

SEPTEMBER EXAMS (2024 – 25)

Class – XII

SUBJECT – BIOLOGY

SET – A

Time allowed: 3 hours

M. M. = 70

INSTRUCTIONS:

1. The question paper consists of four sections - A, B, C and D with total of 17 questions.
2. Section - A has question number 1 having 28 sub-parts of 1 mark each. 15 questions are Multiple-Choice Question type, 5 are fill in the blanks, 5 are True/false and 3 questions from comprehension passage.
3. Section - B has questions number 2 to 11 – total 10 short answer type questions of 2 marks each. Questions 3, 4, 9 and 11 have internal choice.
4. Section - C has questions number 12 to 15 – total 4 questions of 3 marks each. Questions 14 and 15 have internal choice.
5. Section - D has question 16 and question 17 – total 2 questions of 5 marks each. Both questions will have 100% internal choice.
6. Draw neat and well-labelled diagrams wherever necessary.

SECTION – A

1. Each question carries 1 mark.

I. Multiple choice questions:

- (i) **Main cause of Klinefelter's syndrome is**
 - (a) Presence of an additional copy of X-chromosome
 - (b) Absence of one of the X chromosomes
 - (c) Presence of an additional copy of Y-chromosome
 - (d) Presence of an extra autosome
- (ii) **During spermatogenesis, the number of sperms that are formed from 40 spermatogonia, 30 primary spermatocytes, 25 secondary spermatocytes and 15 spermatids respectively are**

(a) 40, 30, 25 and 30	(b) 160, 160, 50 and 15
(c) 160, 30, 160 and 30	(d) 40, 160, 50 and 15
- (iii) **Emergency contraceptives are effective if used within:**

(a) 72 hours of ovulation	(b) 72 hours of coitus
(c) 72 hours of implantation	(d) 72 hours of menstruation
- (iv) **BOD stands for**

(a) Biochemical oxygen deficit	(b) Biological oxygen demand
(c) Biological oxygen deficit	(d) Biochemical oxygen demand
- (v) **Transplantation of tissues/organs to save certain patients often fails due to rejection of such tissues/organs by the patient. Which type of immune response is responsible for such rejections?**

(a) Auto-immune response	(b) Humoral immune response
(c) Physiological immune response	(d) Cell-mediated immune response
- (vi) **If the amount of adenine in a DNA is 30%, then according to Chargaff's rules, the amount of Uracil and Guanine present in the DNA respectively are:**

(a) 0% and 30%	(b) 30% and 0%	(c) 0% and 20%	(d) 20% and 30%
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- (vii) **The method of directly injecting a sperm into ovum in assisted reproductive technology is called**

(a) ICSI	(b) IVF	(c) ZIFT	(d) GIFT
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- (viii) **The initiator codon, AUG codes for which of the following amino acids?**

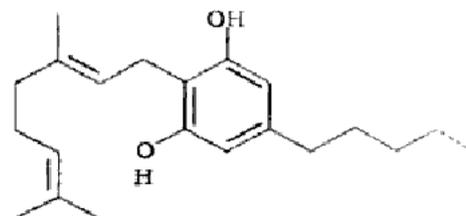
(a) Methionine	(b) Leucine	(c) Arginine	(d) Glycine
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- (ix) **Which of the following organic acids can be produced on commercial scale by *Aspergillus niger*?**

(a) Butyric acid	(b) Citric acid	(c) Lactic acid	(d) Acetic acid
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- (x) **Hear shaped embryo is the feature of**

- (a) Dicots (b) Monocots (c) Both of these (d) None of these
- (xi) The cavity present in the blastula is called
 (a) Coelom (b) Fluid (c) Blastocoel (d) Blastopore
- (xii) An ideal contraceptive should be
 (a) Costly (b) User friendly (c) With side effects (d) All of these
- (xiii) The number of megaspores formed from one megaspore mother cell is
 (a) one (b) Two (c) Four (d) Eight
- (xiv) Which of the following is correct according to Chargaff's rules?
 (a) A+T = C+G (b) A+U = C+T (c) A+G = C+T (d) A+T = U+G

(xv) Identify the group of the drugs from the given structure.

