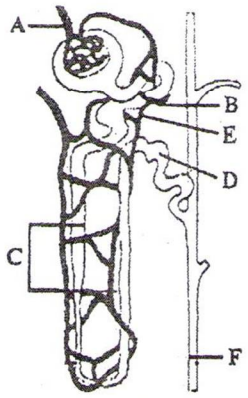
1. Nepenthes, Utricularia and Drosera all are
   A) autotrophs B) saprotrophs C) insectivores D) parasites

2. Select the option that correctly identifies the parts labelled from A to F in the given figure of nephron.



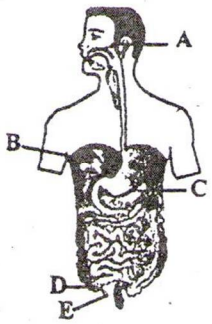
	A	B	C	D	E	F
A)	Afferent arteriole	PCT	Henle's loop	DCT	Collecting duct	Vasa recta
B)	Efferent arteriole	PCT	Henle's loop	DCT	Collecting duct	Vasa recta
C)	Afferent arteriole	Peritubular capillaries	Henle's loop	DCT	PCT	Collecting duct
D)	Afferent arteriole	Henle's loop	Collecting duct	PCT	DCT	Peritubular capillaries

3. Match Column-I with Column-II and select the correct option from the choices given below.

Column-I	Column-II
A. Galactose	i) Protein
B. Anticoagulant	ii) Phospholipid
C. Fructose	iii) Brain sugar
D. Lecithin	iv) Heparin
E. Insulin	v) Fruit sugar

   A) A-(v), B-(iii), C-(ii), D-(i), E-(iv) B) A-(v), B-(iii), C-(i), D-(iv), E-(ii)
   C) A-(i), B-(ii), C-(iii), D-(v), E-(iv) D) A-(iii), B-(iv), C-(v), D-(ii), E-(i)

4. The given figure represents the human digestive system. Identify A, B, C, D and E.



   A) A-Parotid gland, B-Liver, C-Pancreas, D-Caecum, E-Vermiform appendix
   B) A-Parotid gland, B-Pancreas, C-Liver, D-Caecum, E-Vermiform appendix
   C) A-Parotid gland, B-Caecum, C-Pancreas, D-Liver, E-Vermiform appendix
   D) A-Parotid gland, B-Liver, C-Caecum, D-Pancreas, E-Vermiform appendix.

5. Site of Kreb's cycle in mitochondria is
   A) outer membrane B) matrix
   C) oxysome D) inner membrane

6. Which of these statements are incorrect?
   i) Parapodia are lateral appendages in arthropods used for swimming.
   ii) Radula in molluscs are structures involved in excretion.

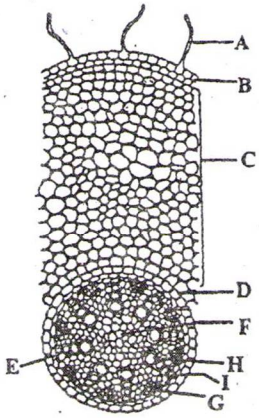
iii) Aschelminthes are dioecious.
iv) Echinoderm adults show radial symmetry.
v) Ctenophorans are diploblastic.

A) (i) and (ii) B) (i) and (iii) C) (i), (iv) and (v) D) (iii) and (v)

7. Smallest bone in human system is

A) stapes B) patella C) malleus D) incus

8. Transverse section of a part of a typical monocotyledonous root has been shown in the figure given. Identify the different parts (from A to I) and select the correct answer.



A) A-Root hair, B-Epiblema, C-Cortex, D-Endodermis, E-Pericycle, F-Pith, G-Phloem, H-Metaxylem, I-Protoxylem

B) A-Root hair, B-Epiblema, C-Cortex, D-Pericycle, E-Endodermis, F-Pith, G-Phloem, H-Metaxylem, I-Protoxylem.

C) A-Root hair, B-Epiblema, C-Cortex, D-Endodermis, E-Pericycle, F-Pith, G-Phloem, H-Protoxylem, I-Metaxylem.

