Reg. No.										

MANIPAL UNIVERSITY

FIRST MBBS DEGREE EXAMINATION – SEPT/OCT 2017

SUBJECT: PHYSIOLOGY– PAPER I (ESSAY)

Thursday, September 28, 2017

Time: 10:20 – 13:00 Hrs. Maximum Marks: 80

✍ **Answer ALL the questions.**

✍ **Long Essays:**

1A. Explain the sequence of events involved in excitation contraction coupling in skeletal muscle.
1B. Explain the physiological mechanisms by which force of contraction of skeletal muscle is increased.

(7+3 = 10 marks)

2. A 66 year old hypertensive patient, who had a stroke suffered a lesion in the primary somatosensory cortex. He was unable to appreciate sensations in his left lower limb.
2A. Draw a labelled diagram to show the origin, course and termination of the pathway carrying conscious proprioceptive sensations from the lower limb.
2B. Explain how stimulus intensity is coded by the receptors. Add a note on receptor adaptation.

(5+5 = 10 marks)

3. **Short answer questions:**

3A. In response to a complete section of alpha motor neuron, explain the:
  i) Degenerative changes that occur in the same neuron.
  ii) Structural and functional changes that occur in skeletal muscle supplied the same neuron.
3B. Briefly explain the mechanisms by which parathyroid hormone elevates blood calcium levels.
3C. Mention the source and functions of:
  i) Somatomedin C
  ii) Androgen binding protein
3D. Explain how a lack of insulin leads to hyperglycemia in type I diabetes mellitus.
3E. Explain the structure and innervation of the muscle spindle.
3F. Briefly explain why:
  i) Unilateral lesions in the cerebellum produce ipsilateral motor manifestations.
  ii) Unilateral lesions of the visual cortex result in macular sparing.
3G. Give the structure and mention the functional properties of the blood brain barrier.
3H. Explain the steps in spermatogenesis.
3I. Name any two hormones secreted by the placenta and explain their role in pregnancy.
3J. Write briefly on the different refractive media in the eye and explain their role in vision.
3K. Briefly explain the steps in the synthesis of thyroid hormones.
3L. Describe impedance matching. Based on this, explain why Rinne negative response is seen in conductive deafness.
3M. Write briefly on the different waves observed in EEG.
3N. Enumerate the differences between various chemical classes of hormones. What is permissive action of hormones?
3O. Describe the clinical features of upper motor neuron lesion.

(4 marks × 15 = 60 marks)

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MANIPAL UNIVERSITY

FIRST MBBS DEGREE EXAMINATION – SEPT/OCT 2017

SUBJECT: PHYSIOLOGY- PAPER II (ESSAY)

Saturday, September 30, 2017

Time: 10:20 – 13:00 Hrs. Max. Marks: 80

✍ **All questions are compulsory.**

✍ **Long Essays:**

1. A 7 year old boy had prolonged bleeding following tooth extraction. His parents gave a past history of recurrent swollen painful joints. Investigation showed lack of factor VIII in his plasma.
   - i) Identify the hemostatic disorder in the above condition.
   - ii) What would be the results of bleeding time and clotting time in this condition? Justify your answer.
   - iii) Outline the mechanism of clotting and highlight the importance of factor VIII in clotting.
   - iv) Name any two factors which normally keep the blood in the fluid state in the body.

   (1+2+6+1 = 10 marks)

2. Define cardiac output and give its normal value. Mention any two conditions each for increase & decrease in cardiac output. Explain the role of various determinants in the regulation of cardiac output.

   (2+2+6 = 10 marks)

3. **Short answer questions:**

3A. Describe the placement of electrodes for limb leads of ECG. Represent the axis of these leads.
3B. Explain the phasic changes that occur in coronary blood flow.
3C. Describe the ionic basis of:
   - i) Pacemaker potential
   - ii) Plateau phase of ventricular action potential.

3D. Draw a graph to depict the changes in the intrapleural pressure, intra alveolar pressure and lung volume during quiet breathing.
3E. State Fick's law of diffusion. Explain how partial pressure gradients determine gas exchange at the lung and tissue level.
3F. Mention the location and explain the functions of brainstem respiratory centers.
3G. Depict Bohr effect in an Oxygen dissociation curve. Mention the significance of this effect.
3H. Briefly explain the mechanism and regulation of peristalsis in the gastrointestinal tract.
3I. Briefly explain the effects of complete bile duct obstruction on digestion and absorption of nutrients.
3J. Explain the regulation of salivary secretion.
3K. Explain defecation reflex.
3L. Outline the role of T-lymphocytes in immunity.
3M. Explain the water reabsorption that occurs at proximal convoluted tubule and collecting duct of nephrons.
3N. Describe the role of skin in thermoregulation
3O. Name the components of 'juxta glomerular apparatus'. Explain the importance of JG apparatus in the regulation of arterial blood pressure

(4 marks × 15 = 60 marks)