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# Answers & Solutions

**Time : 45 min.** *for* **M.M. : 200**

# CUET UG-2023

## (Biology)

**IMPORTANT INSTRUCTIONS:**

1. The test is of 45 Minutes duration.
2. The test contains 50 Questions out of which 40 questions need to be attempted.
3. Marking Scheme of the test:
   a. Correct answer or the most appropriate answer: Five marks (+5)
   b. Any incorrect option marked will be given minus one mark (–1).
   c. Unanswered/Marked for Review will be given no mark (0).

**Choose the correct answer :**

1. The two closely linked genes HBA1 and HBA2 are associated with _____

(1) $\alpha$ thalassemia (2) $\beta$ thalassemia

(3) Haemophilia (4) Sickle cell anaemia

**Answer (1)**

**Sol.** $\alpha$ thalassemia is controlled by two closely linked genes HBA1 and HBA2 on chromosome 16 of each parent and it is observed due to mutation or deletion of one or more of the four genes. Thus option (1) is correct.

$\beta$ thalassemia is controlled by a single gene HBB on chromosome II.

Haemophilia is an X-linked recessive disorder caused due to impaired blood clotting factor.

Sickle cell anaemia is an autosomal recessive disorder caused due to point mutation at 6$^{th}$ position of $\beta$-globin chain.

**2.** Match List I with List II

| **List I (Crops)** | | **List II (Variety)** | |
|---|---|---|---|
| A. | Wheat | I. | Pusa Sadabahar |
| B. | Cauliflower | II. | Himgiri |
| C. | *Brassica* | III. | Pusa Shubhra |
| D. | Chilli | IV. | Pusa Swarnim |

Choose the correct answer from the options given below:

(1) A-III, B-I, C-IV, D-II (2) A-II, B-III, C-IV, D-I

(3) A-III, B-IV, C-II, D-I (4) A-I, B-III, C-II, D-IV

**Answer (2)**

**Sol.** Himgiri is a variety of wheat resistant is leaf and stipe rust and hill bunt.

Pusa Swarnim is a variety of *Brassica* resistant to white rust.

Pusa Shubhra is a variety Cauliflower resistant of blight black rot and black rots.

Pusa Sadabahar is a variety of Chilli resistant to leaf chilly mosaic virus.

Thus, option (2) is correct.

**3.** Identify the tools for recombinant DNA technology:

A. Restriction enzymes and host organism

B. Ligases and vectors

C. Ribosome

D. Polymerase enzyme

Choose the **correct** answer from the options given below:

(1) A, B and D only (2) A, B and C only

(3) A, B, C and D (4) A, C and D only

**Answer (1)**

**Sol.** Option (1) is the correct answer because restriction enzymes, host organism, ligases and vectors as well as polymerase enzymes are required tools for recombinant DNA technology.

Option (2), (3) and (4) are incorrect because ribosomes are not required in recombinant DNA technology.

**4.** Match List I with List II

| List I | | List II | |
|---|---|---|---|
| A. | Mucus lining | I. | Physiological barrier |
| B. | Acid in stomach | II. | Cellular barrier |
| C. | PMNL-neutrophils | III. | Physical barrier |
| D. | Interferons | IV. | Cytokine barrier |

Choose the **correct** answer from the options given below:

(1) A-II, B-I, C-IV, D-III

(2) A-III, B-II, C-IV, D-I

(3) A-II, B-III, C-I, D-IV

(4) A-III, B-I, C-II, D-IV

**Answer (4)**

**Sol.** Option (4) is correct because

- Mucus lining acts as physical barrier of innate immunity.
- Acids in stomach acts as physiological barrier of innate immunity.
- PMNL-neutrophils are cellular barrier of innate immunity.
- Interferons are cytokine barriers of innate immunity.

**5.** The parturition is induced by a complex neuroendocrine mechanism. Which of the following hormone is not involved on this process?

(1) Estrogen (2) Cortisol

(3) Oxytocin (4) Melanin

**Answer (4)**

**Sol.** Option (4) is correct because melanin hormone is not involved in the process of parturition. It is involved in colouration of skin of individuals.

Option (1), (2) and (3) are incorrect because estrogen, cortisol and oxytocin are involved in neuroendocrine mechanism which induces the parturition.

