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INDIAN SCHOOL SALALAH
FIRST TERM EXAMINATION – SEPTEMBER 2025



BIOLOGY-044

Class: XII

Date: 30.9.25

Time: 3hrs.

Maximum Marks:70

General Instructions:

- (i) All questions are compulsory.
- (ii) The question paper has five sections and 33 questions. All questions are compulsory.
- (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. 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 homologous structures from the combinations given below. 1
- i) Forelimbs of whales and bats
 - ii) tuber of potato and sweet potato
 - iii) eyes of octopus and mammals
 - iv) thorns of bougainvillea and tendrils of cucurbita
- a) i) and ii)
 - b) ii) and iv)
 - c) ii) and iii)
 - d) i) and iv)
- 2 Which type of selection is industrial Melanism observed in moth, Biston betularia? 1
- (a) Stabilising
 - (b) Directional
 - (c) Disruptive
 - (d) Artificial

- 3 Which of the following are the reasons for rheumatoid arthritis? **1**
- i) The ability to differentiate pathogens
 - ii) Body attacks self- cells.
 - iii) More antibodies are produced in the body
 - iv) The ability to differentiate foreign molecules from self-cells is lost
- a) i) and ii)
 - b) ii) and iv)
 - c) iii) and iv)
 - d) i) and iii)
- 4 To which type of barriers under innate immunity do the saliva in the mouth and tears from the eyes belong. **1**
- a) Physiological barrier
 - b) Physical barrier
 - c) Cytokine barrier
 - d) Cellular barrier
- 5 Test tube baby implies which of the following techniques? **1**
- a) IUI
 - b) ICSI
 - c) GIFT
 - d) ZIFT
- 6 Match the IUD of column 1 with suitable example of column 2: **1**
- | Column 1 | Column 2 |
|-----------------------------|-------------------------|
| A) Non medicated | 1. LNG-20 |
| B) Copper releasing | 2. Multiload-375 |
| C) Hormone releasing | 3. Lippes loop |
- Choose the correct option.
- a) A-3, B-2, C-1
 - b) A-1, B-2, C-3
 - c) A-1, B-3, C-2.
 - d) A-2, B-3, C -1
- 7 Failure of segregation of chomatids during cell division cycle results in the gain or loss of a chromosome(s) is called **1**
- a) Female heterogamety
 - b) Male heterogamety
 - c) Aneuploidy
 - d) None of the above

- 8 **Select the incorrectly matched pair.** **1**
- Initiation codons – AUG.
 - Stop codons – UAA, UAG, UGA
 - Methionine – AUG
 - Anticodons – mRNA.
- 9 During microsporogenesis, meiosis occurs in **1**
- Microspore mother cells
 - Endothecium
 - Pollen grains
 - Microspore tetrads
- 10 **1**
- | RNA Base | G | C | U | A | C | G | G | A | G | C | U | U | C | G | G | A | G | C | U | A | G |
|-----------|---------|---|---|-----------|---|---|-----------|---|---|---------|---|---|----------|---|---|---------|---|---|---------|---|---|
| Codon | Codon 1 | | | Codon 2 | | | Codon 3 | | | Codon 4 | | | Codon 5 | | | Codon 6 | | | Codon 7 | | |
| Aminoacid | Alanine | | | Threonine | | | Glutamate | | | Leucine | | | Arginine | | | Serine | | | Stop | | |
- Which among the following would cause a frameshift mutation?
- substitution of A by C in codon 2
 - insertion of G after C in codon 4
 - insertion of GCU after C in codon 6
 - deletion of codon 3, GAG.
11. The process of release of spermatozoa from Sertoli cells into cavity of the seminiferous tubules is called **1**
- Spermiogenesis
 - Spermiation
 - Spermatogenesis
 - Spermatocytogen
12. The large holes in swiss cheese are due to production of large amount of CO₂ by **1**
- Penicillium notatum
 - Streptococcus
 - Propionibacterium sharmanii
 - Trichoderma polysporum

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 and 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:** Phenylketonuria is an autosomal recessive disease. 1

Reason: The affected individual lacks an enzyme that converts phenyl alanine to tyrosine

14. **Assertion:** Theory of chemical evolution proposed that life comes from pre-existing nonliving organic molecules. 1

Reason: The primitive earth conditions led to production of organic molecules.

