

# CUET Biology Solved Paper-2023

Held on 02 June 2023, (Shift-III)

## 1. Match List I with List II

### List I

- A. *Lactobacillus*
- B. *Aspergillus niger*
- C. *Acetobacter aceti*
- D. *Clostridium butylicum*

### List II

- I. Citric acid
- II. Butyric acid
- III. Lactic acid
- IV. Acetic acid

Choose the correct answer from the options given below:

- (a) A-II, B-IV, C-I, D-III
- (b) A-III, B-I, C-IV, D-II
- (c) A-I, B-III, C-IV, D-II
- (d) A-II, B-III, C-I, D-IV

## 2. Net Primary Productivity (NPP) is given by the formula

- (a)  $NPP = GPP \times 100$
- (b)  $NPP = GDP - \text{Secondary productivity}$
- (c)  $NPP = GPP - \text{Respiration rate}$
- (d)  $NPP = GPP/100$

## 3. In humans, female, oogenesis is initiated \_\_\_\_\_

- (a) During embryonic development
- (b) At puberty
- (c) After birth
- (d) After 18 years of age

## 4. The experimental verification of the chromosomal theory of inheritance was given by

- (a) Sturtevent
- (b) Thomas Hunt Morgan
- (c) Stadler
- (d) Charles Darwin

## 5. Match List I with List II

### List I

### Crop

- A. Wheat
- B. Brassica
- C. Chilli
- D. Cowpea

### List II

### Variety

- I. *Pusa Komal*
- II. *Pusa Sadabahar*
- III. Himgiri
- IV. *Pusa swarnim*

Choose the correct answer from the options given below:

- (a) A-III, B-IV, C-II, D-I
- (b) A-III, B-IV, C-I, D-II
- (c) A-I, B-III, C-II, D-IV
- (d) A-II, B-IV, C-I, D-III

## 6. Expand KVIC

- (a) Khadi and Village Internal Commission
- (b) Khadi and Village Industrial Committee
- (c) Khadi Viable Industries Commission
- (d) Khadi and Village Industries Commission

## 7. Which of the following can solve the problem of hidden hunger?

- (a) MOET
- (b) SCP
- (c) Biofortification
- (d) Hybridization

## 8. Which factor does not affect Hardy-Weinberg equilibrium?

- (a) Gene migration
- (b) Genetic drift
- (c) Random Mating
- (d) Mutation

## 9. The genetically identical plants grown by the process of micropropagation are called

- (a) Meristems
- (b) Somaclones
- (c) Explants
- (d) Somatic hybrids

## 10. Which of the following is NOT a basic step in the genetic modification of an organism?

- (a) Introduction of the identified DNA into the host
- (b) Identification of DNA with maximum number of genes
- (c) Maintenance of introduced DNA in the host
- (d) Transfer of the introduced DNA into the progeny of host

## 11. When a snapdragon plant homozygous for red flower (RR) is crossed with another plant bearing white flowers, (rr) what colour will be observed in flowers of $F_1$ generation?

- (a) Red
- (b) White
- (c) Pink
- (d) Red and white

## 12. Which of the following is/are NOT the benefit of transgenic animal to man?

- A. Chemical safety testing
- B. Vaccine safety testing
- C. Increasing the industrial product
- D. Obtaining useful biological products
- E. Study of diseases

Choose the correct answer from the options given below:

- (a) A and D only
- (b) B only
- (c) D and E only
- (d) C only

## 13. Match List I with List II

### List I

- A. Commensalism
- B. Mutualism
- C. Parasitism
- D. Competition

### List II

- I. *Cuscuta* on hedge plants
- II. *Balanus* and *Chathamalus*
- III. Sea anemone and clownfish
- IV. *Mycorrhizae* and legume plants

Choose the correct answer from the options given below:

- (a) A-I, B-II, C-III, D-IV
- (b) A-IV, B-II, C-I, D-III
- (c) A-III, B-II, C-IV, D-I
- (d) A-III, B-IV, C-I, D-II



14. Identify the correct statements with respect to human evolution.
- Modern *Homo sapiens* arose during ice age between 50,000 to 75,000 years.
  - Ramapithecus* was more man-like.
  - The brain capacity of *Homo erectus* was about 650-800 cc.
  - Dryopithecus* was more ape-like.
- Choose the correct answer from the options given below:
- A and B only
  - B and D only
  - B and C only
  - A and C only
15. Biofertilizers enrich the nutrient quality of the soil. Which of the following is not a source of biofertilizer?
- Bacteria
  - Mycorrhiza
  - Baculoviruses
  - Cyanobacteria
16. Select the wrong statement(s) with respect to HIV.
- HIV belongs to retrovirus group.
  - HIV infection can occur by transfusion of contaminated blood and blood products.
  - In macrophages, viral DNA is produced by reverse transcription.
  - HIV enter into B-lymphocytes, replicate and produce progeny.
- Choose the correct answer from the options given below:
- A only
  - B and C only
  - D only
  - C and D only
17. Match List I with List II
- | List I          | List II          |
|-----------------|------------------|
| Hormone         | Secreted from    |
| A. FSH          | I. Corpus luteum |
| B. Relaxin      | II. Placenta     |
| C. hCG and hPL  | III. Ovary       |
| D. Progesterone | IV. Pituitary    |
- Choose the correct answer from the options given below:
- A-I, B-II, C-III, D-IV
  - A-II, B-I, C-III, D-IV
  - A-III, B-II, C-IV, D-I
  - A-IV, B-III, C-II, D-I
18. Identify the contraceptive measure which can not be practiced by human females:
- IUDs
  - Tubectomy
  - Vasectomy
  - Diaphragms
19. Which of the protein encoded by gene controls corn borer?
- cryIAb
  - CryIAC
  - CryIIAb
  - CryIIAC
20. Steps of Polymerase Chain Reaction (PCR) are given below. Arrange them in the correct sequence.
- Annealing of primers of the template DNA
  - Isolation of gene of interest
  - Extension of primer end on the template DNA using *Taq* polymerase
  - Denaturation of template DNA by heating
- Choose the correct answer from the options given below:
- B, D, C, A
  - B, D, A, C
  - A, C, D, B
  - D, B, C, A
21. Which of the following is not a sexually transmitted disease?
- Hepatitis B
  - Tuberculosis
  - Genital herpes
  - Acquired Immuno Deficiency Syndrome (AIDS)
22. Identify the species which is not invasive:
- Parthenium*
  - Lantana*
  - Eichhornia*
  - Vallisneria*
23. Use of bio-resources without proper authorization from the concerned countries is termed as:
- Bioefficacy
  - Biopiracy
  - Bioethics
  - Biowar
24. Species-area relationship in South American jungles was studied by-
- Alexander von Humboldt
  - Paul Ehrlich
  - Robert May
  - David Tilman
25. Match List I with List II
- | List I                        | List II                                  |
|-------------------------------|--|
| Action                        | Effects: Disturbs                        |
| A. DDT Biomagnification       | I. Aging of lake                         |
| B. Nuclear energy             | II. Electricity generation               |
| C. Accelerated Eutrophication | III. Disturbance in calcium metabolism   |
| D. Thermal power plants       | IV. Damage to Indigenous flora and fauna |
- Choose the correct answer from the options given below:
- A-IV, B-I, C-II, D-III
  - A-III, B-I, C-IV, D-II
  - A-III, B-II, C-I, D-IV
  - A-I, B-II, C-III, D-IV
26. If last year, there were 80 lotus plants in a lake. Then, 16 new lotus plants were added through reproduction and the current population in 96 now. The birth rate of lotus plant is-
- 0.2 offspring per lotus per year
  - 2 offspring per lotus per year
  - 5 offspring per lotus per year
  - 6 offspring per lotus per year



27. Write the correct sequence of events performed in DNA fingerprinting technique.

A. Isolation of DNA  
 B. Separation of DNA fragments by electrophoresis  
 C. Digestion of DNA using restriction endonucleases.  
 D. Transfer of separated DNA fragments to synthetic membrane

Choose the correct answer from the options given below:

(a) A, C, B, D (b) A, B, C, D  
 (c) A, D, B, C (d) B, A, D, C

28. Match List I with List II

List I (Name of the part)	List II (Characteristics)
A. Non-albuminous seed	I. Residual endosperm present
B. Albuminous seed	II. Fruit wall
C. Perisperm	III. Residual endosperm absent
D. Pericarp	IV. Residual nucellus

Choose the correct answer from the options given below:

(a) A-I, B-II, C-IV, D-III (b) A-II, B-I, C-III, D-IV  
 (c) A-III, B-I, C-IV, D-II (d) A-III, B-IV, C-I, D-II

29. The fruits that develop without fertilization are called as

(a) True fruits (b) False fruits  
 (c) Parthenocarpic fruits (d) Hybrid fruit

30. Cocaine is obtained from \_\_\_\_\_

(a) *Erythroxylum coca* (b) *Cannabis sativa*  
 (c) *Papaver somniferum* (d) *Atropa belladonna*

31. Identify the flow information according to the "Central Dogma" of Molecular biology:

(a) mRNA → Protein → DNA  
 (b) mRNA → tRNA → RNA  
 (c) DNA → mRNA → Protein  
 (d) Protein → mRNA → DNA

32. The excessive use of herbicides, pesticides etc. has resulted in selection of resistant varieties. It is an example of evolution by:

(a) Natural selection  
 (b) Chemical action  
 (c) Mutation  
 (d) Anthropogenic action

33. Stages of primary ecological succession in water are given below. Arrange these stages in the correct sequence.

A. Reed-swamp stage  
 B. Forest  
 C. Marsh-meadow stage  
 D. Submerged plant stage  
 E. Scrub stage

Choose the correct answer from the options given below:

(a) A, C, D, B, E (b) C, D, A, E, B  
 (c) E, C, B, A, D (d) D, A, C, E, B

34. Air bubbles are sparged into bioreactor tanks. The role of these bubbles is to:

(a) Remove the foam  
 (b) Mix air with the medium  
 (c) Mix all the contents properly  
 (d) Increase the area for oxygen transfer

35. Match List I with List II

List I	List II
A. The triplet nature of genetic code	I. George Gamow
B. The technique of DNA fingerprinting	II. Francis Crick
C. <i>Lac</i> operon	III. Alec Jeffreys
D. Central dogma	IV. Jacob and Monod

Choose the correct answer from the options given below:

(a) A-III, B-II, C-I, D-IV (b) A-IV, B-II, C-I, D-III  
 (c) A-I, B-III, C-IV, D-II (d) A-II, B-III, C-IV, D-I

36. Select the correct statements from the options given below:

A. *Parthenium* is an endemic species of India  
 B. *Eicchornia* is an invasive alien species in India  
 C. *Lantana* is also known as carrot grass  
 D. African catfish is a threat to indigenous catfish

Choose the correct answer from the options given below:

(a) A and C only (b) B and D only  
 (c) B and C only (d) A and D only

37. Amoebic dysentery is caused by:

(a) *Amoeba proteus*  
 (b) *Entamoeba gingivalis*  
 (c) *Amoeba verrucosa*  
 (d) *Entamoeba histolytica*

38. Which of the following is not an example of hermaphrodite animal?

(a) Leech (b) Cockroach  
 (c) Earthworm (d) Tapeworm

39. Identify the incorrect statements from the following:

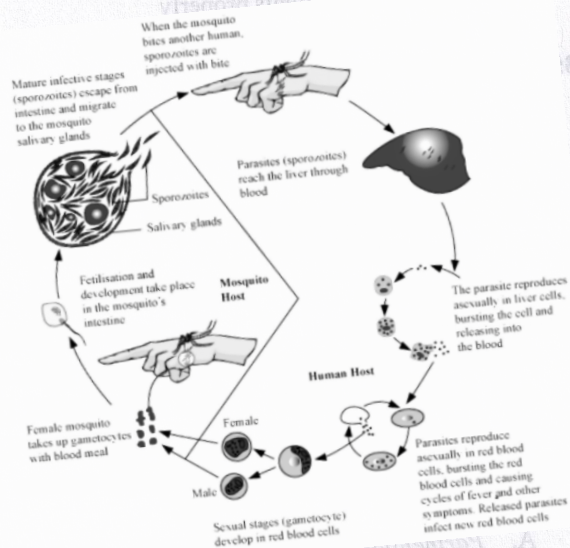
A. Phenylketonuria is an autosomal dominant trait.  
 B. Haemophilia is a sex linked recessive disease.  
 C. Thalassaemia is an autosomal linked recessive blood disease.  
 D. Colour blindness is an autosomal linked recessive disorder.