**6.** Identify curative method (s) used to treat ADA deficiency disease in human.

A. Gene Therapy

B. Bone Marrow Transplantation

C. Complete Blood Replacement

D. Enzyme Replacement Therapy

Choose the **correct** answer from the options given below:

(1) A, B and D only

(2) B, C and D only

(3) A, C and D only

(4) A and C only

**Answer (1)**

**Sol.** Option (1) is correct because gene therapy, bone marrow transplantation and enzyme replacement therapy are curative methods used to treat ADA deficiency disease in human.

Option (2), (3) and (4) are incorrect because complete blood replacement is not a curative method used to treat ADA deficiency disease in humans.

**7.** Montreal protocol is related to _____

(1) Ozone depletion

(2) Green house gases

(3) Acid rain

(4) Deforestation

**Answer (1)**

**Sol.** Recognizing the deleterious effects of ozone depletion, an international treaty, known as the Montreal Protocol, was singed at Montreal (Canada) in 1987 (effective in 1989) to control the emission of ozone-depleting substances. Thus, option (1) is correct.

**8.** Which of the following serve as an important biofertiliser in paddy field?

(1) *Glomus*

(2) *Oscillatoria*

(3) *Rhizobium*

(4) *Azospirillum*

**Answer (2)**

**Sol.** In paddy fields, cyanobacteria (*Oscillatoria*) serve as an important biofertilizer.

**9.** Progestasert and LNG-20 are the examples of:

(1) Copper releasing IUD's

(2) Hormone releasing IUD's

(3) Oral Contraceptives

(4) Non-medicated IUD's

**Answer (2)**

**Sol.** The correct answer is option (2) because progestasert and LNG-20 are the examples of hormone releasing IUD's. CuT, Cu 7 and multiload 375 come under copper-releasing IUD's whereas Lippes loop is the example of non-medicated IUD's.

**10.** Which of the following statements are correct about the structure of a sperm?

A. It is composed of head, thorax, neck and tail

B. The neck region contains a lot of mitochondria

C. The mitochondria produces energy for the movement of tail

D. The tail facilitate sperm motility essential for fertilisation

Choose the most appropriate answer from the options given below:

(1) A and B only

(2) B and C only

(3) C and D only

(4) B and D only

**Answer (3)**

**Sol.** Option (3) is the answer as it includes correct statements about structure of sperm *i.e.*, the mitochondria produce energy for the movement of the tail that facilitate sperm motility essential for fertilization. Statements A and B are incorrect as structure of the sperm is composed of a head, neck, a middle piece and a tail. The middle piece possesses numerous mitochondria and not the neck region. So, option (1), (2) and (4) are not the correct answer.

**11.** In the process of protein synthesis the amino acids bind to tRNA at:

(1) Anticodon site

(2) 3' end

(3) 5' end

(4) any place of tRNA

**Answer (2)**

**Sol.** The amino acid is linked at 3' end of tRNA and this end is also known as amino acid acceptor end.

**12.** Match List I with List II

| | **LIST I (Microorganism)** | | **LIST II (Product Obtained)** |
|---|---|---|---|
| A. | *Trichoderma polysporum* | I. | Ethanol |
| B. | *Monascus purpureus* | II. | Citric Acid |
| C. | *Saccharomyces cerevisiae* | III. | Cyclosporin A |
| D. | *Aspergillus niger* | IV. | Statins |

Choose the correct answer from the options given below:

(1) A-II,B-IV,C-I,D-III

(2) A-IV,B-III,C-I,D-II

(3) A-III,B-IV,C-II,D-I

(4) A-III,B-IV,C-I,D-II

**Answer (4)**

**Sol.** Correct match is

| | | | |
|---|---|---|---|
| A. | *Trichoderma polysporum* | III. | Cyclosporin A |
| B. | *Monascus purpureus* | IV. | Statins |
| C. | *Saccharomyces cerevisiae* | I. | Ethanol |
| D. | *Aspergillus niger* | II. | Citric Acid |

**13.** GEAC is:

(1) Genetic Engineering Approval Committee

(2) Genetic Engineering Addressal Committee

(3) Genetic Engineering Approval Council

(4) Genetic Engineering Approving Council

**Answer (1)**

**Sol.** The correct answer is option (1) as GEAC is Genetic Engineering Approval Committee which is responsible for making decisions regarding the validity of GM research and the safety of introducing GM-organism for public services.