15. **Assertion:** Morphine is useful for patients with depression 1

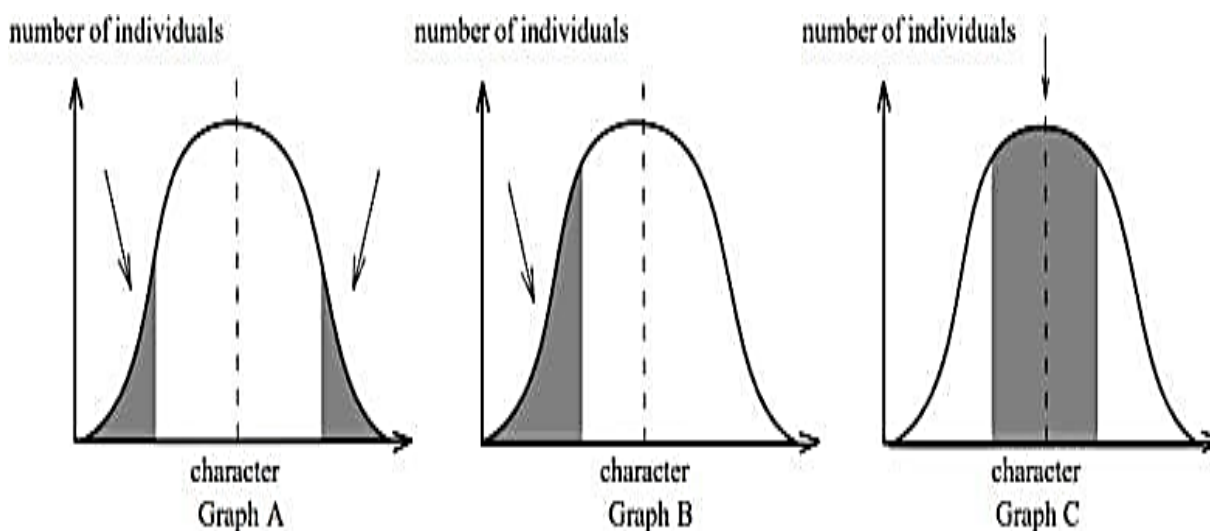
Reason: Morphine is a very effective sedative painkiller

16. **Assertion:** An antibody is represented by H2 L2. 1

Reason: Each antibody is made of four peptide chains.

SECTION B

17. 2



The graphs below show three types of natural selection. The shaded areas marked with arrows show the individuals in the population which are not selected. The dotted vertical lines show the statistical means.

a) What names are given to the types of selection shown in graphs A, B and C?

b) After the selection has operated for several generations in the above populations indicated as

Graph A, B and C, graphically illustrate the probable results.

18. A person shows the condition of chronic inflammation of the lower limbs. 2
- a) What is the above disease called as?
- b) Name the organism and the vector responsible for it.
19. a) Prokaryotic transcription is less complex than in eukaryotes. Give any two reasons. 2
- b) Only one strand of DNA takes part in transcription. Give two reasons.
20. A bilobed, dithecous anther has 500 microspore mother cells per microsporangium. 2
- How many male gametophytes this anther can produce?
21. I. 2
- Give reason;
- a) There is approximately uniform distance between the two strands of the helix.
- b) Transcription occurs in only one strand of the DNA.

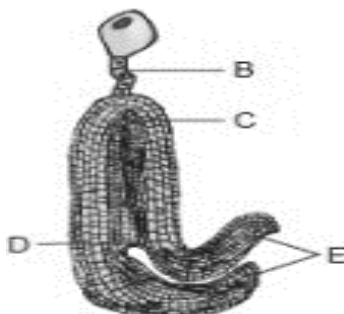
OR

II.

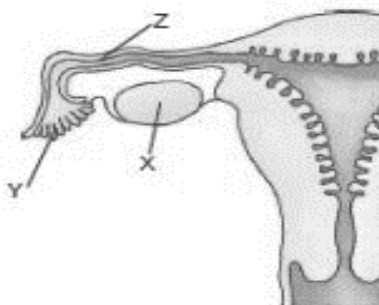
- a) Prokaryotic transcription is less complex than eukaryotic transcription.
- b) Polygenic inheritance is also called quantitative inheritance.

SECTION C

22. 3



- a) Identify the given figure and also identify B to E.
- b) State the function of E.
23. I. The diagram shows a part of the human female reproductive system. 3
- (a) Name the gamete cells that would be present in 'X', if taken from a newborn baby.
- (b) Name 'Y' and write its function.
- (c) Name 'Z' and write the events that take place here.

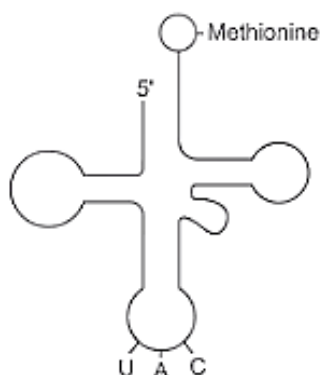


OR

II. Give reason for the following.

- a) Formation of polar bodies occur in oogenesis.
- b) In human, oogenesis though starts in the ovary gets completed in the fallopian tube.
- c) Placenta acts as an endocrine tissue.

