

The West Bengal University of Health Sciences

MBBS 1st Professional Examination (New Regulation), Nov-Dec 2023

Subject: Physiology
Paper : II

Full Marks : 100
Time : 3 hours

Attempt all questions. The figures in the margin indicate full marks.

1. a) A 60-year-old male is suffering from difficulty in initiation of any motor activity. While sitting he is having tremor in his hand which stops during any activity. Doctors also noted, along with change of emotions, there is no change in facial expression.
 - i) What is your probable diagnosis?
 - ii) Explain the pathophysiology of the disease with a diagram.
 - iii) ~~Explain the pathophysiology of the disease with a diagram.~~ *What is the physiologic basis of hyperkinesia in this patient?*
 - iv) Name two drugs used to reduce hypokinesia in this patient.
 - v) What type of rigidity is seen in this patient and how does it differ from the rigidity of upper motor neuron lesion? 1+6+3+2+3
- b) A 45 year old woman presented with buffalo hump, moon face, purple striae over abdomen, weight gain, poor healing of wounds. X-ray showed fracture of vertebrae. Fasting blood sugar level was – 160 mg/100 ml of blood.
 - i) What is the most probable endocrine disorder in the woman?
 - ii) Explain the mechanism of development of clinical features in the patient.
 - iii) Describe physiological actions of the hormone responsible for this condition.
 - iv) Name two investigations required for confirmation of clinical diagnosis. 1+4+8+2
2. a) Explain the mechanism of sound transduction in the Ear. What are the types of deafness and how would you differentiate between them by tuning fork tests? 7+3
- b) Describe various mechanisms of sodium and water reabsorption in renal tubules. What are diuretics? 4+4+2
- c) Discuss the various hormonal changes that take place in ovarian cycle. 10
3. Write short notes on the following: 2x5
 - a) Micturition reflex.
 - b) Referred pain.
4. Explain the following statements: 5x4
 - a) Polyuria, polyphagia and polydipsia are the cardinal signs of Diabetes.
 - b) NREM sleep is known as slow wave sleep.
 - c) Vertigo is a common symptom of inner ear disease.
 - d) UMN lesion is characterized by increased muscle tone in anti gravity muscles and exaggerated deep tendon reflexes.
 - e) Inulin clearance test reflects GFR.

P.T.O

5. Choose the correct answer of each of the following:
- i) All are the features of pain pathway except:
- a) Neospinothalamic pathway consists of $A\delta$ fibres.
 - b) C-fibres end in lamina I and V.
 - c) Pain sensation from face are carried by the 5th cranial nerve.
 - d) Paleospinothalamic pathway transmits slow pain.
- ii) In the absence of vasopressin, the greatest fraction of filtered of water is absorbed in the:
- a) Proximal tubule.
 - b) Loop of Henle.
 - c) Cortical collecting duct.
 - d) Medullary collecting duct.
- iii) All are true of memory except:
- a) Prefrontal cortex plays a role in formation of working memory.
 - b) NMDA receptors play a role in development of short term memory.
 - c) Role of nitric oxide in potentiating long term memory has been seen.
 - d) Reverberatory circuits are involved in short term memory.
- iv) During childbirth, a woman suffers a serious haemorrhage and goes into shock. After she recovers, she displays symptoms of hypopituitarism. Which of the following will not be expected in this patient?
- a) Cachexia
 - b) Infertility
 - c) Pallor
 - d) Stress intolerance
- v) What is the clearance of a substance when its concentration in the plasma is 10mg/dl, it's concentration in urine is 100 mg/dl, and urine flow is 2 ml/min?
- a) 2ml/min.
 - b) 10ml/min.
 - c) 20ml/min.
 - d) 200ml/min.
- vi) Which of the following is least likely to contribute to the beneficial effects of angiotensin-converting enzyme inhibitors (ACE-inhibitors) in treatment of heart failure?
- a) Vasodilatation
 - b) Decreased cardiac growth
 - c) Decreased cardiac afterload
 - d) Decreased plasma renin activity
- vii) A 50 year old woman undergoes a neurologic exam that indicates loss of pain and temperature sensitivity, vibratory sense and proprioception of left leg. These symptoms could be explained by:
- a) A tumor on the right medial lemniscal pathway in the sacral spinal cord.
 - b) Peripheral neuropathy.
 - c) A tumor on the left medial lemniscal pathway in the sacral spinal cord.
 - d) A tumor affecting right posterior paracentral gyrus.
- viii) Following are the tests for detecting defects in colour vision except:
- a) Ishihara Chart.
 - b) Edridge Green Lantern Test.
 - b) Holmgren's Wool Matching Test.
 - d) Snellens's Chart.
- ix) Purkinje fibres are inhibitory to:
- a) Deep cerebellar nuclei
 - b) Climbing fibre
 - c) Basket cells
 - d) Spinocerebellar tracts
- x) Which set of hormones have nuclear receptor:
- a) Oestrogen, thyroxin, glucagon
 - b) Oestrogen, TSH, GnRH
 - c) Oestrogen, cortisol, testosterone
 - d) Thyroxin, LH, GH