

## O. P. JINDAL SCHOOL, SAVITRI NAGAR

## कक्षा बारहवीं प्री बोर्ड I परीक्षा (2025-26)

## PRE-BOARD I Examination for Class XII (2025-26)

## Subject: Biology (044)

M.M.-70

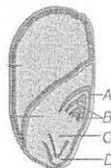
Time: 3 Hours

**General Instructions:**

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions.
- (iii) 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.
- (iv) There is no overall choice. Answer all 33 questions. 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 Select the correct sequence for transport of sperm cells in male reproductive system. 1
  - (a) Seminiferous tubules → Rete testis → Vasa efferentia → Epididymis → Vas deferens → Ejaculatory duct → Urethra → Urethral meatus
  - (b) Seminiferous tubules → Vasa efferentia → Epididymis → Inguinal canal → Urethra
  - (c) Testis → Epididymis → Vasa efferentia → Vas deferens → Ejaculatory duct → Inguinal canal → Urethra → Urethral meatus
  - (d) Testis → Epididymis → Vasa efferentia → Rete testis → Inguinal canal → Urethra
- 2 Identify the parts labelled as A to D in structure of seed given below. 1



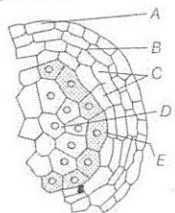
- (a) A-Coleoptile, B-Plumule, C-Radicule, D-Coleorhiza
  - (b) A-Plumule, B-Coleoptile, C-Coleorhiza, D-Radicule
  - (c) A-Coleorhiza, B-Radicule, C-Plumule, D-Coleoptile
  - (d) A-Radicule, B-Plumule, C-Coleoptile, D-Coleorhiza
- 3 Identify the type of pistil in the diagram. 1



- (a) Multicarpellary, apocarpous
  - (b) Multicarpellary, syncarpous
  - (c) Multicarpellary, pistillate
  - (d) Monocarpellary, apocarpous

4 Identify A to E in the following diagram:-

1



(a) A–Tapetum, B–Microspore mother cell, C–Middle layer, D–Endothecium, E–Epidermis

(b) A–Epidermis, B–Middle layer, C–Microspore mother cell, D–Tapetum, E–Endothecium

(c) A–Middle layer, B–Epidermis, C–Tapetum, D–Microspore mother cell, E–Endothecium

(d) A–Epidermis, B–Endothecium, C–Middle layer, D–Microspore mother cell, E–Tapetum

5 Test cross involves a cross between

1

(a) recessive F1 -plant and dominant F2 -plant

(b) recessive F2 -plant and dominant F3 -plant

(c) dominant F2 -plant and recessive parent plants

(d) dominant F2 -plant and heterozygous parent plants

6 Implants (the progesterone or progesterone-oestrogen combination) are used by the females usually under the

1

(a) skin of the inner arm above elbow

(b) vagina

(c) upper skin of stomach

(d) cervix

7 Amniocentesis is the detection of

1

(a) chromosomal pattern by taking amniotic fluid

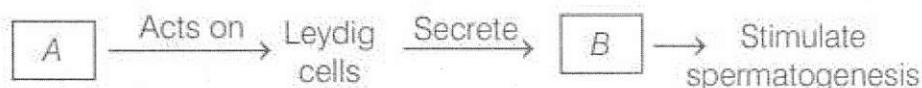
(b) chorionic fluid from developing embryo

(c) chromosomal pattern after childbirth

(d) chromosomal pattern before fertilisation

8 Give the name of two hormones A and B in the figure given below.

1



(a) FSH and GH (b) LH and androgens (c) GH and LH (d) GH and lactic acid

9 The conclusions drawn by Darwin and Wallace were

1

(a) All existing life forms share similarities and common ancestors

(b) The ancestors of existing life forms were present at different periods in the history of earth

(c) The geological history of earth correlates with the biological history of earth

(d) All of the above

10 Viruses having RNA genome and having shorter lifespan, mutate and evolve faster because

1

(a) RNA is unstable and mutates at faster rate

(b) RNA is stable and mutates at faster rate

(c) RNA is stable and mutates at slower rate

(d) RNA is unstable and mutates at slower rate

- 11 Thymine is also called 1  
(a) 2 methyl uracil (b) 3 methyl uracil  
(c) 4 methyl uracil (d) 5 methyl uracil

- 12 Which of the following are chromosomal disorders. I. Colour blindness II. Down's syndrome 1  
III. Phenylketonuria IV. Turner's syndrome V. Thalassaemia  
(a) I, II and III (b) II, IV and V  
(c) III, IV and V (d) II and IV

