CUET Biology Solved Paper-2023

Held on 26 May 2023

1. Match List-I with List-II.

List-I (Causal Agent)	List-II (Disease)
(A) *Salmonella typhi*	(I) Typhoid
(B) *Streptococcus pneumoniae*	(II) Pneumonia
(C) Rhino Viruses	(III) Common cold
(D) *Plasmodium*	(IV) Malaria

Choose the correct answer from the options given below:

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

2. The historic convention on Biological Diversity held in Rio de Janeiro in 1992 is also called:

(a) The World Summit (b) MAB Programme
(c) The Earth Summit (d) G-16 Summit

3. Out of following plants which one is not browsed by cattle:

(a) Wheat (b) Cowpea
(c) Sugar cane (d) *Calotropis*

4. Arrange the following steps of experiments performed by Griffith in correct series.

(A) 'S' strain → injected into mice → Mice died
(B) 'S' strain (Heat killed) → injected into mice → Mice lived
(C) 'R' strain → injected into mice → Mice lived
(D) 'S' strain (Heat killed) + 'R' strain (Live) → injected into mice → Mice died

Choose the correct answer from the options given below:

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

5. The process of RNA interference (RNAi) was used in Tobacco plant to develop resistance against:

(a) Viruses (b) Fungi
(c) Nematodes (d) Insects

6. Identify the gene which is not effective against cotton boll worms?

(a) *cryIAb* (b) *cryIAc*
(c) *cryIIAb* (d) Both (b) and (c)

7. Match List - I with List - II.

List - I	List- II
(A) Polyembryony	(I) Apple
(B) Parthenocarpy	(II) Female gametophyte
(C) False Fruit	(III) Orange
(D) Embryo Sac	(IV) Banana

Choose the correct answer from the options given below:

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

8. Which of the following is not a nitrogen fixing microorganism?

(a) *Azotobacter* (b) *Oscillatoria*
(c) *Acetobacter* (d) *Nostoc*

9. Fresh water animals cannot live for long in sea water and vice versa as they face:

(a) Temperature variations
(b) Tidal waves
(c) Predators
(d) Osmotic problems

10. Match List - I with List - II.

List - I	List - II
(A) Metabolic Disorder	(I) Family tree over generation
(B) Pedigree analysis	(II) Blood disease
(C) Thalassemia	(III) Phenylketonuria
(D) Trisomy of 21st chromosome	(IV) Down's Syndrome

Choose the correct answer from the options given below:

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

11. Match List - I with List – II.

List - I	List - II
(A) Lymphoid Organ	(I) ELISA
(B) Cancer	(II) Widal Test
(C) HIV	(III) Bone marrow and Thymus
(D) Typhoid	(IV) Carcinogens

Choose the correct answer from the options given below:
(a) (A)-(IV), (B)-(II), (C)-(I), (D)-(III)
(b) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)
(c) (A)-(II), (B)-(III), (C)-(IV), (D)-(I)
(d) (A)-(I), (B)-(III), (C)-(II), (D)-(IV)

12. Dobson Units (DU) are used to measure:
(a) Biodiversity index
(b) Thickness of ozone layer
(c) Sustainability index
(d) Thickness of canopy in rainforest

13. Identify the factor which does not affect the Hardy-Weinberg equilibrium?
(a) Genetic drift
(b) Natural selection
(c) Genetic recombination
(d) Genetic equilibrium

14. Antibiotic resistance gene in a vector helps in the selection of:
(a) Recombinant cells (b) Transformed cells
(c) Competent cells (d) Totipotent cells

15. Which of the following area is India's one of the biodiversity hot spots?
(a) Eastern Ghats (b) Indo-Burma Plains
(c) Aravali Hills (d) Indo-Gangetic Plains

16. Sonalika and Ratna respectively are 'High Yielding Varieties' (HYV) of:
(a) Wheat and Rice (b) Rice and Wheat
(c) Maize and Rice (d) Wheat and Millet

17. Match List-I with List-II

List-I	List-II
(A) Sterilized plant part	(I) Pomato
(B) Genetically similar plants	(II) Virus free culture
(C) Meristem	(III) Somaclones
(D) Somatic hybrids	(IV) Explant

