PHYS 800 | **MSC Physiology** | **Tanta University**
Time allowed three Hours | **Second Paper** | **Faculty of Medicine**
Total marks : 270 | **Date: 6 /11/2021**

All the questions must be answered :-

1. **Discuss: The role of integrative function of different types of baroreceptors and chemoreceptors to keep normal homeostatic cardiovascular function .**

   (40 marks)

2. **Change in volume of certain group of alveoli is opposed by the surrounding alveolar groups. Discuss the physiological basis reflecting alveolar stability to keep normal alveolar function. (40marks)**
3. **Discuss : Physiological basis of counter current system and its significance in controlling different body functions. (30 marks)**
4. **Discuss: The physiological significance of oxyntic cell receptors with special reference to their agonists and blockers. (30 marks)**
5. **Discuss : Role of autonomic transmitters and receptors to control occular function. (30 marks)**
6. **Discuss : Factors affecting RBCs fragility. (30 marks)**
7. **Case study . (25 marks)**

40 years old patient admitted to emergency department suffering from head injury and cerebral oedema. The physician recommended artificial hyperventilation .

Which of the following physiological mechanisms could explain this clinical maneuver.

a. Vasodilatation to cerebral blood vessels.
b. Increase cerebral vascular resistance.
c. Decrease cerebral vascular resistance.
d. Increase cerebral blood viscosity.

8. Choose only one choice (45 marks for 15 MCQ)

1- At which phase of cardiac cycle the aortic valve is opened :

a. At beginning of systole.
b. At the end of isometric contraction.
c. At end of diastole
d. during filling phase

2- Which of the following could increase stroke volume:

a. Increase afterload.
b. Decrease venous compliance.
c. Increase heart rate.
d. Decrease cardiac contractility.

3- Which of the following show maximum difference in blood pressure:

a. Capillaries and venules.
b. Veins and venules.
c. Arterial end and venous end of capillary.
d. Aorta and vena cava.

4- Compared with apex of the lung the base is characterized by which of the following:

a. High pulmonary capillary PO_2.
b. High ventilation perfusion ratio.
c. High pulmonary capillary PCO_2.
d. Low pulmonary capillary PCO_2.

5- Which of the following could decrease P50 of oxyhemoglobin :

a. Increase arterial PCO_2.
b. Increase arterial PO_2.
c. Increase blood temperature.
d. Increase blood 2,3 DPG.

6- Which of the following changes occur in restrictive lung disease:

a. Decrease total lung capacity.
b. Normal tidal volume.
c. Increase residual volume.
d. Increase compliance and decrease vital capacity.

7- Which of the following is CORRECT regarding renal handling of amino acids:

a. They are partially reabsorbed in distal conveluted tubules (DCT).
b. They are totally reabsorbed in distal conveluted tubules (DCT).
c. They are partially reabsorbed in proximal conveluted tubules (PCT).
d. They are totally reabsorbed in proximal conveluted tubules (PCT).

8- Metabolic alkalosis differ from respiratory alkalosis in which of the following :

a. Increase blood bicarbonate level.
b. Decrease blood bicarbonate level.
c. Alkaline urine
d. Decrease arterial PCO_2.

9- Which of the following could occur if plasma glucose concentration rise above normal:

a. Transport maximum of glucose (TmG) will be constant .
b. Transport maximum of glucose (TmG) will increase linearly.
c. Transport maximum of glucose (TmG) will decrease linearly.
d. Urinary glucose excretion will increase then decrease.

10- In contrast to primary esophageal peristalsis the secondary esophageal peristalsis is characterized by which of the following:

a. Does not involve relaxation of lower esophageal sphincter.
b. It is continuation to pharyngeal peristalsis.
c. It is initiated by medullary swallowing center.
d. It is localized response to esophageal distension

11- Which of the following is involved in initiation of migrating motor complex of GIT:

a. Gastrtin.
b. Somatostatin.
c. Motilin
d. Secretin

12- Which of the following is CORRECT as regard autonomic ganglia:

a. Could be activated by glutamate.
b. Could be blocked by trimetaphan .
c. Could be inhibited by glycine.
d. Could be blocked by atropine

13- Which of the following is CORRECT regarding sympathetic vasoconstrictor discharge:

a. It is controlled by reticulospinal tract .
b. Totally independent of higher control.
c. Relay in cervical and lumber segments.
d. Relay in all spinal cord segments.