In each of the following questions, a statement of Assertion (A) is given and followed by corresponding statement of Reason (R). Of the statements, mark the correct answer as

- (a) If both A and R are true and R is the correct explanation of the A  
(b) If both A and R are true, but R is not the correct explanation of the A  
(c) If A is true, but R is false  
(d) If A is false, but R is true
- 13 Assertion (A) In commensalism, one organism is benefitted and other is unaffected. 1  
Reason (R) Cattle egret bird and cattle is an example of commensalism.
- 14 Assertion (A) ADA deficiency disorder is caused due to the excessive synthesis of gene for adenosine deaminase. 1  
Reason (R) It affects the human immune system.
- 15 Assertion (A) Foreign DNA and vector DNA cut with the help of ligase. 1  
Reason (R) Ligase acts by forming phosphodiester bonds
- 16 Assertion (A) The presence of hCG in woman urine is the basis for pregnancy test. Reason (R) A woman passes out hCG in the urine during pregnancy. 1

### SECTION B

- 17 In a pond there were 20 Hydrilla plants. Through reproduction 10 new Hydrilla plants were added in a year. Calculate the birth rate of the population. 2

**OR**

State Gause's competitive exclusion principle.

- 18 Mention the number of primers required in each cycle of polymerase chain reaction (PCR). Write the role of primers and DNA polymerase in PCR. 2

**OR**

(a) Write the palindromic nucleotide for the following DNA segment : 5'-GAATTC-3' (b) Name the restriction endonuclease that recognises this sequence.

- 19 A patient showed symptoms of sustained high fever, stomach pain and constipation, but no blood clot in stools. Name the disease and its pathogen. 2  
Write the diagnostic test for the disease. How does the disease get transmitted?

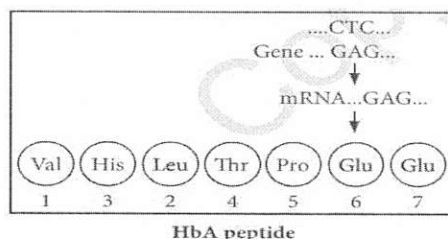
**OR**

What is colostrum? Why are breast-fed babies likely to be healthy?

- 20 Why did Meselson and Stahl use  $^{14}\text{N}$  and  $^{15}\text{N}$  isotopes in the sources of nitrogen present in the culture medium in their experiment? 2
- 21 How many kinds of phenotypes would you expect in F<sub>2</sub> generation in a monohybrid cross exhibiting co-dominance? 2

### SECTION C

- 22 (a) Explain 'standing crop' in an ecosystem. 3  
(b) Construct a pyramid of numbers considering a big banyan tree supporting a population of insects, small birds and their predators.
- 23 A and B are the two different cloning vectors in two different bacterial colonies cultured in chromogenic substrate. Bacterial colonies with cloning vector A were colourless whereas those with B were blue coloured. Explain giving reasons the cause of the difference in colour that appeared. 3
- 24 (a) Name the infective stage of Plasmodium which Anopheles mosquito takes in along with the blood from an infected human. 3  
(b) Why does the infection cause fever in humans?  
(c) Give a flow chart of the part of the lifecycle of this parasite passed in the insect
- 25 A team of students is preparing to participate in the interschool sports meet. During a practice session you find some small glass containers with labels of certain cannabinoids. 3  
(a) Will you report to the authorities? Why?  
(b) Name a plant from which such chemicals are obtained.  
(c) Write the effect of these chemicals on human body.
- 26 (a) How does the Hardy-Weinberg's expression ( $p^2 + 2pq + q^2 = 1$ ) explain that genetic equilibrium is maintained in a population? 3  
(b) List any two factors that can disturb the genetic equilibrium.
- 27 Given below is the representation of amino acid composition of the relevant translated portion of beta-chain of haemoglobin, related to the shape of human red blood cell:- 3



- (a) Is this representation indicating a normal human or a sufferer from certain related genetic disease? Give reason in support of your answer.  
(b) What difference would be noticed in the phenotype of the normal and the sufferer related to this gene?  
(c) Who are likely to suffer more from the defect related to the gene represented the males, the females or both males and females equally? And why?

- 28 Double fertilisation is reported in plants of both castor and groundnut. However, the mature seeds of groundnut are non-albuminous and castor are albuminous. Explain the post fertilisation events that are responsible for it. 3

### SECTION D

- 29 The most serious aspect of the loss of biodiversity is the extinction of species. Extinction is of three types – natural extinction, mass extinction and anthropogenic extinction. Natural or background extinction is a slow process of replacement of existing species with the better adapted species due to alternate evolution, changes in environmental conditions, predators and diseases. Earth has experienced five mass extinctions due to environmental catastrophes. Anthropogenic extinctions are extinctions abetted by human activities like settlements, hunting, over exploitation and habitat destruction. 4
- (a) Why is there a need to conserve biodiversity?
- (b) Differentiate between in situ and ex situ approaches of conservation of biodiversity.
- (c) How is the 'Sixth Extinction', presently in progress, different from the previous episodes?