**14.** Which of the following does not affect genetic equilibrium/Hardy Weinberg Equilibrium?

(1) Mutation

(2) Genetic drift

(3) Genetic recombination

(4) Random mating

**Answer (4)**

**Sol.** Option (4) is the correct answer as five factors that are known to affect Hardy-Weinberg equilibrium are gene flow, genetic drift, mutation, genetic recombination and natural selection.

**15.** Extinction of Steller's sea Cow and passenger pigeon is due to _____

(1) Invasion of alien species

(2) Over exploitation by human

(3) Habitat loss and fragmentation

(4) Co-extinction

**Answer (2)**

**Sol.** Extinction of Steller's sea cow and passenger pigeon is due to over-exploitation by humans.

**16.** Select the condition(s) in which decomposition does not take place in

A. In warm and moist environment

B. In presence of decomposers

C. In absence of decomposers

D. In absence of detritivores

E. In presence of complex compounds like lignin and chitin.

Choose the correct answer from the options given below:

(1) C, D and E only (2) C and D only

(3) A, D and E only (4) B, D and E only

**Answer (1)**

**Sol.** Decomposition does not take place in absence of decomposers and detrivores as they play important role in decomposition.

Decomposition of detritus is slow if it contains lignin, chitin, tannins and cellulose.

**17.** Match List I with List II

| List I | | List II | |
|---|---|---|---|
| A. | Curd | I. | *Streptococcus* |
| B. | Butyric acid | II. | *Propionibacterium sharmanii* |
| C. | Swiss cheese | III. | *Clostridium butylicum* |
| D. | Clot buster | IV. | *Lactobacillus* |

Choose the correct answer from the options given below:

(1) A–I, B–II, C–III, D–IV

(2) A–IV, B–III, C–II, D–I

(3) A–I, B–II, C–IV, D–III

(4) A–IV, B–III, C–I, D–II

**Answer (2)**

**Sol.** Correct match is

| | | | |
|---|---|---|---|
| A. | Curd | – | *Lactobacillus* |
| B. | Butyric acid | – | *Clostridium butylicum* |
| C. | Swiss cheese | – | *Propionibacterium sharmanii* |
| D. | Clot buster | – | *Streptococcus* |

**18.** Which one of the following is not an example of terrestrial ecosystem?

(1) Forest (2) Grassland

(3) Estuaries (4) Deserts

**Answer (3)**

**Sol.** Estuaries are examples of aquatic ecosystem forest, grassland and deserts are terrestrial ecosystem.

**19.** Which of the following is not a marine fish?

(1) Hilsa (2) Rohu

(3) Sardines (4) Pomfrets

**Answer (2)**

**Sol.** Option (2) is the correct answer because Catla, Rohu and common carp are the common fresh water fishes.

Option (1), (3) and (4) are not correct because Hilsa, Sardines, Mackerel and Pomfrets are the marine fishes.

**20.** Which one of the following is an example of community protected biodiversity conservation method?

(1) Wild life sanctuaries

(2) Biosphere reserves

(3) Sacred groves

(4) Botanical gardens

**Answer (3)**

**Sol.** Community protected biodiversity conservation methods conserve the whole community such as sacred groves.

**21.** Trisomy of Chromosome 21 in humans leads to

(1) Klinefelter's syndrome

(2) Turner's syndrome

(3) Down's syndrome

(4) Phenylketonuria

**Answer (3)**

**Sol.** Down's syndrome is caused by trisomy of chromosome 21 in humans.

Klinefelter's syndrome is caused by trisomy of sex chromosome.

Turner's syndrome is caused by monosomy of sex chromosome.

Phenylketonuria is inborn error of metabolism.

**22.** Which one of the following is an example of co-evolution?

(1) Sea anemone and clown fish

(2) Barnacles and Whale

(3) Wasp and Fig

(4) Cuckoo and crow

**Answer (3)**

**Sol.** Sea anemone and clown fish show commensalism as clown fish gets protection from predators which stay away from the stinging tentacles of sea anemone.

Barnacles and whale also show commensalism as Barnacles growing on the back of whale benefits in the form of Shelter. Whale remains unaffected.

