

[A-83]

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SARDAR PATEL UNIVERSITY
M.Sc (III Semester) Examination (Under CBCS)
Monday, 27th April, 2015
2:30 pm to 5:30 pm
Biotechnology
PS03EBIT01 – Human Physiology

TOTAL MARKS: 70

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

- 1) Which of the following pancreatic enzymes digests lipids?

a) Trypsin	c) Lipase
b) Elastase	d) Pepsin

- 2) This term means the return of substances into the blood stream from the filtrate.

a) Secretion	c) Reabsorption
b) Filtration	d) Excretion

- 3) Na⁺/K⁺-ATPases are considered to be electrogenic pumps because
 - a) They contribute to the negativity of the resting membrane potential
 - b) Because the sodium ions are negatively charged
 - c) Because they exhibit low permeability
 - d) Both a and b

- 4) When a depolarizing graded potential makes the axon membrane depolarize to threshold
 - a) Voltage gated Na⁺ channels open rapidly
 - b) Voltage-gated Ca²⁺ channels open rapidly
 - c) Ligand-gated Na⁺ channels close rapidly
 - d) Voltage gated Ca²⁺ channels close rapidly

- 5) Which of the following reduces blood loss?

a) Erythrocyte	c) Lymphocyte
b) Platelet	d) Basophil

- 6) Which of the following is not an agranular leukocyte?
 - a) Monocytes
 - b) Basophil
 - c) Lymphocyte
 - d) Macrophage

- 7) _____ hormone secreted by the _____ controls the ovarian and uterine cycles.
 - a) FSH, anterior pituitary
 - b) LH, anterior pituitary
 - c) HGH, hypothalamus
 - d) GnRH, hypothalamus

- 8) Which is the correct order of filtrate flow?
 - a) loop of Henle, glomerular capsule, PCT, DCT, collecting duct
 - b) ascending limb of loop, PCT, DCT, collecting duct
 - c) collecting duct, DCT, PCT, collecting duct, glomerular capsule
 - d) glomerular capsule, proximal convoluted tubule (PCT), loop of Henle, distal convoluted tubule (DCT), collecting duct

- Q.2** Answer **any seven** from the following: **14**
- a) Which cells remove worn out (dead) red blood cells from circulation? What happens of the hemoglobin?
 - b) Draw a neat labeled diagram of a nephron and add a note on any two function of kidney.
 - c) How does filtered glucose enter and leave proximal convoluted tubule.
 - d) Give a list of all the enzymes secreted in the pancreatic juice.
 - e) What is hemostasis? List the three mechanisms that contribute to hemostasis.
 - f) Which two enzymes contribute to chemical digestion in the mouth? Explain the action of those enzymes on the ingested food.
 - g) Briefly describe what causes depolarizing phase.
 - h) State four function of estrogen.
 - i) What is the difference between inhibitory post synaptic potential (IPSP) and excitatory post synaptic potential (EPSP)
- Q.3** (A) What is erythropoiesis? Which factors speed up or slow down erythropoiesis? **6**
- (B) Explain the formation and destruction of red blood cells, and recycling of hemoglobin components with the help of a diagram. Add a note on the consequences of iron buildup in the plasma. **6**
- OR**
- (B) Describe the structure and function of different types of white blood cells. **6**
- Q.4** (A) Describe the structure and function of four basic tissue layers of the GI tract that are commonly found from stomach to the anus. **6**
- (B) What is defecation? Describe the physiology of absorption, feces formation and feces elimination in the large intestine. **6**
- OR**
- (B) Describe the mechanism of absorption of carbohydrates and lipids in the small intestine. **6**
- Q.5** (A) What is net filtration pressure? Write the equation and calculate NPF. **6**
- (B) Explain the structure of filtration membrane and size of molecules being filtered by it in the glomerular capsule. **6**
- OR**
- (B) Which cells secrete the enzyme renin? Describe the three main ways angiotensin II affects renal physiology. Include the role of Aldosterone. **6**
- Q.6** (A) Explain the events of signal transmission at a chemical synapse. **6**
- (B) Enlist the various phases of menstrual cycle and give a graphical overview of changes in concentration of anterior pituitary and ovarian hormones during the course of female reproductive cycle. **6**
- OR**
- (B) What is resting membrane potential? Explain the three major factors that contribute to the resting membrane potential. **6**