Choose the correct answer from the options given below:

(a) A and B only (b) C and D only  
 (c) B and D only (d) A and D only

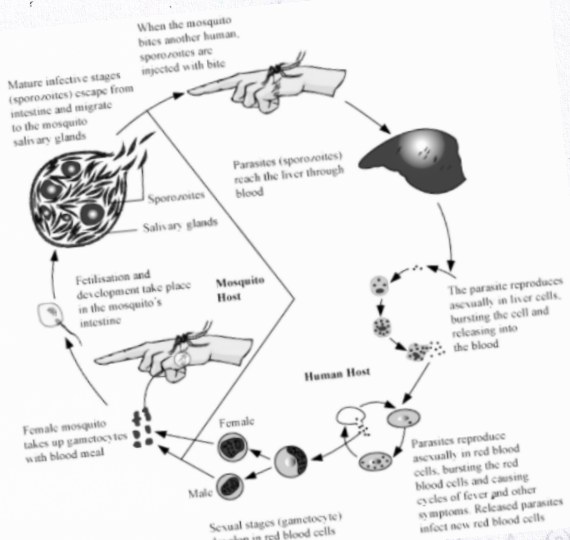


40. Catalytic converters, made of platinum palladium and rhodium, change unburnt hydrocarbons into:
- Carbon monoxide and water
  - Carbon dioxide and water
  - Nitric oxide
  - Methane
41. Observe the given figure and answer the given question.



Where does the fertilization and development takes place in the life cycle of *Plasmodium*?

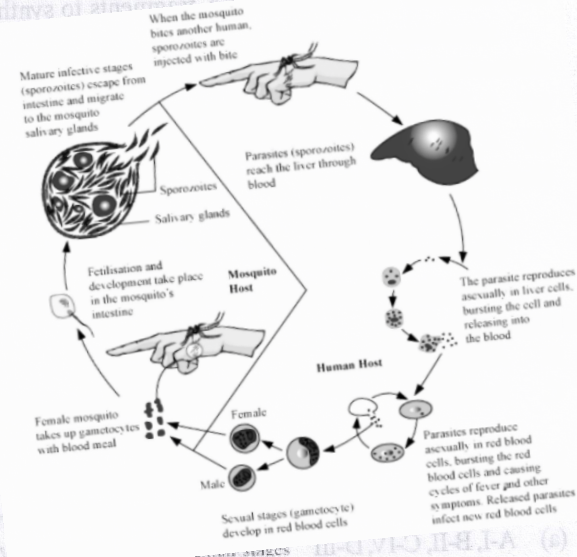
- Gut of mosquito
  - Salivary glands of mosquito
  - Human RBCs
  - Human Liver Cells
42. Observe the given figure and answer the given question.



Sexual stages of *Plasmodium* which develop in human RBC's are known as:

- Gametophytes
- Zygote
- Gametocytes
- Gametospores

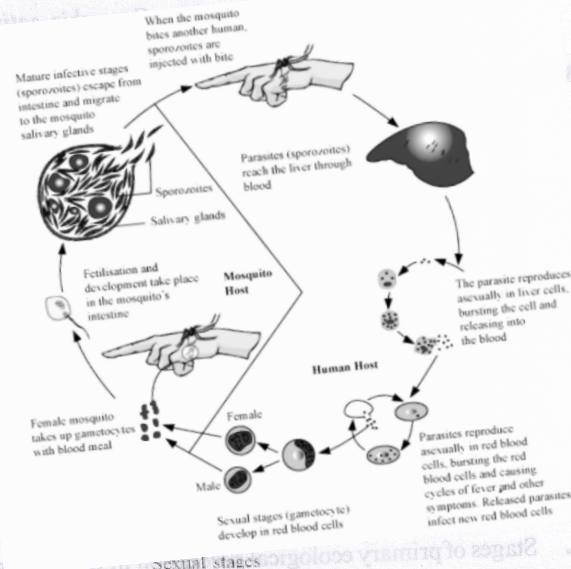
43. Observe the given figure and answer the given question.