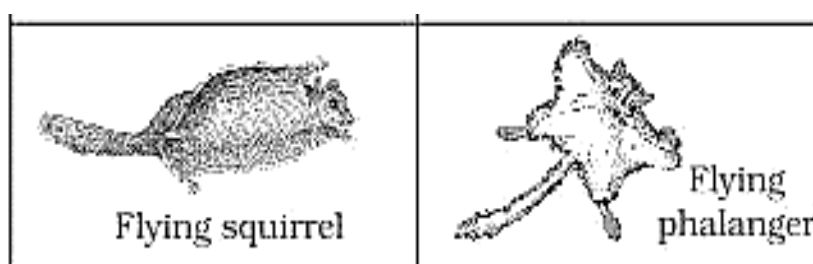
24.



3

- a) Identify the given figure and what is UAC shown called as?
- b) What will be the triplet codon on the mRNA to which the above will bind?
- c) State the importance of this process.

25.



3

Sometimes two groups of organisms as shown above develop resemblances. Explain the phenomena in terms of evolution.

26. A true breeding pea plant, homozygous dominant for **Yellow seeds (YY)** is crossed with another pea plant with **Green seeds (yy)**.

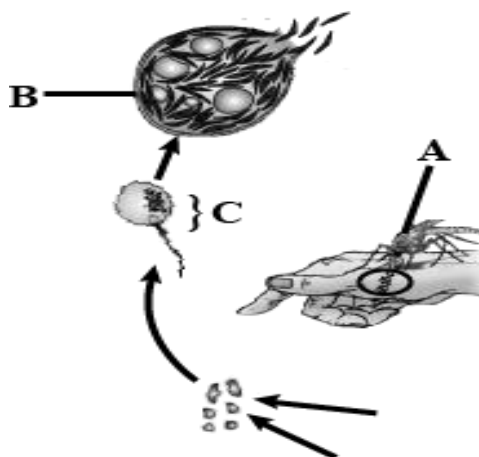
3

- a) With the help of Punnett square show the above cross and mention the results obtained phenotypically and genotypically in the F_2 generation.
- b) State the law which can be depicted by the cross.

27. A village health worker was taking a session with women. She tells the women that one has to be very careful while using oral pills as method of birth control. Wrong usage can actually promote conception.

3

- (a) Analyze the statement and compare the merits and demerits of using oral pills and surgical methods of birth control.
- (b) Village women confused as to how a thin metallic Copper loop can provide protection against pregnancy. Justify the use explaining the mode of action of IUDs.



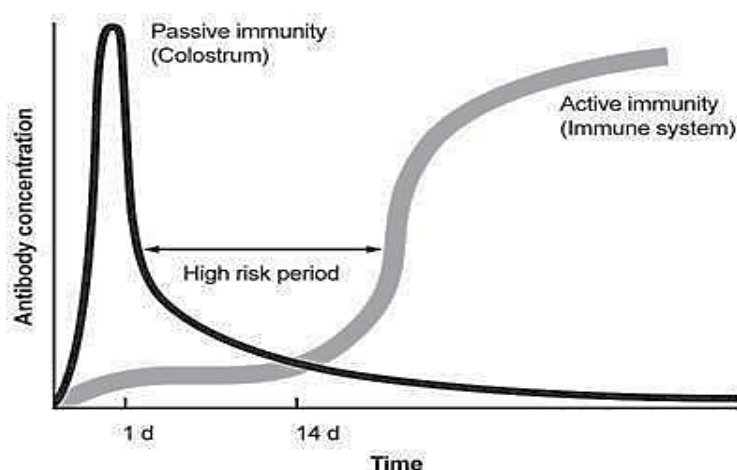
Study a part of the life cycle of malarial parasite given. Answer the questions that follow.

- Mention the role of A in the life cycle of the malarial parasite.
- Name the event C and the organ where this event occurs.
- Identify the organ B and name the cells being released from it.

SECTION D

29.

4



The graph shows the Antibody concentration in young calves.

Study the graph and answer the questions that follow:

- What do you think is the difference between passive and active immunity in this case? (1)
- What happens to passive immunity as days go by and why? (1)

Attempt either subpart C or D.

