

### Sample paper 3

#### Question: 1

The semi fluid mass of partly digested food is called chyme. Formation of chyme takes place in

- A. Mouth
- B. Small intestine
- C. Large intestine
- D. Liver
- E. Stomach

**Correct Answer: E. Stomach**

#### Explanation:

The semifluid mass of partly digested food in stomach before entering duodenum is called as chyme. The food mixes thoroughly with the acidic gastric juice of the stomach by the churning movements of its muscular wall and results in the formation of chyme.

#### Question: 2

Which of the following kinds of signalling occurs when the cells communicate with each other through direct contact?

- A. Endocrine signalling
- B. Paracrine signalling
- C. Juxtacrine signalling
- D. Intracrine signalling
- E. None of the above

**Correct Answer: C. Juxtacrine signalling**

#### Explanation:

Juxtacrine signalling is an example of intercellular communication where cells communicate through direct contact. Endocrine signalling occurs between cells that are present over large distance. Paracrine signalling occurs between cells that are present over short distance. In intracrine signalling the signals are produced inside the target cell.

#### Question: 3

Chains of sarcomeres in muscles are organized into

- A. Sarcolemma
- B. Sarcoplasm
- C. Myoblasts
- D. Myofibrils
- E. Fascia

**Correct Answer: D. Myofibrils**

#### Explanation:

Sarcolemma is the muscle cell membrane and the sarcoplasm is the cytoplasm of muscle cell. The connective tissue outside the epimysium (sheath of connective tissue that surrounds each muscle)

that separates two muscles is called the fascia. The parallelly arranged filaments in the sarcoplasm, which are arranged by the chains of sarcomeres are called myofibrils. The embryonic cell that gives rise to muscle cell is called myoblast.

**Question: 4**

**Which of the given organelles is not present in animal cells?**

- A. Nucleus
- B. Golgi apparatus
- C. Lysosome
- D. Leucoplast
- E. Mitochondria

**Correct Answer: D. Leucoplast**

**Explanation:**

Among the given organelles, leucoplasts are present only in plant cells but not in animal cells. They are the sites responsible for storage of proteins, starch and lipid molecules.

**Question: 5**

**The adipose tissue plays role in**

- A. Pigment storage
- B. Fat storage
- C. Stretching
- D. Binding organs
- E. None of the above

**Correct Answer: B. Fat storage**

**Explanation:**

Adipose is a type of connective tissue whose cells get expanded with fat droplets and hence the nucleus and cytoplasm of this cell are pushed towards edges to form ring like structure. Adipose tissue provides insulation, stores fat and gives protection. Pigmented connective tissue that is present in eyes and skin is meant to store pigments. Elastic connective tissue helps in stretching. Dense connective tissues bind the organs together.

**Question: 6**

**The shortest phase of cardiac cycle is**

- A. Atrial systole
- B. Ventricular systole
- C. Atrial diastole
- D. Ventricular diastole
- E. Equal duration for A and B

**Correct Answer: A. Atrial systole**

**Explanation:**

Atrial systole is the shortest phase of cardiac cycle. Atrial systole gets completed in 0.1 seconds. Duration of atrial diastole is 0.7 seconds. Duration of ventricular systole and diastole is 0.3 seconds and 0.5 seconds respectively.

**Question: 7**

**Implantation is the process where**

- A. The blastocyst becomes embedded in the endometrium.
- B. The sperm nuclei fuse with the egg nuclei
- C. Loss of the lining of endometrium takes place
- D. The gastrula becomes embedded in the endometrium
- E. None of the above

**Correct Answer: A. The blastocyst becomes embedded in the endometrium.**

**Explanation:**

The process of embedding of blastocyst to the endometrium is known as implantation. The fetus receives oxygen and nutrients from mother due to this adhesion. The blastula differentiates into three layers namely endoderm, mesoderm and ectoderm to form gastrula.