D) A-Root hair, B-Cortex, C-Epiblema, D-Pericycle, E-Endodermis, F-Passage cell, G-Protoxylem, H-Phloem, I-Metaxylem.

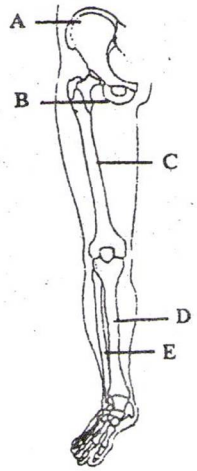
9. Match Column-I with Column-II and select the correct option from the choices given below.

Column-I	**Column-II**
A. FSH	i) Transported axonally to neurohypophysis from hypothalamus
B. MSH	ii) Acts on melanocytes and regulates
C. Vasopressin (ADH)	iii) Stimulates the growth and development of ovarian follicles in female
D. Pars intermedia	iv) In humans, it is almost merged with pars distalis

A) A-(iii), B-(ii), C-(i), D-(iv) B) A-(i), B-(ii), C-(iii), D-(iv)

C) A-(iv), B-(iii), C-(ii), D-(i) D) A-(iii), B-(ii), C-(iv), D-(i)

10. The figure showing part of right pelvic girdle and lower limb bones is given here. Identify the parts labelled A to E and select the correct option.



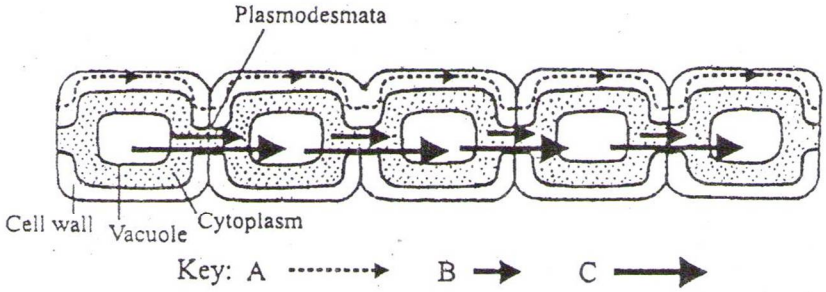
	A	B	C	D	E
A)	Sacrum	Pubis	Patella	Metatarsal	Fibula
B)	Ilium	Ischium	Femur	Tibia	Fibula
C)	Ilium	Ischium	Femur	Fibula	Tibia
D)	Ischium	Ilium	Patella	Tibia	Tarsal

11. Match Column-I with Column-II and select the correct option from the choices given below.

Column-I	Column-II
A. Choanocytes	i) Platyhelminthes
B. Cnidoblasts	ii) Ctenophora
C. Flame cells	iii) Porifera
D. Nephridia	iv) Coelenterata
E. Comb plates	v) Annelida

A) A-(ii), B(i), C-(iv), D-(v), E-(iii)
B) A-(ii), B-(iv), C-(i), D-(v), E-(iii)
C) A-(v), B-(i), C-(iii), D-(ii), E-(iv)
D) A-(iii), B-(iv), C-(i), D-(v), E-(ii)

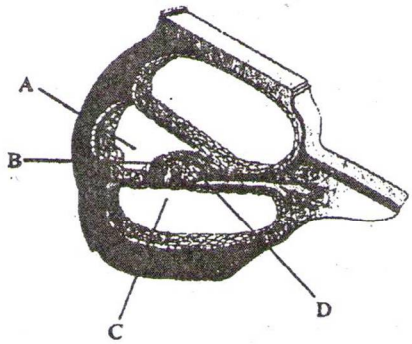
12. The figure given shows three different types of pathways of intercellular movement of water in plants. Identify A, B and C and select the correct option.