Choose the correct answer from the options given below:
(a) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
(b) (A)-(II), (B)-(I), (C)-(III), (D)-(IV)
(c) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
(d) (A)-(IV), (B)-(III), (C)-(II), (D)-(I)

18. The natural interconnections of food chain is :
(a) GFC (b) DFC
(c) Food web (d) Biomass

19. Agarose, a gel used as matrix in gel electrophoresis is a natural polymer which is extracted from:
(a) Soya bean (b) Sea weeds
(c) Sea anemone (d) Sea corals

20. Identify the statements true for RNA.
(A) RNA acts as a genetic material for some viruses.
(B) RNA also functions as an adapter molecule.
(C) RNA has hexose sugar as its backbone.
(D) RNA also acts as catalyst in some cases.
Choose the correct answer from the options given below:
(a) (A), (B) and (C) only (b) (A), (B) and (D) only
(c) (B), (C) and (D) only (d) (A), (C) and (D) only

21. Match List I with List-II

List I	List II
A. Ribosome	(I) Replication
B. Histone	(II) Transcription
C. DNA polymerase	(III) Translation
D. RNA polymerase	(IV) Nucleosome

Choose the correct answer from the options given below:
(a) (A)-(I), (B)-(II), (C)-(III), (D)-(IV)
(b) (A)-(II), (B)-(I), (C)-(III), (D)-(IV)
(c) (A)-(I), (B)-(II), (C)-(IV), (D)-(III)
(d) (A)-(III), (B)-(IV), (C)-(I), (D)-(II)

22. Which of the following is NOT a category of waste generated by human beings in daily practice?
(a) Radio-active waste
(b) Bio-degradable waste
(c) Plastic waste
(d) Non-biodegradable waste

23. Select the correct statements regarding menstrual cycle in human female:
(A) The first menstruation begins at puberty and is called menopause.
(B) The ovulation takes place in the middle of cycle (about 14th day), when the level of progesterone is at maximum level.
(C) In absence of fertilisation, the corpus luteum degenerates which causes the disintegration of endometrium leading to menstruation.
(D) In human beings, menstrual cycle ceases around 50 years of age.
Choose the correct answer from the options given below:
(a) (A) and (B) only (b) (B) and (D) only
(c) (A) and (C) only (d) (C) and (D) only

24. The first instance of construction of an artificial recombinant DNA molecule was carried out on the plasmid of
(a) *Bacillus thuringiensis*
(b) *Escherichia coli*
(c) *Agrobacterium tumefaciens*
(d) *Salmonella typhimurium*

25. Identify the terminal method used to prevent pregnancy is:
(a) Lactational amenorrhea
(b) Sterilisation
(c) Intra Uterine Device
(d) Periodic abstinence

26. Single step large mutation leading to speciation is also called:
(a) Founder effect (b) Saltation
(c) Branching descent (d) Natural selection

27. Which of the following is not a cyanobacteria?
(a) *Nostoc* (b) *Glomus*
(c) *Anabaena* (d) *Oscillatoria*

28. Common term used to refer the use of bioresources by multinational companies and other organisations without proper authorisation and compensatory payment to the countries and people concerned is:
(a) Bio-informatics (b) Biopiracy
(c) Biopatenting (d) Biological theft

29. Select the hormone which is not secreted by human placenta?
(a) Estrogen
(b) Progestogen
(c) Human chorionic gonadotropin
(d) Luteinising hormone

30. Which of the following crop was made resistant to yellow mosaic virus and powdery mildew by mutation breeding?
(a) Cowpea (b) Flat bean
(c) Mung bean (d) *Brassica*

31. Which of the following statements are incorrect regarding food chain?
(A) Primary carnivores are the tertiary consumers
(B) The flow of energy form the sun to producers and then to consumers is unidirectional
(C) The death of the organism is the initiation of detritus food chain
(D) Plant are the primary consumers as they utilise the solar energy for making food
Choose the correct answer from the options given below:
(a) (A) and (B) only (b) (A) and (D) only
(c) (B) and (C) only (d) (C) and (D) only

