Indian School Al Wadi Al Kabir

Assessment– I (2024-2025)

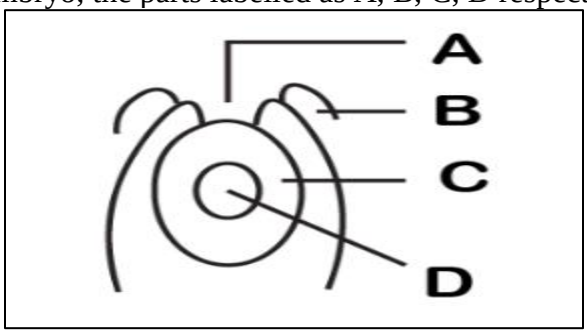
Class: XII **Sub: Biology (044)** **Max marks: 70**
Date: 19/09/2024 **Set – I** **Time: 3 hours**

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. In the given figure of a dicot embryo, the parts labelled as A, B, C, D respectively are:



(a) Chalazal pole, Micropyle, Embryo Sac, Nucellus
(b) Funicle, Integument, Nucellus, Embryo Sac
(c) Hilum, Micropyle, Embryo Sac, Nucellus
(d) Micropyle, Integument, Nucellus, Embryo Sac

2. The surgical method of permanent contraception in males is called:

(a) Vasectomy
(b) Tubal ligation
(c) Hysterectomy
(d) Oophorectomy

3. A plant having the genotype AABbCC will produce _____ kinds of gametes.

(a) 5
(b) 4
(c) 3
(d) 2

4. Cotyledon in seeds of the grass family is called

(a) Plumule
(b) Coleoptile
(c) Scutellum
(d) Epiblast

5. A man marries a woman and both does not show any apparent traits of inherited disease. Five sons and two daughters are born, and three of their sons suffer from a disease. However, one of the daughters is also affected. The following mode of inheritance for the disease is
(a) Sex-linked recessive
(b) Sex-linked dominant
(c) Autosomal dominant
(d) Autosomal recessive

6. In a DNA strand the nucleotides are linked together by
(a) glyosidic bonds
(b) phosphodiester bonds
(c) peptide bonds
(d) hydrogen bonds.

7. Example of a homologous organ:
(a) The arm of a human, wing of a bat
(b) Wing of an insect, wing of a bird
(c) Leg of a dog, leg of a spider
(d) None of the above

8. The hormone responsible for the contraction of uterine muscles during childbirth is:
(a) Estrogen
(b) Progesterone
(c) Prolactin
(d) Oxytocin

9. The human chromosome with the highest and least number of genes in them are respectively
(a) chromosome 21 and Y
(b) chromosome 1 and X
(c) chromosome 1 and Y
(d) chromosome X and Y

10. 'Smack' is a drug obtained from the
(a) latex of Papever somniferum
(b) leaves of Cannabis saliva
(c) flowers of Datura
(d) fruits of Erythroxyl coca.

11. Saccharomyces cerevisiae is used primarily for
(a) Baking
(b) Bleaching
(c) Biofuel
(d) Pesticides

12. The acrosome of the sperm helps in
(a) fertilisation of the ovum.
(b) produce energy for the movement of sperm.
(c) retaining the chromosomal material.
(d) Spermatogenesis.

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(A)**: Hybrid seeds have to be produced every year.
Reason(R): The hybrid seeds in the progeny will segregate and do not maintain hybrid characters.

14. **Assertion(A)**: Smoking can increase blood pressure and heart rate.
Reason(R): Nicotine stimulates adrenal glands to release adrenaline and nor- adrenaline into the blood circulation, both of which decrease blood pressure and increase heart rate.

15. **Assertion(A)**: The foetus receives some antibodies from their mother through the placenta during pregnancy.
Reason(R): The placenta facilitates the transport of substances to and from the embryo.

16. **Assertion(A)**: Filariasis is caused through the bite of the female mosquito.
Reason(R): The lymphatic vessels of the lower limbs develop chronic inflammation.