*Plasmodium* enters the human body as:

- Gametocyte
- Sporozoite
- Gametozoite
- Sporocytes

44. Observe the given figure and answer the given question.

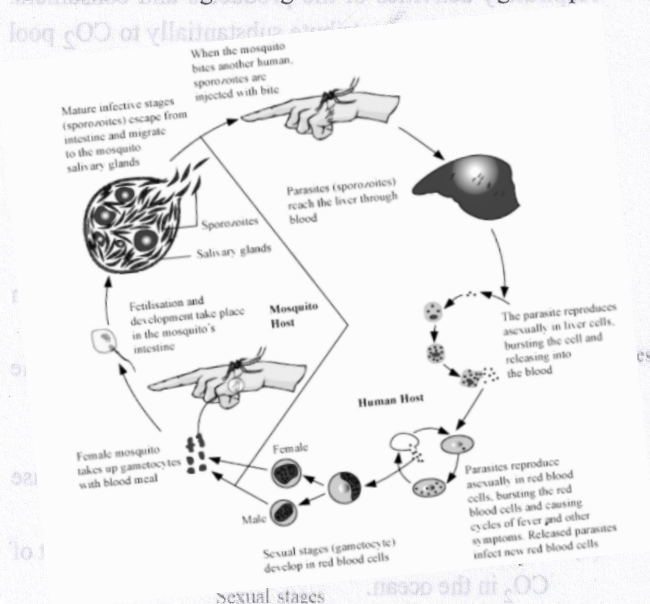


The rupturing of RBCs is associated with release of a toxic substance known as:-

- Haemocyanin
- Haemozoin
- Haemoglobin
- Haemoerythrin



45. Observe the given figure and answer the given question.



In which part of the body of a mosquito the malarial parasite are stored?

- (a) Gut (b) Wings  
(c) Salivary glands (d) Liver
46. Fossil fuel also represent a reservoir of carbon. Carbon cycling occurs through atmosphere, ocean and through living and dead organisms. According to one estimate,  $4 \times 10^3$  kg of carbon is fixed annually in the biosphere through photosynthesis. A considerable amount of carbon returns to the atmosphere as  $\text{CO}_2$  through respiratory activities of the producers and consumers. Decomposers also contribute substantially to  $\text{CO}_2$  pool by their processing of waste materials and dead organic matter of land or oceans. Some amount of the fixed carbon is lost to sediments and removed from circulation. Burning of wood, forest fire and combustion of organic matter, fossil fuel, volcanic activity are additional sources for releasing  $\text{CO}_2$  in the atmosphere.

The role of bacteria in the carbon cycle is

- (a) Breakdown of organic compounds  
(b) Chemosynthesis  
(c) Photosynthesis  
(d) Assimilation of nitrogen compounds
47. Fossil fuel also represent a reservoir of carbon. Carbon cycling occurs through atmosphere, ocean and through living and dead organisms. According to one estimate,  $4 \times 10^3$  kg of carbon is fixed annually in the biosphere through photosynthesis. A considerable amount of carbon returns to the atmosphere as  $\text{CO}_2$  through respiratory activities of the producers and consumers.

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Identify the correct statements with respect to carbon cycle.

- A. 75 percent carbon is found dissolved in oceans  
B. Carbon constitution 49 percent of dry weight of organisms  
C. Atmosphere contains about 1 percent of total global carbon  
D.  $4 \times 10^3$  g of carbon is fixed annually in the biosphere through photosynthesis

Choose the correct answer from the option given below:

- (a) A, B only (b) B, C only  
(c) C, D only (d) A, D only

48. Fossil fuel also represent a reservoir of carbon. Carbon cycling occurs through atmosphere, ocean and through living and dead organisms. According to one estimate,  $4 \times 10^3$  kg of carbon is fixed annually in the biosphere through photosynthesis. A considerable amount of carbon returns to the atmosphere as  $\text{CO}_2$  through respiratory activities of the producers and consumers. Decomposers also contribute substantially to  $\text{CO}_2$  pool by their processing of waste materials and dead organic matter of land or oceans. Some amount of the fixed carbon is lost to sediments and removed from circulation. Burning of wood, forest fire and combustion of organic matter, fossil fuel, volcanic activity are additional sources for releasing  $\text{CO}_2$  in the atmosphere.

