

O. P. JINDAL SCHOOL, SAVITRI NAGAR
Half Yearly Examination (2023– 2024)

Class: XII
Subject: Biology(044)

MM: 70
Time: 3 Hrs.

Fifteen Minutes Extra will be for reading the Question Paper.

General Instructions:

- (i) All questions are compulsory.
(ii) 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.
(iii) There is no overall choice. However, internal choice have been provided in some questions.
(iv) Wherever necessary, neat and properly labeled diagrams should be drawn.
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SECTION-A

- After ovulation Graafian follicle regresses into
(a) corpus atresia (b) corpus callosum
(c) corpus luteum (d) corpus albicans
- Development of new individual from female gamete without fertilisation is termed as
(a) syngamy (b) embryogenesis
(c) oogamy (d) parthenogenesis.
- The sequence that controls the copy number of the linked DNA in the vector, is termed
(a) Selectable marker (b) Recognition site
(c) Palindromic sequence (d) Ori site
- The disease chikunguniya is transmitted by
(a) houseflies (b) Aedes mosquito
(c) cockroach (d) female Anopheles mosquito
- There is a restriction endonuclease called EcoRI. What does the “co” part in it stand for?
(a) coli (b) Coelom
(c) Coenzyme (d) Colon
- The method of directly injecting a sperm into ovum in assisted reproductive technology is called
(a) GIFT (b) ZIFT
(c) ICSI (d) ET
- Technique used to detect mutated genes is called
(a) gel electrophoresis (b) polymerase chain reaction
(c) gene therapy (d) autoradiography

12. Elephantiasis, a chronic inflammation that results in gross deformities is caused by

- (a) Ascaris (b) E.coli
(c) Wuchereria (d) Trichophyton

Direction (Q.No. 13-16)Assertion –Reasoning type questions. Mark the correct answer as

- (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) Both A and R are false

13 Assertion : Interferons help in the elimination of viral infections.

Reason : Interferons released by infected cells, reach nearby unaffected cells and make them resistant to viral infection.

14. **Assertion:** Restriction digestion is a process of cutting DNA by restriction enzyme.

Reason: DNA ligase joins two DNAs.

15. **Assertion:** Streptococcus pneumoniae and Haemophilus influenzae are responsible for causing infectious diseases in human beings.

Reason: A healthy person acquires the infection by inhaling the droplets/aerosols released by an infected person.

16. **Assertion(A)** Each antibody is represented by H_2L_2 .

Reason (R) Each antibody molecule has four nucleotide chains,two small called light chains and two longer called heavy chains.

SECTION-B

Q17. What are the major components of seminal plasma?

Q18. How did Eli Lilly synthesise the human insulin? Mention one difference between this insulin and the one produced by the human pancreas.

Q19. Expand each one to its full form:

- (a) MALT (b) ELISA (c) MRI (d) HIV

Q20 (i) Cleistogamy can favour only autogamy. Justify.

(ii) Why is apple called a false fruit and banana parthenocarpic fruit? Explain.

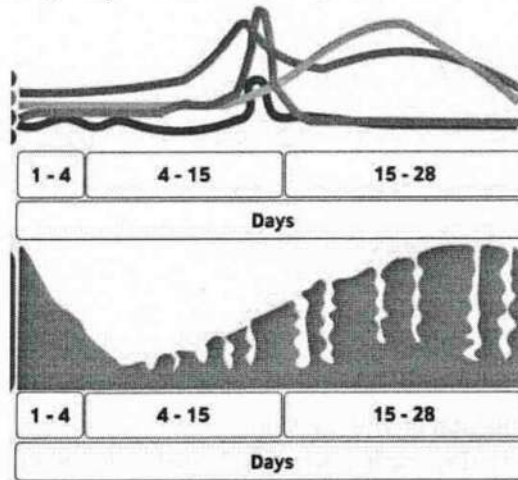
Q 21. Write two examples of palindromic DNA sequences.

OR

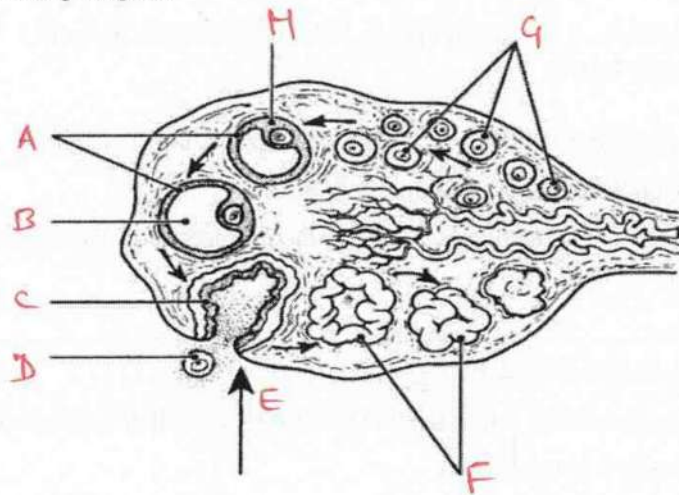
Explain Biolistic method and Microinjection of vector less gene transfer.