**23.** Arrange the following events of Meselson and Stahl's experiment in order of their occurrence

A. DNA extracted from the culture, twenty minutes after transfer from $^{15}N$ to $^{14}N$ medium had a hybrid density.

B. *E. Coli* with heavy DNA were transferred into a medium with $^{14}NH_4Cl$.

C. *E. Coli* were grown in a medium containing $^{15}NH_4Cl$.

D. DNA extracted from the culture after forty minutes had equal amounts of hybrid DNA and light DNA.

Choose the **correct** answer from the options given below:

(1) A, B, C, D

(2) D, C, A, B

(3) B, A, D, C

(4) C, B, A, D

**Answer (4)**

**Sol.** Meselson and Stahl's experiment suggests that DNA replication is semi-conservative.

First *E. Coli* were grown in a medium containing $^{15}NH_4Cl$.

Then *E. Coli* with heavy DNA were transferred into a medium with $^{14}NH_4Cl$.

Then DNA extracted from the culture, twenty minutes after transfer from $^{15}N$ to $^{14}N$ medium had a hybrid density.

Then DNA extracted from the culture after forty minutes had equal amounts of hybrid DNA and light DNA.

So correct sequence is C, B, A, D.

**24.** Cross between two different but related species is called _____.

(1) Cross breeding

(2) Interspecific hybridisation

(3) Out crossing

(4) Out breeding

**Answer (2)**

**Sol.** Option (2) is the correct answer because in interspecific hybridisation, male and female animals of two different related species are mated. *e.g.,* mule.

Option (1) is not the correct answer because in cross breed, superior male of one breed are mated with superior female of another breed. *e.g., Hisardale* is a new breed of sheep developed by crossing Bikaneri ewes and Marino rams.

Option (3) is not the correct answer because in out cross, mating of animals take place within the same breed, but having no common ancestors on either side of their pedigree.

Option (4) is not the correct answer because out breeding is the breeding of the unrelated animals which may be between individuals of the same breed but having no common ancestors for 4-6 generation or between different breeds or different species.

**25.** Match List I with List II

| **LIST I** | | **LIST II** | |
|---|---|---|---|
| A. | Homology | I | Darwin's finches |
| B. | Analogy | II | Single step large mutation |
| C. | Adaptive radiation | III | Convergent Evolution |
| D. | Saltation | IV | Divergent Evolution |

Choose the correct answer from the option given below:

(1) A-III, B-I, C-IV, D-II

(2) A-IV, B-III, C-I, D-II

(3) A-IV, B-I, C-III, D-II

(4) A-I, B-IV, C-II, D-III

**Answer (2)**

**Sol.** Option (2) is the correct answer because homology indicates common ancestry and it is the example of divergent evolution. Analogous organs or structures are the result of convergent evolution. Darwin's Finches represent the adaptive radiation. Evolution for Darwin was gradual while de Veries believed mutation caused speciation and hence called it saltation (single step large mutation).

Options (1), (3) and (4) are not the correct answers because they are not correctly matched.

**26.** Bamboo species exhibit unusual flowering phenomenon, because it flowers:

(1) Once in 12 years in their life time.

(2) Only once in their life time.

(3) Three times in their life span.

(4) Many times in their life span.

**Answer (2)**

**Sol.** Bamboo is a monocarpic plant. It flowers only once in their life time.

**27.** Which one is not a unit of vegetative propagation?

(1) Bulb (2) Runner

(3) Tuber (4) Seed

**Answer (4)**

**Sol.** Seed is not a unit of vegetative propagation. It is fertilised ovule.

Bulb, Runner & Tuber are vegetative propagules.

**28.** In an electrostatic precipitator electrodes wires produce a corona that releases _____ to make dust particles get attracted towards collecting plate.

(1) Protons

(2) Electrons

(3) Neutrons

(4) Positrons

**Answer (2)**

**Sol.** In an electrostatic precipitator electrodes wires produce a corona that releases electrons to make dust particles get attracted towards collecting plate.

**29.** Match List I with List-II

| LIST I | | LIST II | |
|---|---|---|---|
| A. | One species is benefitted and other harmed. | I. | Amensalism |
| B. | One species is benefitted and other neither harmed nor benefitted. | II. | Parasitism |
| C. | Both the interacting species are benefitted. | III. | Commensalism |
| D. | One species is harmed and other remains unaffected. | IV. | Mutualism |

Choose the correct answer from the options given below:

(1) A-I, B-III, C-IV, D-II

(2) A-II, B-III, C-I, D-IV

(3) A-II, B-III, C-IV, D-I

(4) A-IV, B-II, C-I, D-III

**Answer (3)**

**Sol.** Correct match is

| | | |
|---|---|---|
| A. | Amensalism | One species is harmed and other remains unaffected |
| B. | Parasitism | One species is benefitted and other is harmed. |
| C. | Commensalism | One species is benefitted and other neither harmed nor benefitted. |
| D. | Mutualism | Both the interacting species are benefitted. |

**30.** Which one of the following is NOT a method of molecular diagnosis for early detection of a disease?

(1) rDNA technology (2) RNAi

(3) PCR (4) ELISA

**Answer (2)**

**Sol.** Option (2) is the correct answer because RNA interference (RNAi) takes place in all eukaryotic organisms as a method of cellular defence.

