

CLASS - XII
PRE-MID TERM EXAM (2025 - 26)
SUBJECT – BIOLOGY (044)
SET – A2

Time: 2 hours

M. Marks: 50

General Instructions:

- i. This question paper has five sections and 25 questions.
- ii. All questions are compulsory.
- iii. Section–A has 13 questions of 1 mark each; Section–B has 4 questions of 2 marks each; Section– C has 5 questions of 3 marks each; Section– D has 1 case-based question of 4 marks; and Section–E has 2 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 labeled diagrams should be drawn.

Section - A (1 mark each)

- Q 1. In plants, which one of the following helps in the absorption of phosphorus from soil?
(a) *Glomus*
(b) *Rhizobium*
(c) *Frankia*
(d) *Anabaena*
- Q 2. How many pollen grains and ovules are likely to be formed in the anther and the ovary of an angiosperm bearing 50 microspore mother cells and 50 megaspore mother cells respectively.
(a) 100, 25
(b) 200, 50
(c) 50, 50
(d) 200, 100

Q 3. In humans, the secondary oocyte completes meiotic division when:

- (a) it gets implanted in the uterine endometrium.
- (b) it is released from the matured Graafian follicle.
- (c) it is penetrated by the sperm cell.
- (d) acrosomal enzymes break down the zona pellucida.

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Q 4. In humans rolling of tongue is an autosomal dominant trait (R). In a family both the parents have the trait of rolling tongue but their daughter does not show the trait, whereas the sons have the trait of rolling of tongue. The genotypes of the family would be:

	Mother	Father	Daughter	Son
(a)	Rr	Rr	rr	rr
(b)	Rr	Rr	rr	RR
(c)	rr	Rr	RR	rr
(d)	RR	rr	Rr	Rr

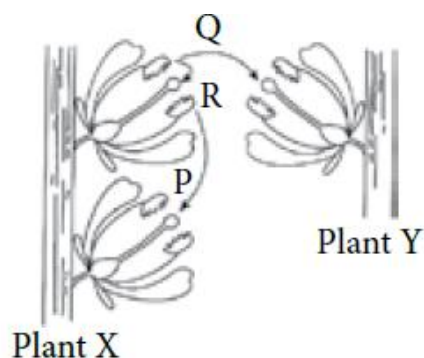
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Q 5. The puffed-up dough of dosa and idli is due to

- (a) Fermentation by bacteria and production of O_2 .
- (b) Hydrolysis by bacteria and production of CO_2 .
- (c) Fermentation by bacteria and production of CO_2 .
- (d) Hydrolysis by bacteria and production of O_2 .

1

Q 6. The diagram given below shows two plants of the same species showing different types of pollination.



Identify the processes P, Q and R.

P	Q	R
(a) Geitonogamy	Cleistogamy	Autogamy
(b) Xenogamy	Chasmogamy	Cleistogamy
(c) Autogamy	Geitonogamy	Xenogamy
(d) Geitonogamy	Xenogamy	Autogamy

1

Q 7. Which of the following statements regarding sex determination are true? In addition to autosomes.

- I. Male grasshoppers have one less sex chromosome than females.
- II. Male birds have one more sex chromosome than female.
- III. Number of sex chromosomes is equal in male and female birds.
- IV. Male grasshoppers have one additional sex chromosome than females.
- V. Male and female grasshoppers have the same number of sex chromosomes.

- (a) I and II
- (b) I and III
- (c) II and IV
- (d) III and V

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Q 8. In humans, mammary gland is divided into _____ lobes.

