

AIPMT 2015

Biology

1. Root pressure develops due to:

- (1) Increase in transpiration
(2) Active absorption
(3) Low osmotic potential in soil
(4) Passive absorption

Solution:

Root pressure is defined as the pressure that develops in xylem vessels as a result of active metabolic activities of roots.

Hence, the correct option is (2).

2. Which one is a wrong statement?

- (1) Brown algae have chlorophyll *a* and *c*, and fucoxanthin.
(2) Archegonia are found in Bryophyta, Pteridophyta and Gymnosperms.
(3) *Mucor* has biflagellate zoospores.
(4) Haploid endosperm is typical feature of gymnosperms .

Solution:

Mucor and *Rhizopus* have non-motile sporangiospores are called aplanospores.

Hence, the correct option is (3).

3. Which of the following structures is not found in prokaryotic cells?

- (1) Plasma membrane
(2) Nuclear envelope
(3) Ribosome
(4) Mesosome

Solution:

Prokaryotic cells lack nucleus and membrane bound organelles that distinguishes them from eukaryotic cells.

Hence, the correct option is (2).

4. Which one of the following animals has two separate circulatory pathways?

- (1) Shark
(2) Frog
(3) Lizard
(4) Whale

Solution:

Whale is a mammal. Thus, a whale has four-chambered heart with two atria and two ventricles. The blood circulation to the lungs is separate from that to the rest of the body.

Hence, the correct option is (4).

5. Most animals that live in deep oceanic waters are:

- (1) Detritivores
(2) Primary consumers
(3) Secondary consumers
(4) Tertiary consumers

Solution:

The deepest benthic zone of ocean consists of organic debris and mud. It consists of both micro and macroconsumers called detritivores.

Hence, the correct option is (1).

6. An association of individuals of different species living in the same habitat and having functional interactions is:

- (1) Population
(2) Ecological niche

(3) Biotic community

(4) Ecosystem

Solution:

A biotic community in a large area living in particular climatic condition constitutes a biome.

Hence, the correct option is (3).

7. The oxygen evolved during photosynthesis comes from water molecules. Which one of the following pairs of elements is involved in this reaction?

(1) Magnesium and Chlorine

(2) Manganese and Chlorine

(3) Manganese and Potassium

(4) Magnesium and Molybdenum

Solution:

Manganese along with chlorine is part of the oxygen-evolving complex associated with photosystem II, where it accumulates charges during the oxidation of water.

Hence, the correct option is (2).

8. Axile placentation is present in:

(1) *Argemone*

(2) *Dianthus*

(3) Lemon

(4) Pea

Solution:

In axile, the gynoecium is made up of two or more carpels, the ventral sutures of which meet at the center of the ovary making it multilocular. The ovules are borne on the placenta of the central axis. For example, lemon.

Hence, the correct option is (3).

9. In which of the following both pairs have correct combination:

(1) Gaseous nutrient cycle Sulphur and Phosphorous

Sedimentary nutrient cycle Carbon and Nitrogen

(2) Gaseous nutrient cycle Carbon and Nitrogen

Sedimentary nutrient cycle Sulphur and Phosphorous

(3) Gaseous nutrient cycle Carbon and Sulphur

Sedimentary nutrient cycle Nitrogen and phosphorous

(4) Gaseous nutrient cycle Nitrogen and Sulphur

Sedimentary nutrient cycle Carbon and phosphorous

Solution:

Gaseous cycle have their reservoirs in the atmosphere or hydrosphere (water), e.g., carbon and nitrogen. Sedimentary cycle have their reservoirs in the Earth's crust, e.g., sulphur and phosphorus.

Hence, the correct option is (2).

10. In mammalian eye, the 'fovea' is the center of the visual field, where:

(1) more rods than cones are found.

(2) high density of cones occur, but has no rods

(3) the optic nerve leaves the eye

(4) only rods are present

Solution:

The fovea centralis is a small depression in the center of the macula lutea. It contains only cones.

Hence, the correct option is (2).

11. Choose the wrong statement:

(1) Yeast is unicellular and useful in fermentation

(2) *Penicillium* is multicellular and produces antibiotics

- (3) *Neurospora* is used in the study of biochemical genetics
(4) Morels and truffles are poisonous mushrooms

Solution:

Morels and truffles are not poisonous. They are edible sac mushroom.

Hence, the correct option is (4).

12. Which of the following are not membrane-bound?

- (1) Mesosomes (2) Vacuoles
(3) Ribosomes (4) Lysosomes

Solution:

Infoldings of the cell membrane are called mesosomes. Vacuole is bound by membrane called tonoplast. Lysosomes enclose digestive enzymes within a membrane. Ribosomes are not membrane bound.