SECTION B

17.Match the column A with B & C

A	B	C
Lactational amenorrhea	Vasectomy	Once a week
IUD	Saheli	Breastfeeding
Sterilization	Natural method	Lippe's Loop
Oral contraceptives	Insert in uterus	Poor reversibility

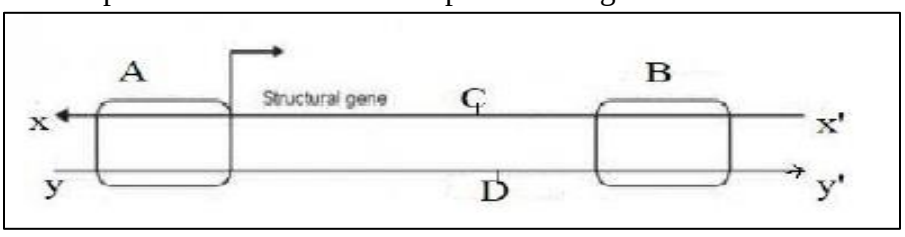
18. Compare Hugo de Vries view and Darwin's view on evolution.

19. With the help of a flow chart represent the life cycle of the Plasmodium in the primary host.

20. Fill in the missing blanks in the columns given in the table below.

Bioactive molecule	Source	Commercial use
Cyclosporin A	----------	----------
----------	----------	Blood cholesterol lowering agent

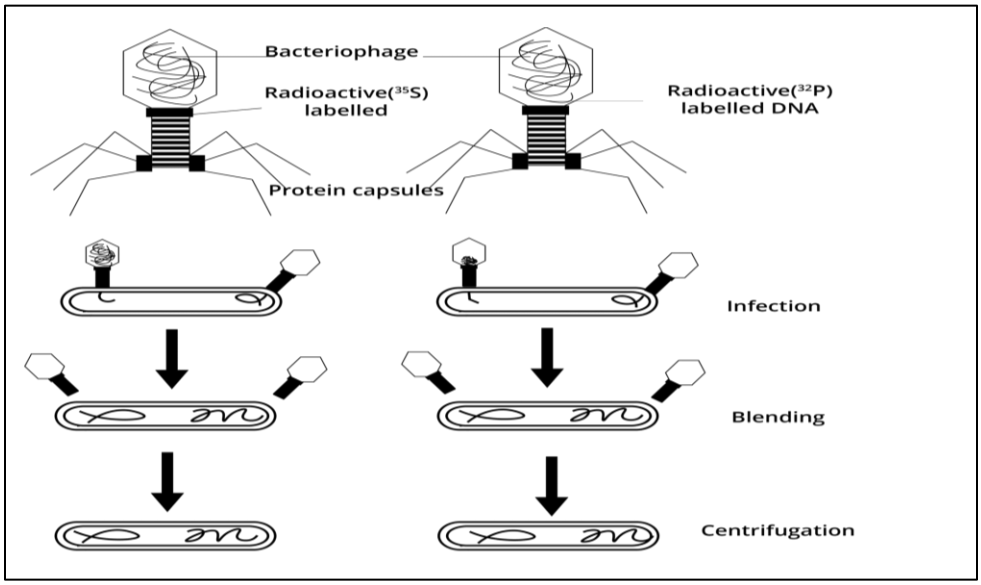
21. From the schematic representation of the transcriptional unit given below answer the following questions.



(a) Identify the two strands of DNA and differentiate between them.
(b) If the sequence of D is y- ATGCATGCATGCATGCATGCATGC-y', write down the sequence of complementary strand and the sequence of mRNA transcribed.

