



Delhi Public School, Howrah

PERIODIC TEST I (2025-2026)

Class-XII

Care must be taken not to write anything on the question paper. All the questions must be attempted in the correct sequence.

Subject: - Biology (Code No. 044)

Time: -3 Hours

F.M.-70

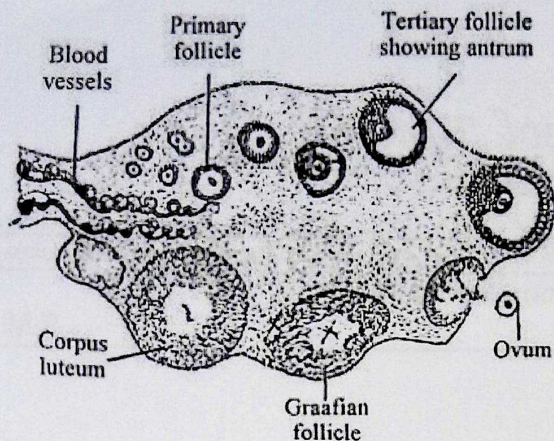
General Instructions:

- All questions are compulsory.
- The question paper has five sections and 33 questions. All questions are compulsory.
- 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.
- 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.
- Wherever necessary, neat and properly labeled diagrams should be drawn.

Q. No.	SECTION A Q. No. 1 to 12 are multiple choice questions. Only one of the choices is correct. Select and write the correct choice as well as the answer to these questions.	Marks
1.	A plant breeder wants to produce hybrids between two genetically different plants. Which condition must be ensured for successful hybridization? A. Cleistogamy B. Geitonogamy C. Artificial emasculation and pollination D. Parthenogenesis	1
2.	In a certain plant, red fruit (R) is dominant over yellow fruit (r) and tallness (T) is dominant over shortness (t). If a plant with RRTt genotype is crossed with a plant rrtt genotype, what will be the percentage of tall plants with red fruits in the progeny? A. 50% B. 100% C. 75% D. 25%	1
3.	A couple is unable to conceive due to blockage in the fallopian tubes of the female partner. Which assisted reproductive technique is most appropriate? A. IVF followed by embryo transfer B. IUI (Intrauterine Insemination) C. Test-tube baby using intrauterine fertilization D. Natural ovulation monitoring	1
4.	A doctor observes that a male patient has low sperm count but normal hormone levels and secondary sexual characters. Which of the following structures is most likely defective? A. Testes B. Vas deferens C. Pituitary gland D. Seminal vesicle	1

5. Identify the wrongly labelled part in the diagram given below:

1



- A. Primary follicle
- B. Ovum
- C. Graafian follicle
- D. Corpus luteum

6. The base pairs of DNA double helix is given below. Select the suitable mRNA strand that derived from transcription

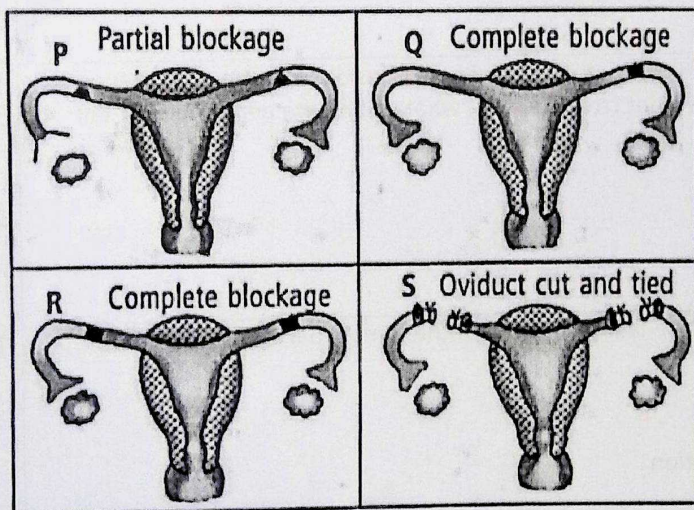
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3'-ATTTC-5'
5'-TAAAGG-3'

- A. UAAAGG
- B. CUUUCC
- C. GAAAGG
- D. CCUUUC

7. The diagram given below shows the uterine tubes of four women (P, Q, R and S). In which two women is fertilisation impossible at present?