Identify the human activity which has major influence on the carbon cycle.

- A. Photosynthesis  
B. Deforestation  
C. Wheat crop plantation  
D. Burning of fossil fuels

Choose the correct answer from the option given below:

- (a) A and D only (b) C only  
(c) B and D only (d) D only

49. Fossil fuel also represent a reservoir of carbon. Carbon cycling occurs through atmosphere, ocean and through living and dead organisms. According to one estimate,  $4 \times 10^3$  kg of carbon is fixed annually in the biosphere through photosynthesis. A considerable amount of



carbon returns to the atmosphere as  $\text{CO}_2$  through respiratory activities of the producers and consumers. Decomposers also contribute substantially to  $\text{CO}_2$  pool by their processing of waste materials and dead organic matter of land or oceans. Some amount of the fixed carbon is lost to sediments and removed from circulation. Burning of wood, forest fire and combustion of organic matter, fossil fuel, volcanic activity are additional sources for releasing  $\text{CO}_2$  in the atmosphere.

Human beings return carbon to the atmosphere through:

- (a) Glucose formation (b) Cellular respiration  
(c) Nitrogen metabolism (d) Sweating

50. Fossil fuel also represent a reservoir of carbon. Carbon cycling occurs through atmosphere, ocean and through living and dead organisms. According to one estimate,  $4 \times 10^3$  kg of carbon is fixed annually in the biosphere through photosynthesis. A considerable amount of carbon returns to the atmosphere as  $\text{CO}_2$  through

respiratory activities of the producers and consumers. Decomposers also contribute substantially to  $\text{CO}_2$  pool by their processing of waste materials and dead organic matter of land or oceans. Some amount of the fixed carbon is lost to sediments and removed from circulation. Burning of wood, forest fire and combustion of organic matter, fossil fuel, volcanic activity are additional sources for releasing  $\text{CO}_2$  in the atmosphere.

Identify the statement which is NOT correct for carbon cycle.

- (a) There is respiratory release of carbon in the atmosphere.  
(b) The gaseous reservoir of carbon is atmosphere.  
(c) Carbon dioxide is a major constituent of green house gases.  
(d) The environmental reservoir regulate the amount of  $\text{CO}_2$  in the ocean.



## Hints & Explanations

1. (b)  
*Lactobacillus* → Lactic acid  
*Aspergillus niger* → Citric acid  
*Acetobacter aceti* → Acetic acid  
*Clostridium butylicum* → Butyric acid
2. (c) Gross primary productivity minus respiration losses (R), is the net primary productivity (NPP).  
 Net primary productivity (NPP) is given by the formula,  