- (a) Opioids (b) Cannabinoids
 (c) Coca alkaloid (d) Barbiturates



II. Fill in the Blanks:

- (xvi) The sterilisation procedure in males is called _____.
- (xvii) Coconut water is an example of a _____ endosperm.
- (xviii) ELISA stands for _____.
- (xix) During spermiogenesis, nebenkern of the sperm develops from _____ of the spermatid.
- (xx) Cyclosporin A, which is used as an immunosuppressive agent in organ-transplant patients, is produced by the fungus named _____.

III. State True/False:

- (xxi) Menstrual cycle ceases during pregnancy.
- (xxii) Sex determination in honey bees is XX-XY type.
- (xxiii) Floral parts are un-wettable in case of hydrophilous flowers.
- (xxiv) Organic farming does not include chemical fertilizers.
- (xxv) A child may have O blood group if his father and mother have A and AB blood group respectively.

IV. Comprehension Passage

Read the passage carefully and answer the given questions:

Lymphoid organs are the organs where origin and/or maturation and proliferation of lymphocytes occur. The primary lymphoid organs are the organs where immature lymphocytes differentiate into antigen-sensitive lymphocytes. After maturation the lymphocytes migrate to secondary lymphoid organs. The secondary lymphoid organs provide the sites for interaction of lymphocytes with the antigen, which then proliferate to become effector cells.

- (xxvi) The lymphoid organs are the part of which system of human body?
- (xxvii) What are primary lymphoid organs?
- (xxviii) Name one primary lymphoid organ and one secondary lymphoid organ found in the human body.

$\frac{1}{2} + \frac{1}{2} = 1$

SECTION – B

Note: Each question carries 2 marks.

2. Draw a neat and well-labelled diagram of a transverse section of a young anther. 2
3. Define infertility. Explain any one assisted reproductive technology to check the problem of infertility. 1+1=2

OR

- What is Amniocentesis? For what purpose, it is used? 1+1=2
4. State and explain Mendel's law of dominance with the help of an example. 1+1=2

OR

A woman carrier for haemophilia marries a normal man. Predict the possible genotypes and phenotypes of the offspring using a Punnett square. Also state, what percentage of offspring are:

- (a) normal males
(b) carrier for haemophilia? $1+1=2$
5. What happens to the corpus luteum in human females if the ovum is
(a) fertilised (b) not fertilised? $1+1=2$
6. Distinguish between innate and acquired immunity. 2
7. Define codominance. Explain the concept of co-dominance by taking an example of AB blood group in humans. $1+1=2$
8. (a) Define transcription.
(b) If the sequence of the template strand in a transcription unit is written as follows:
 $5' - ATGCATGCATGCATGC - 3'$
What is the sequence of mRNA so formed as a result of transcription? $1+1=2$
9. What is Human Genome Project? Why is the Human Genome Project called a Mega project? 2

OR

- Give the characteristics of genetic code. 2
10. How has the bacterium *Bacillus thuringiensis* helped us in controlling caterpillars of insect pests? 2
11. Briefly describe the role of microbes in household food processing. 2
- OR
- List any four harmful effects caused by alcohol or drug abuse. 2

SECTION - C

12. Briefly describe the Meselson and Stahl's experiment to prove that DNA replication is semi-conservative. 3
13. (a) What would happen if a large volume of untreated sewage is discharged into a river? $1\frac{1}{2}$
(b) In what way, anaerobic sludge digestion is important in sewage treatments? $1\frac{1}{2}$
14. Name the causative agent of Amoebiasis. Mention its symptoms and mode of transmission in humans. Also, state any two precautionary measures to be taken to prevent the spread of this disease. <https://www.punjabboardonline.com> $1+1+\frac{1}{2}+\frac{1}{2}=3$