- (a) 10 – 12
- (b) 25 – 30
- (c) 30 – 35
- (d) 15 – 20

1

Q 9. Match List-I with List-II :

List-I Various Assisted Reproductive Technologies	List-II Process Involved
(A) ZIFT	(I) Formation of embryo <i>in vitro</i> by injecting sperm directly into ovum
(B) ICSI	(II) Transferring of embryo with more than 8 blastomeres into the uterus
(C) IUI	(III) Transferring of fertilised egg up to 8 blastomeres into fallopian tube
(D) IUT	(IV) Transfer of semen from a healthy donor into the uterus artificially

Choose the correct answer from the options given below :

- (a) (A) - (III), (B) - (I), (C) - (II), (D) - (IV)
- (b) (A) - (III), (B) - (I), (C) - (IV), (D) - (II)
- (c) (A) - (II), (B) - (III), (C) - (IV), (D) - (I)
- (d) (A) - (IV), (B) - (III), (C) - (I), (D) - (II)

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Q 10. Which of the following methods of contraception is **not** meant for females?

- (a) IUDs
- (b) Lactational amenorrhea
- (c) Vasectomy
- (d) Condoms

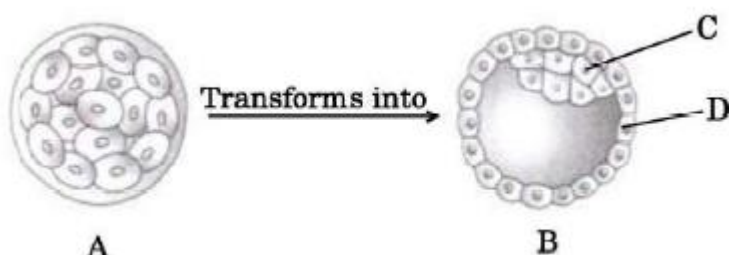
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- Q 11. **Assertion:** PKU leads to mental retardation.
Reason: Phenyl pyruvic acid and their derivatives are accumulated in brain in PKU.
- Both assertion and reason are true, and the reason is the correct explanation of the assertion.
 - Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
 - Assertion is true but reason is false.
 - Both assertion and reason are false.
- 1
- Q 12. **Assertion:** Perisperm is the protective covering of seed which helps in its dispersal.
Reason: A ripened ovary wall forms a pericarp which functions as a fruit wall.
- Both assertion and reason are true, and the reason is the correct explanation of the assertion.
 - Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
 - Assertion is true but reason is false.
 - Assertion is false but reason is true.
- 1
- Q 13. **Assertion:** While working on *Staphylococci*, Alexander Fleming observed that *Penicillium notatum* inhibits the growth of bacteria.
Reason: The inhibiting chemical was commercially extracted and its full potential was established by Alexander Fleming.
- Both assertion and reason are true, and the reason is the correct explanation of the assertion.
 - Both assertion and reason are true, but the reason is not the correct explanation of the assertion.
 - Assertion is true but reason is false.
 - Assertion is false but reason is true.
- 1

Section – B (2 marks each)

- Q 14. How do 'implants' act as an effective method of contraception in human females? Mention their one advantage over contraceptive pills.
- 2
- Q 15. Justify giving reasons for the following:
- A seed of an orange has many embryos.
 - Cashew is a false fruit but Guava is a true fruit.
- 2

Q 16. Study the given diagram:



A is an embryonic stage that gets transformed into B, which in turn gets implanted in the endometrium in human females.

- Identify A, B.
- State the fate of C and D in the course of embryonic development in humans.

2

Q 17. Attempt either option A or B.

A.

- A normal man marries a haemophiliac carrier woman. Write the percentage of carrier daughters and sufferer sons of the disease that could be born to this couple.
- What would happen in case a carrier mother for the disease marries a sufferer man? Explain.

2

OR

B.

Give an example of a gene responsible for multiple phenotypic expressions. What are such genes called? State the cause that is responsible for such an effect.

2

Section – C (3 marks each)

Q 18. Expand PID. Name any two common viral infections transmitted through sexual contact in human females. State TWO contraceptive methods that do not protect against STDs.

3

Q 19. What are the three different parts of a human sperm and write their involvement in the process of fertilisation.

