



BK BIRLA CENTRE FOR EDUCATION
SARALA BIRLA GROUP OF SCHOOL
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL
PRE-BOARD-II 2024-25
BIOLOGY (044)



Class: XII

Date: 13/12/2024

Duration: 3 Hr

Max. Marks: 70

General Instructions:

All questions are compulsory.

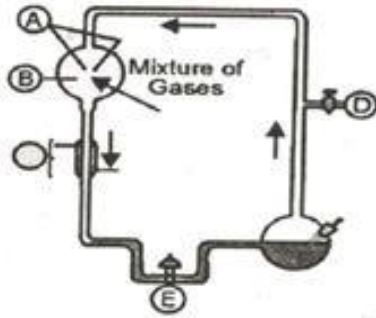
1. The question paper has five sections and 33 questions. All questions are compulsory.
2. Section–A has 16 questions of 1 mark each; Section–B has 5 questions of 2 marks each; Section– C has 7 questions of 3 marks each; Section– D has 2 case - based questions of 4 marks each; and Section– E has 3 questions of 5 marks each.
3. 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.
4. Wherever necessary, neat and properly labeled diagrams should be drawn.

Section A

- 1 How much solar energy falling on the leaf of a plant is converted into chemical energy? 1
a) 60% b) 10%
c) 100% d) 1%
- 2 In the IVF technique, a fusion of ovum and sperm takes place in: 1
a) Vagina b) Fallopian tube
c) Uterus d) Culture medium
- 3 Which of the following is not a cause for the loss of biodiversity? 1
a) Invasion by alien species
b) Keeping animals in zoological parks
c) destruction of habitat
d) over-exploitation of natural resources
- 4 Inability to conceive or produce children even after two years of unprotected sexual co-habitation is called: 1
a) Infertility
b) Incapability
c) Malfunction
d) Sterility
- 5 Most industrialized nations are rich financially but poor in: 1
a) Population
b) Biodiversity and traditional knowledge
c) Traditional knowledge and land requirement
d) Health and manpower
- 6 A common biocontrol agent for the control of plant diseases is: 1
a) Baculo virus
b) Glomus
c) Bacillus thuringiensis
d) Trichoderma
- 7 Klinefelter's syndrome is due to: 1
a) One X only
b) Two X and one Y
c) One Y only
d) One X and two Y

8 What was the resultant found in the place marked E?

1



- a) Glucose, fatty acids and lipids
- b) Some fatty acids and organic acids
- c) Some amino acids as glycine and alanine
- d) Organic esters only

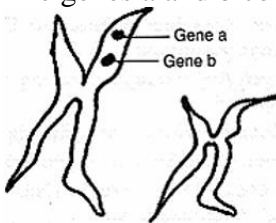
9 The product of ecosystem processes are called as:

1

- a) Ecological benefits
- b) Ecosystem services
- c) Economic services
- d) Biological services

10 Given below is a highly simplified representation of human sex chromosomes from a karyotype. The genes a and b could be of:

1



- a) Colour blindness and body height
- b) Attached ear lobe and Rh blood group
- c) Phenylketonuria and haemophilia.
- d) Haemophilia and red green colour blindness

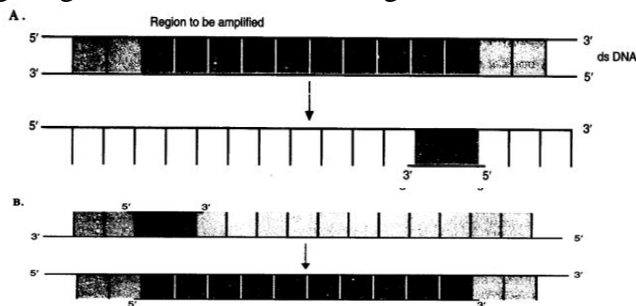
11 Lactobacillus mediated conversion of milk to curd results because of:

1

- a) Coagulation and partial digestion of milk proteins.
- b) Coagulation and partial digestion of milk fats.
- c) Coagulation of milk fats and complete digestion of milk proteins.
- d) Coagulation of milk proteins and complete digestion of milk fats.