OR

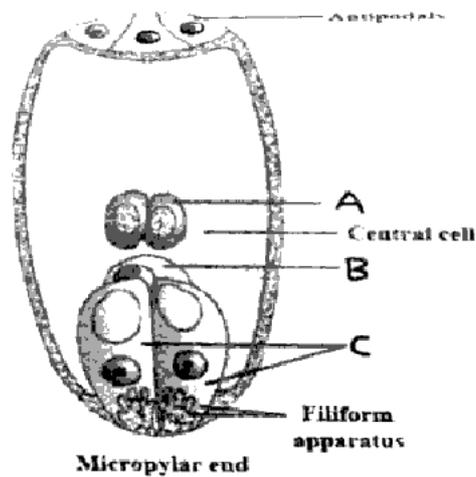
- Name the parasite which causes Malaria. At what stage of its life cycle does it enter into the human body? Mention the symptoms of the disease and two measures that must be taken to control Malaria. $1+1+\frac{1}{2}+\frac{1}{2}=3$
15. (a) What are Intra-uterine devices (IUDs)? Discuss their mode of action. $1+1=2$
(b) What are the measures one has to take to prevent from contracting STDs? 1
- OR
- (a) Differentiate between homozygous and heterozygous individuals. $1\frac{1}{2}$
(b) What is linkage? Discuss any two factors affecting linkage. $\frac{1}{2}+1=1\frac{1}{2}$

SECTION - D

16. What is fertilization? In which part of the human female reproductive system does it occur? Explain, with the help of diagrams, various physical and chemical events of fertilization in humans. $1+1+3=5$

OR

- (a) What is meant by monosporic development of female gametophyte? 1
(b) The given diagram represents the female gametophyte of angiosperms. Observe the diagram carefully and answer the following:

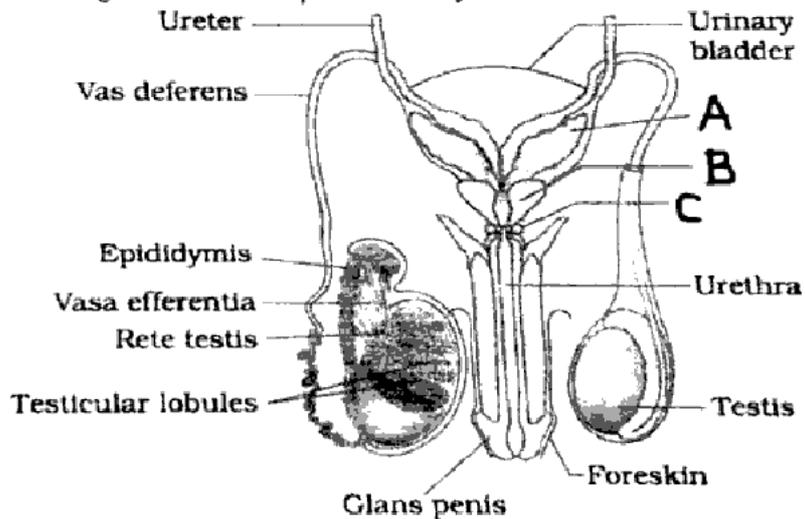


- Name the parts - A, B and C. $\frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 1\frac{1}{2}$
- State the function(s) of filiform apparatus. $\frac{1}{2}$
- Which part of female gametophyte fuses with the male gamete to form primary endosperm nucleus (PEN)? **1**
- What is the ploidy of antipodal cells? **1**

17. (a) Name the mode of pollination by insects. Give any five characteristics of the flowers pollinated by insects. $\frac{1}{2} + 2\frac{1}{2} = 3$
- (b) Differentiate between self-pollination and cross-pollination. **2**

OR

Observe the given diagram of male reproductive system and answer the following questions:



- Label the parts shown and state the function(s) of these parts. the parts as A, B and C
- $1+1+1=3$
- Name the primary sex organs of males and state their functions. $\frac{1}{2} + \frac{1}{2} = 1$
 - Trace the path of flow of sperms from the testes to the outside of male's body. **1**