Hence, the correct option is (3).

13. In which of the following interactions both partners are adversely affected?

- (1) Mutualism (2) Competition
(3) Predation (4) Parasitism

Solution:

Competition is a situation in which organisms that live near one another strive to obtain the same limited resources, thus compete with other.

Hence, the correct option is (2).

14. A colour blind man marries a woman with normal sight who has no history of colour blindness in her family. What is the probability of their grandson being colour blind?

- (1) 0.25 (2) 0.5
(3) 1 (4) Nil

Solution:

Their grandson can be carrier of the diseases, but the probability of being colorblind is nil.

Hence, the correct option is (4).

15. Ectopic pregnancies are referred to as:

- (1) Pregnancies terminated due to hormonal imbalance
(2) Pregnancies with genetic abnormality.
(3) Implantation of embryo at site other than uterus.
(4) Implantation of defective embryo in the uterus

Solution:

Ectopic pregnancy is the development of an embryo or foetus outside the uterine cavity.

Hence, the correct option is (3).

16. Cellular organelles with membranes are:

- (1) Lysosomes, Golgi apparatus and mitochondria
(2) Nuclei, ribosomes and mitochondria
(3) Chromosomes, ribosomes and endoplasmic reticulum
(4) Endoplasmic reticulum, ribosomes and nuclei

Solution:

Lysosomes, Golgi apparatus and mitochondria are small, membrane-bound organelles found in eukaryotic cells.

Hence, the correct option is (1).

17. Cell wall is absent in:

- (1) *Nostoc* (2) *Aspergillus*
(3) *Funaria* (4) *Mycoplasma*

Solution:

Mycoplasma are free-living prokaryotes, and thus do not have cell walls. They are also known as pleuropneumonia-like organisms (PPLLO).

Hence, the correct option is (4).

18. The term "linkage" was coined by:

- (1) W.Sutton (2) T.H. Morgan
(3) T.Boveri (4) G.Mendel

Solution:

Thomas Hunt Morgan coined the term linkage and explained the mechanism through his studies on the fruit fly *Drosophila melanogaster*.

Hence, the correct option is (2).

19. Which of the following biomolecules does have a phosphodiester bond?

- (1) Nucleic acids in a nucleotide (2) Fatty acids in a diglyceride
(3) Monosaccharides in a polysaccharide (4) Amino acids in a polypeptide

Solution:

In DNA or RNA, nucleotides are joined to each other via phosphodiester bond. The 5' end of one nucleotide is joined with the 3' end of the other.

Hence, the correct option is (1).

20. The primary dentition in human differs from permanent dentition in not having one of the following type of teeth:

- (1) Incisors (2) Canine
(3) Premolars (4) Molars

Solution:

The deciduous molars are replaced by the first and second premolars (bicuspid), which have two cusps and one root (upper first premolars have two roots) and are used for crushing and grinding.

Hence, the correct option is (2).

21. A protoplast is a cell:

- (1) without cell wall (2) without plasma membrane
(3) without nucleus (4) undergoing division

Solution:

A protoplast is a cell whose cell wall has been removed by enzymes.

Hence, the correct option is (1).

22. In which group of organisms the cells walls form two thin overlapping shells which fit together?

- (1) Slime moulds (2) Chrysophytes
(3) Euglenoids (4) Dinoflagellates

Solution:

Chrysophytes, diatoms are unicellular and have two overlapping cell walls and look like fancy microscopic glass boxes of various shapes with shells composed of silica known as frustule.

Hence, the correct option is (2).

23. The DNA molecules to which the gene of interest is integrated for cloning is called:

- (1) Carrier (2) Transformer
(3) Vector (4) Template

Solution:

A fragment of DNA, containing the desired gene to be cloned, is inserted into a circular DNA molecule called a vector, to produce a recombinant DNA molecule.

Hence, the correct option is (3).

24. Male gametophyte in angiosperms produces:

- (1) Three sperms (2) Two sperms and a vegetative cell
(3) Single sperm and a vegetative cell (4) Single sperm and two vegetative cells

Solution:

Male gametophyte is derived from a pollen grain or microspore. It is three-celled when the pollen grain is shed. It contains two generative cells and one vegetative cell.

Hence, the correct option is (2).

25. Coconut water from a tender coconut is:

- (1) Degenerated nucellus (2) Immature embryo
(3) Free nuclear endosperm (4) Innermost layers of the seed coat

Solution:

In coconut, the cell wall formation remains incomplete. Thus, coconut water is an example of free-nuclear endosperm.

Hence, the correct option is (3).