	A	B	C
A)	Apoplast	Symplast	Vacuolar
B)	Symplast	Apoplast	Vacuolar
C)	Symplast	Vacuolar	Apoplast
D)	Apoplast	Vacuolar	Symplast

13. Which one of the following statements is true regarding digestion and absorption of food in humans?
A) Fructose and amino acids are absorbed through intestinal mucosa with the help of carrier ions like Na^+.
B) Chylomicrons are small lipoprotein particles that are transported from intestine into blood capillaries.
C) About 60% of starch is hydrolysed by salivary amylase in our mouth.
D) Oxyntic cells in our stomach secrete the proenzyme pepsinogen.

14. Identify the parts labelled A, B, C and D in the figure and match the correct names from the list (i – viii) given below.



i) Reissner's membrane
ii) Basilar membrane
iii) Tectorial membrane
iv) Organ of Corti
v) Hair cells
vi) Otolith organ
vii) Scala media
viii) Scala vestibuli

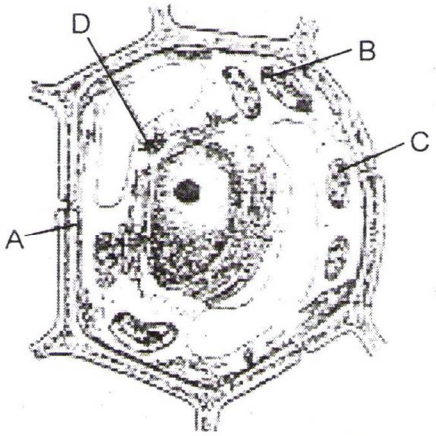
	A	B	C	D
A)	(ii)	(v)	(iii)	(i)
B)	(vii)	(iv)	(ii)	(iii)
C)	(vii)	(iv)	(i)	(ii)
D)	(viii)	(vi)	(i)	(iii)

15. Match Column-I with Column-II and select the correct option from the choices given below.

Column-I	Column-II
A. Royal botanical garden, Kew	i) Lucknow
B. Indian botanical garden	ii) England
C. National Botanical Research Institute	iii) Howrah
D. Largest herbarium in India	iv) Sibpur

A) A-(ii), B-(iii), C-(i), D-(iv) B) A-(i), B-(iii), C-(ii), D-(iv)
C) A-(iv), B-(ii), C-(i), D-(iii) D) A-(iv), B-(iii), C-(ii), D-(i)

16. Identify the parts labelled A, B, C and D in the given ultrastructure of a plant cell and select the correct option.



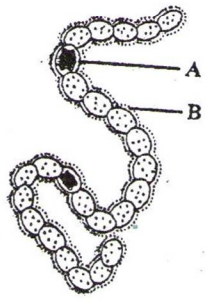
	A	B	C	D
A)	Plasma membrane	Chloroplast	Mitochondrion	Golgi complex
B)	Plasma membrane	Mitochondrion	Chloroplast	RER
C)	Cell wall	Mitochondrion	Chloroplast	RER
D)	Cell wall	Chloroplast	Mitochondrion	Golgi complex

17. Which of the following statements about dark reactions is correct?
A) They occur in darkness.
B) They are not light-dependent.
C) They are dependent upon the products synthesized during light reactions.
D) All of these.

18. Gibberellin was first extracted from
A) Gibberella fujikori B) Gelidium
C) Gracilaria D) Aspergillus

19. Refer the given equation:
$2(C_{51}H_{98}O_6) + 145\ O_2 \longrightarrow 102\ CO_2 + 98\ H_2O + Energy$
The RQ in this case is
A) 1 B) 0.7 C) 1.45 D) 1.62

20. Given figure is of filamentous blue green alga Nostoc. Identify the parts marked A and B and select the correct option.

