Batch 40 - March 2018

Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

MELAKA MANIPAL MEDICAL COLLEGE (MANIPAL CAMPUS)

MBBS PHASE – I STAGE – I DEGREE EXAMINATION – MARCH 2018

SUBJECT: PHYSIOLOGY – PAPER - I (ESSAY)

Saturday, March 10, 2018

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. Susan, a 20-year-old girl complained of severe weakness and fatigue. Her monthly menstrual flow was always heavy and prolonged since the age of thirteen years. Her blood investigation showed the following findings:
   RBC count: 2 million cells/mm3 of blood
   PCV: 15%
   Hemoglobin: 5 g%
   Serum Iron: Less than normal
   Peripheral smear: Small and pale red cells with anisocytosis and poikilocytosis

1A. Calculate the mean corpuscular volume (MCV) from the given data and comment on the result

1B. Give the diagnosis based on the history and laboratory findings

1C. Mention the treatment option for the above disorder

1D. Define the terms:
   i) Anisocytosis
   ii) Poikilocytosis

(2+1+1+1 = 5 marks)

2. Draw a neat labeled diagram of nerve action potential and explain its ionic basis.

(5 marks)

3. Define the terms 'Passive tension' and 'resting length'. With the help of a graphical representation, describe the length-tension relation in skeletal muscle.

(2+3 = 5 marks)

4. A 35 year old man got his blood pressure (BP) checked at the hospital which was found to be 150/90 mm Hg. Explain the short-term reflex mechanism that would bring his BP towards normal range with the help of a flow chart.

(5 marks)

5. Mention the source, chemical nature and function of lung surfactant.

(3 marks)

6. Describe the second stage of deglutition.

(5 marks)

7. Write two differences between pituitary dwarfism and cretinism

(2 marks)

8. Give physiological basis for the following:

8A. Polycythemia in high altitude

8B. Peripheral chemoreceptors are not stimulated in anemic hypoxia

8C. Aldosterone deficiency produces hyperkalemia

8D. Abnormally tall stature in gigantism

8E. Polyuria in diabetes insipidus

(1×5 = 5 marks)

9. Explain in detail the endometrial changes in non-pregnant women during a normal menstrual cycle. Mention the hormones responsible for these changes.

(3+2 = 5 marks)

10. Define countercurrent mechanism. Describe the role of countercurrent exchanger in the concentration of urine.

(1+4 = 5 marks)

11. Philip, a 58 year old man visited the neurologist with a complaint of progressive difficulty in walking over the past six months. He informed the neurologist that his handwriting has changed over a period of time with the size of the alphabets becoming smaller. He also reported tightness in his limbs which caused him great difficulty in performing his daily activities. When Philip was asked to walk a short distance, the neurologist noticed that Philip had a stooped posture, took short steps and there was decreased swinging of arms.

11A. Name the neurological disorder in Philip and mention the cause for it.

11B. Write the physiological basis for decreased swinging of arms in Philip while walking.

11C. Name any two hyperkinetic features associated with the above neurological disorder.

11D. Mention the type of gait seen in patients with the above neurological disorder.

(2+1+1+1 = 5 marks)

12A. Draw a neat labeled diagram of the pathway carrying crude touch and pressure sensations from the right great toe.

12B. Explain the property of "adaptation" of sensory receptors.

(3+2 = 5 marks)

13A. Explain the sequence of events in phototransduction, in the form of a flow chart, when bright light strikes the retina of the human eye.

13B. Mention how pitch of sound is discriminated in the cochlea.

(3+2 = 5 marks)