KENYATTA UNIVERSITY

SUPPLEMENTARY/SPECIAL EXAMINATIONS 2021/2022

EXAMINATION FOR THE DEGREE OF BACHELOR OF PHARMACY

HMP 220: MEDICAL PHYSIOLOGY V

AUGUST, 2022 TIME: 2 HOURS

INSTRUCTIONS:

ANSWER THE FOLLOWING MCQ QUESTIONS BY **TICKING ONLY ONE** ANSWER

1. Which of the following comments regarding lateral corticospinal tract is FALSE?
   a. It contains 80% fiber of the corticospinal pathway.
   b. It decussates at the level of medullary pyramids.
   c. It innervates lateral nuclei in the anterior horn.
   d. It controls axial muscle mainly & so is important for posture regulation.

2. The cerebellum controls performance of rapid movements by :-
   a. directly stimulating AHCs of the acting muscles.
   b. by storing pre-planed motor programs for these movements.
   c. by rapidly receiving proprioceptive information from the acting muscles.
   d. by inhibiting antagonistic muscles.

3. Which component of the basal ganglia plays the major role in the control of cognitive (memory-guided) motor activity?
   a. Globus pallidus
   b. Substantianigra
   c. Caudate nucleus
   d. Putamen

4. A wide variety of neurotransmitters have been identified in the cell bodies and afferent synaptic terminals in the basal ganglia. A deficiency of which of the following transmitters is typically associated with Parkinson disease?
   a. Norepinephrine
   b. Dopamine
   c. Serotonin
   d. GABA

5. Which of the following features is characteristic of the supplementary motor cortex?
   a. It has no somatotopic representation of the body.
   b. Stimulation of the supplementary motor cortex leads to bilateral movements, typically involving both hands.
   c. It is located just anterior to the premotor cortex on the lateral surface of the hemisphere.
   d. Like the premotor cortex, stimulation in the supplementary motor cortex leads to discrete movement of individual muscles.

6. In the basal ganglia loop for movement control, the _____ region receives axons from multiple cortical regions, which in turn send their axons to the internal region of the globuspallidus. The internal globuspallidus send their axons to the _____ region.
   a. caudate/putamen; cortex.
   b. externalglobuspallidus; caudate/putamen.
   c. caudate/putamen; thalamus.
   d. thalamus; caudate/putamen.

7. The cerebellum:
   a. Modifies the discharge of spinal motor neurones.
   b. Is essential for finely coordinated movements.
   c. Has an afferent input from the motor cortex.
   d. Has an afferent input from muscle proprioceptors.

8. Which of the following is an example of monosynaptic reflex?
   a. Stretch reflex
   b. Withdrawal reflex
   c. Abdominal reflex
   d. Baroreceptor reflex

9. A reflex arc includes :-
   a. at least two sets of sequential neurons.
   b. at least two sequential sets of central synapses.
   c. at least two types of sensory receptors.
   d. at least two types of efferent neurons.

10. Complete transection of the spinal cord produces all of the following effects, except :-
    a. permanent loss of all sensations mediated by the cord below level of lesion.
    b. permanent loss of voluntary movements by muscles innervated by the cord below level of lesion.
    c. permanent loss of reflexes mediated by the cord below level of lesion.
    d. temporary loss of micturition reflexes.

11. Stretch reflex is the fastest in the body. What is the most acceptable reason for the above?
    a. It is mediated by proprioceptive receptors.
    b. Skeletal muscle contracts faster than smooth muscle.
    c. It is monosynaptic.
    d. α motor neurons are myelinated.

12. The testis-determining gene (or the SRY gene) is located normally on/in:
    a. chromosome 6
    b. chromosome 12
    c. short arm of chromosome 22
    d. Y chromosome

13. The hormone that is essential for intrauterine development of male external genitalia is:
    a. testosterone
    b. dihydrotestosterone
    c. Mullerian regression factor
    d. SOX factor

14. A 4 year old girl presents with bilateral inguinal masses, thought to be hernias, but these were found to be testes in the inguinal canals. The karyotype would most likely be:
    a. 46 XX
    b. 46 XY
    c. 47 XXY
    d. 47 XYY

15. Patients with sexual precocity are apt to be dwarf because of:
    a. increased levels of androgens
    b. the estrogen surge during precocious puberty
    c. deficiency of androgen receptors
    d. increased levels of thyroxine

