

KENDRIYA VIDYALAYA SANGATHAN, LUCKNOW REGION

SECOND PRE-BOARD EXAMINATION 2020-21

Class: XII BIOLOGY (044) Theory (SET-II)

Time: 3 Hours

Maximum Marks: 70

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 of 4 Marks each. 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 has to attempt only one of the alternatives in such questions.
- (v) Wherever necessary, neat and properly labelled diagrams should be drawn.

SECTION A (Q1 to Q14 =1 MARK EACH)

1. How is it possible in *Oxalis* and *Viola* plants to produce assured seed sets even in absence of pollinators?
2. A doctor has observed the chromosomal disorders in developing foetus and advised the couple to undergo abortion. Suggest the technique by which doctors observed the chromosomal disorders?
3. Why that father is never passed on the gene for haemophilia to his son?
4. Expand:- a) SNPs b) VNTR
5. Name the host where the following events occurs in the lifecycle of malarial parasite:-
a) Formation of gametophytes b) Fusion of gametocytes
6. Why is the enzyme cellulase needed for isolating genetic material from plant cell and not in animal cell?
7. Which committee makes decisions regarding validity and safety of GM research for public services?
8. What for *Nucleopolyhedroviruses* are being used now these days?
9. Mention the source organism of the gene **cryI Ac** and its target pest?
10. Why are cattle and goat not seen browsing on *Calotropis* growing in the field?
11. **ASSERTION (A):** The signals for parturition originating from foetus, trigger release of Oxytocin which stimulates uterine contraction.

REASON (R): Vigorous contraction of the uterus at the end of pregnancy causes expulsion.

- a) Both A and R is true, and R is the correct explanation of A.
- b) Both A and R is 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

12. ASSERTION (A): In Griffith's experiment, the mixture of heat – killed virulent-R bacteria and live non-virulent-S bacteria lead to the death of mice.

REASON (R): The transforming principle got transferred from heat killed-S strain and made it Virulent-R.

- a) Both A and R is true, and R is the correct explanation of A.
- b) Both A and R is 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

13. ASSERTION (A): For organ transplantation Cyclosporin-A needs to be injected to the patient.

REASON (R): Cyclosporin–A inhibits activation of T-cells and interferons and act as immunosuppressant.

- a) Both A and R is true, and R is the correct explanation of A.
- b) Both A and R is 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 (A): Species with high genetic variability are at greater risk of extinction than species with low genetic variability.

REASON (R): Species with low genetic variability are more vulnerable to predators and environmental challenges.

- a) Both A and R is true, and R is the correct explanation of A.
- b) Both A and R is 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

15. Read the following Case Study and answer questions from 15 (I) to 15 (V) given below: - (1x4marks)

Presently , human population is doubling every 35 years. If this continues, soon earth will be over crowded with human beings. Man has started realising his fate and initiated plans to check this rate of increase by adopting planned control of population like education, increasing marriageable age, family planning. Government of India in an attempt to check high birth rate, started voluntary approach towards birth control measures. This programme initially failed in view of people's traditional resistance to birth control measures, but steadily voluntary approach along with steps to educate the people regarding benefits of family planning measures. A variety of methods are known for birth control. The birth control methods which deliberately prevent fertilisation are referred to as contraception.

- (I) A mother of one year old daughter wanted to space her second child. Her doctor suggested CuT . Explain its contraceptive action.
- (II) Bring out main difference between CuT and LNG-20.

(III) Which of the following is barrier method of contraception?