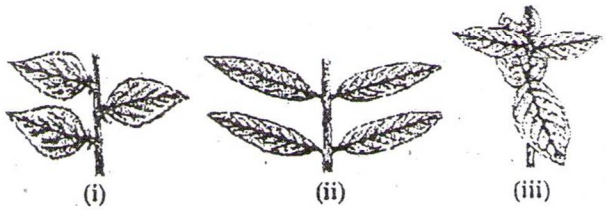


	A	B
A)	Heterocyst	Mucilaginous sheath
B)	Vegetative cell	Mucilaginous sheath
C)	Trichomes	Cell wall
D)	Mucilaginous sheath	Heterocyst

21. Which of the following is not related to the autonomic nervous system?
A) Peristalsis B) Digestion
C) Excretion D) Memory and learning

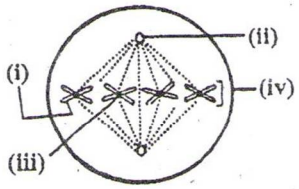
22. Anti-A and Anti-B antigens are not found in which of the following blood groups?
A) AB B) A C) O D) B

23. Study the given figures and identify the kind of phyllotaxy.



	(i)	(ii)	(iii)
A)	Alternate	Opposite superposed	Opposite decussate
B)	Alternate	Opposite superposed	Whorled
C)	Opposite decussate	Alternate	Whorled
D)	Opposite decussate	Whorled Alternate	

24. Identify the structures indicated by labels (i), (ii), (iii) and (iv) and select the correct option.



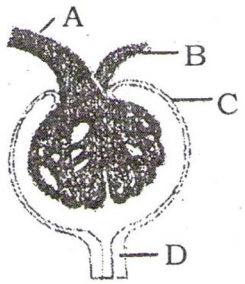
A) (i)-Chromatid, (ii)-Centriole, (iii)-Centromere, (iv)-Chromosome.
B) (i)-Chromosome, (ii)-Centriole, (iii)-Centromere, (iv)-Chromatid
C) (i)-Chromatid, (ii)-Centromere, (iii)-Centriole, (iv)-Chromosome.
D) (i)-Chromosome, (ii)-Centromere, (iii)-Centriole, (iv)-Chromatid.

25. Match Column-I with Column-II and select the correct option from the choices given below.

Column-I (Type of fleshy tap root)	**Column-II (Example)**
A. Conical	i) Brassica rapa
B. Fusiform	ii) Daucus carota
C. Napiform	iii) Raphanus sativus
D. Tuberous	iv) Mirabilis jalapa

A) A-(ii), B-(i), C-(i), D-(iv) B) A-(iii), B-(ii), C-(i), D-(iv)
C) A-(ii), B-(i), C-(iii), D-(iv) D) A-(ii), B-(iii), C-(iv), D-(i)

26. The figure given represents the Malpighian body. Identify the parts labelled A to D and select the correct option.



	A	B	C	D
A)	Efferent arteriole	Afferent arteriole	Bowman's capsule	Proximal convoluted tubule
B)	Afferent arteriole	Efferent arteriole	Renal corpuscle	Proximal convoluted tubule
C)	Afferent arteriole	Efferent arteriole	Bowman's capsule	Proximal convoluted tubule
D)	Afferent arteriole	Efferent arteriole	Bowman's capsule	Distal convoluted tubule

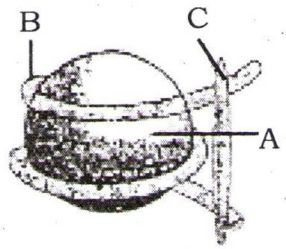
27. In a cardiac output of 5250 ml per minute, with 75 heartbeats per minute, the stroke volume is
A) 60 ml B) 80 ml C) 55 ml D) 70 ml

28. Which of the following statements are correct?
i) Ca^{+2} is necessary for blood coagulation.
ii) Coagulation in blood vessel is prevented during normal condition by heparin.
iii) Clotting of blood involves change of fibrinogen to fibrin by thrombin.
iv) Blood clotting involves cascading process involving a number of factors present in the active form always.
A) (i), (iii) and (iv) B) (ii) and (iv)
C) (i), (ii) and (iii) D) (iii) and (iv)

29. Which of the following is a bone of skull?
A) Atlas B) Patella C) Ethmoid D) Phalanges

30. Yellowish edges appear in leaves deficient in
A) potassium B) calcium C) magnesium D) phosphorus

31. Refer the figure of nucleosome and select the option that correctly identifies the parts A, B and C.



	A	B	C
A)	DNA	Histone	H_1 histone
B)	Histone octamer	H_1 histone	DNA
C)	Histone octamer	DNA	H_2 histone
D)	DNA	H_1 histone	Histone octamer

