

Sample paper 5

Question: 1

A plant that lives in calcium- rich soil is called

- A. Calcifuge
- B. Calciplant
- C. Limnophyte
- D. Agarophyte
- E. Calcicole

Correct Answer: E. Calcicole

Explanation:

Calcicole is a plant that grows well in calcareous soil (lime-rich soil). Calciphile and calciphyte are the other terms by which such a plant is referred. Some plants cannot tolerate more calcium so they are not capable of living in lime-rich soil. Such plants are called calcifuges. Limnophytes are the plants that grow in marshy conditions and in shallow water. Agarophyte is a sea weed from which agar is produced.

Question: 2

Highly repeated eukaryotic non-coding DNA sequences that are clustered in heterochromatin are

- A. Mitochondrial DNA
- B. Spacer DNA
- C. Satellite DNA
- D. Single copy DNA
- E. Complementary DNA

Correct Answer: C. Satellite DNA

Explanation:

Satellite DNA is a highly repeated eukaryotic non-coding DNA sequence that is clustered in heterochromatin region of chromosome. Mitochondrial DNA is located in organelles called mitochondria. Spacer DNA is the sequence of nucleotides that occurs between genes. Single copy DNA are the nucleotide sequences present once in haploid genome. DNA transcribed from a specific mRNA through the action of the enzyme reverse transcriptase is called complementary DNA.

Question: 3

Inner mitochondrial membrane has high amounts of

- A. Cholesterol
- B. Cardiolipin
- C. Ergosterol
- D. Stigmasterol
- E. Galactolipids

Correct Answer: B. Cardiolipin

Explanation:

Cardiolipin is a glycerophospholipid. It is seen at high concentration in the inner membrane of mitochondria. Its concentration is very low in plasma membrane. Ergosterols are found widely in the plasma membrane of fungi. Stigmasterol is found in plant cell membrane.

Question: 4

Haemocoel is a characteristic feature of phylum _____

- A. Porifera
- B. Cnidaria
- C. Mammalia
- D. Arthropoda
- E. Platyhelminthes

Correct Answer: D. Arthropoda

Explanation:

Haemocoel is a cavity in the organs of arthropods and molluscs through which blood circulates. It develops from part of blood system.

Question: 5

Maturation of sperm takes place in which part of male reproductive system?

- A. Prostate gland
- B. Seminal vesicles
- C. Vas deferens
- D. Epididymis
- E. Scrotal sac

Correct Answer: D. Epididymis

Explanation:

Epididymis is a coiled tube attached to the backside of testis. It is present within the scrotum. Sperms take longer time to pass through this tube. The maturation of spermatozoa takes place here and later moves to vas deferens.

Question: 6

The type of mutation that codes for a stop codon is called

- A. Missense mutation
- B. Nonsense mutation
- C. Silent mutation
- D. Both A and C
- E. All of the above

Correct Answer: B. Nonsense mutation

Explanation:

In nonsense mutation, a mutation in the DNA sequence stops the translation and results in an incomplete and non functional protein. It codes for a stop codon. A mutation which causes insertion of different amino acid in the polypeptide chain which results in an altered protein is called as missense mutation. Silent mutation is a type of mutation where the mutation in DNA will not result in amino acid change.

Question: 7

Which of the following is called as pacemaker?

- A. SAN (sino-atrial node)
- B. AVN (atrio-ventricular node)
- C. Right Ventricle
- D. Aorta
- E. Pulmonary vein

Correct Answer: A. SAN (sino-atrial node)

Explanation:

Sino-atrial node is a patch of tissue present in the right upper corner of the right atrium which is responsible for initiating and maintaining the rhythmic contractile activity of the heart. Each wave of excitation begins at this region and acts as stimulus for next wave of excitation and hence SAN is called pacemaker.