Options (1), (3) and (4) are not correct because recombinant DNA technology, PCR and ELISA are some of the techniques that serve the purpose of early diagnosis.

**31.** Hind-II cuts DNA at a particular by recognising a specific sequence of _____

(1) 6 bp (2) 5 bp

(3) 4 bp (4) 3 bp

**Answer (1)**

**Sol.** Option (1) is the correct answer of this question because *Hin*d II cuts DNA at a particular point by recognising a specific sequence of 6 bp. This specific base sequence is known as the recognition sequence or Palindromic sequence for *Hin*d II. This sequence is

5′ GT (Pyrimidine : T or C) (Purine: A or G) AC3′ 3′ CA (Purine: A or G) (Pyrimidine: T or C) TG5′ options 2, 3 and 4 are not the answer because they have 5, 4 and 3 bp respectively.

**32.** Match List I with List II

| | **List** | | **List II** |
|---|---|---|---|
| A. | Transforming principle | I. | Jacob and Monod |
| B. | Replication of DNA | II. | Frederick Griffith |
| C. | Lac operon concept | III. | Alec Jeffreys |
| D. | DNA Fingerprinting | IV. | Watson and Crick |

Choose the **correct** answer from the options given below :

(1) A-II, B-III, C-IV, D-I (2) A-II, B-IV, C-I, D-III

(3) A-IV, B-II, C-III, D-I (4) A-I, B-III, C-II, D-IV

**Answer (2)**

**Sol.** Correct match is

A. Transforming principle – Frederick Griffith

B. Replication of DNA – Watson and Crick

C. Lac operon concept – Jacob and Monod

D. DNA Fingerprinting – Alec Jeffreys

So, correct option is (2)

A-II, B-IV, C-I, D-III

**33.** Which of the following is/are not the characteristic of wind pollinated flowers?

A. Light and non-sticky

B. Possess well exposed stamens

C. Large and often feathery stigma

D. Often have many ovules in each ovary.

Choose the **correct** answer from the options given below:

(1) A and C only (2) C only

(3) B and D only (4) D only

**Answer (4)**

**Sol.** Wind-pollinated flowers are light, non-sticky, have well-exposed stamens. They have large and often feathery stigma and they have single ovule in each ovary.

**34.** Arrange the following steps regarding HIV infection in correct sequence

A. Viral RNA produced by the infected cell

B. Virus infects macrophages.

C. Viral DNA is produced by reverse transcriptase

D. Viral RNA is introduced into the cell.

E. Viral DNA incorporates into the host genome.

Choose the **correct** answer from the options given below :

(1) D, B, A, C, E (2) B, C, D, A, E

(3) B, D, C, E, A (4) D, C, B, E, A

**Answer (3)**

**Sol.** Option (3) is the correct answer of this question because it represents correct sequence of HIV infection in host cell which is

B- virus infects macrophages

D- viral RNA is introduced into the cell

C- viral DNA is produced by reverse transcriptase

E- viral DNA incorporates into host genome

A - viral RNA produced by the infected cell

options 1, 2 and 4 are not the answer of this question because they do not represent correct sequence of HIV infection in host cell.

**35.** The endosperm is absent in the seed of :

(1) Wheat

(2) Castor

(3) Maize

(4) Pea

**Answer (4)**

**Sol.** Endosperm is absent in the seed of Pea.

Wheat, Castor and Maize are endospermous seeds.

**36.** Identify the diagnostic test used to detect the sex of the foetus from the following:

(1) ELISA

(2) WIDAL

(3) Amniocentesis

(4) Urine analysis

**Answer (3)**

**Sol.** Option (3) is the answer because, amniocentesis is a diagnostic test which can be used to detect the sex of the foetus. In amniocentesis some of the amniotic fluid of the developing foetus is taken to analyse the foetal cells and dissolved substances. It is used to test for the presence of genetic disorders. In India, there is statutory ban on amniocentesis for sex-determination. Options (1), (2) and (4) are incorrect because ELISA is based on antigen-antibody reaction and is used for early detection of a number of diseases including HIV infection. Widal test is a diagnostic test for typhoid. Urine analysis is a conventional diagnostic method which takes time for analysis and used in diabetes mellitus and urinary tract infections.