32. Which of the following statements is/are correct?
i) Endothecium lies behind epidermis.
ii) Fusion of egg with male gamete is called apogamy.
iii) Synergids are haploid.
iv) The point at which funicle touches the ovule is raphe.
A) (i) and (iv) B) (i) and (ii) C) (i) and (iii) D) (ii) and (iii)

33. Polycistonic messenger RNA (mRNA) usually occurs in
A) bacteria B) prokaryotes C) eukaryotes D) both (A) and (B)

34. Read the given statements and select the correct option.
Statement 1: MTP is considered relatively safe during the first trimester of pregnancy.
Statement 2: Foetus becomes intimately associated with the maternal tissues after the first trimester.
A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.
B) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.
C) Statement 1 is correct and statement 2 is incorrect.
D) Both statements 1 and 2 are incorrect.

35. Both chasmogamous and cleistogamous flowers are present in
A) Helianthus B) Commelina C) Rosa D) Gossypium

36. The part of gynoecium that determines the compatible nature of pollen is
A) stigma B) style C) ovary D) synergids

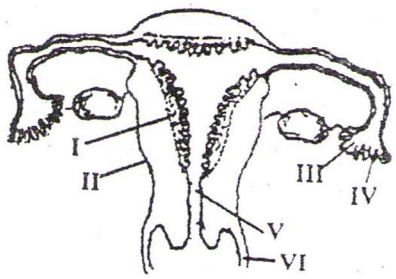
37. Match Column-I with Column-II and select the correct option from the choices given below.

Column-I	Column-II
A. Griffith	i) Lac operon
B. Hershey and Chase	ii) Semi-conservative DNA replication
C. Messelson and Stahl	iii) Transduction
D. Jacob and Monod	iv) Transformation

A) A-(iv), B-(iii), C-(ii), D-(i)
B) A-(iii), B-(iv), C-(ii), D-(i)
C) A-(iv), B-(ii), C-(iii), D-(i)
D) A-(ii), B-(i), C-(iii), D-(iv)

38. The one-horned rhinoceros is specific to which of the following National Parks?
A) Bhitarkanika B) Bandipur C) Kaziranga D) Jim Corbett park

39. The given figure depicts a sectional view of the human female reproductive system. Which set of three parts out of I-VI have been correctly identified?



A) (II) endometrium, (III) infundibulum, (IV) fimbriae
B) (III) infundibulum, (IV) fimbriae, (V) cervix
C) (IV) oviducal funnel, (V) uterus, (VI) cervix
D) (I) perimetrium, (II) myometrium, (III) Fallopian tube.

40. Read the given statements and select the correct option.

Statement 1: Test cross is used to determine an unknown genotype within one breeding generation.

Statement 2: Test cross is a cross between F_1 hybrid and dominant parent.

A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.
B) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.
C) Statement 1 is correct and statement 2 is incorrect.
D) Both statements 1 and 2 are incorrect.

41. Match Column-1 with Column-II and select the correct answer from the choices given below.

Column-I	**Column-II**
A. Leishmania donovani	i) Malaria
B. Wichereria bancrofti	ii) Amoebiasis
C. Trypanosoma gambiense	iii) Kala azar
D. Entamoeba histolytica	iv) Sleeping sickness
	v) Filariasis

A) A-(iv), B-(iii), C-(ii), D-(i)
B) A-(iii), B-(iv), C-(v), D-(ii)
C) A-(iii), B-(v), C-(iv), D-(ii)
D) A-(iii), B-(v), C-(ii), D-(i)