**Question: 8**

**Acceptor stem is present in**

- A. tRNA
- B. rRNA
- C. siRNA
- D. mRNA
- E. hnRNA

**Correct Answer: A. tRNA**

**Explanation:**

tRNA consists of variable loop, TΨC loop, anticodon loop, D-loop and acceptor stem. The anticodon loop is needed for binding to the mRNA. Acceptor stem is needed for attaching the amino acid.

**Question: 9**

**In the process of animal development, gastrulation is represented as**

- A. Gamete to zygote
- B. Zygote to blastula
- C. Blastula to gastrula
- D. Gastrula to neurula
- E. None of the above

**Correct Answer: D. Gastrula to neurula**

**Explanation:**

Gastrulation is the stage in development of an embryo, in which three distinct germ layers (ectoderm, endoderm and mesoderm) are formed. It takes place next to cleavage, in which blastula formation occurs from zygote. After gastrulation is neurulation which is the typical organogenesis.

**Question: 10**

**A measure of the disorder or randomness in a closed system is called**

- A. Entropy
- B. Enthalpy
- C. Potential energy
- D. Kinetic energy
- E. None of the above

**Correct Answer: A. Entropy**

**Explanation:**

Entropy is the measure of the disorder or randomness which is derived from the second law of thermodynamics. Enthalpy is the sum of the internal energy of the system plus the product of its volume multiplied by the pressure. Potential energy is the ability of a system to do work due to its position or internal structure. Kinetic energy of an object is the energy it possesses due to its motion.

**Question: 11**

**In amphibian, vitellogenin is synthesized by**

- A. Oocyte
- B. Uterus
- C. Liver
- D. Spleen
- E. Intestine

**Correct Answer: C. Liver**

**Explanation:**

Vitellogenin is a precursor protein that is expressed in the females of all oviparous species including amphibians, fishes, reptiles and birds. Vitellogenin is a glycolipoprotein secreted by the liver. Vitellogenin can be expressed by the male (in a few species) in the presence of estrogenic endocrine disruptive chemicals. Vitellogenin precursors provide the major egg yolk proteins which serves as nutrients.

**Question: 12**

**The state of a neuron which inhibits the generation of action potential is said to be**

- A. Depolarized
- B. Repolarized
- C. Hyperpolarized
- D. Resting potential
- E. A, B and D

**Correct Answer: C. Hyperpolarized.**

**Explanation:**

Resting potential is the state of a neuron which is not under any stimulus. The normal resting potential of human nerves is -70 mV. When a neuron receives stimulus, the cell's interior will be depolarized with influx of Na<sup>+</sup> ions which will result in action potential. Immediately after the generation of action potential the cell is hyperpolarized; that makes the cell more negative and keeps the neuron in a refractory period so that the next action potential cannot generate. Next is the repolarization i.e. neuron will come to its original resting state.

**Question: 13**

**The term 'staminate' refers to**

- A. Unisexual male flower bearing stamens
- B. Unisexual female flower bearing pistils
- C. Bisexual flower bearing stamens and pistils
- D. Unisexual male flower bearing pistils
- E. Unisexual female flower bearing stamens

**Correct Answer: A. Unisexual male flower bearing stamens**

**Explanation:**

Staminate refers to the male flowers that bear only stamens but lack pistils. Pistillate refers to the female flowers that bear only pistils but lack stamen.

**Question: 14**

**Which protein is targeted by cholera toxin?**

- A. G proteins
- B. Actin
- C. Permease
- D. Vinculin
- E. Vitonectin

**Correct Answer: G proteins**

**Explanation:**

Cholera toxin inhibits the GTPase activity of the G protein. So the protein always remains in the activated state. This results in the constant activation of adenylate cyclase enzyme. cAMP level rises due to the activation of adenylate cyclase. This eventually leads to secretion of water, sodium ions etc to the intestinal lumen.

**Question: 15**

**The process of delivery of foetus is called**

- A. Implantation
- B. Lactation
- C. Parturition
- D. Fertilization
- E. None of the above

**Correct Answer: C. Parturition**

**Explanation:**

The process in which the foetus is delivered is called as parturition. Oxytocin is released during parturition which is responsible for the contraction of uterus.