**37.** Which of the following statement is FALSE in relation to colour blindness?

(1) Colour blindness is an autosome-linked recessive disorder

(2) Boys are more likely to be colour blind than girls

(3) A daughter will not normally be colour blind, unless her mother is a carrier and her father is colour blind

(4) Colour blind people generally fail to discriminate between red and green color

**Answer (1)**

**Sol.** Colour-blindness is a sex-linked recessive disorder.

**38.** Arrange the following steps of gel electrophoresis in correct order.

(A) DNA fragments were forced to move towards anode under electric field through agarose gel

(B) Staining DNA fragments with Ethidium Bromide

(C) DNA fragments separated according to their size

(D) Visualising them in UV rays

Choose the correct answer from the options given below:

(1) A, C, B, D

(2) A, B, C, D

(3) B, A, C, D

(4) B, C, D, A

**Answer (1)**

**Sol.** Option (1) is the answer because, in gel electrophoresis the fragments of the DNA can be separated based on their size and charge. The correct sequence of this process is

DNA fragments are forced to move towards anode under an electric field through agarose gel

↓

DNA fragments separated according to their size. (The smaller the fragment size, the farther it moves)

↓

Staining DNA fragments with Ethidium bromide

↓

Visualising them in UV rays

**39.** Which one of the following human ancestors probably lived in East African grasslands two million years ago?

(1) *Ramapithecus* (2) *Dryopithecus*

(3) *Australopithecines* (4) *Neanderthal* man

**Answer (3)**

**Sol.** Option (3) is the answer because, two mya, *Australopithecines* probably lived in East African grasslands. Evidences show that they hunted with stone weapons but essentially ate fruits.

Option (1) and (2) are not the answers because about 15 mya, *Ramapithecus* and *Dryopithecus* were existing.

Option (4) is not the answer because, *Neanderthal* man lived in near east and central Asia between, 1,00,000 – 40,000 years back.

**40.** Widal test is used to diagnose:

(1) Typhoid

(2) Malaria

(3) Pneumonia

(4) Cancer

**Answer (1)**

**Sol.** Option (1) is the answer because, Widal test is used to diagnose typhoid fever which is caused by bacteria known as *Salmonella typhi*.

Option (2) is not the answer because, malaria is usually investigated by the microscopic examination of blood smear for the presence of malarial parasite.

Options (3) is not the answer because, chest X-ray is often used to diagnose pneumonia.

Option (4) is not the answer because, cancer detection is based on biopsy and histopathological studies of the tissue and blood and bone marrow test for increased cell count in case of leukemias. X-ray, CT Scan and MRI are very useful for detection of cancer of internal organs.

**41.** Read the paragraph given below and answer the question.

If a person is born with a hereditary disease, can a corrective therapy be taken for such a disease? Gene therapy is an attempt to do this. Gene therapy is a collection of methods that allows correction of a gene defect that has been diagnosed in a child/embryo. Here genes are inserted into a person's cells and tissues to treat disease.

ADA enzyme is crucial for the functioning of _____

(1) Immune System

(2) Respiratory System

(3) Cardiovascular System

(4) Excretory System

**Answer (1)**

**Sol.** Option (1) is the answer because, ADA enzyme *i.e.* adenosine deaminase is responsible/crucial for functioning of immune system.

Option (2), (3) and (4) are the not the answers because deletion of the gene for ADA leads to non-functioning of the immune system.

**42.** Read the paragraph given below and answer the question.

If a person is born with a hereditary disease, can a corrective therapy be taken for such a disease? Gene therapy is an attempt to do this. Gene therapy is a collection of methods that allows correction of a gene defect that has been diagnosed in a child/embryo. Here genes are inserted into a person's cells and tissues to treat disease.

ADA deficiency can be permanently cured by

A. Bone Marrow Transplant

B. Gene therapy

C. Enzyme replacement therapy

D. DNA recombination

Choose the *correct answer* from the options given below :

(1) A, B and D only

(2) B only

(3) B and C only

(4) C only

**Answer (2)**

**Sol.** Option (2) is the answer because, gene therapy can be the permanent method to cure ADA deficiency if the gene isolated from marrow cells producing ADA is introduced into cells at early embryonic stages.