12 The figure below shows three steps (A, B, C) of Polymerase Chain Reaction (PCR). Select the option giving correct identification together with what it represents?

1

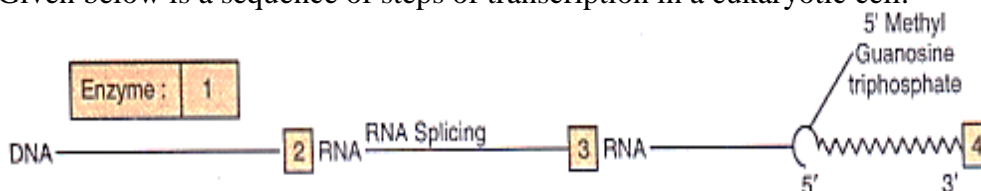




- a) C - extension in the presence of heat stable DNA polymerase.
 b) A - denaturation at a temperature of about 50° C.
 c) B - denaturation at a temperature of about 98° C separating the two DNA strands.
 d) A - annealing with two sets of primers.
- 13 Assertion (A): Administration of progestogens or progestogen-estrogen combinations or IUDs within 72 hours of coitus has been found to be very effective as emergency contraceptives. Reason (R): I- pills are steroidal preparation and it is very effective and is well accepted by females, as emergency contraceptives. 1
- 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.
- 14 Assertion (A): Anabaena is commonly called a symbiotic biofertilizer. Reason (R): Anabaena is found as endosymbiont in the thallus of Anthoceros. 1
- 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.
- 15 Assertion (A): Vertical distribution of different species occupying different levels in the ecosystem is called stratification. Reason (R): Trees occupy top vertical strata or layer of a forest, herbs, grasses the second and shrubs occupy the bottom layers. 1
- 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.
- 16 Assertion (A): Dinosaurs disappeared due to mass extinction. Reason (R): Mass extinction occurred due to spread of epidemic. 1
- 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.

Section B

- 17 Write short notes on the Production of human growth hormone by E.coli. 2
- 18 Given below is a sequence of steps of transcription in a eukaryotic cell. 2



Fill up the blanks (1, 2, 3, 4) left in the sequence.

- 19 Identify the types of flower shown in A and B. Which out of the two will produce an assured seed set. 2



20 Name the labels A, B, C, D, E and F in the diagram of seminiferous tubule. 2



21 Mention the product and its use produced by each of the microbes listed below 2

- (i) *Streptococcus*
- (ii) *Lactobacillus*
- (iii) *Saccharomyces cerevisiae*

OR

- (i) Differentiate between humoral and cell mediated immune response.
- (ii) Why is a patient who has undergone organ transplant put on immunosuppressants? Explain.

Section C

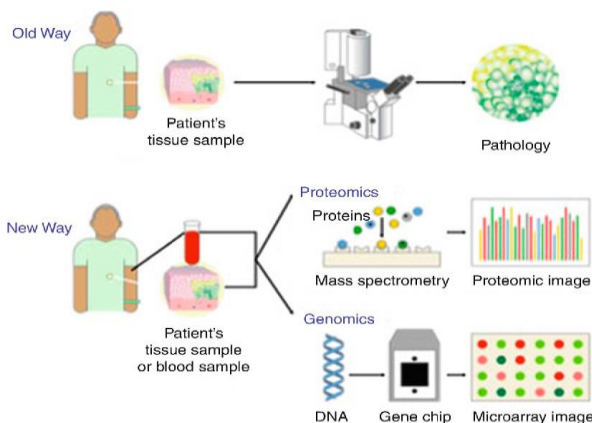
22 $A \rightarrow \text{DNA} \xrightarrow{B} \text{mRNA} \xrightarrow{C} \text{Protein}$ 3

- (i) Look at the above sequence and mention the event A, B and C.
- (ii) What does central dogma state in molecular biology? How does it differ in some viruses?