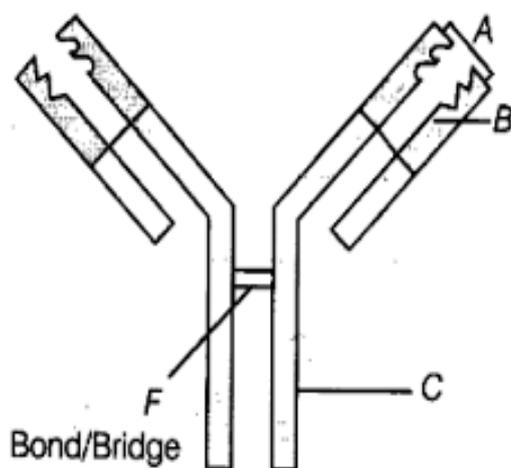
- a) Periodic abstinence
- b) Lactational amenorrhea
- c) Withdrawal method
- d) None of these

(IV) Tubectomy is a method of sterilisation in which

- a) Nucleus is removed
- b) Ovaries are removed
- c) Small part of fallopian tube is removed
- d) Small part of vas deferens is removed

16. The most important characteristics of the immune system is its ability to recognise body's own cells and macromolecules (self) from those which are foreign invaders (non- self). It tolerates the self but destroys the non-self. It stimulates the immune system to produce protective chemicals or special cells to destroy the antigen. The antigens entering a body may be viruses, bacteria or toxins such as snake poison. Usually the protein molecules present on the surface of foreign material act as antigens.

Study the figure given below and answer the questions that follow:-



(I) Identify A and C in the diagram given above .

(II) Antibodies in our body are complex

- a) Glycoproteins
- b) Lipoproteins
- c) Sterioids
- d) Prostaglandlins

(III) B- Lymphocytes are associated with

- a) Humoral immunity
- b) Inflammatory response
- c) Cell mediated Immunity

d) Phagocytosis

(IV) A boy of 10 years had chicken pox. He is not expected to have the same disease for the rest of his life. Mention how it is possible?

SECTION B (Q17 to Q25 = 2 MARKS EACH)

17. Double fertilisation is reported in plants of both Sunflower and Groundnut. However, the mature seeds of Groundnut are Non – albuminous and Sunflower are Albuminous . Explain the Post-fertilisation events that are responsible for it?

18. In a Snapdragon, a cross between True–breeding red flowered (RR) plants and True-breeding white flowered (rr) plants showed a progeny of plants with all pink flowers.

- a) The appearance of pink flowers is not known as blending. Why?
- b) What is this phenomenon known as?

19. Explain the role of S³⁵ and P³² in the experiments conducted by Hershey and Chase?

20. Name the blank spaces **a, b, c, d** in the table:-

S.NO.	Name of the drug	Plant source	Organ system affected
1	a	Poppy plant	b
2	Marijuana	c	d

21. a) Patients who have undergone myocardial infraction are given Clot buster. Mention the clot buster administered and its microbial source .

b) A person recovering from illness is advised to have curd regularly. Why?

22. Why does the Insertional inactivation method to detect recombinant DNA is preferred to “antibiotic resistance” procedure?

23. Identify and name the type of interaction seen in each.

- i) *Ascaris* worms living in the intestine of humans.
- ii) Clown fish living among the tentacles of Sea-anemone.
- iii) Disappearance of smaller Barnacles when *Balanus* dominated coast of Scotland.
- iv) Wasps pollinating Fig inflorescence.

24. Which region/biome in the world is considered as the “Lungs of the planet “? Give two reasons for its degradation?

25. In a pond there are 20 *Hydrilla* plants, through reproduction 10 new *Hydrilla* plants

were added in an year. Calculate the birth rate of the population.

SECTION C (Q 26 to Q 30 = 3 MARKS EACH)

26. a) Name the Codons that codes for terminating the polypeptide chain formation.
b) Codon is Unambiguous and exhibit Degeneracy. What does it mean?

OR

The base sequence in one of the strand of DNA is “TAGCATGAT”

- I) Give the base sequence of its complementary strand.
II) How are these base pairs held together in a DNA molecule?
III) Explain the base complementary rules.

27. A woman with blood group O married a man with AB group. Show the possible blood groups of the progeny. List the alleles involved in this Inheritance? Will there be any impact on blood group of progeny, if blood groups of their parents are reversed?