42. The most abundant class of immunoglobulins (Igs) in the body is
A) IgA B) IgG C) IgE D) IgM

43. Match Column-I with Column-II and select the correct answer from the choices given below.

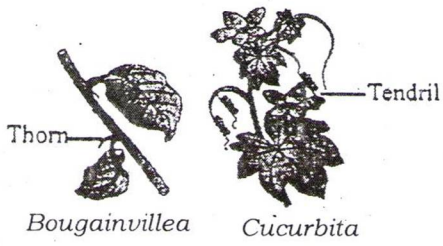
Column-I	**Column-II**
A. Ganga action plan	i) N_2 fixing cyanobacterium
B. Bt cotton	ii) Ministry of Environment and Forests
C. Rhizobium	iii) Insect resistant plant
D. Nostoc	iv) N_2 fixing bacterium

A) A-(ii), B-(iii), C-(iv), D-(i)
B) A-(iii), B-(ii), C-(iv), D-(i)
C) A-(ii), B-(iv), C-(iii), D-(i)
D) A-(i), B-(iii), C-(ii), D-(iv)

44. A is an improved breed of cattle and B is an improved breed of chicken. Which of the following options correctly identifies A and B?
A) A-Jersey, B-Leghorn
B) A-Surti, B-Sangamneri
C) A-Marwari, B-Sirohi
D) A-Beetal, B-Jamunapari

45. Regulatory proteins are the accessory proteins that interact with RNA polymerase and affect its role in transcription. Which of the following statements is correct about regulatory proteins?
A) They only increase its expression.
B) They only decrease its expression.
C) They interact with RNA polymerase but do not affect the expression.
D) They can act both as activators and as repressors.

46. The figure given shows an example of
A) homologous organs
B) convergent evolution
C) divergent evolution
D) both (A) and (C).



47. Match Column-I with Column-II and select the correct answer from the choices given below.

Column-I	Column-II
A. Methanogens	i) BOD
B. Fermenters	ii) Methane-rich fuel gas
C. Organic waste in water	iii) Production of methane
D. Biogas	iv) Large vessels for growing microbes

A) A-(ii), B-(iv), C-(iii), D-(i) B) A-(iv), B-(iii), C-(ii), D-(i)
C) A-(ii), B-(i), C-(iv), D-(iii) D) A-(iii), B-(iv), C-(i), D-(ii)

48. Lichens are the indicators of
A) water pollution B) air pollution
C) soil pollution D) all of these

49. Read the given statements and select the correct option.
Statement 1: In a Graafian follicle, the primary oocyte and the follicle cells may be regarded as sibling cells.
Statement 2: Both arise from the same parent cell, the oogonium, by mitotic divisions.
A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.
B) Both statements 1 and 2 are correct but statement 2 is not the correct explanation of statement 1.
C) Statement 1 is correct and statement 2 is incorrect.
D) Both statements 1 and 2 are incorrect.

50. What is the function of filiform apparatus in an angiospermic embryo sac?
A) Guides pollen tube from synergid to egg
B) Helps in the entry of pollen tube into a synergid
C) Prevents entry of more than one pollen tube into a synergid
D) Brings about opening of the pollen tube.

51. Match Column-I with Column-II and select the correct answer from the choices given below.

Column-I	Column-II
A. Biopiracy	i) Effort to fix the non-functional gene
B. Biopatent	ii) Gene silencing
C. Gene therapy	iii) Illegal removal of biological materials
D. RNAi	iv) Right granted for biological entities

A) A-(iv), B-(ii), C-(i), D-(iii) B) A-(ii), B-(iv), C-(i), D-(iii)
C) A-(iii), B-(iv), C-(i), D-(ii) D) A-(iii), B-(iv), C-(ii), D-(i)

52. In which pair can both the plants be vegetatively propagated by leaf pieces?
A) Bryophyllum and Kalanchoe
B) Chrysanthemum and Agave
C) Agave and Dioscorea
D) Bryophyllum and Asparagus

53. Read the following statements carefully.
i) An electrostatic precipitator removes particulate matter by imposing negative charge on them.
ii) Catalytic converters convert unburnt hydrocarbons into CO_2 and water.
iii) Peroxyacyl nitrate (PAN) is a secondary pollutant.
iv) DDT is a non-biodegradable pollutant.