Options (1), (3) and (4) are not the answers because, in some children, ADA deficiency can be cured by bone marrow transplantation; in other it can be treated by gene replacement therapy, but the problem with both of these approaches are that they are not completely curative.

**43.** Read the paragraph given below and answer the question.

If a person is born with a hereditary disease, can a corrective therapy be taken for such a disease? Gene therapy is an attempt to do this. Gene therapy is a collection of methods that allows correction of a gene defect that has been diagnosed in a child/embryo. Here genes are inserted into a person's cells and tissues to treat disease.

Gene therapy method involves:

(1) Cloning of cells with alternative gene

(2) Delivery of normal functional gene in the embryo to compensate for non functional gene

(3) Modification of defective genes in the cells

(4) cDNA recombination

**Answer (2)**

**Sol.** Option (2) is the answer because, gene therapy is a collection of methods that allow correction of a gene defect that has been diagnosed in a child/embryo. It involves delivery of a normal functional gene in the embryo to compensate for non-functional gene.

**44.** Read the paragraph given below and answer the question.

If a person is born with a hereditary disease, can a corrective therapy be taken for such a disease? Gene therapy is an attempt to do this. Gene therapy is a collection of methods that allows correction of a gene defect that has been diagnosed in a child/embryo. Here genes are inserted into a person's cells and tissues to treat disease.

ADA deficiency is caused due to:

(1) Deficiency of bone marrow

(2) Deletion of gene for adenosine deaminase

(3) Addition of Adenosine

(4) Deletion of amino group in genome

**Answer (2)**

**Sol.** Option (2) is the answer, because ADA deficiency is caused due to the deletion of gene for adenosine deaminase.

Adenosine deaminase is crucial for the normal functioning of immune system.

**45.** Read the paragraph given below and answer the question.

If a person is born with a hereditary disease, can a corrective therapy be taken for such a disease? Gene therapy is an attempt to do this. Gene therapy is a collection of methods that allows correction of

a gene defect that has been diagnosed in a child/embryo. Here genes are inserted into a person's cells and tissues to treat disease.

The first clinical gene therapy was given in _____ to _____.

(1) 1990, 4 year old boy

(2) 1990, 4 year old girl

(3) 1992. 3 year old boy

(4) 1992, 3 year old girl

**Answer (2)**

**Sol.** Option (2) is the answer because, the first clinical gene therapy was given in the year 1990 to a 4-year old girl with ADA deficiency.

**46. Read the paragraph given below and answer the question.**

Bee-keeping is the maintenance of hives of honeybees for the production of honey. Honey is a food of high nutritive value and also finds use in the indigenous systems of medicine. Honeybee also produces bee-wax, which finds many uses in industry, such as in the preparation of cosmetics and polishes of various kinds. The increased demand of honey has led to large-scale beekeeping practices; it has become an established income generating industry, whether practiced on a small scale or on a large scale.

Bee-keeping can be practiced in any area where there are sufficient bee pastures. There are several species of honeybees which can be reared. Beehives can be kept in one's courtyard, on the verandah of the house or even on the roof.

Bee-keeping is also known as:

(1) Sericulture

(2) Apiculture

(3) Pisciculture

(4) Aquaculture

**Answer (2)**

**Sol.** Option (2) is the correct answer as apiculture deals with maintenance of hives of honeybees for the production of honey.

- Option (1) is the incorrect answer as sericulture deals with the cultivation of silkworms to produce silk.
- Option (3) is the incorrect answer as pisciculture is the rearing of fishes.
- Option (4) is the incorrect answer as aquaculture is breeding, raising and harvesting fish, shell fish and aquatic plants.

**47. Read the paragraph given below and answer the question.**

Bee-keeping is the maintenance of hives of honeybees for the production of honey. Honey is a food of high nutritive value and also finds use in the indigenous systems of medicine. Honeybee also produces beewax, which finds many uses in industry, such as in the preparation of cosmetics and polishes of various kinds. The increased demand of honey has led to large-scale beekeeping practices; it has become an established income generating industry, whether practiced on a small scale or on a large scale.

Bee-keeping can be practiced in any area where there are sufficient bee pastures. There are several species of honeybees which can be reared. Beehives can be kept in one's courtyard, on the verandah of the house or even on the roof.