32. Out of the following which one is not a hermaphrodite?
(a) Sponge (b) Earthworm
(c) Leech (d) Cockroach

33. Match List - I with List - II.

List – I	List – II
(A) Lippes loop	(I) Barrier
(B) Vaults	(II) Hormone releasing device
(C) Periodic abstinence	(III) Non- medicated IUDs
(D) Progestasert	(IV) Natural method

Choose the correct answer from the options given below:
(a) (A)-(I), (B)-(III), (C)-(IV), (D)-(II)
(b) (A)-(III), (B)-(II), (C)-(IV), (D)-(I)
(c) (A)-(III), (B)-(I), (C)-(IV), (D)-(II)
(d) (A)-(III), (B)-(I), (C)-(II), (D)-(IV)

34. Arrange the following stages of development of a dicot embryo in the order of their occurrence:
(A) Formation of heart shaped embryo
(B) Formation of typical dicot embryo
(C) Formation of zygote
(D) Formation of globular embryo
Choose the correct answer from the options given below:
(a) (A), (B), (C), (D) (b) (C), (D), (A), (B).
(c) (C), (A), (B), (D) (d) (D), (A), (B), (C)

35. The statements are not true for allergy:
(A) Allergy is due to release of chemicals like histamine and serotonin
(B) Allergens are the substances which cause allergy
(C) The antibodies produced due to allergens are IgA type
(D) Adrenalin and steroids quickly enhance the symptoms of allergy
Choose the correct answer from the options given below:
(a) (C) and (D) only (b) (A) and (C) only
(c) (A) and (B) only (d) (B) and (D) only

36. Paleontological evidences for evolution refers to:
(a) Development of embryo
(b) Homologous Organs
(c) Fossils
(d) Analogous Organs

37. In DNA N-glycosidic linkage is present between _____.
(a) Pentose sugar and Phosphate group
(b) A nitrogenous base and a Pentose sugar
(c) Two nitrogenous bases
(d) Two pentose sugars

38. Which of the following is not a Mendelian Disorder?
(a) Haemophilia (b) Sickle-cell anaemia
(c) Down's Syndrome (d) Phenylketonuria

39. Parthenogenesis does not occur in:
(a) Rotifers (b) Honeybees
(c) Lizards (d) Mammals

40. The large holes in 'Swiss Cheese' are due to:
(a) Production of large amount of O_2
(b) Citric acid
(c) Production of large amount of CO_2
(d) Ethyl alcohol

41. Read the given paragraph and answer the given question:

Parasitism has evolved in many taxonomic groups from plants to higher vertebrates. Many parasites have evolved to be host specific in such a way that both host and the parasite tend to co-evolve. In accordance with their life styles, parasite evolve special adaptations and complex life cycle.

Complex life cycle of parasites means:

(a) Having only one intermediate host
(b) Having special adaptations to cling on to the host
(c) Having many hosts
(d) Having one or two intermediate hosts to facilitate parasitisation of its primary host

42. Read the given paragraph and answer the given question:

Parasitism has evolved in many taxonomic groups from plants to higher vertebrates. Many parasites have evolved to be host specific in such a way that both host and the parasite tend to co-evolve. In accordance with their life styles, parasite evolve special adaptations and complex life cycle.

Parasites harm the host by:

(a) Reducing its size
(b) Improving its growth and reproduction
(c) Reducing its survival, growth, reproduction and population density
(d) Improving its survival, growth and reproduction

43. Read the given paragraph and answer the given question:

Parasitism has evolved in many taxonomic groups from plants to higher vertebrates. Many parasites have evolved to be host specific in such a way that both host and the parasite tend to co-evolve. In accordance with their life styles, parasite evolve special adaptations and complex life cycle.

Match List-I with List-II.