$$\text{NPP} = \text{GPP} - \text{Respiration rate.}$$
3. (a) The process in which formation of a mature female gamete occurs is known as oogenesis. Oogenesis is initiated during the embryonic development stage when a couple of million gamete mother cells (oogonia) are formed within each fetal ovary; no more oogonia are formed and added after birth.
4. (b) The experimental verification of the chromosomal theory of inheritance was given by Thomas Hunt Morgan and his colleagues.
5. (a)  
 Wheat → Himgiri  
 Brassica → Pusa swarnim  
 Chilli → Pusa Sadabahar  
 Cowpea → Pusa Komal
6. (d) The full form of KVIC is Khadi and Village Industries Commission. KVIC and IARI (Indian Agricultural Research Institute) developed the technology of biogas production in India.
7. (c) Hidden hunger is a term that is used to describe the deficiencies of micronutrients in the food that people eat. In this condition people do not get essential vitamins and minerals that are essential for the growth and development. Such type of problem can be solved by the process of biofortification. In this process crops are developed with higher levels of vitamins and minerals or higher protein and healthier fats that improves the public health.
8. (c) Gene migration or gene flow, genetic drift, mutation, genetic recombination and natural selection are the factors that affect Hardy-Weinberg equilibrium. Random mating does not affect Hardy-Weinberg equilibrium.
9. (b) The method by which thousands of plants are produced through tissue culture is known as micro-propagation. Each of these plants will be genetically identical to the original plant from which they were grown and known as somaclones.
10. (b) Identification of DNA with maximum number of genes is not a basic step in the genetic modification of an organism.  
 The basic steps that are involved in the genetic modification of an organisms are-  
 (i) identification of DNA with desirable genes.  
 (ii) introduction of the identified DNA into the host.  
 (iii) maintenance of introduced DNA in the host  
 (iv) transfer of the introduced DNA into the progeny of host.
11. (c) When a cross occurs in snapdragon plant between true-breeding red-flowered (RR) and true breeding white-flowered plants (rr), then the F<sub>1</sub> (Rr) generation will be pink. It is an example of incomplete dominance.
12. (d) Following are the benefits of transgenic animal to man-  
 (i). Normal physiology and development  
 (ii). Study of disease  
 (iii). Biological products  
 (iv). Vaccine safety  
 (v). Chemical safety testing.  
 So statement (C) increasing the industrial product, is not the benefit of transgenic animal to man.
13. (d)  
 Commensalism → Sea anemone and clownfish  
 Mutualism → *Mycorrhizae* and legume plants  
 Parasitism → *Cuscuta* on hedge plants  
 Competition → *Balanus* and *Chathamalus*
14. Only statements (B) and (D) are correct while statements (A) and (C) are incorrect. The correct statements are-  
 A- Modern *Homo sapiens* arose during ice age between 75,000-10,000 years.  
 C- The brain capacity of *Homo erectus* was about 900 cc.
15. (c) Such type of organisms that enrich the nutrient quality of the soil are known as biofertilisers. The main sources of biofertilisers are bacteria, fungi and cyanobacteria. Baculoviruses are pathogens that attack insects and other arthropods. The majority of baculoviruses are used as biological control agents.
16. (c) Only statement (D) is incorrect with respect to HIV. The correct statement is- HIV enters into helper T-lymphocytes (TH), replicates and produce progeny viruses.
17. (d)  
 FSH → Pituitary  
 Relaxin → Ovary  
 h CG and hPL → Placenta  
 Progesterone → Corpus luteum
18. (c) Sterilisation procedure that occurs in the male is known as vasectomy. IUDs, tubectomy and diaphragm are used in female as contraceptive.
19. (a) Proteins encoded by gene *cryIAb* controls corn borer.
20. (b) The correct sequence of steps of polymerase chain reaction are- (B). Isolation of gene of interest → (D). Denaturation of template DNA by heating → (A). Annealing of primers of the template DNA. → (C). Extension of primer end on the template DNA using *Taq* polymerase.
21. (b) Such type of diseases or infections that are transmitted through sexual intercourse are collectively called as sexually transmitted diseases such as gonorrhoea, syphilis, genital herpes, chlamydia, genital warts, trichomoniasis, hepatitis-B and AIDS.  
 Tuberculosis is not a sexually transmitted disease.
22. (d) The organisms that are not native to the particular area and causes ecological or economical harm in a new environment are known as invasive organisms.



*Parthenium*, *Lantana* and *Eichhornia* are examples of invasive organisms. They cause decline or extinction of indigenous species.