SECTION -C

Q. 22- Study the following diagram and write the processes and results at each step.



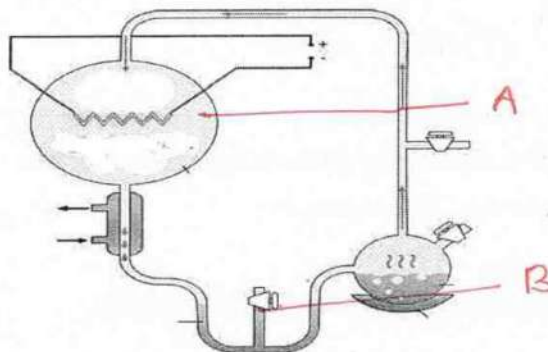
Q. 23- Label the following diagram



Q. 24- A woman has certain queries as listed below, before starting with contraceptive pills, answer them.

- What do contraceptive pills contain and how do they act as contraceptives?
- What schedule should be followed for taking these pills?

Q. 25- Given below is a diagrammatic representation of the experimental setup used by St. Miller for his experiment.



- Write the names of different gases contained and the conditions set for the reaction in the flask A.

(b) State the type of organic molecule he collected in water at B.

(c) Write the conclusion he arrived at.

Q. 26- What are broad spectrum antibiotic? Name one such antibiotic.

Q. 27- What is GEAC and what are its objectives?

OR

Biopiracy should be prevented. State why and how?

Q. 28- Expand GMO. How is it different from hybrid?

SECTION – D

Question No. 29 and 30 are case based questions. Each question has three subparts with internal choice in one subpart.

Q. 29- When cut by the same restriction enzyme, the resultant DNA fragments have the same kind of 'sticky ends' and, these can be joined together (end-to-end) using DNA ligases. The cutting of DNA by restriction endonucleases results in the fragments of DNA. These fragments can be separated by a technique known as gel electrophoresis. Since DNA fragments are negatively charged molecules they can be separated by forcing them to move towards the anode under an electric field through a medium/matrix. Nowadays the most commonly used matrix is agarose which is a natural polymer extracted from sea weeds. The DNA fragments separate (resolve) according to their size through sieving effect provided by the agarose gel. Hence, the smaller the fragment size, the farther it moves. The separated DNA fragments can be visualized only after staining the DNA with a compound known as ethidium bromide followed by exposure to UV radiation (you cannot see pure DNA fragments in the visible light and without staining). You can see bright orange coloured bands of DNA in an ethidium bromide stained gel exposed to UV light.

The separated bands of DNA are cut out from the agarose gel and extracted from the gel piece. This step is known as elution. The DNA fragments purified in this way are used in constructing recombinant DNA by joining them with cloning vectors.

(i)..... is used to join sticky ends of DNA.

(a) DNA Ligase (b) DNA polymerase (c) DNA restriction (d) None of them

(ii) On the basis of....., fragments of DNA gets separated in the Gel electrophoresis.

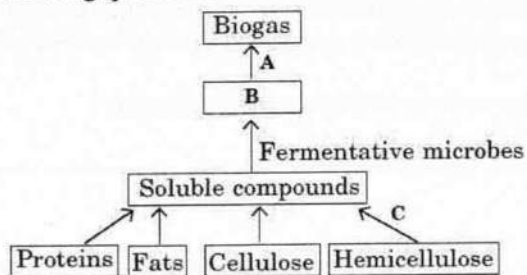
(a) Nucleotide (b) Colour (c) Shape (d) Size

(iii) After DNA fragment separation, DNA is stained by..... for the visualization.

(a) Toluidine (b) Ethidium bromide (c) Sulphuric acid (d) Phloroglucinol

(iv) Define elution.

Q. 30- Villagers in a place near Chambur started planning to make power supply for agricultural purposes from cow dung. They have started a biogas plant for the purpose. Study the flow chart for biogas production given below and answer the following questions.



(i) Biogas is composed of majorly:

(a) methane, CO₂ and O₂

(c) methane, CO₂ and H₂S

(b) CO₂, H₂S and H₂O

(c) H₂S, H₂ and O₂.

(ii) In the given flow chart, 'A' denotes:

(a) aerobic bacteria

(c) cellulose degrading bacteria

(b) methanogenic bacteria

(d) yeast and protozoa.

(iii) What is represented by 'B' in the flow chart?

(a) carbohydrates

(c) organic acids

(b) protein polymers

(d) fat globules

(iv) Can biogas be used in place of fossil fuels?

OR

What are the environmental impacts of producing using biogas?

SECTION - E

Q. 31(i) Why is Cu-T considered a good contraceptive device to space children?

(ii) Name an oral pill used as a contraceptive by human females. Explain, how does it prevent pregnancy?

(iii) Describe the lactational amenorrhea method of birth control.

OR

(i) Intra Cytoplasmic Sperm Injection (ICSI) and 'Gamete Intra Fallopian Transfer (GIFT)' are two assisted reproductive technologies. How is one different from the other? .

(ii) Why is ZIFT a boon to childless couples? Explain the procedure.

(iii) What do oral pills contain and how do they act as effective contraceptives?

Q. 32- (i) Which organ of the human body is initially affected when bitten by an infected female Anopheles! Name the stage of the parasite that infects this organ.

(ii) Explain the events that are responsible for chill and high fever in the patient.

(iii) Trace the life-cycle of malarial parasite in the human body when bitten by an infected female Anopheles.

OR

(i) Name the group of viruses responsible for causing AIDS in humans. Why are these viruses so named?

(ii) List any two ways of transmission of HIV infection in humans, other than sexual contact.

(iii) Draw the diagram showing replication of HIV in humans.

Q. 33(i) Explain the phenomena of dominance, multiple allelism and codominance taking human ABO blood group as an example.

(ii) What is a test cross? How can it decipher the heterozygosity of a plant?

OR

(i) Compare in any three ways the chromosomal theory of inheritance as proposed by Sutton and Boveri with that of experimental results on pea plant presented by Mendel

(ii) Explain polygenic inheritance with the help of a suitable example.
