



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

MAY SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF
MEDICINE AND BACHELOR OF SURGERY (M.B.Ch.B)

PMP 203: MEDICAL PHYSIOLOGY PAPER II - MCQ

DATE: Monday, 23rd July, 2012

TIME: 2.00 p.m. – 3.30 p.m.

INSTRUCTIONS:

This paper consist of a stem/question followed by 4 alternative responses/choices

Choose the single best response out of the choices given. Each question carries equal marks=1 mark

1. Steroids are synthesized by:
 - a. Smooth endoplasmic reticulum
 - b. Rough endoplasmic reticulum
 - c. Mitochondria
 - d. Lysosomes
2. Osmotic pressure of a solution is related to the:
 - a. Number of particles dissolved in the solution
 - b. Size and type of the particles
 - c. Chemical composition of the solution
 - d. Number of equivalents of an electrolyte in the solution
3. A large part of the basal metabolism is due to:

- a. Operation of sodium-potassium pump
 - b. Flow of large molecules through membrane channels by facilitated diffusion
 - c. Phenomenon of osmosis
 - d. Sodium dependent secondary active transport
4. E.C.F. differs from I.C.F in man in that:
- a. It forms major portion of total body water
 - b. It has lower tonicity
 - c. Its principal anions are organic
 - d. It has higher $\text{Na}^+ : \text{K}^+$ molar ratio
5. The magnitude of the membrane potential at any given moment can be determined with considerable accuracy by:
- a. Nernst equation
 - b. Goldman-Hodkin – Katz (GHK) equation
 - c. Gibbs Donnan membrane equilibrium
 - d. Equilibrium potential
6. Absolute refractory period:
- a. Begins from the time of firing level is reached until the repolarization is complete
 - b. During this period no stimulus, no matter how strong, can initiate the fresh impulse
 - c. During this period stimulus stronger than usual can cause excitation
 - d. During this period more sodium channels open up
7. In multiple sclerosis:
- a. There is excessive deposition of myelin round the axons
 - b. Thickness of myelin increases
 - c. There is patchy destruction of myelin
 - d. It is associated with increased conduction in the axons
8. Which of the following nerve fibers is affected by local anaesthetics first?
- a. Parasympathetic
 - b. A
 - c. B
 - d. C
9. In the skeletal muscle ryanodine receptor controls uptake of:
- a. Calcium by sarcoplasmic reticulum
 - b. K^+ by sarcoplasmic reticulum
 - c. Na^+ by mitochondria
 - d. Mg^{2+} by nucleus

10. The motor unit is:
 - a. Muscle fibre and neurons supplying it
 - b. Ventral horn cells along with its motor nerve
 - c. Single motor neuron and all the muscle fibers it supplies
 - d. Single muscle fiber with its nerve
11. Stimulation of sympathetic nerve to intestinal smooth muscle results in:
 - a. Increase in muscle tension
 - b. Muscle relaxation
 - c. Increase in rhythmic muscle contraction
 - d. Increased secretions
12. A unique characteristic of smooth muscle is that:
 - a. It can sustain a contraction for prolonged periods
 - b. Calcium is not required for contraction
 - c. Repetitive contractions are not possible
 - d. Myosin filaments are not required
13. What is the first step in transfer of energy derived from creatine phosphate to cause muscle contraction?
 - a. The creatine phosphate causes the power stroke of the cross bridges
 - b. The creatine phosphate transfers its energy to the actin filament
 - c. The creatine phosphate transfers its energy to the myosin filament
 - d. The energy of the creatine phosphate is used to convert ADP to ATP
14. Actin-myosin interaction in resting state is inhibited by:
 - a. ATP
 - b. Calcium ions
 - c. Troponin
 - d. Troponin-tropomyosin complex
15. True about pseudocholinesterase is:
 - a. Stored in the synaptic vesicles
 - b. Normally found in the plasma
 - c. Gets destroyed in the body itself
 - d. Also called specific cholinesterase
16. Defecation is severely impaired if
 - a. Meissner's plexus is destroyed
 - b. Myenteric plexus is destroyed
 - c. Both the above plexuses need to be destroyed together
 - d. A person is dehydrated

