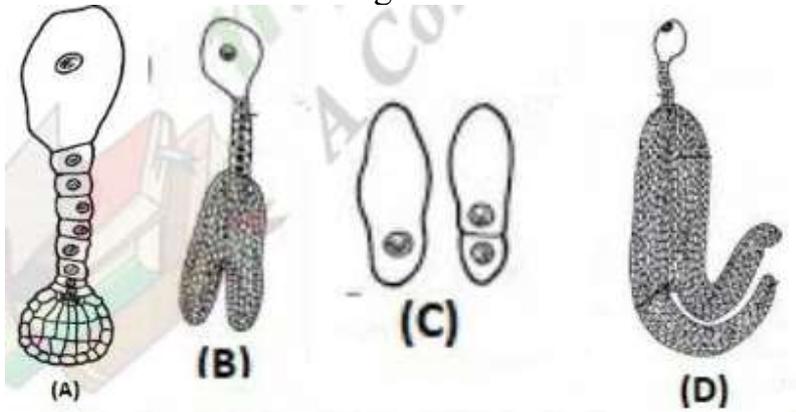
iii. The triple fusion involves fusion of

- a. three haploid nucleus
- b. three diploid nucleus
- c. two diploid and one haploid nucleus
- d. none of the above

iv. The cotyledon in grass family is called

- a. Epicotyl
- b. Scutellum
- c. Plumule
- d. Radical

v. Which of the following statement is correct for the figure given below



- a. (A) is the globular embryo, (D) is the immature embryo
- b. (A) fertilized embryo sac
- c. (D) stage in embryo development in dicot.
- d. (B) zygote

Section B

17. Name the structure that forms corpus luteum after ovulation. Discuss its role in pregnancy.
18. A child has blood group O. If the father has blood group A and mother blood group B, work out the genotypes of the parents and the all-possible genotypes of the other offspring.
19. Write short notes on the Production of human insulin hormone by *E. coli*.
20. With respect to understanding diseases, discuss the importance of transgenic animal models.

OR

How has recombinant technology helped in large scale production of vaccines? Explain giving one example.

21. A cross between a normal couple resulted in a son who was haemophilic & a normal daughter. In course of time, when the daughter was married to a normal man, to their surprise, the grandson was also haemophilic.
- a. Represent this cross in the form of a pedigree chart. Give the genotypes of the daughter & her husband.
22. How does one visualize DNA on an agarose gel ?

OR

A recombinant vector with a gene of interest inserted within the gene of B-galactosidase enzyme is introduced into a bacterium. Explain the method that would help in selection of recombinant colonies from non-recombinant ones.

23. Give two examples of biodiversity loss due to overexploitation.
24. Why do cattle avoid grazing on Calotropis plants? Explain.
25. How will you measure population density in case of fish in lake, tiger census in national park and parthenium grass?

Section C

26. Work out a cross between true-breeding red and white flowered dog flower plants (snapdragon) up to F₂ progeny. Discuss the results of F₁ and F₂ generation.
27. A fire broke in a hotel that resulted in many deaths. The dead bodies are burnt and beyond recognition. Name and write the steps of technique that will be used to identify these dead bodies and hand over the them to their relatives,
28. i. What precaution(s) would you recommend to a patient requiring repeated Blood transfusion?
- ii. If the advice is not followed by the patient there is an apprehension that the patient might contract a disease that would destroy the immune system of his/her body. **Explain with the help of a schematic diagram only** how the immune system would get affected and destroyed.
29. Differentiate between the process of transcription in prokaryotes and eukaryotes.
30. Mention the name of causal organism, symptoms and the mode of

transmission of the disease Amoebiasis.

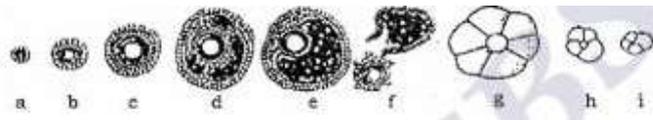
OR

What is the basic principle of vaccination? How do use of vaccines prevent microbial infections? Name the organism in which hepatitis B vaccine is produced.

Section D

31. i. Explain the process of spermatogenesis in humans.
ii. Draw a human sperm and label acrosome and middle piece. Write their functions.

OR



- i. Identify the figure that illustrates corpus luteum and name the pituitary hormone that influences its formation.
ii. Specify the endocrine function of corpus luteum. How does it influence the uterus? Why is it essential?
iii. What is the difference between 'd' and 'e'?
iv. Draw a neat labelled sketch of Graafian follicles
32. Given below is a table depicting different restriction enzymes and its examples

Restriction enzyme	Examples
(a)	Hind II
(b)	EcoRI

- i. Name the following type of restriction enzymes (a) and (b).
ii. What is PCR? For what purpose is it used in biotechnology? Draw a well-labelled diagram showing different steps of PCR

OR

- i. Why must a cell be made 'competent' in biotechnology experiments? How does calcium ion help in doing so?
 - ii. State the role of 'biolistic gun' in biotechnology experiments.
 - iii. Mention two features that a cloning vector must possess.
33. i. Name the category of microbes naturally occurring in sewage and making it less polluted during the treatment?
- ii. Explain the different steps involved in the secondary treatment of sewage.

OR

Answer the following with respect to cancer.

- a. How does a cancerous cell differ from a normal cell?
- b. Benign tumor is less dangerous than a malignant tumor. Why?
- c. Describe causes of cancer.
- d. Mention two methods of treatment of the disease.