O. P. JINDAL SCHOOL, SAVITRI NAGAR

Half Yearly Examination (2024– 2025)

Class: XII **MM: 70**

Subject: Biology(044) **Time: 3 Hrs.**

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)Whereever necessary, neat and properly labeled diagrams should be drawn.

SECTION-A

1. The antibody mainly found in sweat, tears, saliva, mucus and colostrums is
   (a) IgM (b) IgA
   (c) IgD (d) IgE

2. Which of the following can be used as a biocontrol agent in the treatment of plant disease ?
   (a)Lactobacillus (b) Trichoderma
   (c) Chlorella (d) Anabaena

3. XX/XO type of sex determination is seen in
   (a)platypus (b)snails
   (c)human (d) grasshoppers

4. Cross –pollination through insect agent is called
   (a) anthropophily (b) malacophily
   (c)entomophily (d)ornithophily

5. Which of the following statements is incorrect about ‘ori’
   (a) it stands for origin of replication (b) it is one of the feature of a good vector
   (c)it is a RNA sequence (d) it is linked to the foreign DNA to replicate with in the host cell

6. Technique used to detect mutated genes is called
   (a)gel electrophoresis (b) polymerase chain reaction
   (c) gene therapy (d) autoradiography

7.The functional megaspore of an angiosperm develops into
   (a) embryo sac (b) endosperm
   (c) embryo (d) ovule

8 . An infertile couple was advised to undergo In vitro fertilization by the doctor. Out of the options given below, select the correct stage for transfer to the fallopian tube for successful results?

(a) Zygote only
(b) Zygote or early embryo upto 8 blastomeres
(c) Embryos with more than 8 blastomeres
(d) Blastocyst Stage

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9.The thalamus contributes to the fruit formation in

(a)banana (b)orange
(c)straw-berry (d)guava

10. After ovulation Graafian follicle regresses into
(a) corpus atresia
(b) corpus callosum
(c) corpus luteum
(d) corpus albicans

11. The autosomal disorder/ disease in human is

(a)colour blindness (b) thalassemia
(c) haemophilia (d) Turner's syndrome

12. Which of the following is not a cloning vector ?

(a) pBR322 (b)Cosmid
(c)Yeast artificial chromosome (d)Hind II

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(A) An organ transplant patient is administered regular dose of cyclosporin –A.
Reason(R) Cyclosporin –A is an immunosuppressant agent.

14.Assertion(A) Placenta secretes estrogen.
Reason (R) Estrogen maintains the corpus luteum to secrete progesterone.

15.Assertion(A) AIDS is a disorder caused by HIV.
Reason (R) HIV is a virus that damages immune system of its host.

16.Assertion(A) In gel electrophoresis, DNA fragments move towards anode.
Reason (R) DNA is negatively charged molecule.

SECTION-B

Q17. (i) Cleistogamy can favour only autogamy. Justify.

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

Q 18. (i)Write the scientific name of the source organism of the thermostable DNA polymerase used in PCR.

(ii)State the advantage of using thermostable DNA polymerase.

OR

Explain Biolistic method and Microinjection of vector less gene transfer.

Q19. (i) State the function of filiform apparatus found in mature embryo sac of an angiosperm.?

(ii)Why an anther with malfunctioning tapetum often fails to produce viable male gametophytes ?

Q20. How did Eli Lilly synthesise the human insulin? Mention one difference between this insulin and the one produced by the human pancreas.

Q21. (i)How does normal cells become cancerous ?

(ii) How do the following help in detecting cancer?

(a) Biopsy (b) MRI

SECTION –C

Q. 22-Expand and explain the following techniques used in the Test Tube Baby programme:

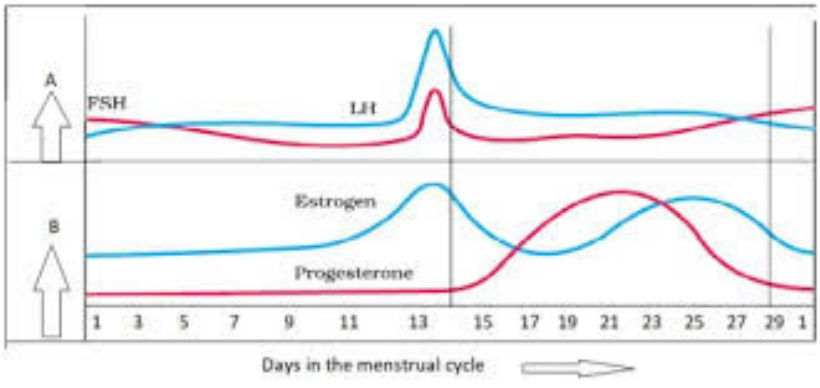
(i)GIFT (ii)ZIFT (iii)IUI

Q. 23- Answer the following questions:

(i) Mention the importance of LH surge during menstrual cycle.