26. The species confined to a particular region and not found elsewhere is termed as :

- (1) Rare (2) Keystone
(3) Alien (4) Endemic

Solution:

An 'Endemic Species' is defined as the one that is found only in a particular region and found nowhere other in the entire world.

Hence, the correct option is (4).

27. Metagenesis refers to:

- (1) Presence of a segmented body and parthenogenetic mode of reproduction
(2) Presence of different morphic forms
(3) Alternation of generation between asexual and sexual phases of an organism
(4) Occurrence of a drastic change in form during post-embryonic development

Solution:

Metagenesis is also known as alternation of generations. In this phenomenon, one generation of a plant or animal reproduces asexually, followed by a sexual mode of reproduction.

Hence, the correct option is (3).

28. The enzymes that is not present in succus entericus is:

- (1) lipase (2) maltase
(3) nucleases (4) nucleosidase

Solution:

The intestinal juice or succus entericus is formed by the secretions of goblet as well as brush border cells. It contains hormones, mucous, bicarbonate and enzymes for complete digestion of carbohydrates (maltase), fats (lipase) and nucleic acids (nucelosidase).

Hence, the correct option is (3).

29. Eutrophication of water bodies leading to killing of fishes is mainly due to non-availability of :

- (1) oxygen (2) food
(3) light (4) essential minerals

Solution:

In eutrophication, enrichment of water with nutrients stimulates the growth of algae resulting in high BOD and decrease in oxygen content. Thus, the fish die due to lack of oxygen.

Hence, the correct option is (1).

30. The function of the gap junction is to :

- (1) stop substance from leaking across a tissue
(2) performing cementing to keep neighbouring cells together
(3) Facilitate communication between adjoining cells by connecting the cytoplasm for rapid transfer of ions, small molecules and some large molecules
(4) separate two cells from each othe

Solution:

Gap junctions allow the cells in a tissue to communicate with one another. Through the junctions, ions, small molecules and few big molecules can diffuse from the cytosol of one cell to another.

Hence, the correct option is (3).

31. Match the following list of microbes and their importance:

- | | |
|----------------------------------------|------------------------------------------------------|
| (a) <i>Saccharomyces cerevisiae</i> | (i) Production of immunosuppressive drug |
| (b) <i>Moascus purpureus</i> | (ii) Ripening of Swiss cheese |
| (c) <i>Trichoderma polysporum</i> | (iii) Commercial production of ethanol |
| (d) <i>Propionibacterium sharmanii</i> | (iv) Production of blood cholesterol lowering agents |

- | | | | | |
|-----|-------|-------|------|-------|
| | (a) | (b) | (c) | (d) |
| (1) | (iii) | (i) | (iv) | (ii) |
| (2) | (iii) | (iv) | (i) | (ii) |
| (3) | (iv) | (iii) | (ii) | (i) |
| (4) | (iv) | (ii) | (i) | (iii) |

Solution:

Saccharomyces cerevisiae is used for production of ethanol. *Monascus purpureus* is used for the production of agent used in lowering of blood cholesterol. *Trichoderma polysporum* is used for the production of immunosuppressive drug. *Propionibacterium sharmanii* is used for ripening of Swiss cheese.

Hence, the correct option is (2).

32. Arrange the following events of meiosis in correct sequence:

- (a) Crossing over (b) Synapsis
(c) Terminalisation of chiasmata (d) Disappearance of nucleolus

- (1) (b), (c), (d), (a)
(3) (b), (a), (c), (d)

- (2) (b), (a), (d), (c)
(4) (a), (b), (c), (d)

Solution:

The important characteristics of each phase of prophase I of meiosis are (a) leptotene—chromosomal compaction, (b) zygotene—chromosome pairing or synapsis and formation of synaptonemal complex (SC), (c) pachytene—recombination nodules and crossing over between non-sister chromatids of the homologous chromosomes, (d) diplotene—chiasmata formation, separation of homologous chromosomes and (e) diakinesis—terminalization of chiasmata, assembly of the meiotic spindle, recompaction of the chromosomes, breakdown of the nuclear envelope and the movement of the tetrads to the metaphase plate.

Hence, the correct option is (3).

33. The cutting of DNA at specific locations became possible with the discovery of:

- (1) Ligases
(3) Probes
(2) Restriction enzymes
(4) Selectable markers

Solution:

The restriction enzymes belong to a class of enzymes called nucleases. They recognize and cut DNA at a specific sequence. They were first identified by H.O. Smith, K.W. Wilcox and T.J. Kelly.

Hence, the correct option is (2).

34. During biological nitrogen fixation, inactivation of nitrogenase by oxygen poisoning prevented by:

- (1) Cytochrome
(3) Xanthophyll
(2) Leghaemoglobin
(4) Carotene

Solution:

Leghemoglobin protects nitrogenase (nitrogen fixing enzyme) from oxygen by combining very rapidly with oxygen, and thus acting as a very efficient oxygen scavenger.