17. The principal storage form of iron in tissues:
- Ferritin
 - Hemosiderin
 - Transferrin
 - Apoferritin
18. Motilin:
- Produced by the ileum
 - Inhibits GIT motility
 - Increases ileal blood flow
 - Regulates intestinal motility during inter-digestive phase
19. Ejection fraction of the ventricle refers to the ratio of:
- Amount of blood received/amount of blood ejected
 - Stroke volume/end-diastole volume
 - End-systolic volume/end-diastolic volume
 - Stroke volume/end-systolic volume
20. Which of the following is a very serious and emergent condition?
- Paroxysmal atrial tachycardia
 - Paroxysmal ventricular tachycardia
 - Atrial fibrillation
 - Ventricular fibrillation
21. Compared with the systemic circulation, the pulmonary circulation is a:
- Low-pressure system
 - Low-flow system
 - High resistance system
 - High-volume system
22. Capillary diameter is precisely controlled by:
- Alteration in the tone of pre-capillary sphincters
 - Efficient local myogenic tone
 - Extrinsic sympathetic constrictor nerves superimposed on myogenic tone
 - Local concentration of tissue metabolites
23. Volume receptors:
- Discharge with onset of atrial contraction
 - Discharge both during atrial systole and diastole
 - Provide information about circulating blood volume
 - Help in regulation of systemic arterial BP

24. The renal-body fluid volume mechanism for regulating arterial pressure is important for:
- Raising the pressure when a person stands suddenly after having been in a lying position
 - Minimising a decrease in arterial pressure following severe hemorrhage
 - Increasing arterial pressure during strenuous physical exercise
 - Maintaining arterial pressure at a normal level over a period of weeks, months or years
25. Shock always involves:
- External haemorrhage
 - Internal haemorrhage
 - Central nervous system involvement
 - Decreased tissue perfusion
26. In which of the following diseases would you expect to find an increase in thickness of the respiratory membrane?
- Asthma
 - Pulmonary artery thrombosis
 - Skeletal abnormalities of the chest
 - Pulmonary edema
27. A major function of surfactant is to:
- Decrease alveolar surface tension
 - Increase alveolar surface tension
 - Increase the work of breathing
 - Increase the tendency of the lungs to collapse
28. The major factor regulating alveolar ventilation during rest is:
- Arterial P_{O_2}
 - Arterial p_{CO_2}
 - Arterial pH
 - Nervous output from the joint proprioceptors
29. Metabolic alkalosis associated with prolonged vomiting is due primarily to loss of:
- Sodium
 - Potassium
 - Chloride
 - Hydrogen ion

30. A person rapidly ascends to 3600 mts (12,000 feet) and develops acute breath-lessness; this is due to:
- Decrease pulmonary blood flow
 - Stimulation of peripheral chemoreceptor
 - Decreased hypoxic stimulation of respiration
 - Mechanical interference of thorax
31. The prime regulator of blood flow through exercising muscles is:
- Venous tone
 - Sympathetic control
 - Vasodilator metabolites
 - Parasympathetic control
32. In menopause, hormone relation are:
- LH/TSH increases
 - Gonadotrophins increases oestrogen decreases
 - Oestrogen and gonadotrophins decrease
 - Oestrogen and gonadotrophins increase
33. Secretion of oestriol during pregnancy:
- Is dependent on both a viable foetus and a functioning placenta
 - Is largely produced by the maternal ovaries
 - Is not dependent on a viable fetus
 - Is lower than the secretion rate of oestriol in non-pregnant body
34. How much negative pressure is required to open up the foetal alveoli for the first time?
- 10 mmHg
 - 15 mmHg
 - 20 mmHg
 - 25 mmHg
35. The secretion of growth hormone:
- Dependent on integrity of hypothalamus
 - Ceases when adult state reached
 - Decreases during stress such as injury
 - Increased during fasting and other state where the blood glucose level is reduced
36. Thiocyanates inhibit thyroid functions by affecting:
- Iodide pump
 - Thyroglobulin proteolysis
 - Coupling of iodotyrosines to form T_4
 - Thyroid blood flow

37. Voice becomes slow and husky in:
- Addison's disease
 - Myxoedema
 - Grave's disease
 - Cushing's disease
38. Accidental removal of parathyroid glands during thyroidectomy results in:
- Hypercalcemia
 - Tremors and muscle spasm
 - Myxoedema
 - Fall in the BMR
39. Glucocorticoids
- Secretion increases following injury
 - Favours protein synthesis
 - Enhances effects of antigen-antibody reactions
 - Tends to lower blood pressure
40. The secretion of aldosterone is caused by:
- Angiotensin II
 - ACTH
 - Epinephrine
 - Insulin
41. Pheochromocytomas predominantly secrete:
- Epinephrine
 - Norepinephrine
 - Serotonine
 - Dopamine
42. Glucagon:
- Helps correct hyperglycemia
 - Is secreted by alpha cells of the islets of Langerhans
 - Promotes glycogen storage by the liver
 - Decreases gluconeogenesis
43. The primary physiologic effect of insulin seems to be:
- Increased glycogen synthesis in the liver
 - Increased glucose uptake by the brain