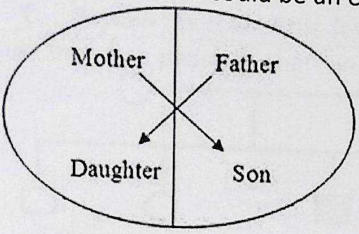
1



- A. P and Q
- B. Q and R
- C. R and S
- D. S and P

8. Which of the following statements indicates the parallelism in genes and chromosomes?
I) They occur in pairs.
II) They segregate during the gamete formation.

1

	III) They show linkage. IV) The independent pairs segregate independently. A. (I) and (III) B. (II) and (III) C. (I), (III) and (III) D. (I), (II) and (IV)	
9.	A zygote undergoes cleavage and forms a 16-celled stage called morula. If one cell divides every 12 hours starting from 1 cell, how long will it approximately take to reach the stage of morula? A. 12 hours B. 24 hours C. 36 hours D. 48 hours	1
10.	Represented below is the inheritance pattern of a certain type of trait in humans. Which one of the following conditions could be an example of this pattern?  A. Thalassemia B. Sickle Cell anemia C. Haemophilia D. Phenyl ketonuria	1
11.	A flower undergoes successful double fertilization, but due to a mutation, the ovule's integuments do not develop. What will be affected most from the following? A. Embryo formation B. Fruit development C. Endosperm formation D. Seed coat formation	1
12.	What were the main criteria taken under consideration for the experiment by Hershey and Chase? A. DNA contains phosphorus, protein contains sulphur. B. Protein contains phosphorus, DNA contains sulphur. C. Both DNA and protein contains phosphorus and not sulphur. D. Both DNA and protein contains sulphur and not phosphorus.	1
	Question No. 13 to 16 consist of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below: 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. A is False but R is true.	
13.	Assertion (A): 'Saheli' is an oral pill which has high contraceptive value and very little side effects. Reason (R): It contains progestin, with no estrogen and non-steroidal preparation.	1
14.	Assertion (A): Phenylpyruvic acid is excreted through urine in case of phenylketonuria. Reason (R): The affected individual lacks enzyme phenylalanine hydroxylase.	1
15.	Assertion (A): Scaffold proteins are nonhistone chromosomal proteins. Reason (R): They are rich in lysine and arginine.	1
16.	Assertion (A): Fimbriae are finger-like projections of the infundibulum part of oviduct which is closest to ovary. Reason (R): They are important for collection of ova after ovulation from ovary.	1

SECTION B

17. Explain haplodiploidy in honey bee along with the relevant diagram. 2
18. Attempt either option A or B. 2
- A. Draw a well labelled diagram of transverse section of young anther.
- OR
- B. Represent the stages of a microspore maturing into a pollen grain through a diagram.
19. Go through the newspaper image given below carefully and answer the following questions: 2

The Daily Science Chronicle

MAY 15, 2024

Amniocentesis Rates on Rise as Prenatal Testing Becomes More Common

Medical use of the procedure grows—but ethical concerns remain

NEW DELHI—The rate of amniocentesis procedures has been increasing across the country as more expectant parents turn to prenatal screening to diagnose genetic disorders, according to medical professionals.

Amniocentesis fens involves inserting a thin needle into the uterus to sample amniotic fluid such as Down syndrome, and neural tube defects.

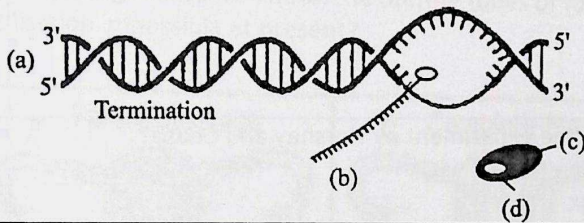
Ethics experts warn about the potential misuse of the procedure for sex selection, which remains a significant issue despite legal restrictions.