List-I	List-II
(A) Cuckoo and Crow	(I) Ectoparasite
(B) Copepods	(II) Commensal Organism
(C) *Plasmodium*	(III) Brood Parasitism
(D) Orchids and Mango tree	(IV) Endoparasite

Choose the correct answer from the options given below:

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

44. Read the given paragraph and answer the given question:

Parasitism has evolved in many taxonomic groups from plants to higher vertebrates. Many parasites have evolved to be host specific in such a way that both host and the parasite tend to co-evolve. In accordance with their life styles, parasite evolve special adaptations and complex life cycle.

Identify the statements which are not true with respect to host parasite relationship.

(A) Host and parasite tend to co-evolve.
(B) Parasite have evolved elaborate nervous system for survival.
(C) If the host evolves to reject the parasite, the parasite also evolve to counteract them in order to be successful with the same host species.
(D) If the host evolves special mechanisms for rejecting the parasite, the parasite evolves to be successful in the another host species.

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 (C) only

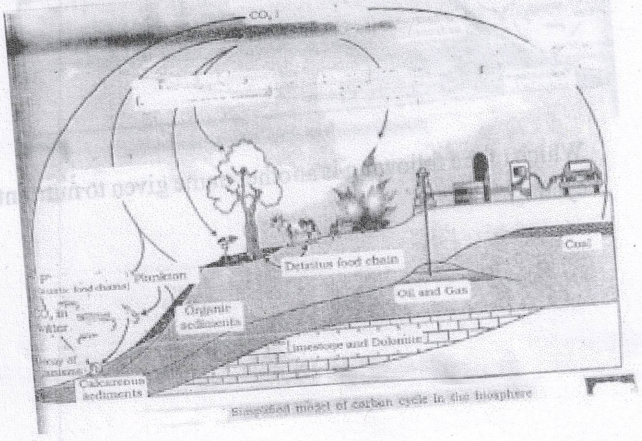
45. Read the given paragraph and answer the given question:

Parasitism has evolved in many taxonomic groups from plants to higher vertebrates. Many parasites have evolved to be host specific in such a way that both host and the parasite tend to co-evolve. In accordance with their life styles, parasite evolve special adaptations and complex life cycle.

What are the intermediate hosts for human liver fluke?

(a) Snail and Fish
(b) Snail and fresh water mussel
(c) Fish and Man
(d) Snail and Man

46. Observe the diagram and answer the given question.

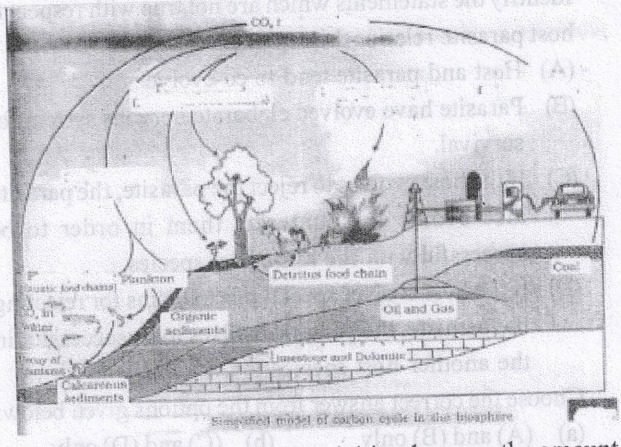


Simplified model of carbon cycle in the biosphere

Which of the following does not constitute the underground store of carbon?

(a) Limestone and Dolomite
(b) Oil and Gas
(c) Coal
(d) CO_2

47. Observe the diagram and answer the given question.

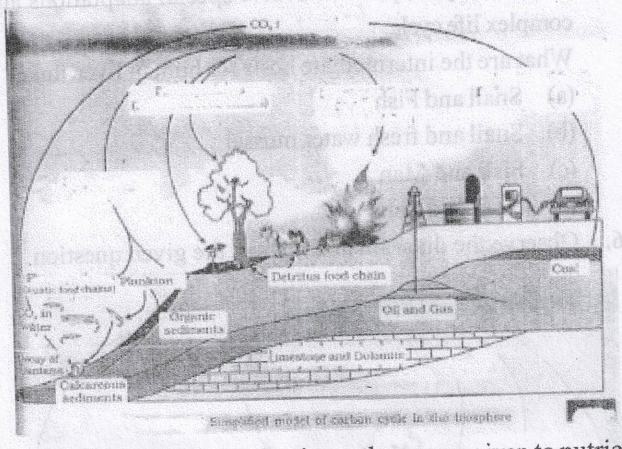


Simplified model of carbon cycle in the biosphere

Which of the following activities decrease the amount of CO_2 in atmosphere?