Which of the above statements are incorrect?
A) (i) and (ii)
B) (iii) and (iv)
C) (i) and (iii)
D) None of these

54. The population growth is generally described by the following equation:

$$\frac{dN}{dt} = rN\left(\frac{K - N}{K}\right)$$

What does 'r' represent in the given equation?
A) Population density at time 't'
B) Intrinsic rate of natural increase
C) Carrying capacity
D) The base of natural logarithm

55. The population growth is generally described by the following equation:

Statement 1: Net primary productivity is less than the gross primary productivity.

Statement 2: Net primary productivity is equal to the gross primary productivity minus the respiration losses.
A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.
B) Both statements 1 and 2 are correct but statement 2 is not the explanation of statement 1.
C) Statement 1 is correct and statement 2 is incorrect.
D) Both statements 1 and 2 are incorrect.

56. Read the following statements and select the correct option.

Statement 1: Malarial parasite requires two hosts – humans and mosquitoes to complete its life cycle.

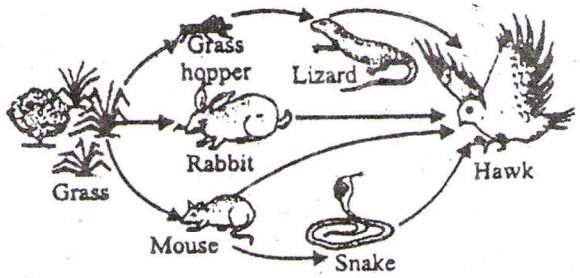
Statement 2: Haemozoin is a toxic substance produced by the rupturing of liver cells during malarial infection.
A) Both statements 1 and 2 are correct and statement 2 is the correct explanation of statement 1.
B) Both statements 1 and 2 are correct but statement 2 is not the explanation of statement 1.
C) Statement 1 is correct but statement 2 is incorrect.
D) Both statements 1 and 2 are incorrect.

57. Match the terms given in Column-I with their description given in Column-II and select the correct option from the choices given below.

Column-I	**Column-II**
A. Out-crossing	i) Mating of closely related individuals within the same breed.
B. Interspecific hybridisation	ii) Mating of animals of same breed but having no common ancestors on either side of their pedigree for 4-6 generations
C. Cross-breeding	iii) Mating of animals of two different species
D. Inbreeding	iv) Mating of animals belonging to different breeds

A) A-(ii), B-(iii), C-(iv), D-(i)
B) A-(iii), B-(ii), C-(iv), D-(i)
C) A-(iv), B-(ii), C-(iii), D-(i)
D) A-(ii), B-(iv), C-(iii), D-(i)

58. In the food web given, an increase in the population of hawks will not result in



A) decrease in the population of rabbits and snakes
B) increase in the population of producers
C) increase in the population of lizards
D) increase in the population of grasshoppers.

59. Biopiracy means
A) use of biopatents
B) theft of plants and animals
C) stealing of bioresources
D) exploitation of bioresources without authentic permission

60. Enzyme 'Taq polymerase' used in PCR, has been isolated from the bacterium
A) Agrobacterium tumefaciens
B) Thermus aquaticus
C) Streptomyces albus
D) Escherichia coli.

Answer Key

Q.No.	Answer
1.	C
4.	D
7.	C
10.	C
13.	A
16.	A
19.	B
22.	C
25.	A
28.	C
31.	C
34.	A
37.	A
40.	C
43.	A
46.	D
49.	A
52.	A
55.	A
58.	C

Q.No.	Answer
2.	A
5.	B
8.	A
11.	D
14.	B
17.	C
20.	A
23.	A
26.	C
29.	C
32.	D
35.	B
38.	C
41.	C
44.	A
47.	D
50.	A
53.	D
56.	C
59.	D

Q.No.	Answer
3.	D
6.	A
9.	A
12.	A
15.	B
18.	A
21.	D
24.	A
27.	D
30.	A
33.	D
36.	A
39.	B
42.	B
45.	D
48.	B
51.	D
54.	B
57.	A
60.	B