Hence, the correct option is (2).

35. Grafted kidney may be rejected in a patient due to:

- (1) Innate immune response
(3) Cell-mediated immune response
(2) Humoral immune response
(4) Passive immune response

Solution:

The organs cannot be taken from just anybody because usually, the immune system recognizes the proteins in the transplanted organ as foreign and mounts both cell-mediated and antibody mediated immune responses against them. This phenomenon is known as graft rejection.

Hence, the correct option is (2).

36. The body cells in cockroach discharge their nitrogenous waste in the haemolymph mainly in the form of :

- (1) Calcium carbonate
(3) Potassium urate
(2) Ammonia
(4) Urea

Solution:

In cockroaches, the nitrogenous wastes such as urates of sodium and potassium formed in the tissues enter the haemolymph and enter the lumen of the distal end of the Malpighian tubule, where uric acid is formed and is excreted with the faeces from the hindgut.

Hence, the correct option is (3).

37. Filiform apparatus is characteristic feature of:

- (1) Synergids
(3) Nucellar embryo
(2) Generative cell
(4) Aleurone cell

Solution:

The synergids have a filiform apparatus (finger-like cellular thickenings at the micropylar tip) attached to their upper wall that functions to attract and guide the pollen tube into the synergid.

Hence, the correct option is (1).

38. Acid rain is caused by increase in the atmospheric concentration of:

- (1) O₃ and dust (2) SO₂ and NO₂
(3) SO₃ and CO (4) CO₂ and CO

Solution:

Acid rain is a mixture of wet and dry acidic depositions from the atmosphere containing higher than normal amounts of nitric and sulphuric acid.

Hence, the correct option is (2).

39. The wheat grain has an embryo with one large, shield-shaped cotyledon known as :

- (1) Coleoptile (2) Epiblast
(3) Coleorrhiza (4) Scutellum

Solution:

Monocots have a single cotyledon which is known as scutellum. It is situated on one side of the embryonal axis.

Hence, the correct option is (4).

40. Among China rose, mustard, brinjal, potato, guava, cucumber, onion and tulip, how many plants have superior ovary?

- (1) Four (2) Five
(3) Six (4) Three

Solution:

When the gynoecium occupies the top most position above other floral whorls, the ovary is called superior. For example, in china rose, brinjal, mustard, Citrus, potato, onion and tulip. Cucumber and guava have inferior ovary.

Hence, the correct option is (3).

41. Which of the following is not a function of the skeletal system?

- (1) Locomotion (2) Production of erythrocytes
(3) Storage of minerals (4) Production of body heat

Solution:

The skeletal system provides support, protection to the body, assist in movement, bones store and release minerals, storage triglycerides and produce blood cells.

Hence, the correct option is (4).

42. Golden rice is a genetically modified crop plant where the incorporated gene is meant for biosynthesis of :

- (1) Vitamin A (2) Vitamin B
(3) Vitamin C (4) Omega 3

Solution:

Golden rice, is a transgenic variety of rice (*Oryza sativa*) that is so named because of its yellow color grains due the presence of large quantities of β -carotene (provitamin A).

Hence, the correct option is (1).

43. Chromatophores take part in:

- (1) Respiration
(2) Photosynthesis
(3) Growth

(4) Movement

Solution:

Cyanobacteria have structures called chromatophores. These contain the pigments used for photosynthesis.

Hence, the correct option is (2).

44. Select the wrong statement:

- (1) Mosaic disease in tobacco and AIDS in human being are caused by viruses
- (2) The viroids were discovered by D.J. Ivanowski
- (3) W.M. Stanley showed that viruses could be crystallized
- (4) The term 'contagium vivum fluidum' was coined by M.W. Beijerinck

Solution:

Viroids were discovered by T.O. Diener.

Hence, the correct option is (2).

45. A pleiotropic gene:

- (1) controls multiple traits in an individual
- (2) is expressed only in primitive plants
- (3) is a gene evolved during Pliocene
- (4) controls a trait only in combination with another gene

Solution:

When a gene controls multiple phenotypes that are mostly unrelated, it is said to exhibit pleiotropy.

Hence, the correct option is (1).

46. Human urine is usually acidic because:

- (1) hydrogen ions are actively secreted into the filtrate.
- (2) the sodium transporter exchanges one hydrogen ion for each sodium ion, in peritubular capillaries.
- (3) excreted plasma proteins are acidic
- (4) potassium and sodium exchange generates acidity

Solution:

The pH of urine ranges between 4.6 and 8.0; average 6.0 (slightly acidic). It varies considerably with diet. High-protein diets increase acidity. Tubular secretion involves the removal of urea uric acid, hippuric acid, creatinine, K^+ , H^+ , etc.