**OR**

Who is mainly responsible for the 'Sixth Extinction'?

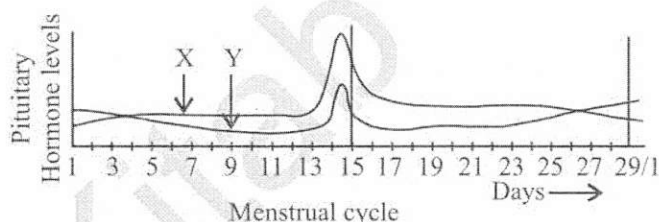
- 30 A variety of products in enormous amounts are produced by microbes such as – beverages (alcoholic and non alcoholic), antibiotics, organic acids, enzymes, vitamins, hormones, amino acids, vaccines and steroids. 4
- (a) why are bottled fruit juices clearer as compared to those made at home?
- (b) Identify A, B, C and D in the table given below :

| Micro-organism                | Product        | Biological Activity | Medical Ailment/ Procedure |
|-------------------------------|----------------|---------------------|----------------------------|
| A                             | Strep-tokinase | C l o t - buster    | B                          |
| <i>Trichoderma polysporum</i> | C              | D                   | Transplant surgery         |

- (c) Mention a product of human welfare obtained from: *Saccharomyces cerevisiae* **OR** *Propionibacterium sharmanii* .

### SECTION E

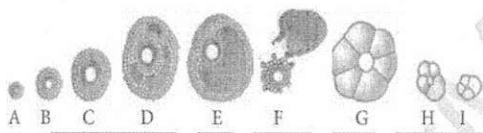
- 31 Study the graph given below and answer the questions that follow:- 5



- (a) Name the hormones 'X' and 'Y'.
- (b) Identify the ovarian phases during a menstrual cycle
- (i) 5th day to 12th day of the cycle
- (ii) 14th day of the cycle
- (c) Explain the ovarian events (i), (ii) and (iii) under the influence of hormones 'X' and 'Y'.

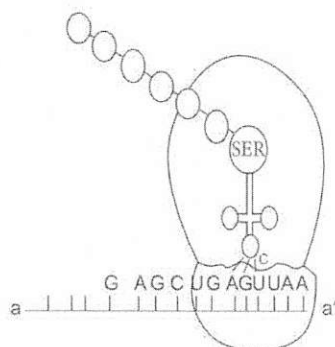
OR

The following is the illustration of the sequence of ovarian events "A" to "I" in a human female



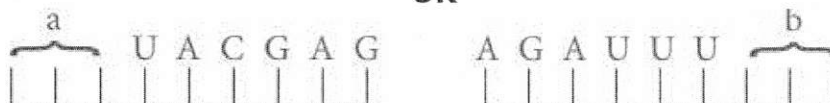
- Identify the figure that illustrates ovulation and mention the stage of oogenesis it represents.
- Name the ovarian hormone and the pituitary hormone that have caused the above mentioned event.
- Explain the changes that occur in the uterus simultaneously in anticipation.
- Write the difference between 'C' and 'H'.
- Draw a labelled sketch of the structure of a human ovum prior to fertilisation.

32



- Identify the polarity from a to a' in the above diagram and mention how many more amino acids are expected to be added to this polypeptide chain.
- Mention the DNA sequence coding for serine and the anticodon of tRNA for the same amino acid.
- Why are some untranslated sequence of bases seen in mRNA coding for a polypeptide? Where exactly are they present on mRNA?

OR



Study the mRNA segment given above which is complete to be translated into a polypeptide chain.

- Write the codons 'a' and 'b'.
- What do they code for?
- How is peptide bond formed between two amino acids in the ribosome?

- Name the source from which insulin was extracted earlier. Why is this insulin no more used by diabetic people?
  - Explain the process of synthesis of insulin by Eli Lilly company. Name the techniques used by the company.
  - How is the insulin produced by human body different from the insulin produced by the above mentioned company?

OR

- Tobacco plants are damaged severely when infested with *Meloidogyne incognita*. Name and explain the strategy that is adopted to stop this infestation.
- Name the vector used for introducing the nematode specific gene in tobacco plant.
- Describe any three potential applications of genetically modified plants