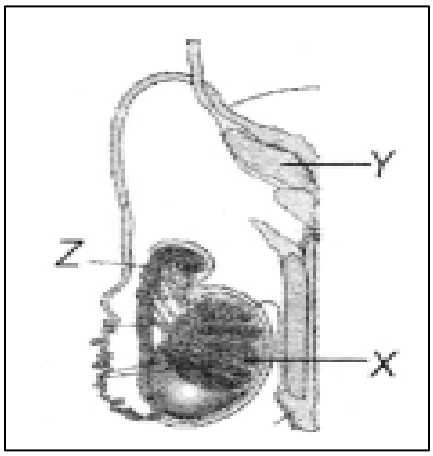
OR

The Figure given below represents Hershey-Chase experiment, answer the questions in relation to the experiment.
(a) What was the aim of the experiment and why was Bacteriophage used in the experiment?
(b) Write the observation and the conclusion of the experiment.



SECTION C

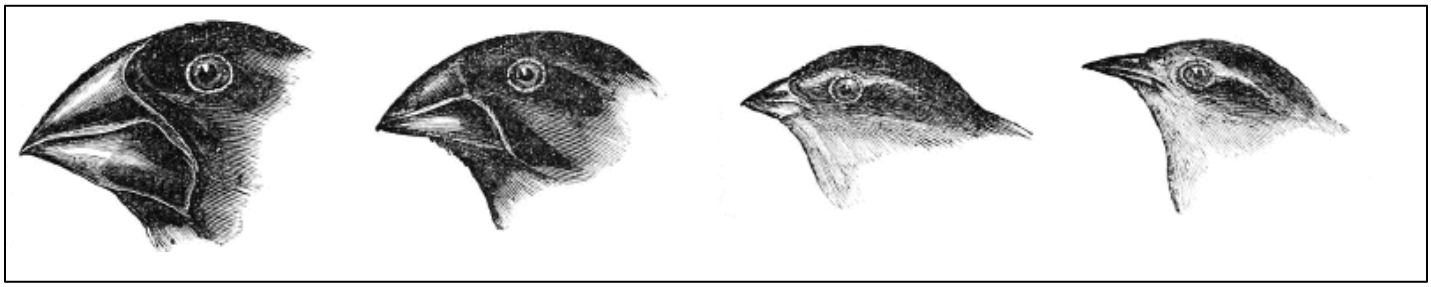
22. The below diagram shows human male reproductive system (one side only)



(i) Identify 'X' and write its location in the body.
(ii) Name the accessory gland 'Y' and its secretion.
(iii) Name and state the function of 'Z'.

23. (a) Spleen and lymph nodes are very important secondary lymphoid organs, briefly explain their functions as lymphoid organs.
(b) What is MALT and where are they located?

24. Given below is the picture of the variety of beak pattern seen in finches that Darwin found in Galapagos Island.



(a) What was Darwin's conclusion about all these varieties of finches in the island? Briefly explain.

(b) What type of evolution is seen between the mole and the marsupial mole? Briefly explain.

25. Briefly explain the Lac operon, with the help of a schematic representation of the system in the switch on mechanism.

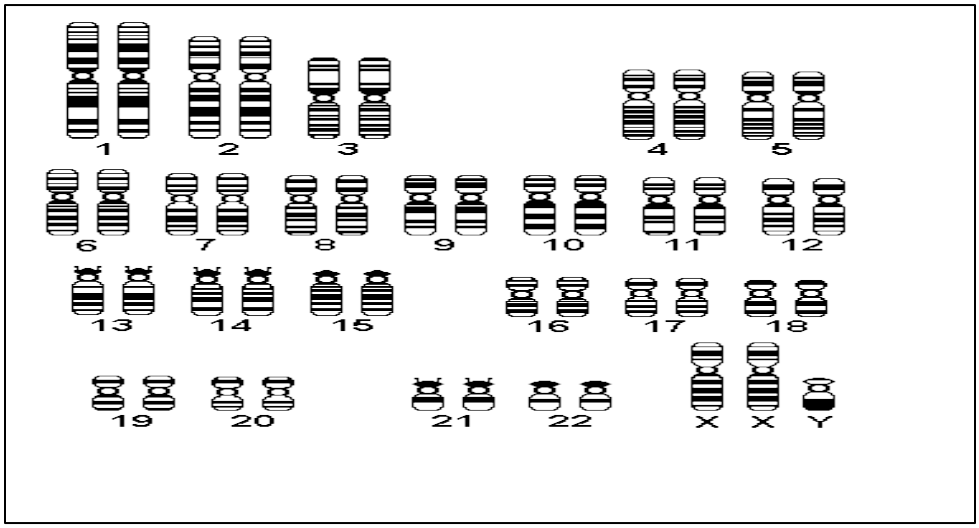
26. (a) What do oral pills contain and how do they act as effective contraceptives?
(b) Name any two In vitro fertilisation programme that can help infertile couples.

