

Sample paper 6

Question: 1

Which of the following pairing is incorrect?

- A. Mesosomes : infolding of bacterial cell wall
- B. Ribosomes : sites of protein synthesis
- C. Flagella : locomotory organ of bacteria
- D. Endospores : bacterial mode of reproduction
- E. Both A and D

Correct Answer: E. Both A and D

Explanation:

Mesosomes are the infolding in the bacterial plasma membrane which is rich in enzymes that helps to perform functions like cellular respiration and DNA replication. They appear to be associated with DNA during replication.

Endospores are the dormant, tough, non-reproductive structure produced by certain bacteria. Their major function is to protect the bacteria during the stress condition.

Question: 2

Interaction between hermit crab and sea anemone is

- A. Parasitic
- B. Neutral
- C. Symbiotic
- D. Commensalism
- E. None of these

Correct Answer: C. Symbiotic

Explanation:

In a symbiotic relationship, both organisms are benefitted from each other. Interaction between hermit crab and sea anemone is symbiotic. Sea anemone gives protection to the crab and the crab transports the sea anemone to places where food is abundant.

Question: 3

A hierarchical unit at any level of classification is called as

- A. Species
- B. Genus
- C. Clade
- D. Group
- E. Taxon

Correct Answer: E. Taxon

Explanation:

Organisms are identified, classified and grouped into different hierarchical levels such as kingdom, phylum, class, order, family, genus and species. In the taxonomical classification, these units are

referred to as taxa (singular: taxon). Hence a taxon means a taxonomic group at any level or rank. Clade is the term used to refer a group of organisms that share a common ancestor.

Question: 4

Jellyfish uses _____ to kill its prey.

- A. Stinging cells
- B. Proboscis
- C. Parapodium
- D. Antenna
- E. Cilia

Correct Answer: A. Stinging cells

Explanation:

Stinging cells are also called nematocyst. They are capsules found within specialized cells of animals belonging to phylum Cnidaria like jellyfish. The capsules contain coiled tubes. The tube is commonly used for defence and prey capture.

Question: 5

Liver develops from the

- A. Ectoderm
- B. Endoderm
- C. Paraxial mesoderm
- D. Intermediate mesoderm
- E. Axial plate mesoderm

Correct Answer: B. Endoderm

Explanation:

Endoderm is the inner layer of gastrula. Endoderm develops into liver, pancreas, trachea etc. The outer layer of the embryo develops into the ectoderm. Mesoderm is the middle layer and is absent in diploblastic animals.

Question: 6

Which part of the microscope helps to control the brightness of light falling on specimen?

- A. Eyepiece
- B. Objective lens
- C. Stage
- D. Diaphragm
- E. Condenser

Correct Answer: D. Diaphragm

Explanation:

The specimen can be viewed through the eyepiece that is placed on the stage of a microscope. Objective lenses help in magnification. The specimen to be viewed is placed on the stage. Diaphragm, that is located on the lower surface of stage, regulates the light falling on the specimen. Condenser collects the rays of light into a single cone of light.

Question: 7

Mutation of BRCA gene is directly linked to

- A. Breast cancer
- B. Colon cancer
- C. Prostate cancer
- D. Glioblastoma
- E. Hepatocarcinoma

Correct Answer: A. Breast cancer

Explanation:

BRCA is a tumour suppressor gene whose mutation is found to contribute to the development of breast cancer. BRCA mutation is found in most of the breast cancers.

Question: 8

Vitamin D is needed for

- A. Calcium absorption
- B. Protein absorption
- C. Fat absorption
- D. ADH secretion
- E. Sugar absorption

Correct Answer: A. Calcium absorption

Explanation:

Calcium absorption in the gut is facilitated by vitamin D and it helps to maintain calcium and phosphorus level in blood. Deficiency of vitamin D causes rickets.

Question: 9

Which of the following factors affects a population's size?

- A. Birth
- B. Death
- C. Immigration
- D. Emigration
- E. All the above

Correct Answer: E. All the above

Explanation:

The size of a population can be altered by any one of the factors such as birth, death, immigration (entry of individuals into a population) and emigration (individuals moving away from a population). Birth and immigration are the factors that increase a population's size. On the other hand, death and emigration decrease a population's size.

Question: 10

In which part of the kidney does the process of selective reabsorption take place?

- A. Proximal convoluted tubule
- B. Distal convoluted tubule
- C. Renal corpuscle
- D. Medulla
- E. Urinary bladder

Correct Answer: A. Proximal convoluted tubule

Explanation:

During ultrafiltration, some of the useful substances are lost from plasma along with excretory products. The absorption of some of these useful components of the glomerular filtrate back into the blood is called selective reabsorption and it takes place in proximal convoluted tubule.

Question: 11

All ecosystems grouped together make up a

- A. Niche
- B. Community
- C. Population
- D. Biosphere
- E. Habitat

Correct Answer: D. Biosphere

Explanation:

Biosphere includes the entire ecosystem. It defines the behaviour and interaction of organisms with elements present in the hydrosphere, lithosphere and atmosphere.

Question: 12

The following are complementary base pairs except

- A. G- C
- B. A-T
- C. G- A
- D. A-U
- E. None

Correct Answer: C. G- A

Explanation:

The nucleotide bases pair specifically by hydrogen bonds. Guanine always pairs with cytosine and adenine always pairs with thymine in DNA. In RNA, adenine pairs with uracil. This indicates that purines always bind with pyrimidines through hydrogen bonds. This specific hydrogen bonding in bases is called complementary base pairing.

Question: 13

Which of the following hormones causes ovulation?

- A. Follicle stimulating hormone
- B. Luteinising hormone
- C. Gonadotrophin-releasing hormone
- D. Testosterone
- E. Inhibin

Correct Answer: B. Luteinising hormone

Explanation:

Luteinising hormone is produced in the anterior pituitary gland. In females, luteinising hormone helps in regulating menstrual cycle and ovulation. In males, it stimulates the synthesis of hormone testosterone.

Question: 14

Spindle fibres attach to

- A. Centromere
- B. Telomere
- C. Telomerase
- D. Cell membrane
- E. None of these

Correct Answer: A. Centromere

Explanation:

Centromeres are the chromosomal parts where spindle fibres get attached. Telomeres are the chromosomal ends which get reduced after each cell division. Telomerase are needed to maintain the ends of chromosomes (telomere).

Question: 15

The following tissues are the derivatives of inner cell mass except

- A. Amnion
- B. Yolk sac
- C. Allantois
- D. Placenta
- E. None of these

Correct Answer: D. Placenta

Explanation:

Placenta and chorion compose the fetal-maternal junction. The former is a trophoblast derivative and the latter is a derivative of both trophoblast and extraembryonic mesoderm. The other extraembryonic tissues such as the amnion, the yolk sac and the allantois are derived from the inner cell mass. Among them, the yolk sac and the allantois are endodermal derivatives whereas the amnion is an ectodermal derivative.