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**MANIPAL UNIVERSITY**

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**MELAKA MANIPAL MEDICAL COLLEGE (MANIPAL CAMPUS)****MBBS PHASE – I STAGE – I DEGREE EXAMINATION – SEPTEMBER 2017****SUBJECT: PHYSIOLOGY – PAPER - I (ESSAY)**

Saturday, September 09, 2017

Time : 2.00 p.m. – 4.00 p.m.

Max. marks : 60

- ✓ **Answer all the questions**
- ✓ **Write the question number clearly in the margin**
- ✓ **Draw diagrams wherever appropriate**

1. Lawson, a 10 year old boy had a height of 6 feet and was taller as compared to his classmates. He complained very often to his parents of severe headache and excessive sweating. His parents were worried and so they consulted their family physician. Investigations revealed the presence of hyperglycemia and a benign tumor in the pituitary gland. The physician briefed Lawson's parents about the complications that Lawson may develop as he reaches adulthood.
  - 1A. Name the endocrine disorder in Lawson.
  - 1B. Name the hormone responsible for the tall stature in Lawson. In the form of a flow chart describe how the secretion of this hormone is regulated normally.
  - 1C. Give reason for hyperglycemia in Lawson. (1+3+1 = 5 marks)
  
- 2A. List two differences between graded potential and action potential. (2 marks)
- 2B. Define absolute refractory period and mention the ionic basis for the same in a nerve. What is the importance of refractory period in a nerve? (2+1 = 3 marks)
  
3. In the form of a flow chart write the steps involved in excitation-contraction coupling in a skeletal muscle. (5 marks)
  
4. Explain in detail the various stages of erythropoiesis in a normal adult. Mention any two essential factors regulating erythropoiesis. (4+1 = 5 marks)

5. Robert, a 64 year old businessman was brought to the emergency department with substernal chest pain that radiated to his left arm. He had marked shortness of breath and was sweating profusely. His ECG evaluation showed extreme bradycardia (R-R interval 1.5 s) with an elevated S-T segment.
- 5A. Mention the probable diagnosis based on the symptoms and ECG findings in Robert.
- 5B. Calculate Robert's heart rate from the above mentioned ECG data.
- 5C. Draw and label a normal electrocardiogram (ECG) recorded with limb lead II indicating the waves and intervals.

(1+1+3 = 5 marks)

6. Draw and label the diagram of oxyhemoglobin dissociation curve. Mention the significance of the flat portion of this curve.

(5 marks)

7. With the help of a labeled diagram, describe the cellular mechanism of hydrochloric acid secretion in stomach. Add a note on peptic ulcer.

(3+2 = 5 marks)

- 8A. Give physiological basis for the following:

- i. Ureteral obstruction decreases GFR
- ii. Albuminuria in nephritis
- iii. Contraction of mesangial cells decreases GFR

(1+1+1 = 3 marks)

- 8B. Write a note on glucose reabsorption from the renal tubules.

(2 marks)

- 9A. Explain milk ejection reflex with the help of a flow chart.

- 9B. Enumerate any two functions of Sertoli cells.

(3+2 = 5 marks)

10. Mention any four clinical features of cerebellar lesion. Write the basis for any two features.

(2+3 = 5 marks)

11. Draw and label the pathway for slow pain from right foot. Explain the physiological basis for referred pain.

(3+2 = 5 marks)

- 12A. Name any one refractory error of eye and describe the cause and correction for it.

- 12B. Describe any two functions of middle ear.

(2+3 = 5 marks)