- c. Increased lipid synthesis in the liver
 - d. Increased glucose uptake by many different tissues
44. The most important physiological function of the lymphatic system is to:
- a. Transport fluid and proteins away from the interstitium
 - b. Concentrate proteins in the lymph
 - c. Remove particulate material from the interstitium
 - d. Create negative pressure in the free interstitial fluid
45. Cells previously exposed to an antigen and readily converted to effector cells by a later encounter with the same antigen are:
- a. Helper T cells
 - b. Cytotoxic/effector T cells
 - c. Memory T cells
 - d. Suppressor T cells
46. T_m (Transport Maximum) limited reabsorption implies that:
- a. Reabsorption is passive
 - b. Amount of reabsorption depends critically on the length of time the substance is present in the tubules
 - c. Below a threshold tubular load, the substance is completely reabsorbed
 - d. Renal clearance of substance reabsorption decreases as its plasma concentration increases until its T_m is reached
47. A substance commonly used to measure renal blood flow is:
- a. Glucose
 - b. Cobalt labeled red cells
 - c. Inulin
 - d. Para-aminohippuric acid (PAH)
48. In young children micturition is:
- a. Controlled by higher centres
 - b. A spinal reflex
 - c. Voluntarily controlled
 - d. A perfectly controlled activity
49. Regulation of body temperature is required:
- a. To obtain neutral zone temperature
 - b. To speed up chemical reactions within the body

- c. Because enzyme system of body has narrow temperature range to function
 - d. To prevent body invasion by bacteria
50. Pyrogens raise body temperature by:
- a. Setting the thermostat to higher level
 - b. Releasing interleukins
 - c. Decreasing peripheral heat liberating mechanism
 - d. Causing peripheral vasoconstriction
51. Simultaneous stimulation of two afferent nerve fibers converging on to a single motor neuron results in production of a spike discharge, this is called:
- a. Temporal summation
 - b. Spatial summation
 - c. EPSP
 - d. Depolarizing response
52. What can be the most likely mechanism responsible for the abrupt cessation of skeletal muscle contraction in a normal subject attempting to lift a heavy load?
- a. Activation of stretch receptors in golgi tendon organ
 - b. Activation of stretch receptors in annulospiral endings
 - c. Skeletal muscle ischaemia
 - d. Inactivation of stretch receptors in golgi tendon organ
53. Beta endorphins are found in high concentration in:
- a. Substantia gelatinosa
 - b. Post pituitary
 - c. Spinal cord
 - d. Medulla
54. Superficial pain:
- a. Involves the skin and subcutaneous tissue
 - b. Is dull and poorly localized
 - c. Associated with faintness, vomiting and fall in BP
 - d. In both local and radiates to distant site
55. In an alert wakeful person, the common EEG wave is:
- a. α - wave
 - b. β - wave
 - c. θ - wave
 - d. δ - wave
56. The condition known as REM is:
- a. That point at which the individual becomes aware and alert

- b. Also referred to as paradoxical sleep
 - c. Characterized by total lack of all muscular activity
 - d. Characterized by slow high voltage regular EEG activity
57. Destruction of which of the following structure is the usual cause of Parkinson's disease?
- a. Subthalamus nucleus
 - b. Putamen
 - c. Substantial nigra
 - d. Caudate nucleus
58. Kluver-Bucy animal exhibits all of the following features except:
- a. Hypersexuality
 - b. Visual agnosia
 - c. Marked increase in oral activity
 - d. Eating habits not altered
59. Olfactory receptors are:
- a. Sensitive to physical stimuli
 - b. Rapidly replaced
 - c. Slowly adapting
 - d. Bipolar neurons
60. When rhodopsin is decomposed by light what happens to the membrane potential of rods?
- a. The activity of the sodium pump is increased
 - b. Membrane permeability for chloride ions in the outer segment is increased
 - c. The membrane permeability for potassium greatly increased
 - d. Membrane permeability for sodium ions in the outer segment is decreased