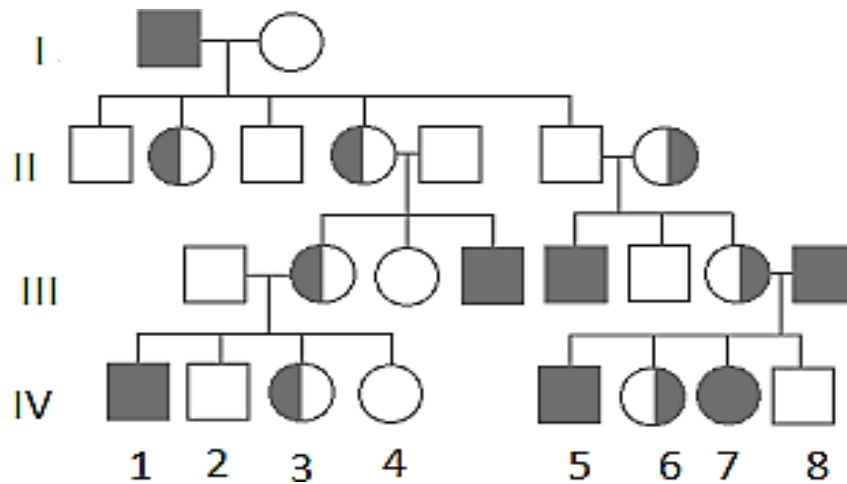
- What kind of trend does active immunity show and why?

OR

- What kind of immunity will be observed when a vaccine is administered to the calf and why? (2)

30. Study the pedigree chart and answer the following questions. (Half shaded -carrier of disease)

4



The pedigree chart shows a family's pedigree for colorblindness.

- A) Which sex can be carriers of colorblindness and not have it? (1)
- B) What kind of trait is colorblindness? (1)

Attempt either subpart C or D.

- C) Why does individual IV-7 have colorblindness? (2)

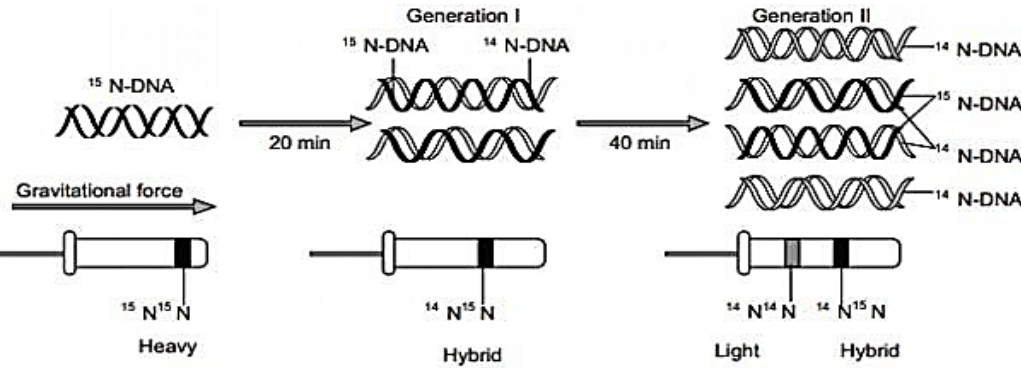
OR

- D) Why do all the daughters in generation II carry the colorblind gene?

SECTION E

31. I.

5



Study the above figure answer the following questions:

- a) Name and define the property of DNA which is proved by this experiment.
- b) Name the scientist who performed this experiment.
- c) Name the organism that the scientist used in this experiment.
- d) What was source of 15N isotope?
- e) How the heavy DNA is separated from normal DNA in this experiment?

OR

II. Study the schematic representation of the genes involved in the lac operon given below and answer the questions that follow.

p	i	p	o	z	y	a
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- Identify and name the regulatory gene in this operon.
- Explain its role in 'switching off the operon.
- Why is operon's regulation referred to as negative regulation?
- Name the inducer molecule.
- State the role of z, y and a.

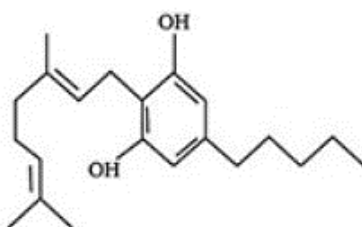
32. I. A woman has conceived, and implantation has occurred in her uterus. Trace the sequence of changes up to parturition which take place within her body. 5

OR

- II. (a) Draw a diagram of L.S of an anatropous ovule of an angiosperm and label the following parts. (i) Nucellus (ii) Secondary nucleus
(b) Trace the fate of haploid megaspores formed by the megaspore mother cell in an angiosperm plant.

33. I. **Answer the following questions on the outline structure of a drug shown below:** 5

- Name the group of drugs this structure represents.
- List the modes of consumption of this drug.
- Which organ of the body is affected by the consumption of this drug?



- Name the plant which serves as the source of this.
- What is the nature of this group of drugs?

OR

II.

Bioactive Molecule	Source	Medical Importance
a	Streptococcus	Removes clots from blood vessels
Cyclosporin A	b	c
d	Monascus Purpureus	Blood Cholesterol lowering agent

- Complete the above table by identifying a to d.
- Microbes are useful in making curd. Justify with an example and add a note on the importance of the microbe used.
- What are antibiotics? What does this Greek term mean?