(a) Respiration
(b) Photosynthesis
(c) Burning of forests
(d) Combustion of fossil fuels

48. Observe the diagram and answer the given question.

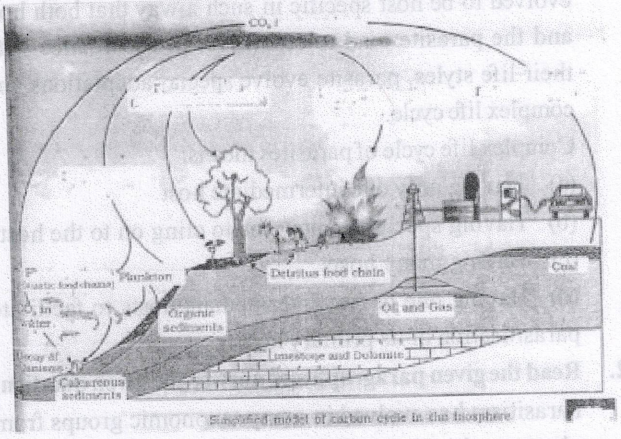


Simplified model of carbon cycle in the biosphere

Which of the following is another name given to nutrient cycling?

(a) Biological cycle (b) Biogeological cycle
(c) Biogeochemical cycle (d) Biochemical cycle

49. Observe the diagram and answer the given question.

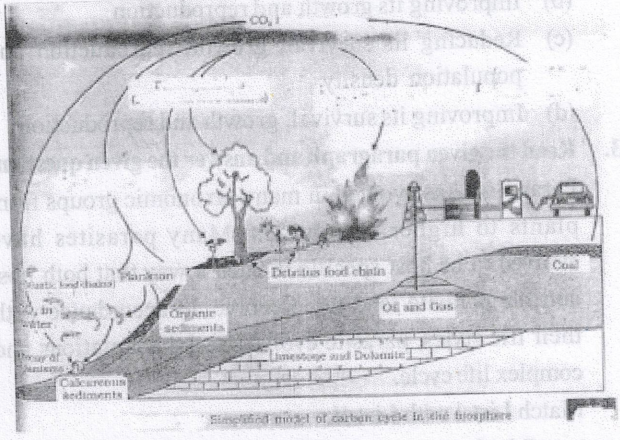


Simplified model of carbon cycle in the biosphere

The amount of carbon dioxide in the atmosphere is regulated by which of the following?

(a) Plants
(b) Animals
(c) Oceanic reservoir of carbon
(d) Burning of fossil fuels

50. Observe the diagram and answer the given question.



Simplified model of carbon cycle in the biosphere

The amount of nutrients such as carbon etc. present in soil at any specific time is referred to as

(a) Standing rate (b) Standing state
(c) Nutrient rate (d) Nutrient value

Hints & Explanations

1. **(a)**
Salmonella typhi → Typhoid
Streptococcus pneumonia → Pneumonia
Rhino Viruses → Common cold
Plasmodium → Malaria

2. **(c)** The historic Convention on Biological Diversity held in Rio de Janeiro in 1992 is also called 'The Earth Summit'. This convention was for the conservation of biodiversity and sustainable utilisation of its benefits.

3. **(d)** *Calotropis are a type of weed that* grows in abandoned fields. This plant produces highly poisonous cardiac glycosides and that is why it is not browsed by any cattle or goats.

4. **(d)** The correct series of steps of experiment performed by Griffith is – (A), (C), (B), (D)
'S' strain → injected into mice → Mice died
'R' strain → injected into mice → Mice lived.
'S' strain (Heat- killed) → injected into mice → Mice lived
'S' strain (Heat- killed) + 'R' strain (Live) → injected into mice → Mice died.