Which of the following is not suitable for practicing bee-keeping?

(1) Wild Shrubs

(2) Fruit Orchards

(3) Barren Land

(4) Cultivated crops

**Answer (3)**

**Sol.** Option (3) is the correct answer as bee-keeping is practiced in area where there are sufficient bee pastures of some wild shrubs, fruit orchards and cultivated crops.

Option (1), (2) and (4) are the incorrect answer as bee-keeping is practiced in area in which there are wild shrubs, fruit orchards and cultivated crops.

**48. Read the paragraph given below and answer the question.**

Bee-keeping is the maintenance of hives of honeybees for the production of honey. Honey is a

food of high nutritive value and also finds use in the indigenous systems of medicine. Honeybee also produces bee wax, which finds many uses in industry, such as in the preparation of cosmetics and polishes of various kinds. The increased demand of honey has led to large-scale beekeeping practices; it has become an established income generating industry, whether practiced on a small scale or on a large scale.

Bee-keeping can be practiced in any area where there are sufficient bee pastures. There are several species of honeybees which can be reared. Beehives can be kept in one's courtyard, on the verandah of the house or even on the roof.

Bees help the farmers by:

(1) Visiting pesticide free plants

(2) Decreasing crop yield

(3) Pollinating Crops

(4) Collecting nector

**Answer (3)**

**Sol.** Option (3) is the correct answer as bees are the pollinators of many of our crop species such as sunflower, *Brassica*, apple and pear. Keeping beehives in crop fields during flowering period increases pollination efficiency.

- Option (1) is the incorrect answer as bees does not help farmers by visiting pesticide free plants.
- Option (2) is the incorrect answer as bees helps the farmers by increasing crop yield.
- Option (4) is the incorrect answer as bees collect nectar from flower for production of honey.

**49. Read the paragraph given below and answer the question.**

Bee-keeping is the maintenance of hives of honeybees for the production of honey. Honey is a food of high nutritive value and also finds use in the indigenous systems of medicine. Honeybee also produces beewax, which finds many uses in industry, such as in the preparation of cosmetics and polishes of various kinds. The increased demand of honey has led to large-scale beekeeping practices; it has become an established income generating industry, whether practiced on a small scale or on a large scale.

Bee-keeping can be practiced in any area where there are sufficient bee pastures. There are several species of honeybees which can be reared. Beehives can be kept in one's courtyard, on the verandah of the house or even on the roof.

Identify the reasons as to why a bee-keeper could not get enough honey with the practiced beekeeping in the garden of his home.

A. He had used chemical pesticides in his garden.

B. There were not enough flowers in the garden.

C. There were no medicinal plants growing in his garden.

D. There was no verandah in his courtyard.

Choose the correct answer from the options given below:

(1) A and C only

(2) A and B only

(3) B and C only

(4) C and D only

**Answer (2)**

**Sol.** Option (2) is the correct answer as a bee-keeper could not get enough honey with the practiced beekeeping in the garden of his house due to the use of chemical pesticides in his garden as well as due to the unavailability of enough flowers in the garden. As, from flowers, bees collect nectar.

**50. Read the paragraph given below and answer the question.**

Bee-keeping is the maintenance of hives of honeybees for the production of honey. Honey is a food of high nutritive value and also finds use in the indigenous systems of medicine. Honeybee also produces beewax, which finds many uses in industry, such as in the preparation of cosmetics and polishes of various kinds. The increased demand of honey has led to large-scale beekeeping practices; it has become an established income generating industry, whether practiced on a small scale or on a large scale.

Bee-keeping can be practiced in any area where there are sufficient bee pastures. There are several species of honeybees which can be reared.

Beehives can be kept in one's courtyard, on the verandah of the house or even on the roof.

Identify the statements which are **not** true for bee-keeping

A. Bee-keeping is a very old cottage industry.

B. Bee-keeping is a labour intensive activity.

C. The demand for honey is poor.

D. Bee-keeping also yields beewax.

Choose the correct answer from the options given below:

(1) A and B only

(2) A and C only

(3) C and D only

(4) B and C only

**Answer (4)**

**Sol.** Option (4) is the correct answer as bee-keeping is a very old cottage industry. Bee-keeping is not a labour intensive industry. The demand for honey is not poor. Bee-keeping yields beewax, which finds many uses in industry, such as in the preparation of cosmetics and polishes of various kinds.

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