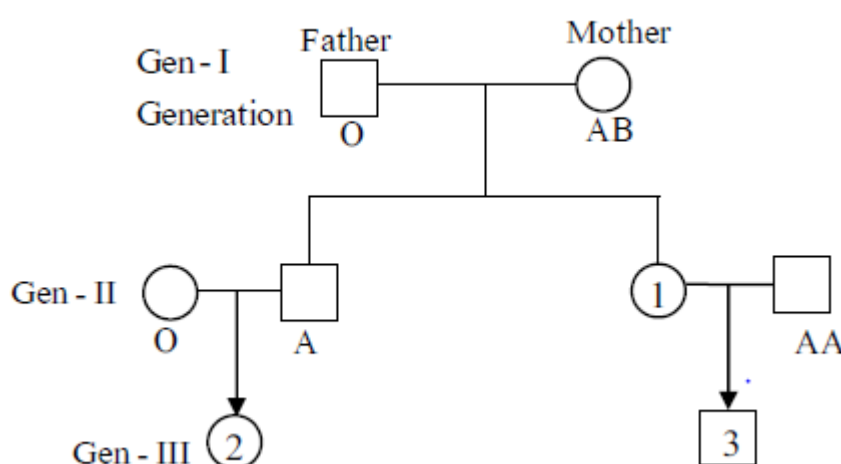
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Q 20. Identify a, b, c, d, e and f in the table given below:

Sl. No.	Organism	Bioactive Molecule	Use
1.	<i>Monascus purpureus</i>	a	b
2.	c	d	Antibiotic
3.	e	Cyclosporin A	f

3

Q 21. Given below is the pedigree chart up to 3 generations (Generation I, Generation II, Generation III) of a family with respect to their blood groups.



(a) Mention the blood group along with the genotype of the offspring numbered '1' in Generation II.

(b) Write the possible blood groups along with their genotypes of the offsprings numbered '2' and '3' in Generation III.

3

Q 22. (a) Distinguish between the two cells enclosed in a mature male gametophyte of an angiosperm.

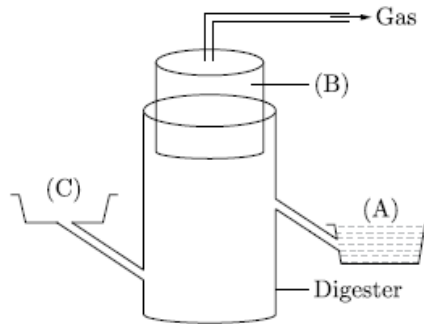
(b) How are 'pollen banks' useful?

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Section – D (4 marks)

Q.no 23 is a case-based question. This question has subparts with internal choice in one subpart.

Q 23. Villagers in a place near Bhiwadi started planning to make power supply for agricultural purposes from cow dung. They have started a biogas plant for the purpose. Study the picture of biogas plant given below and answer the questions that follow :



- (a) Name the parts labelled as B & C.
 (b) Mention the group of bacteria involved in the production of biogas and the condition in which they act on the raw material to produce the biogas.

Attempt either subpart (c) or (d)

- (c) How is biogas generated from activated sludge?

OR

- (d) Name the two institutes which developed the technology of biogas production in India. Mention two main components of biogas.

4

Section – E (5 marks)

Q 24. Attempt either option A or B

A.

- (a) Draw a L.S. of a typical anatropous ovule labelling at least eight major parts in it.
 (b) Number of chromosomes in an onion plant cell is 16. Name the cells of the embryo sac having 16 and 24 chromosomes formed after fertilization.

5

OR

B.

- (a) Differentiate between spermatogenesis and oogenesis in humans starting from primary spermatocyte and primary oocyte up to the respective gamete formation.
 (b) Draw a labelled diagram of a human ovum.

5

Q 25. Attempt either option A or B

A.

- (a) Write the symptoms of Thalassaemia in humans. How is the disease caused ? Explain.
 (b) Thalassaemia and sickle cell anemia are both blood related diseases in humans but very different. How ?

5

OR

B.

- (a) A true-breeding pea plant, homozygous for tall plants with round seeds is crossed with another pea plant with dwarf plants with wrinkled seeds (ttrr). What would be the phenotypes and genotypes of F1 and F2 generations? Give the phenotypic ratio of F2 generation.
- (b) State the generalisation proposed by Mendel on the basis of the above mentioned cross.