(ii) At which phase of menstrual cycle both LH and FSH attain a peak level ?

(iii)What is the fate of corpus luteum in the absence of fertilisation ?



Q. 24-Explain Co-dominance and Incomplete dominance.

Q. 25- (i)Why are certain cotton plants called Bt-cotton plants ?

(ii) Why does Bt toxin not kill the bacterium that produces it but kill the insect that ingests it ?

OR

(i)What is Biopiracy ? Explain its significance with example.

(ii) State the initiative taken by Indian Parliament against biopiracy.

Q. 26- Explain how primary and secondary immune response are carried out in human body ?

Q. 27- A woman has certain queries as listed below, before starting with contraceptive pills, answer them.

(i) What do contraceptive pills contain and how do they act as contraceptives?

(ii) What schedule should be followed for taking these pills?

Q. 28- (i)Give an example of a genus of virus used as narrow spectrum insecticidal biocontrol agent .

(ii) How does its use serve as an aid in overall integrated pest management programme ?

(iii) What are biofertilisers ? Give two examples.

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)Define elution.

(ii)How can the DNA fragments separated on a agarose gel be visualised ?

(iii)Name the natural source of agarose. Write its role in biotechnology.

Q. 30-One DNA helix runs continuously from one end to the other in each chromatid, in a highly supercoiled form. Therefore loss (deletions) or gain (insertion/duplication) of a segment of DNA, result in alteration in chromosomes. Since genes are known to be located on chromosomes, alteration in chromosomes results in abnormalities or aberrations. Chromosomal aberrations are commonly observed in cancer cells. Mutation also arise due to change in a single base pair of DNA. This is known as point mutation. A classic example of such a mutation is sickle cell anemia. Deletions and insertions of base pairs of DNA, causes frame-shift mutations.

(i).Mutagen is…

(a)Organism which undergoes mutation (b) Mutation inducing agent

(c)Genes which undergo mutation (d)Genes which show multiple phenotypes

(ii).(Assertion): Point mutations occur at nucleotide level.

(Reason): Gene mutations are caused by chemical mutagens.

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

(b) Both A & 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.

(iii).Frame shift mutation occurs when…

(a) Base is deleted (b) Base is added

(c) Base is deleted or added (d) Anticodons are not present

(iv).Mutation is essential for evolution because…

(a) It produces new variant (b) It stops the struggle for existence

(c) It causes recombination (d) It brings a balance in the environment

SECTION - E

Q31. (i)Why are thalassemia and haemophilia categorised as Mendelian disorders ? Write the symptoms of these diseases . Explain their pattern of inheritance in humans.

(ii)Write the genotypes of the normal parents producing a haemophilic son.

OR

(i)In a family ,the father, the daughter and the son are colourblind ,whereas the mother has normal vision.Do you think the son and the daughter have inherited the disease from their father ? Work out a cross to justify your answer.

(ii) Identify the condition caused due to the single base substitution from GAG to GUG at sixth codon in beta globin gene in haemoglobin and explain its inheritance.

Q. 32-(i)Explain any four devices that flowering plants have developed to encourage cross –pollination.

(ii) Why do plants discourage self-pollination ? State any one reason.

OR

(i)When and how does placenta develop in human female?
(ii)How is the placenta connected to the embryo?
(iii)Placenta acts as an endocrine gland .Explain.

Q. 33 (i)Name the malarial parasite. Where do the gametocytes of this parasite develop?

(ii) Why does the infection cause fever in humans?

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

OR

(i) What is biogas ? Describe the structure of biogas plant.

(ii) List two major reasons for using cow-dung in a biogas plant instead of using domestic sewage.

(iii) Mention one use of the unspent slurry of the biogas plant.

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