

Note: Answer to all questions (including multiple choice questions) should be written in the provided answer book only.
(96)

Number of Printed Pages = 2

SARDAR PATEL UNIVERSITY
M.Sc (III Semester) Examination (CBCS)
Thursday, 6th December, 2012
2:30 p.m. to 5:30 pm
Biotechnology
PS03EBIT01 – Human Physiology

TOTAL MARKS: 70

Q.1 Tick mark / select the correct answer for the following. (Only correct option against given question number needs to be written in provided answer book) (08 Marks)

- 1) The functions of tropomyosin in skeletal muscle include:
 - a) Sliding on actin to produce shortening
 - b) Releasing Ca^{2+} after initiation of contraction
 - c) Acting as a "relaxing protein" at rest by covering up the sites where myosin binds to actin
 - d) Binding myosin during contraction
- 2) In normal human blood
 - a) The eosinophil is the most common type of white blood cell
 - b) There are more lymphocytes than neutrophils
 - c) The iron is mostly in hemoglobin
 - d) There are more white cells than red cells
- 3) Which of the following is not primarily a function of blood plasma?
 - a) Transport of hormones
 - b) Maintenance of red cell size
 - c) Transport of O_2
 - d) Transport of antibodies
- 4) Glucose reabsorption occurs in the
 - a) Loop of henle
 - b) Distal tubule
 - c) Proximal tubule
 - d) Cortical collecting duct
- 5) Which of the following are incorrectly paired?
 - a) Elastase: tissue rich in elastin
 - b) Enteropeptidase: Fatty acids
 - c) Pancreatic α - amylase: Starch
 - d) Lingual lipase: digestion in the stomach
- 6) This hormone stimulates leydig cells to secrete testosterone:
 - a) GnRH
 - b) LH
 - c) FSH
 - d) DHT
- 7) Which of the following enzymes is correctly matched with site of production:
 - a) Amylase-Pancreas
 - b) Trypsin-Salivary glands
 - c) Chymotrypsin-Liver
 - d) Pepsin-Liver
- 8) When a depolarizing graded potential makes the axon membrane depolarize to threshold
 - a) Ligand-gated Ca^{2+} channels close rapidly
 - b) Voltage gated Na^+ channels open rapidly
 - c) Voltage-gated Ca^{2+} channels open rapidly
 - d) Ligand-gated Na^+ channels close rapidly

Q.2 Answer any seven from the following:

(14 marks)

- a) What is the function of transferrin?
- b) Explain: A Person with lactose intolerance can tolerate yoghurt?
- c) Differentiate between action potential and graded potential
- d) What factors determine the speed of propagation of an action potential
- e) Name the important hormones secreted by the leydig cells and sertoli cells of the testis and by the graffin follicles and corpora lutea of the ovaries.
- f) What are the functions of gastric lipase and lingual lipase in the stomach?
- g) Name the three types of neurons based on the functional classification of neurons
- h) What is the difference between cortical nephron and juxtamedullary nephron
- i) Which hormone is detected by home pregnancy test? State the function of this hormone in the post ovulatory events in the ovary.

Q.3 A: Give a diagrammatic overview of the blood-clotting cascade and write the important features of intrinsic, extrinsic and common pathway **(6 marks)**

Q.3 B: What is erythropoiesis? Describe how erythropoiesis affect hematocrit by stepping up negative feedback system when a subject moves from a town at sea level to a high mountain village **(6 marks)**

OR

Q.3 B: Describe how Hcl is secreted by the cells in the gastric mucosa **(6 marks)**

Q.4 A: Describe the processes by which fatty acids and other lipids are absorbed from the intestine into the blood stream **(6 marks)**

Q.4 B: List the principal gastrointestinal hormones, the sites where each is secreted, and the main physiologic function of each of these hormones **(6 marks)**

OR

Q.4 B: Name the cells / glands from which estrogen and progesterone are secreted. State functions of the estrogen and progesterone. **(6 marks)**

Q.5 A: Describe how the renal tubule and collecting ducts produce dilute and concentrated urine? **(6 marks)**

Q.5 B: What is a myoneural junction? Summarize the major steps occurring in a myoneural junction leading to muscle contraction. **(6 marks)**

OR

Q.5 B: What is GFR? Explain neural and hormonal regulation of GFR? **(6 marks)**

Q.6 A: Name the phases of the female reproductive cycle and describe the events in the ovaries and uterus occurring in the menstrual phase. **(6 marks)**

Q.6 B: Explain the events of signal transmission at a chemical synapse. State the nature of post synaptic potential under the influence of (a) acetylcholine and (b) GABA **(6 marks)**

OR

Q.6 B: Describe the four types of ion channels upon which the electrical signals produced by neurons and muscle fibres rely upon? **(6 marks)**

— X —