Hence, the correct option is (1).

47. Auxin can be bioassayed by:

- (1) Lettuce hypocotyl elongation
- (2) Avena coleoptile curvature
- (3) Hydroponics
- (4) Potometer

Solution:

In Went's Avena curvature test, a small cube of agar containing auxin is placed on the cut surface of a shoot tip. The auxin diffuses into the plant tissue, stimulating growth of the cells below the agar cube. The differential growth causes the shoot tip to curve away from the block. This curvature is plotted against auxin concentration to obtain a linear curve.

Hence, the correct option is (1).

48. Which of the following events is not associated with ovulation in human female?

- (1) LH surge
- (2) Decrease in estradiol
- (3) Full development of Graafian follicle
- (4) Release of secondary oocyte

Solution:

Ovulation is the rupture of a mature ovarian (Graafian) follicle with discharge of a secondary oocyte into the pelvic cavity. It is controlled by luteinizing hormone.

Hence, the correct option is (2).

49. Body having meshwork of cells, internal cavities lined with food filtering flagellated cells and indirect developments are the characteristics of phylum:

- (1) Protozoa (2) Coelenterata
(3) Porifera (4) Mollusca

Solution:

The inner cavity of the sponge is lined by specialized, flagellated cells called collar cells or choanocytes.

Hence, the correct option is (3).

50. Which one of the following hormones is not involved in sugar metabolism?

- (1) Glucagon (2) Cortisone
(3) Aldosterone (4) Insulin

Solution:

Aldosterone regulates homeostasis of sodium and potassium ions. Rest all the hormones are involved in the metabolism of sugar.

Hence, the correct option is (3).

51. Which of the following diseases is caused by a protozoan?

- (1) Blastomycosis (2) Syphilis
(3) Influenza (4) Babesiosis

Solution:

Babesiosis is a malaria sort of parasitic disease. It is caused due to the infection by *Babesia*, a protozoal.

Hence, the correct option is (4).

52. Outbreeding is an important strategy of animal husbandry because it :

- (1) exposes harmful recessive genes that are eliminated by selection
(2) helps in accumulation of superior genes.
(3) is useful in producing purelines of animals.
(4) is useful in overcoming inbreeding depression

Solution:

Inbreeding depression can be overcome by mating the selected animals of the breeding population with unrelated superior animals of the same breed that is through outbreeding.

Hence, the correct option is (4).

53. A childless couple can be assisted to have a child through a technique called GIFT. The full form of this technique is:

- (1) Germ cell internal fallopian transfer (2) Gamete inseminated fallopian transfer
(3) Gamete intra fallopian transfer (4) Gamete internal fertilization and transfer

Solution:

If a woman cannot produce ova, but can provide a suitable environment for fertilization and further development, then Gamete Intra Fallopian Transfer (GIFT) is used.

Hence, the correct option is (3).

54. A jawless fish which lays eggs in fresh water and whose ammocoetes larvae after metamorphosis return to the ocean is:

- (1) Petromyzon (2) Eptatretus
(3) Myxine (4) Neomyxine

Solution:

In Petromyzon (Lamprey), fertilization takes place externally and the fertilized eggs develop into larvae. The larvae take a few years to mature and metamorphose (change) into parasitic adults. Their round ventral jawless mouth is like a suction-cup that can attach to the prey.

Hence, the correct option is (1).

55. The structures that help some bacteria to attach to rocks and/or host tissues are :

- (1) Holdfast (2) Rhizoids
(3) Fimbriae (4) Mesosomes

Solution:

Attachment pilli also called fimbriae are short and helps bacterium to adhere to surfaces. It helps bacteria in forming colonies.

Hence, the correct option is (3).

56. If you suspect major deficiency of antibodies in a person, to which of the following would you look for confirmatory evidence?

- (1) Serum globulins (2) Fibrinogen in plasma
(3) Serum albumins (4) Haemocytes

Solution:

The straw-colored liquid, called serum, is simply blood plasma minus the clotting proteins. This blood plasma contains antibodies called agglutinins. Thus, it can be used to test the level of antibodies in the body.

Hence, the correct option is (3).

57. In human females, meiosis-II is not completed until?

- (1) birth (2) puberty
(3) fertilization (4) uterine implantation

Solution:

If fertilization occurs, then meiosis II resumes. The sperms are present in the fallopian tube and one of them penetrates the secondary oocyte, which then splits into two haploid cells, again of unequal size. The larger cell is the ovum, or mature egg; the smaller one is the second polar body.

