

Total No. = 03 pages

Q.P. Code: MBN103

M.B.B.S. 1st Prof.

(New Scheme w.e.f. 2019 admission onwards)

BF/2023/06

Physiology – A

M.M. : 100

Time : 3 Hours(First30 Min. for MCQs)

- Note: 1. **Use OMR Sheet to answer Multiple Choice Questions(MCQs).**
2. Attempt all questions. Illustrate your answers with suitable diagrams
3. **NO SUPPLEMENTARY SHEET SHALL BE ALLOWED/PROVIDED**
4. **The student must write Q.P. Code in the space provided on OMR Sheet and the Title page of the Answer Book.**

Q.1 MCQs (Attempt on OMR sheet) [1x20]

1. Massaging the skin or applying an irritating substance to the skin can suppress the transmission of pain signals from the corresponding area of the body by suppressing the sensory fibres that transmit the pain signal. Which statement describes best?
 - a. Presynaptic and postsynaptic inhibition of serotonin C-type fibers.
 - b. Lateral inhibition of allogenic fibers by tactile fibers from adjacent areas of the skin.
 - c. Activation of neurons of the periaqueductal grey substance.
 - d. Release of endorphin from local neurons in the spinal cord.
2. A 48-year-old man was undergoing a thorough neurological exam after falling from a construction platform. The test included an evaluation of his deep tendon reflex. Considering entire reflex pathway is intact, which of the following structures CAN NOT trigger a muscle contraction when stimulated?
 - a. Gamma motor neurons
 - b. Loading of spindle.
 - c. Primary (Group Ia) fiber
 - d. Golgi tendon organ
3. A man falls into deep sleep with one arm under his head. After awakening the arm is paralyzed but tingling sensation and pain sensation persists. This loss of motor function without the loss of sensory function is because
 - a. type A fibres are more susceptible to hypoxia than B
 - b. type A fibres are more sensitive to pressure than C
 - c. C fibres are more sensitive to pressure than A
 - d. Sensory nerves are nearer bone and hence affected by pressure
4. 33-year-old man presents with headache for 4 weeks and a right-sided lower motor neuron facial weakness for 3 days. On the day of admission he had developed partial nerve deafness in his left ear. Which is correct finding after doing hearing test.
 - a. Rinne's test is positive right ear and sound lateralized to left ear in weber's test.
 - b. Rinne's test is negative in left ear and sound lateralized to right ear in weber's test.
 - c. Rinne's test is positive in left ear and sound lateralized to right ear in weber's test .
 - d. Sounds are not perceived.
5. A 69-year-old woman was admitted to hospital with complains of headache and blurring of vision and pain in both the eyes. On visual examination, she has a reduced ability to see objects in upper and lower quadrant of the left visual fields of both eye but vision is present in the central regions of the visual field. The diagnosis is
 - a. Heteronymous hemianopia without macular sparing
 - b. Heteronymous hemianopia with macular sparing
 - c. Homonymous hemianopia without macular sparing
 - d. Homonymous hemianopia with macular sparing

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6. A 48-year-old man was undergoing a thorough neurological exam after falling from a construction platform. The test included an evaluation of his knee jerk reflex and considering entire reflex pathway is intact, which of the following is true regarding reflexes
 - a. The reaction time for stretch reflex is between 19-24 ms.
 - b. The spinal nerve involved in the testing of knee jerk reflex S1 spinal nerve
 - c. Spindles are located in muscle tendons.
 - d. Muscle spindle fibres are innervated by Ib type.
7. An ophthalmologist explains to a patient that he is a protanope these patients have difficulty in identifying which of the following colour
 - a. Red
 - b. Green
 - c. Blue
 - d. Black
8. An MD/PhD candidate was studying the role of the hypothalamus in appetite control. In particular, he made a lesion on the ventromedial nucleus of the hypothalamus in order to investigate the effects of this area on appetite. A lesion of this area in the hypothalamus causes to:
 - a. Decrease eating ,hyperactivity and weight loss
 - b. Excessive eating and weight gain
 - c. Decreased eating and no change in weight
 - d. Satiety and weight gain
9. An MD/Ph.D. candidate was studying the role of various areas of the brain on the induction of sleep. In particular, he stimulated numerous areas of the brain and brain stem in order to investigate the effects of these areas on Sleep. Which of the following brain regions induces sleep when stimulated?
 - a. Facilitating reticular formation
 - b. Raphe nuclei
 - c. Hippocampus
 - d. Substantia nigra
10. A 20-year-old women who was Administered a gonadotroph- stimulating drug responded with an increase in plasma luteinizing hormone levels but follicles stimulating hormone levels remain low. Level of which of the following hormones would also be expected to remain unaffected by such a drug
 - a. Oestradiol
 - b. Progesterone
 - c. Androstenedione
 - d. Testosterone
11. Blood tests on a 34-year-old man identified high levels of circulating adrenocorticotrophic hormone (ACTH). Levels of which of the following adrenal cortex hormones would be least likely to be affected by high ACTH ?
 - a. Dehydroepiandrosterone sulfate
 - b. Cortisol
 - c. Corticosterone
 - d. Aldosterone.
12. A young woman loses sensation on the left side below the mid-thoracic region after falling down a flight of stairs. A CT scan of her spine revealed a lesion in her dorsal column. All of the following ascending sensory pathways are located in the dorsal column except
 - a. pain
 - b. touch
 - c. pressure
 - d. vibration
13. A 25- year -old Olympic weightlifter tries to lift a weight .The length of skeletal muscle at which he can develop maximal active tension is called:
 - a. Initial length
 - b. Resting length
 - c. Maximum length
 - d. Active length
14. A young woman lost sensation on the left side below the mid-thoracic region after falling down a flight of stairs. A CT scan of her spine revealed a lesion in her anterolateral spinal cord segment. A lesion in the anterolateral segment of the spinal cord is associated with
 - a. Contralateral loss of pain
 - b. Ipsilateral loss of temperature
 - c. Contralateral loss of pressure
 - d. Contralateral vibration loss
15. A 14-year-old boy with an autoimmune disease that destroyed his pancreatic β cell is most likely to exhibit which of the following signs and symptoms?
 - a. Hyperglycaemia and diuresis
 - b. Hyperkalaemia
 - c. Enhanced protein storage in muscle
 - d. Enhance glucose uptake by deposit.