28. i) Draw a well labelled sketch of a typical Biogas plant.

ii) State its one application?

iii) Name the group of bacteria responsible for functioning of Bio gas plant.

29. a) State the role of DNA ligase in biotechnology ?

b) What happens when *Meloidogyne incognitia* consumes cells with RNA -i gene?

c) Name one transgenic animal that can synthesise human milk protein.

30. Alien species are highly invasive and are a threat to indigenous species. Substantiate this statement with any three examples.

SECTION D (Q31 to Q33 = 5 MARKS EACH)

31. a) Draw a well labelled diagrammatic sectional view of a Human Seminiferous tubule.

b) Write specific location and function of the following cells in Human males:-

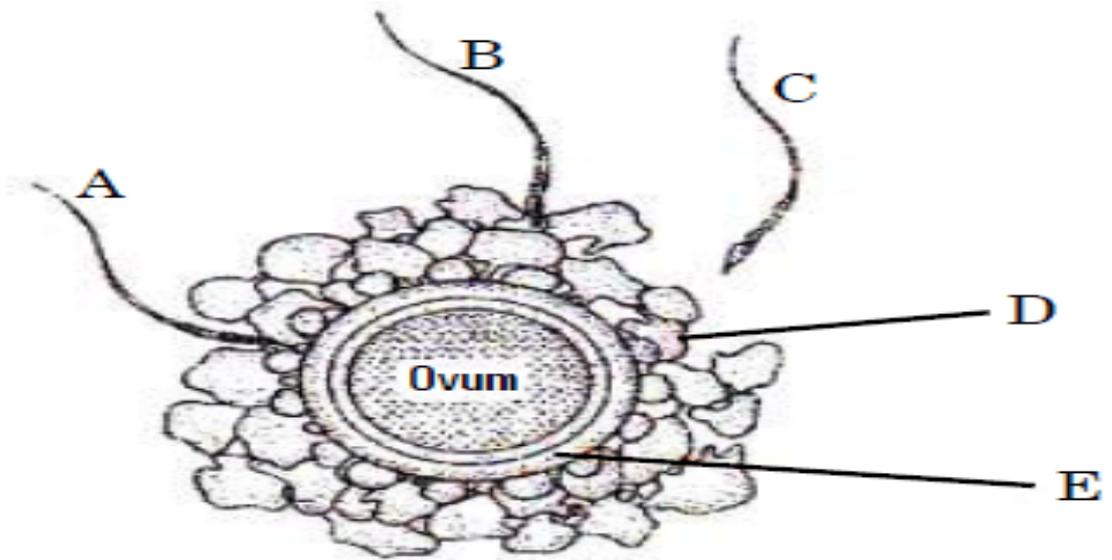
i) Leydig cells

ii) Sertoli cells

iii) Primary spermatocytes

OR

Given below is the diagram of a Human ovum surrounded by a few sperms. Observe the diagram and answer the following questions:-



- Compare the fate of sperms shown in the diagram.
- What is the role of Zona pellucida in the process?
- Label the C and D given in the above diagram.
- How is the entry of sperm into the ovum facilitated?
- Specify the region of female reproductive system where the event represented in the diagram takes place.

32. a) Name the source from which insulin was extracted earlier. Why is this Insulin no more in use by diabetic patients?

b) Explain the process of synthesis of insulin by Eli Lilly Company. Name the technique used by the company.

c) How is the insulin produced by human body different from the insulin produced by the above mentioned company?

OR

- A person is born with a hereditary disease with a weakened immune system due to deficiency of an enzyme. Suggest a technique for cure for this disease ,
- Identify the deficient enzyme and explain the technique used for cure.
- Mention two disadvantages of this procedure.

33. a) State the arrangement of different genes that in bacteria referred to as “Operon”.

b) Draw a schematic labelled illustration of Lac Operon in switched “ON” state.

c) Describe the role of Lactose in the Lac operon?

OR

Name and describe the technique that will help in solving a case of paternity dispute over custody of child by two different families.