Hence, the correct option is (3).

58. Which of the following layers in an antral follicle is acellular?

- (1) Zona pellucida (2) Granulosa
(3) Theca interna (4) Stroma

Solution:

The zona pellucida is a clear glycoprotein layer between the corona radiata and the oocyte's plasma membrane.

Hence, the correct option is (3).

59. In his classic experiments on pea plants, Mendel did not use:

- (1) Flower position (2) Seed colour
(3) Pod length (4) Seed shape

Solution:

Mendel used seven characters of pea plants: plant height, color and position of flower, shape and color of pod and shape and color of seed.

Hence, the correct option is (3).

60. Which one of the following fruits is parthenocarpic?

- (1) Banana (2) Brinjal
(3) Apple (4) Jackfruit

Solution:

Parthenocarpic fruits are those that develop without fertilization. For example, banana, pineapple, grapes, orange etc.

Hence, the correct option is (3).

61. In angiosperms, microsporogenesis and megasporogenesis :

- (1) occur in ovule (2) occur in anther
(3) form gametes without further divisions (4) involve meiosis

Solution:

In the angiospermic plants, the sporophytic and the gametophytic generation is extremely reduced. Formation of spores is the first phase of gametogenesis while formation of gametophyte containing the gametes is the second phase. Thus, both microsporogenesis and megasporogenesis involve meiosis.

Hence, the correct option is (3).

62. A gene showing codominance has:

- (1) both alleles independently expressed in the heterozygote
(2) one allele dominant on the other
(3) alleles tightly linked on the same chromosome
(4) alleles that are recessive to each other

Solution:

Codominance is the condition in which there is independence of function of two alleles. This implies that neither allele is dominant, or even partially dominant, over the other.

Hence, the correct option is (3).

63. The chitinous exoskeleton of arthropods is formed by the polymerisation of:

- (1) lipoglycans (2) keratin sulphate and chondroitin sulphate
(3) D-glucosamine (4) N-acetyl glucosamine

Solution:

The exoskeleton of arthropods is composed of protein and flexible chitin. Chitin is a polymer of N acetylglucosamine, a derivative of glucose.

Hence, the correct option is (3).

64. The imperfect fungi which are decomposers of litter and help in mineral cycling belong to :

- (1) Ascomycetes (2) Deuteromycetes
(3) Basidiomycetes (4) Phycomycetes

Solution:

The Fungi Imperfecti, or Deuteromycota, are called imperfect since no sexual stage has been observed in their life cycles.

Hence, the correct option is (2).

65. The wings of a bird and the wings of an insect are :

- (1) homologous structures and represent convergent evolution

- (2) homologous structures and represent divergent evolution
- (3) analogous structures and represent convergent evolution
- (4) phylogenetic structures and represent divergent evolution

Solution:

The wings of birds and insects are analogous structures though they perform similar function, but they do not have same embryological origin or similar anatomy.

Hence, the correct option is (3).

66. Flowers are unisexual in:

- (1) Onion
- (2) Pea
- (3) Cucumber
- (4) China rose

Solution:

Unisexual flowers are those in which only one reproductive whorl is present either androecium or gynoecium., for example, cucumber.

Hence, the correct option is (3).

67. Increase in concentration of the toxicant at successive trophic levels is known as :

- (1) Biogeochemical cycling
- (2) Biomagnification
- (3) Biodeterioration
- (4) Biotransformation

Solution:

Biomagnification is the accumulation or increase in the concentration of a substance in living tissue as it moves through a food web (also known as bioaccumulation).

Hence, the correct option is (2).

68. Destruction of the anterior horn cells of the spinal cord would result in loss of :

- (1) Integrating impulses
- (2) Sensory impulses
- (3) voluntary motor impulses
- (4) Commissural impulses

Solution:

The grey matter on each side of the spinal cord is subdivided into regions called horns. The anterior (ventral) grey horns contain somatic motor nuclei, which are clusters of cell bodies of somatic motor neurons that provide nerve impulses for contraction of skeletal muscles.

Hence, the correct option is (3).

69. Roots play insignificant role in absorption of water in:

- (1) Wheat
- (2) Sunflower
- (3) *Pistia*
- (4) Pea

Solution:

Roots of *Pistia* are covered by several root pockets instead of root cap. These pockets help the plant in balancing.

Hence, the correct option is (3).