5. **(c)** A nematode *Meloidegyne incognitia* infects the roots of tobacco plants and causes a great reduction in yield. So the process of RNA interference (RNAi) was used in tobacco plant to develop resistance against nematodes.

6. **(a)** The gene *cryIAb* controls corn borer so it is not effective against cotton boll worms.

7. **(b)**
Polyembryony→ Orange
Parthenocarpy→ Banana
False fruit→ Apple
Embryo Sac→ Female gametophyte

8. **(c)** *Acetobacter* is not a nitrogen fixing microorganism. It is used in the production of acetic acid.

9. **(d)** Fresh water animals cannot live for long in sea water and vice versa as they face osmotic problems.

10. **(c)**
Metabolic disorder → Phenylketonuria
Pedigree analysis → Family tree over generation
Thalassemia → Blood disease
Trisomy of 21st chromosome → Down's Syndrome

11. **(b)**
Lymphoid organ → Bone marrow and thymus
Cancer → Carcinogens
HIV → ELISA
Typhoid → Widal test

12. **(b)** Dobson Units (DU) are used to measure thickness of ozone layer.

13. **(d)** There are five factors that are known to affect Hardy-Weinberg equilibrium. These are gene migration or gene flow, genetic drift, mutation, genetic recombination and natural selection. Thus genetic equilibrium does not affect the Hardy Weinberg equilibrium.

14. **(b)** Antibiotic resistance gene in a vector helps in the selection of transformed cells.

15. **(b)** Three hotspots such as Western Ghats and Sri Lanka, Indo-Burma and Himalaya – cover India's exceptionally high biodiversity regions.

16. **(a)** Sonalika and Ratna respectively are high yielding varieties of wheat and rice.

17. **(d)**
Sterilized plant part → Explant
Genetically similar plants → Somaclones
Meristem → Virus free culture
Somatic hybrids → Pomato

18. **(c)** The natural interconnection of food chains make it a food web.

19. **(b)** Agarose is the most commonly used matrix which is a natural polymer and extracted from sea weeds.

20. **(b)** Statements A, B, and D are true statements about RNA. Statement C is incorrect because RNA contains ribose sugar.

21. **(d)**
Ribosome → Translation
Histone → Nucleosome
DNA polymerase → Replication
RNA polymerase → Transcription

22. **(a)** Radio- active waste is not a category of waste that is generated by human beings in daily practice. Bio-degradable, non- biodegradable and plastic wastes are generated by human beings in daily practice.

23. **(d)** Statements A and B are incorrect while statements C and D are correct. The correct statements are-
A- The first menstruation begins at puberty and is called menarche.
B- The ovulation takes place in the middle of cycle (about 14th day), when rapid secretion of LH leading to its maximum level called LH surge and the level of progesterone is low.

24. **(d)** The first instance of construction of an artificial recombinant DNA molecule was carried out on the plasmid of *Salmonella typhimurium*.

25. **(b)** Sterilisation is the terminal method used to prevent pregnancy.

26. **(b)** deVries believed mutation caused speciation and hence called it saltation .It is a single step large mutation.

27. **(b)** Cyanobacteria are autotrophic microbes widely distributed in aquatic and terrestrial environments many of which can fix atmospheric nitrogen such as *Anabaena*, *Nostoc*, *Oscillatoria,* etc. Glomus is a type of fungi that forms symbiotic association with plant roots.

28. **(b)** Biopiracy is a term used to refer the use of bio-resources by multinational companies and other organisations without proper authorisation and compensatory payment to the countries and people concerned.

29. **(d)** Placenta acts as an endocrine tissue and produces several hormones like human chorionic gonadotropin (hCG), human placental lactogen (hPL), estrogens, progestogens, etc. Luteinising hormone is not secreted by human placenta.

30. **(c)** Mung bean crop was made resistant to yellow mosaic virus and powdery mildew by mutation breeding.

31. **(b)** Statements A and D are incorrect while statements B and C are correct. The correct statements are:
A- Primary carnivores consume herbivores so they are secondary consumers such as wolf, birds etc. Top carnivores are tertiary consumers such as man, lion etc.
D- Plants are producer because they utilise the solar energy for the production of food.