27. What is IPM programme and why is this programme very important when an ecologically sensitive area is being treated for pest management?

OR

In organic farming, the use of biofertilizers are very crucial. What are biofertilizers and identify their different types?

28. (a) Identify the karyotype given below indicating a chromosomal disorder in humans with a reason.



(b) How is Mendelian disorder different from chromosomal disorders?
(c) Which experiments carried out by Morgan lead to the discovery of linkage and how did this discovery help in the study of genetics?

SECTION D

Q.no 29 and 30 are case based questions. Each question has subparts with internal choice in one subpart.
Sub-questions (a) & (b) carry 1 mark each and Sub-question (c) carries 2 marks

29. Many different microorganisms can infect the human respiratory system, causing symptoms such as fever, runny nose or sore throat. Even the common cold, which may range from mild to serious, can be caused by any of more than 200 viruses!
Usually, cold symptoms appear within two to three days of infection and include: mucus buildup in the nose, swelling of sinuses, cough, headache, sore throat, sneezing and mild fever (particularly in infants and young children). The body's immune system, which protects against disease-causing microbes, almost always is able to eliminate the viruses responsible for a cold.

(a) Identify the group of viruses that causes common cold and the site of their infection.
(b) How is pneumonia different from common cold infection?

(c) The body's immune system, which protects against disease-causing microbes, almost always is able to eliminate the viruses responsible for a cold. This statement is not true for AIDS disease.
(i) Which immune cells do these viruses destroy?
(ii) Identify the causative organism and the mode of transmission of this disease.

OR

(c) Illustrate the life cycle of the disease-causing microorganism of AIDS.

30. Wastewater treatment is a process which removes and eliminates contaminants from wastewater. It thus converts it into an effluent that can be returned to the water cycle. Once back in the water cycle, the effluent creates an acceptable impact on the environment. It is also possible to reuse it. This process is called water reclamation. The treatment process takes place in a wastewater treatment plant, where the BOD of the waste water is reduced before releasing it in the water bodies. There are several kinds of wastewater which are treated at the appropriate type of wastewater treatment plant. For domestic wastewater the treatment plant is called a Sewage Treatment.

(a) What is BOD and what does it indicate if a water sample has more BOD?

(b) The sewage water contains a large amount of
i. Organic matter
ii. Microbes
iii. Biogas
iv. Both i & ii

(c) How does the aeration tank in the treatment of sewage treatment plant help in reducing the BOD of the waste water?

OR

(c) How does the anaerobic treatment of sewage treatment plant help in the production of biogas?

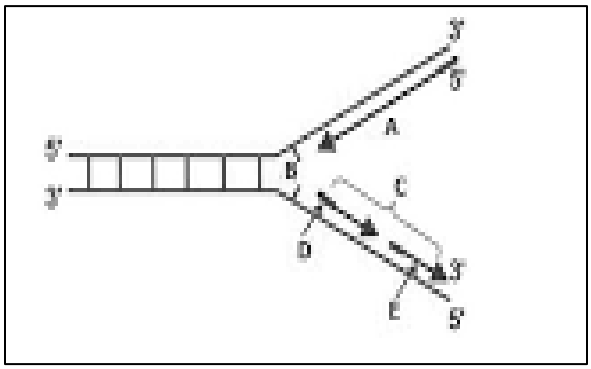
SECTION E

31. (a) Draw a neat and labelled diagram of the pollen tube entering the synergid in embryo sac.
    (b) List any four advantages the seed offers to angiosperms.
    (c) How does self- incompatibility help to prevent inbreeding in angiosperms?