70. Match the columns and identify the correct option:

Column-I	Column-II
(a) Thylakoids	(i) Disc-shaped sacs in Golgi apparatus
(b) Cristae	(ii) Condensed structure of DNA
(c) Cisternae	(iii) Flat membranous sacs in stroma

(d) Chromatin	(iv) Infoldings in mitochondria
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	(a)	(b)	(c)	(d)
(1)	(iii)	(iv)	(ii)	(i)
(2)	(iv)	(iii)	(i)	(ii)
(3)	(iii)	(iv)	(i)	(ii)
(4)	(iii)	(i)	(iv)	(ii)

Solution:

The flattened membranous sacs in chloroplast are called thylakoids. Cristae are deep in-folds characteristic of the inner mitochondrial membrane. Cisternae are disc-shaped sacs in Golgi apparatus. Chromatin is the condensed structure of DNA.

Hence, the correct option is (3).

71. Identify the correct order of organisation of genetic material from largest to smallest:

- (1) Chromosome, genome, nucleotide, gene
- (2) Chromosome, gene, genome, nucleotide
- (3) Genome, chromosomes, nucleotide, gene
- (4) Genome, chromosome, gene, nucleotide

Solution:

Nucleotides combine to code for a gene. A sequence of gene forms a chromosome. All the chromosomes are collectively called as genome.

Hence, the correct option is (4).

72. Which one of the following hormones though synthesised elsewhere, is stored and released by the master gland?

- (1) Melanocyte stimulating hormone
- (2) Antidiuretic hormone
- (3) Luteinizing hormone
- (4) Prolactin

Solution:

After the production of antidiuretic hormone in the cell bodies of neurosecretory cells, it is packaged into secretory vesicles, which move by fast axonal transport to the axon terminals in the posterior pituitary, where they are stored until nerve impulses trigger release of the hormone.

Hence, the correct option is (2).

73. Read the different components from (a) to (d) in the list given below and tell the correct order of the components with reference to their arrangement from outer side to inner side in a woody dicot stem:

- (a) Secondary cortex
- (b) Wood
- (c) Secondary phloem
- (d) Phellem

The correct order is:

- (1) (d), (c), (a), (b)
- (2) (c), (d), (b), (a)
- (3) (a), (b), (d), (c)
- (4) (d), (a), (c), (b)

Solution:

In a dicot stem, the correct order from outer side to inner side is Phellem, followed by secondary cortex and secondary phloem and then wood.

Hence, the correct option is (4).

74. Which of the following joints would allow no movement?

- (1) Ball and Socket joint
- (2) Fibrous joint
- (3) Cartilaginous joint
- (4) Synovial joint

Solution:

Fibrous joints lack a synovial cavity, and the articulating bones are held very closely together. They permit little or no movement.

Hence, the correct option is (3).

75. Which one of the following is not applicable to RNA?

- (1) Chargaff's rule
- (2) Complementary base pairing
- (3) 5' phosphoryl and 3' hydroxyl ends
- (4) Heterocyclic nitrogenous bases

Solution:

Chargaff rules are applicable only on double stranded DNA.

Hence, the correct option is (1).

76. Doctors use stethoscope to hear the sound; produced during each cardiac cycle. The second sound is heard when:

- (1) AV node receives signal from SA node
- (2) AV valves open up
- (3) Ventricular walls vibrate due to gushing of blood from atria
- (4) Semilunar valves close down after the blood flows into vessels from ventricles

Solution:

The second sound is shorter and high-pitched, is called dub sound. S2 is caused by blood turbulence associated with closure of the SL valves at the beginning of ventricular diastole.

Hence, the correct option is (4).

77. During ecological succession:

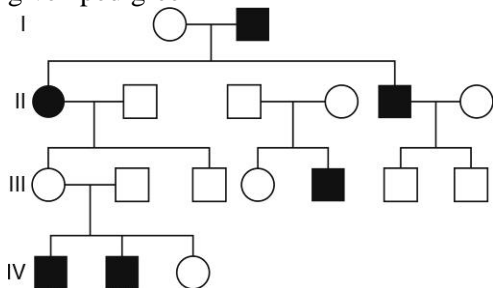
- (1) the changes lead to a community that is in near equilibrium with the environment and is called pioneer community
- (2) the gradual and predictable change in species composition occurs in a given area
- (3) the establishment of a new biotic community is very fast in its primary phase
- (4) the number and types of animals remain constant

Solution:

The process of development of an ecological community or ecosystem over a system of stages; early, middle, late and mature (or climax) is called ecological succession. The change in species is gradual and can be predicted.

Hence, the correct option is (2).

78. In the following human pedigree, the filled symbols represent the affected individuals. Identify the type of given pedigree



- (1) X-linked dominant
- (2) Autosomal dominant
- (3) X-linked recessive
- (4) Autosomal recessive

Solution:

Autosomal recessive mutations could be detected in an unlikely event of bringing two mutant alleles together in a homozygote.

Hence, the correct option is (4).