23 What is pedigree analysis? Suggest how such an analysis can be useful. 3

24 Egrets are often seen along with grazing cattle. How do you refer to this interaction? Give reason. 3

25 3



The image below describes the molecular diagnostic procedures.

- (i) Write any two biochemical/molecular diagnostic procedures for early detection of viral infection.
- (ii) Explain the principle of any one of them.

26 Differentiate between in situ and ex situ approaches of conserving biodiversity. 3

OR

Why has conservation of biodiversity become important recently?

- 27 When did life originate? **3**
- 28 (i) How are primary and secondary immune responses carried out by B-lymphocytes and T-lymphocytes respectively in our body? **3**
(ii) Enlist two differences between primary response and secondary response produced by our body in response to a pathogen.

Section D

- 29 Read the following passage and answer the questions that follow. **4**
Spermatogenesis is an important primary sex characteristic in humans and all other vertebrates. The process is coordinated and controlled under the influence of hormones. It starts with the onset of puberty in humans and thereafter continues. The primordial cells within the embryonic testis which differentiate into spermatogonia are the precursors of the sperms. These are located at the outer walls of the seminiferous tubules where the process of spermatogenesis proceeds.
(i) State the site of action of FSH in the testes and describe its action thereafter. **(2)**

OR

- (i) Describe the role of LH in the process of spermatogenesis. **(2)**
(ii) Name the cells and their products which undergo: **(1)**
a. Mitosis and Differentiation
b. Meiosis I and Meiosis II
during the process of spermatogenesis.
(iii) Name the accessory ducts that the sperms travel through from seminiferous tubules to reach the epididymis. **(1)**
- 30 Read the following passage and answer the questions that follow: **4**
"Mosquitoes are drastically affecting the human health in almost all the developing tropical countries. Different species of mosquitoes cause very fatal diseases so much so that many humans lose their life and if they survive, are unable to put in productive hours to sustain their life. With the result the health index of the country goes down."
(i) Name the form in which Plasmodium gains entry into (i) human body (ii) the female Anopheles body. **(1)**
(ii) Why do the symptoms of malaria not appear in a person immediately after being bitten by an infected female Anopheles? Give one reason. Explain when and how do the symptoms of the disease would appear. **(2)**

OR

- (ii) Explain the events which occur within a female Anopheles mosquito after it has sucked blood from a malaria patient. **(2)**
(iii) Name a species of mosquito other than female Anopheles and the disease, for which it carries the pathogen. **(1)**

Section E

- 31 Draw a labelled sketch of L.S. of pistil showing the progamous type of fertilization. **5**
- OR
- Draw a diagram of a transverse section of an angiospermic anther. Label any six parts.
- 32 (i) Name the type of DNA that forms the basis of DNA fingerprinting and mention two features of this DNA. **5**
(ii) Write the steps carried out in the process of DNA fingerprinting technique, and mention its application.

OR

Explain the relationship of ribosomes, t-RNA and m-RNA during the process of translation in Prokaryotes.

33 DNA fragmentation is the separation or breaking of DNA strands into pieces. It can be done intentionally by laboratory personnel or by cells, or can occur spontaneously. Spontaneous or accidental DNA fragmentation is fragmentation that gradually accumulates in a cell. Observe the given sequence of nitrogenous bases on a DNA fragment and answer the following questions. **5**

5'—CAGAATTCTTA—3'

3'—GTCTTAAGAAT—5'

1. Name of restriction enzyme which can recognise this DNA sequence.
2. Write the sequence after digestion.
3. Why are the ends generated after digestion called sticky ends?

OR

Suggest and describe a technique to obtain multiple copies of a gene of interest in vitro.