OR

    (a) Draw a neat and labelled diagram of a human sperm.
    (b) Briefly correlate the effects of the ovarian hormones and the events taking place in the ovaries.
    (c) Identify any two developments that is seen in the foetus by the end of the second semester.

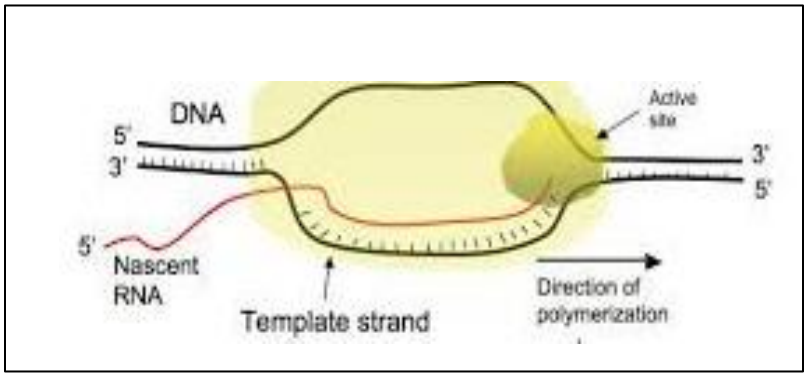
32. The figure given below illustrates the process of DNA replication.



    (a) Identify the function of DNA ligase in this process.
    (b) Explain the term origin of replication.
    (c) Identify the enzyme required for this process and state its function.
    (d) Differentiate between replication and translation process.

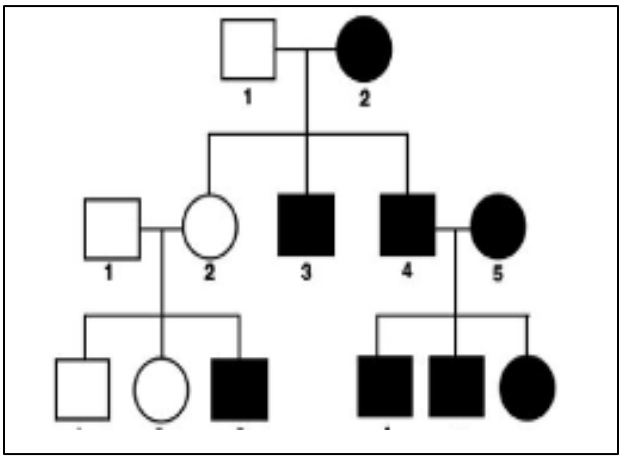
OR

The figure given below illustrates the process of DNA transcription in prokaryotes.



(a) Briefly explain the Initiation and the Termination stages of the transcription process.
(b) With the help of diagrams explain the two additional steps that are carried out in Eukaryotes at the end of termination.

33.Study the pedigree chart given below, study the pattern of inheritance and answer the questions given:



(a) (i) Identify whether the disease is sex-linked recessive trait or Autosomal linked.
(ii) Identify the genotype of the parents in Generation 1& individual 2 in generation 2.
(iii) Why does the daughter born to 4 & 5 show the disease?
(b) What is chromosomal theory of inheritance and who put forth this theory?

OR

(a) In humans, blue eye colour is recessive to brown eye colour. A brown eyed man has blue eyed mother.
(Draw the pedigree chart to represent your answers)
(i) What is the genotype of the man and his mother?
(ii) What are the possible genotypes of his father?
(iii) If the man marries a blue-eyed woman, what are the possible genotypes of his offsprings?
(b) Both Sickle cell anemia and Haemophilia are blood related genetic diseases, yet how are these two diseases different from each other? Briefly explain.