79. Balbiani rings are sites of:

- | | |
|-------------------------------|------------------------------|
| (1) RNA and protein synthesis | (2) Lipid synthesis |
| (3) Nucleotide synthesis | (4) Polysaccharide synthesis |

Solution:

A Balbiani ring is a large chromosome puff, a site for the transcription of RNA.

Hence, the correct option is (1).

80. Name the pulmonary disease in which alveolar surface area involved in gas exchange is drastically reduced due to damage in the alveolar walls:

- | | |
|---------------|---------------|
| (1) Asthma | (2) Pleurisy |
| (3) Emphysema | (4) Pneumonia |

Solution:

Emphysema is a disorder characterized by destruction of the walls of the alveoli, producing abnormally large air spaces that remain filled with air during exhalation.

Hence, the correct option is (3).

81. Which the following are most suitable indicator of SO₂ pollution in the environment?

- | | |
|--------------|-------------|
| (1) Fungi | (2) Lichens |
| (3) Conifers | (4) Algae |

Solution:

Lichens obtain their nutrition from the atmosphere rather than soil, thus they act as bioindicators for air pollution, mainly for sulfur dioxide pollution.

Hence, the correct option is (2).

82. Satellite DNA is important because it:

- (1) Codes for enzymes needed for DNA replication
- (2) Codes for proteins needed in cell cycle
- (3) Shows high degree of polymorphism in population and also the same degree of polymorphism in an individual, which is heritable from parents to children
- (4) Does not code for proteins and is same in all members of the population

Solution:

The satellite DNAs in eukaryotes has long repetitive sequences. They do not code for any proteins but exhibit polymorphism on which DNA fingerprinting is based.

Hence, the correct option is (3).

83. Industrial melanism is an example of:

- | | |
|-----------------------|-------------------|
| (1) Neo Lamarckism | (2) Neo Darwinism |
| (3) Natural selection | (4) Mutation |

Solution:

In industrial melanism, the dark-winged moths were naturally selected over the white-winged moths and have almost replaced white-winged moth.

Hence, the correct option is (3).

84. A column of water within xylem vessels of tall trees does not break under its weight because of :

- (1) Positive root pressure
- (2) Dissolved sugars in water
- (3) Tensile strength of water
- (4) Lignification of xylem vessels

Solution:

Force of gravity acts on the water column and allows the absorption of water till the adhesive and cohesive forces are balanced by the force of gravity. As a result of adhesion, cohesion and surface tension, water has high tensile strength which provides it the ability to resist the pull.

Hence, the correct option is (3).

85. The introduction of t-DNA into plants involves:

- (1) Allowing the plant roots to stand in water
- (2) Infection of the plant by *Agrobacterium tumefaciens*
- (3) Altering the pH of the soil, then heat shocking the plants
- (4) Exposing the plants to cold for a brief period

Solution:

Nematode-specific genes are introduced into the plant using the vector *Agrobacterium tumefaciens*.

Hence, the correct option is (2).

86. Pick up the wrong statement:

- (1) Nuclear membrane is present in Monera
- (2) Cell wall is absent in Animalia
- (3) Protista has photosynthetic and heterotrophic modes of nutrition
- (4) Some fungi are edible

Solution:

All monerans are unicellular; they lack true nuclei and generally lack membrane-enclosed organelles.

Hence, the correct option is (1).

87. In photosynthesis, the light-independent reactions take place at :

- (1) Stromal matrix
- (2) Thylakoid lumen
- (3) Photosystem – I
- (4) Photosystem-II

Solution:

Light-independent reactions also known as dark reactions take place in the stromal matrix of chloroplast. They are dependent on the products of light reactions.

Hence, the correct option is (1).

88. Which of the following immunoglobulins does constitute the largest percentage in human milk?

- (1) IgG
- (2) IgD
- (3) IgM
- (4) IgA

Solution:

IgA is present in tears, nasal mucus, breast milk and intestinal secretions.

Hence, the correct option is (4).

89. Which of the following pairs is not correctly matched?

	Mode of reproduction	Example
(1)	Conidia	<i>Penicillium</i>
(2)	Offset	Water hyacinth
(3)	Rhizome	Banana
(4)	Binary fission	<i>Sargassum</i>

Solution:

Sargassum reproduces by fragmentation and not binary fission.

Hence, the correct option is (4).

90. The UN conference of Parties on climate change in the year 2012 was held at:

- | | |
|------------|------------|
| (1) Warsaw | (2) Durban |
| (3) Doha | (4) Lima |

Solution:

The 18th session of the United Nations Conference of the Parties on climate change in the year 2012 held in Doha, Qatar.

Hence, the correct option is (3).

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