Question: 8

Disulphide bond can be formed between

- A. Two threonine molecules
- B. Two serine molecules
- C. Two cysteine molecules
- D. A Tyrosine and Glycine molecule
- E. An aspartic acid and glutamic acid molecule

Correct Answer: C. Two cysteine molecules

Explanation:

Disulphide bond is a covalent bond formed by the oxidation of two SH groups that are attached to cysteine molecules. It can be inter or intra molecular bridges. Cysteine is the only amino acid that have sulfhydryl group.

Question: 9

The malarial parasite plasmodium is

- A. An amoeboid protozoan
- B. A flagellated protozoan
- C. A ciliated protozoan
- D. A sporozoan
- E. Both B and D

Correct Answer: D. A sporozoan

Explanation:

Plasmodium is a protozoan which is a causative organism of malaria. It has no locomotory organ and it belongs to the class sporozoa. Sporozoans are also called as apicomplexa since they share an apical complex of microtubules at one end. They have an infectious spore –like stage in their life cycle.

Question: 10**Cuticles of annelids are made of**

- A. Chitin
- B. Collagen fibres
- C. Calcium carbonate
- D. Pectins
- E. None of these

Correct Answer: B. Collagen fibres**Explanation:**

Cuticles of annelids are made of collagen fibres. Collagen is secreted by the epidermis. Chitin is present in the exoskeleton of arthropods. Pectin is a structural polysaccharide present in primary wall of plants.

Question: 11**The method used to predict genotypic and phenotypic ratios of progeny from a genetic cross is called**

- A. Punnett square
- B. Chi square
- C. Friedman test
- D. Paired t test
- E. None of the above

Correct Answer: A. Punnett square**Explanation:**

Punnett square, multiplication rule and addition rule are the methods used for determining the outcome of a genetic cross. The rest of the given methods are statistical methods.

Question: 12**The gametophyte of fern is called**

- A. Prothallus
- B. Thallus
- C. Hyphae
- D. Conidia
- E. Haustoria

Correct Answer: A. Prothallus

Explanation:

The gametophyte of a Pteridophyte such as fern is called as prothallus. It is a small, greenish heart-shaped structure that produces male and female gametes. Thallus is the plant body of algae and other lower organisms that is composed of filaments. The filamentous body of fungi is called as hyphae. Conidia are the asexually produced fungal spores. Haustoria are the specialized absorbing structures of parasitic plants.

Question: 13**Casuarina flowers exhibit**

- A. Porogamy
- B. Chalazogamy
- C. Apogamy
- D. Mesogamy
- E. Acrogamy

Correct Answer: B. Chalazogamy**Explanation:**

Chalazogamy is a type of fertilization in which the pollen tube penetrates into the embryo sac through the chalaza instead of entering through the micropyle (porogamy). Chalazogamy can be seen in flowers of casuarina.

Question: 14**Which of the following mechanisms uses ATP molecule during transport across cell membrane?**

- A. Diffusion
- B. Passive transport
- C. Osmosis
- D. Active transport
- E. All the above

Correct Answer: D. Active transport**Explanation:**

Pumping of molecules or ions through a membrane against their concentration gradient is called active transport. This requires a transmembrane protein called transporter and energy in the form of ATP. In diffusion, passive transport and osmosis the movement of molecules occurs down its concentration gradient. Osmosis and diffusion are types of passive transport.

Question: 15**Phenylketonuria is caused by a mutation in the gene coding for**

- A. Pyruvate carboxylase
- B. Phenylalanine hydroxylase
- C. Homogentisate dioxygenase
- D. Glutaryl dehydrogenase
- E. None of these

Correct Answer: B. Phenylalanine hydroxylase

Explanation:

Absence of phenylalanine hydroxylase enzyme causes phenylketonuria. Phenylalanine hydroxylase (PAH) is a hepatic enzyme needed for phenylalanine metabolism. In the absence of PAH, phenylalanine accumulates and is converted to phenyl pyruvate (also called as phenyl ketone). Absence of homogentisate dioxygenase causes alkaptonuria.