16. In terms of serum estradiol (E) and progesterone (P), and inhibin, the induction of the preovulatory LH surge is associated with
    a. High E and low P
    b. High E, high P, and high inhibin B
    c. Low E and low P
    d. Low E and high P

17. The enzyme that catalyzes the conversion of androstenedione to estrone in the granulosa cells of the maturing ovarian follicle is
    a. P450 side chain cleavage enzyme
    b. 11 beta-hydroxylase
    c. aromatase
    d. 17-beta hydroxysteroid dehydrogenase

18. In a 30 year old woman evaluated for infertility, the following data are obtained on a blood sample obtained on the 21st day of her menstrual cycle: Serum gonadotropins, estradiol, progesterone, TSH, prolactin and growth hormone. The following would best indicate if this cycle was ovulatory or not:
    a. Growth hormone
    b. Prolactin
    c. Estradiol
    d. Progesterone
    e. FSH

19. The following hormone peaks during the mid-luteal phase
    a. Inhibin B
    b. FSH
    c. LH
    d. GnRH

20. In the absence of fertilization, the uterine endometrium is shed since:
    a. involution of corpus luteum causes estradiol and progesterone levels to fall
    b. there is an LH surge prior to ovulation.
    c. theca lutein cells are the principal source of progesterone.
    d. blood flow to the endometrium increases

21. The following causes luteolysis
    a. PGF2 alpha
    b. Progesterone
    c. Inhibin B
    d. Relaxin

22 The sympathetic nervous system includes the nerves whose neurons have cell bodies that found in the _____.
    a. sympathetic nervous system
    b. dorsal root ganglia
    c. motor system
    d. autonomic system

23 The parasympathetic nervous system is part of the _____so
    a. motor system
    b. autonomic nervous system
    c. sympathetic system
    d. somatic nervous system.

24 The autonomic nervous system contains nerves that control
    a. skeletal muscles
    b. internal organs, joints, and glands
    c. skeletal muscles, skin, and glands
    d. smooth muscles, cardiac muscles and glands

25. The sympathetic nervous system has a _____
    a. Craniosacral outflow
    b. Thoracolumbar outflow
    c. Cervicosacral outflow
    d. Craniothoraxic outflow

26. The parasympathetic nervous system leaves through this combination of cranial nerves:
    a. II, IV, X & XI
    b. I, VI, VIII & XII
    c. V, VI, X & XI
    d. III, VII, IX & X

27. The autonomic nervous system functions:
    a. are critical to conscious decision making
    b. help maintain homeostasis
    c. trigger all neurotransmitters
    d. control our emotional moods

28. Which of the following are characteristic of the sympathetic system?
    a. accelerates digestion
    b. inhibits respiration
    c. accelerates the heartbeat
    d. causes pupillary constriction

29. The sympathetic system is involved in:
    a. readying the body for "fight or flight."
    b. vegetative functions
    c. accelerates gastric emptying
    d. all of the above

30. Which of the following is characteristic of the parasympathetic system?
    a. causes the pupillary dilatation
    b. reduces blood supply to the alimentary canal
    c. accelerates the heart beat
    d. promotes digestion of food

SECTION B: SHORT ANSWER QUESTIONS - 5 MARKS EACH

Indicate your answers on the answer booklets provided

1. As regards the reflex arc, discuss the flexor and crossed extensor and the importance.
2. Describe the function of the cerebellum.
3. What is the function of premotor area and what defect will be associated with a lesion in the area.
4. Describe the mechanism of lactational amenorrhea.
5. List the hormones of the second trimester of pregnancy.
6. Outline the mechanisms of contraception.
7. Define spermiogenesis and elaborate the 4 steps involved.
8. Outline the systemic effects of sympathetic nervous system activation.
9. Describe the physiological functions of the eight cranial nerve.
10. Outline a comparison of autonomic and somatic motor systems.

SECTION C: LAQS – LONG ANSWER QUESTIONS (10 MARKS EACH)

Indicate your answers on the answer booklet provided

1. With the help of a diagram, describe the hormonal variations during the menstrual cycle. (10 marks)
2. Describe the components and functions of the basal ganglia. (10 marks)
3. Describe the functions of the Vagus Nerves in the Gastro-Intestinal System. (10 marks)
4. Describe the classification and functions of peripheral sensory receptors. (10 marks)