23. (b) The use of bio-resources by multinational companies and other organisations without proper authorisation from the countries and people concerned without compensatory payment is known as biopiracy.
24. (a) Species-area relationship in South American jungles was studied by the great German naturalist and geographer Alexander von Humboldt.
25. (c) DDT Biomagnification → Disturbance in calcium metabolism  
Nuclear energy → Electricity generation  
Accelerated Eutrophication → Aging of lake  
Thermal power plants → Damage Indigenous flora and fauna.
26. (a) In the question, initial lotus plants are given- 80, new lotus plants are-16.  
So,  $\text{birth} = \frac{\text{number of added new lotus plants}}{\text{number of initial lotus plants}}$   
 $= 16/80 = 0.2$   
Result- 0.2 offspring per lotus per year.
27. (a) The correct sequence of events performed in DNA fingerprinting technique are- (A). Isolation of DNA → (C). Digestion of DNA using restriction endonucleases → (B). Separation of DNA fragments by electrophoresis → (D). Transfer of separated DNA fragment to synthetic membrane.
28. (c) Non-albuminous seed → Residual endosperm absent  
Albuminous seed → Residual endosperm present  
Perisperm → Residual nucellus  
Pericarp → Fruit wall
29. (c) The fruits that develop without fertilization are known as parthenocarpic fruits such as banana.
30. (a) Cocaine is a type of drug that is obtained from coca plant *Erythroxylum coca*. This plant is native to South America. It interferes with the transport of the neurotransmitter dopamine. Cocaine, commonly called coke or crack is usually snorted. It has a potent stimulating action on central nervous system, producing a sense of euphoria and increased energy.
31. (c) The Central dogma in molecular biology, which states that the genetic information flows from DNA → mRNA → Protein.
32. (a) The excessive use of herbicides, pesticides, etc., has resulted in selection of resistant varieties. It is an example of evolution by Anthropogenic action.
33. (d) The correct sequence of stages of primary ecological succession in water are- (D). Submerged plant stage → (A). Reed-swamp stage → (C). Marsh-meadow stage → (E). Scrub stage → (B). Forest
34. (d) Air bubbles are sparged into bioreactor tanks. The role of these bubbles is to increase the area for oxygen transfer.
35. (c) The triplet nature of genetic code → George Gamow  
The technique of DNA fingerprinting → Alec Jeffreys

Lac operon → Jacob and Monod

Central dogma → Francis Crick

36. (b) Only statements (B) and (D) are correct while statements (A) and (C) are incorrect. The correct statements are-  
A- *Parthenium* is an example of invasive species in India.  
C- *Parthenium* is also known as carrot grass.
37. (d) *Entamoeba histolytica* is a protozoan parasite that is present in the large intestine of human and causes amoebic dysentery. Symptoms of this disease include constipation, abdominal pain and cramps, stools with excess mucous and blood clots.
38. (b) Such type of organism in which both male and female characters are present in a single individual is known as hermaphrodite such as leech, earthworm, tapeworm, etc.
39. (d) Only statements (A) and (D) incorrect. The correct statements are-  
A- Phenylketonuria is an autosomal recessive trait.  
D- Colour blindness is a sex-linked recessive disorder.
40. (b) Catalytic converters are made of platinum palladium and rhodium that change unburnt hydrocarbons into carbon dioxide and water.
41. (a) According to the figure, the fertilization and development take place in the mosquito's gut in the life cycle of the plasmodium.
42. (c) Sexual stages of *Plasmodium* which develop in human RBC's are known as gametocytes.
43. (b) *Plasmodium* enters the human body as sporozoites during its life cycle.
44. (b) The rupturing of RBCs is associated with release of a toxic substance named as haemozoin that is responsible for the chill and high fever recurring every three to four days.
45. (c) The malarial parasites are stored in the salivary glands of a mosquito. When a female *Anopheles* mosquito bites an infected person, these parasites enter the mosquito's body and undergo further development. The parasites multiply within them to form sporozoites that are stored in their salivary glands. When these mosquitoes bite a human, the sporozoites are introduced into his/ her body.
46. (a) Bacteria are the decomposers so they play important role in the breakdown of the organic compounds in the carbon cycle.
47. (b) Only statements (B) and (C) are correct while statements (A) and (D) are incorrect. The correct statements are-  
A- 71 percent carbon is found dissolved in oceans.  
D-  $4 \times 10^{13}$  kg of carbon is fixed annually in the biosphere through photosynthesis.
48. (c) Deforestation and burning of fossil fuels are the human activities that have major influence of the carbon cycle.
49. (b) Human beings return carbon to the atmosphere through cellular respiration. During cellular respiration human beings exhale  $\text{CO}_2$  in the atmosphere.
50. (d) Statement (d) is not correct about carbon cycle. Environmental factors such as soil, moisture, pH, temperature etc., regulate the rate of release of nutrients into the atmosphere.