Ethics experts warn about the potential misuse of the procedure for sex selection, which remains a significant issue.



- A. What is the medical purpose of amniocentesis, and how does it assist in prenatal care?
- B. Explain how misuse of amniocentesis for sex selection violates ethical standards and Indian law.

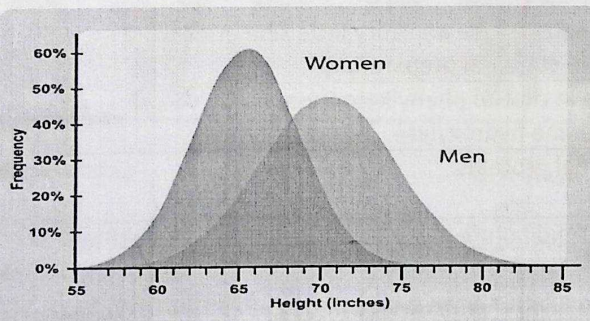
20. The process of termination during transcription in a prokaryotic cell is being represented here. Name the label a, b, c and d. 2

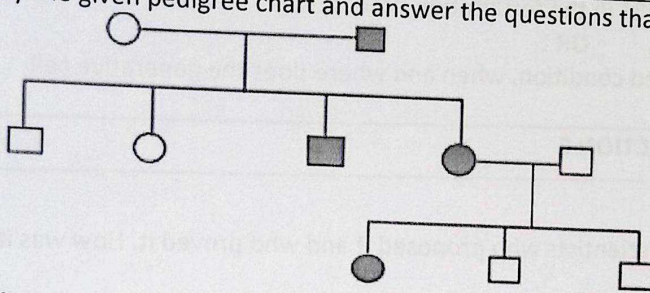
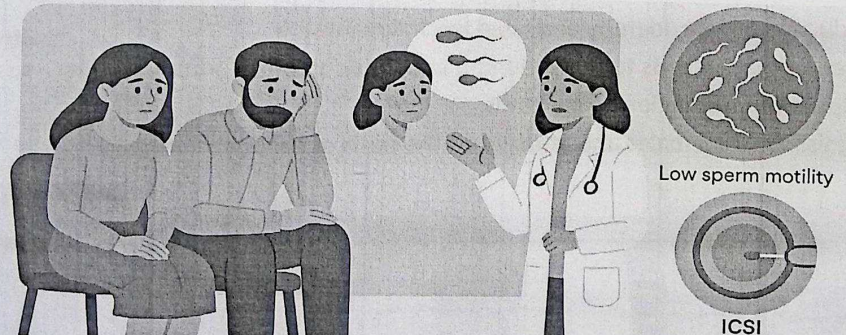


21. Attempt either option A or B. 2
- A. Mention any four objectives of RCHC.
- OR
- B. How are non-medicated IUDs different from hormone-releasing IUDs? Give examples.

SECTION C

22. The graph given below shows the distribution of height in adult men and women. Observe the picture carefully and answer the following questions: 3



