

Question Paper

Exam Date & Time: 10-Jun-2022 10:20 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST MBBS DEGREE EXAMINATION – JUNE 2022

SUBJECT: PHYSIOLOGY - PAPER I

(OLD REGULATION – 2018-19 & PRIOR BATCH – REPEATERS)

Marks: 80

Duration: 160 mins.

All questions are compulsory.

Essay questions:

1. A 22-year old male with a history of type I Diabetes mellitus was admitted to the emergency in a state of coma. His blood glucose was 574 mg/dL, urine showed presence of glucose and ketones
 - 1A) Explain the normal mechanism of secretion of the hormone that is deficient in this case. (2)
 - 1B) Explain the physiological actions of the hormone that is deficient in this patient. (5)
 - 1C) Give the basis for coma and the lab findings seen in this patient (3)

- 2A) Draw a labelled diagram showing the dorsal column medial lemniscal pathway and lateral spinothalamic tract formed by fibres originating from the lower limbs (6)
- 2B) Compare the clinical features seen in upper and lower motor neuron lesions. (4)

Short answer questions:

- 3A) Explain spatial summation and temporal summation in synaptic transmission (4)
- 3B. Draw neural pathways to depict:
 - i) Stretch reflex (2)
 - ii) Inverse Stretch reflex (2)

- 3C) Define aphasia. Name the different types of aphasia. Explain the cause of each type (4)
- 3D) Tabulate the differences between REM sleep and NREM sleep (4)
- 3E) Explain the features of Parkinson's disease. (4)
- 3F) Draw diagrams to show image formation from a distant object in hypermetropia and myopia. (4)
- 3G) Explain the role of Middle Ear in hearing. (4)
- 3H) List the different taste sensations. Draw a labelled diagram for taste pathway (4)
- 3I) Outline the steps in the synthesis of thyroid hormones (4)
- 3J) Write briefly on stages of spermatogenesis (4)
- 3K) Explain the mechanism of ovulation. Name any TWO indicators of ovulation. (4)
- 3L) Explain the functions of placenta. (4)

- 3M) Explain the different phases of nerve action potential (4)
- 3N) Explain the role of calmodulin in smooth muscle contraction. Write a note on plasticity of smooth muscles.
- 3O) Define:
- i) Isometric contraction (1)
 - ii) Isotonic contraction (1)
 - iii) Refractory period (1)
 - iv) Threshold stimulus (1)

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Question Paper

Exam Date & Time: 11-Jun-2022 10:20 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST MBBS DEGREE EXAMINATION – JUNE 2022

SUBJECT: PHYSIOLOGY - PAPER II

(OLD REGULATION – 2018-19 & PRIOR BATCH – REPEATERS)

Marks: 80

Duration: 160 mins.

All questions are compulsory

Write brief, clear and legible answers.

Illustrate your answers with diagrams and flow charts wherever appropriate.

Essay questions.

1. A 52 year old man was admitted to the hospital following complaint of retrosternal chest pain, radiating up to the neck, shoulder, jaws and down to the left arm, which was also associated with profuse sweating and breathlessness. The pain was not relieved by taking rest. ECG showed significant changes. His cardiac troponin levels were elevated. The treating doctor prescribed him medications accordingly and advised him to take rest.
 - 1A) What is the most likely condition? Mention the hallmark changes in ECG, as might be seen in this case. (2)
 - 1B) Draw a neat labeled diagram of a normal ECG from limb lead II. Mention the cause of each wave. List the uses of ECG. (6)
 - 1C) Explain the special features of coronary circulation. (2)
- 2) State Landsteiner's Law. Mention in tabular format the agglutinogens and agglutinins present in the ABO system. Explain the principle of cross matching. Explain the complications of blood transfusion. (2+4+2+2 = 10 Marks)

3. Short Answer Questions:

- 3A) Define blood-pressure. Give its normal range. Explain the baroreceptor mechanism of regulation of blood pressure. (1+1+2 = 4 marks)
- 3B) Where is pulmonary surfactant secreted from? Mention the main component of surfactant. Mention the functions of surfactant. (1+1+2 = 4 marks)
- 3C) Mention the cause and differences between first and second heart sound. (4)
- 3D) Explain cystometrogram with the help of a diagram. (4)
- 3E) Define hypoxia. Mention its types. Explain any one of them. (1+1+2 = 4 marks)

- 3F) Define cardiac-output. Give its normal value. Enumerate the factors affecting cardiac output. (1+1+2 = 4 marks)
- 3G) Define renal clearance. Give its formula. Mention the criteria for the selection of a substance to be used for measurement of GFR. (1+1+2 = 4 marks)
- 3H) Explain the stages of erythropoiesis with the help of neatly labelled diagram. (4)
- 3I) Define glomerular filtration rate. Mention its normal value. Enumerate the factors affecting it. (1/2 + 1/2 + 3 = 4 marks)
- 3J) Describe the mechanism of HCl secretion in the stomach. (4)
- 3K) Draw the diagram of juxtaglomerular apparatus. Explain its functions. (1+3 = 4 marks)
- 3L) Explain the oxygen-hemoglobin dissociation curve. Mention the factors shifting the curve to right and left. (2+2 = 4 marks)
- 3M) Mention any two gastrointestinal hormones. Explain the functions of any one of them. (1+3 = 4 marks)
- 3N) Explain with help of diagram the various lung volumes and capacities as recorded in a normal spiogram. (4)
- 3O) Explain the second stage of deglutition. (4)

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