16. After falling down a flight of stairs a young woman has partial loss of voluntary movement on the right side of her body and loss of pain and temperature sensation on the left side. It is probable that she has a lesion damaging the right half of the spinal cord. All are characteristic features of this lesion except
- Fine touch, vibration preserved on same side
 - Motor paralysis on the same side
 - Loss of pain and temperature on opposite side
 - Loss of kinaesthetic sensation on opposite side
17. A 60-year-old man with Parkinson's disease has been able to continue to work and help with routine jobs around the house but now he has tremors and rigidity that interfere with these activities. The characteristics of these tremors could be all except
- It consists of regular rhythmic alternate contraction of antagonist and agonist muscle
 - Common side being the face muscles
 - Present at rest but disappear during activity
 - Occur at rate of 6-8 times per second
18. A 35-year-old woman reports muscle weakness in the extraocular eye muscles and muscles of the extremities. She feels fine in the morning, but the weakness begins soon after she becomes active. The weakness is improved by rest. The physician treats her with an anticholinesterase inhibitor. Her physician diagnoses her with
- Lambert–Eaton syndrome.
 - Myasthenia Gravis.
 - Multiple Sclerosis.
 - Parkinson Disease.
19. An MD/Ph.D. student studied sleep patterns in full-term infants. Paradoxical sleep occupies about 80% of total rest. Paradoxical sleep consists of
- REM sharp wave and fast rhythm
 - REM spike and slow wave
 - NREM Delta wave
 - NREM high spikes theta wave
20. Which hormone from the list below is produced by Sertoli cells and stimulates GnRH (gonadotropin-releasing hormone) and FSH (follicle-stimulating hormone) secretion?
- Luteinizing hormone (LH)
 - Activin
 - Androgen-binding protein (ABP)
 - Testosterone
- Q.2. Enumerate the components of basal ganglia. What is Parkinson's disease? Discuss the features and rationale of treatment of Parkinson's disease. [1.5+1.5+7+2]
- Q.3. **Write short notes on:-** [5x4]
- Role of cAMP as second messenger in signal amplification
 - Molecular basis of skeletal muscle contraction
 - Enumerate the hormones regulating the calcium homeostasis. Explain the role of any of them
 - Differentiate between non REM sleep and REM sleep
- Q.4. **Explain why/reason: -** [3x5]
- Why neuron is refractory to subsequent stimuli during action potential?
 - Why patients with amputated limb may complain of pain and proprioceptive sensations in the absent limb?
 - Why damage to ossicles in middle ear results in hearing loss?
 - Why stretching of tendon results in muscle contraction?
 - Why is a person entering a dark room from a day light takes time to see the objects?
- Q.5. **Short notes on(applied aspect):-** [6x3]
- Explain the consequences of adrenal hyperplasia involving outermost cortical layer.
 - Explain the feedback regulation of ovarian hormones and physiological basis of oral contraceptive pills in prevention of pregnancy.
 - Explain the feeding behavior abnormalities in lesion of certain areas of hypothalamus.
- Q.6. **Short notes:-** [5x3]
- Explain spermatogenesis and its regulation.
 - Explain the cardiovascular and metabolic effects of thyroid hormones.
 - Explain the physician's role and responsibility to society and the community.