32. **(d)** Bisexual animals that possess both male and female reproductive organs are known as hermaphrodites such as earthworms, sponge, tapeworm, leech etc. Cockroach is not a hermaphrodite because it is unisexual.

33. **(c)**
Lippes loop → Non-medicated IUDs.
Vaults → Barrier
Periodic abstinence→ Natural method
Progestasert → Hormone releasing device.

34. **(b)** The correct stages of development of a dicot embryo in the order of their occurrence are – (C).Formation of zygote → (D).Formation of globular embryo → (A). Formation of heart (shaped embryo → (B). Formation of typical dicot embryo.

35. **(a)** Statements A and B are correct while statements C and D are incorrect.
The correct statements are-
C- The antibodies produced due to allergens are IgE type.
D- Drugs like anti-histamine, adrenalin and steroids quickly reduce the symptoms of allergy.

36. **(c)** Paleontological evidences for evolution refers to fossils.

37. **(b)** A nitrogenous base is linked to the OH of 1 'C pentose sugar through a N-glycosidic linkage to form a nucleoside, such as adenosine or deoxyadenosine, guanosine or deoxyguanosine, cytidine or deoxycytidine and uridine or deoxythymidine.

38. **(c)** Such type of disorders that are mainly determined by alteration or mutation in the single gene are known as Mendelian disorder. These disorders are transmitted to the offspring on the same lines. Haemophilia, cystic fibrosis, sickle cell anaemia, colour blindness, phenylketonuria, thalassemia, etc. are the examples of Mendelian disorders. Down's syndrome is an example of chromosomal disorder.

39. **(d)** The phenomenon in which the female gamete undergoes development to form new organisms without fertilisation is known as parthenogenesis. Organisms like rotifers, honeybees, some lizards, birds (turkey) etc. Mammals do not show parthenogenesis.

40. **(c)** The large holes in 'Swiss cheese' are due to production of a large amount of CO_2 by a bacterium named *Propionibacterium sharmanii*.

41. **(d)** Complex life cycles of parasites means that parasites having one or two intermediate hosts or vectors to facilitate parasitisation of its primary host.

42. **(c)** Such type of the organisms that lives in or on another plants or animals and obtain their food from them are known as parasites. Parasites harm the host in many ways such as they may reduce the survival, growth and reproduction of the host and reduce its population density.

43. **(b)**
Cuckoo and Crow→ Brood parasitism
Copepods→ Ectoparasite
Plasmodium→ Endoparasite
Orchid and Mango tree → Commensal organism.

44. **(c)** Statements B and D are not correct. The correct statements are:-
B- Parasites evolved special adaptations such as the loss of unnecessary sense organs, presence of adhesive organs or suckers to cling on to the host, loss of digestive system and high reproductive capacity.
D- If the host evolves special mechanisms for rejecting or resisting the parasite, the parasite has to evolve mechanisms to counteract and neutralise them, in order to be successful with the same host species.

45. **(a)** The human liver fluke depends on two intermediate hosts one is a snail and the other is a fish to complete its life cycle.

46. **(d)** CO_2 is present in the atmosphere in gaseous state and it is also present in the ocean in dissolved states. It is not found as underground store of carbon. Coal, oil, gas, limestone and dolomite are found as underground store of carbon.

47. **(b)** Photosynthesis is a biochemical process that decreases the amount of CO_2 in the atmosphere. In this process, green plants absorb carbon dioxide from the atmosphere to synthesise their food, thus decreases the amount of CO_2. According to one estimate 4×10^{13} kg of carbon is fixed annually in the biosphere through photosynthesis.

48. **(c)** The movement of nutrient elements through the various components of an ecosystem is known as nutrient cycle. This cycle is also named as biochemical cycle.

49. **(c)** Oceanic reservoir of carbon regulates the amount of carbon dioxide in the atmosphere.

50. **(b)** The amount of nutrients, such as carbon, nitrogen, phosphorus, calcium, etc., present in the soil at any given time , is known as standing state.