	A. What kind of inheritance pattern is illustrated here? B. How does this distribution differ from Mendelian traits? C. What role does the environment play in this type of inheritance?	
23.	A. Coconut Palm is monoecious while Date Palm is dioecious. Why are they called so? B. Banana is a parthenocarpic fruit whereas oranges show polyembryony. How are they different from each other with respect to seeds? C. The flower of Brinjal is referred to as chasmogamous while that of Bean is cleistogamous. How are they different from each other.	3
24.	A woman in labor is observed to have weak uterine contractions and delayed delivery, even though the fetus is fully developed. A. Based on the neuroendocrine mechanism of parturition, what could be a possible hormonal cause of this issue? B. Suggest a suitable medical intervention and explain how it helps, based on the feedback mechanism involved. C. Explain the role of the fetal ejection reflex in initiating parturition.	3
25.	Study the given pedigree chart and answer the questions that follow:  A. Is the trait recessive or dominant? B. Is the trait sex-linked or autosomal? C. Give the genotypes of the parents shown in generation I and their third child shown in generation II and the first grandchild shown in generation III.	3
26.	A. State one reason, why breastfeeding the baby acts as a natural contraceptive for the mother. B. Why is Cu-T considering a good contraceptive device to space children? Mention two points.	3
27.	Draw a labeled schematic sketch of replication fork of DNA. Explain the role of the enzymes involved in DNA replication.	3
28.	A. A bilobed, dithecous anther has 100 microspore mother cells per microsporangium. How many male gametophytes this anther can produce? B. Micropyle remains as a small pore in the seed coat of a seed. Why?	3
SECTION D		
29.	A couple undergoes fertility testing and discovers that the male partner has very low sperm motility. The fertility specialist recommends ICSI as a suitable ART procedure.  A. What is ICSI and how is it different from IVF?	4

	B. Why is ICSI preferred in cases of low sperm motility? What risks might be associated with manipulating gametes in the lab? <u>Attempt either subpart C or D</u> C. Identify one social challenge couples might face when opting for ARTs. OR D. Explain one psychological impact that repeated ART failures might have on a couple.	
30.	Pollen-pistil interaction plays a crucial role in successful fertilization in flowering plants. While pollination helps in transferring pollen grains to the stigma, not all pollen grains are suitable. The pistil identifies whether the pollen is compatible (right type) or incompatible (wrong type). A. Why is it important for the pistil to recognize compatible pollen, and how does this recognition affect fertilization? B. How can the study of pollen-pistil interaction be useful in developing new plant hybrids? <u>Attempt either subpart C or D</u> C. In what way does the filiform apparatus assist in the fertilization process? OR D. If a plant species sheds pollen in a two-celled condition, when and where does the generative cell divide?	4
SECTION E		
31.	<u>Attempt either option A or B.</u> A. 'DNA replication is semiconservative'. Name the scientists who proposed it and who proved it. How was it proved experimentally? (Along with diagram) OR B. (i) Describe the various steps of Griffith's experiment that led to the conclusion of the 'Transforming principle'. (ii) How did the chemical nature of the 'transforming principle' get established?	5
32.	<u>Attempt either option A or B.</u> A. I. Draw the diagram of female reproductive system. Identify and label the following: (i) The edges of the infundibulum which help in collection of the ovum after ovulation. (ii) Small canal that connects the uterus and vagina. II. Name the muscular and glandular layers of human uterus. III. What is the function of the alveoli in the mammary gland? OR B. I. Draw the diagram of male reproductive system. Identify and label the following: (i) The epididymis leads to the structure that ascends to the abdomen and loops over the urinary bladder. (ii) The secretions of this gland helps in the lubrication of the penis. II. Differentiate between gametogenesis in human males and females on the basis of products formed at the end of the process. III. What is urethral meatus?	5

33. Attempt either option A or B.

5

- A. (i) A man with blood group A married a woman with B group. They have a son with AB blood group and a daughter with blood group O. Work out the cross and show the possibility of such inheritance.
(ii) State and explain the law of segregation as proposed by Mendel in a monohybrid cross.
(iii) Two pea plants with genotype RrYy are crossed. Out of 320 total offspring, how many will be homozygous for both traits?

OR

- B. (i) A plant of *Antirrhinum majus* with red flowers was crossed with another plant of the same species with white flowers. The plants of the F_1 generation bore pink flowers. Explain the pattern of inheritance with the help of a cross till F_2 generation.
(ii) What are 'true-breeding lines' that are used to study inheritance pattern of traits in plants?
(iii) In a garden, a geneticist plants 800 pea plants from a dihybrid cross. How many plants are expected to show dominant traits for only one character (either shape or colour, but not both)?