14- Which of the following cells secrete circulating antibodies:

a. T suppressor lymphocytes.
b. Plasma cells.
c. T helper lymphocytes
d. B lymphocytes

15- Which of the following is CORRECT regarding platelets:

a. Having small nucleus.
b. Having life span 120 days.
c. Less numerous than white cells.
d. Can alter its shape when contact with collagen.

Tanta University
Faculty of Medicine
Department of Ophthalmology

Examination for August Semester
MSc Degree
Physiology of The Eye

Time allowed: 3 hours
Total marks: 30 marks
All questions to be attempted

A) What is the Physiological basis of the following:

(3 points, 5 marks for each point)

1. Corneal dehydration

2. Outflow mechanism of Aqueous humor

3. Entoptic phenomenon of the eye

B) MCQ: Choose only one answer:

(15 points, 1 marks for each point)

1) The following is present in higher concentration in the tear than in the serum:
   a) Sodium
   b) Potassium
   c) IgG
   d) Glucose

2) The following fact is true about human tears:
   a) The pH of tears is 6.0
   b) The pH of tears is 7.4
   c) Tears do not contain ammonia
   d) Tears do not contain albumin

3) **Glucose metabolism in the lens principally occurs by:**
   a) Anaerobic glycolysis
   b) Aerobic metabolism
   c) Hexose monophosphate shunt
   d) Sorbitol pathway

4) **When produced, aqueous humor passes out through the membranes of:**
   a) Trabecular meshwork
   b) Corneal endothelial cells
   c) Non-pigmented cells of the ciliary body
   d) Pigmented cells of the ciliary body

5) **The principle of IOP measurement is defined by:**
   a) Schwalbe's equation
   b) Poiseuille's law
   c) Imbert-Fick principle
   d) Holladay's equation

6) **The corneal stroma is mainly composed of:**
   a) Keratan sulphate
   b) Chondroitin sulphate
   c) It is acellular
   d) Chondroitin phosphate

7) **Arrangement of stromal lamellae contributes to corneal transparency can be explained by:**
   a) Maurice theory
   b) Schwalbe's equation
   c) Imbert-Fick principle
   d) Holladay's equation

8) **Which of the following is NOT a function of RPE?**
   a) Secretion of mucopolysacharide
   b) It plays a role in the embryological development of photoreceptors
   c) Absorption of stray light
   d) Adherence to other RPE cells via zona adherens to form the blood retinal barrier

9) **In phototransduction, activation of rhodopsin occurs via:**
   a) Isomerization of retinol
   b) Glycosylation of transducing
   c) Opening of GLUT-1 receptors
   d) Unfolding of opsin

10) A number of corresponding points on the retina that projects to a definite single point in space:

a) The Auberg phenomenon
b) A horopter
c) Panum's area
d) The Pulfrich phenomenon

11) Which is the minimum threshold of Vernier hyperacuity?

a) 1 second of arc
b) 10 seconds of arc
c) 20 seconds of arc
d) 1 minute of arc

12) All of the following are true about amino acids content of the lens except:

a) Lens contains all types of amino acids
b) Concentration of amino acids are higher than vitreous
c) Not affected by aging, fasting or feeding protein-free diet
d) Actively transported inside the lens by lens epithelium

13) Which of the following methods can be used to isolate a cone response from the electroretinogram?

a) Dim background lightening conditions.
b) 50-Hz flicker
c) 10- Hz flicker
d) Single flash ERG

14) In cortical cataract, there is:

a) Increased protein content & increase in water insoluble fraction
b) Increased protein content & decrease in water insoluble fraction
c) Decreased protein content &increase in water insoluble fraction
d) Decreased protein content &decrease in water insoluble fraction

15) Regarding VEP, which of the following statements is NOT accurate?

a) VEPs are a measure of the response of the occipital cortex to visual stimulation
b) VEPs can be used to assess crossover of visual pathway fibers at the optic chiasm
c) An amblyopic eye will usually have an abnormal pattern and flash VEP
d) VEPs can be used to approximate the visual acuity

-- Good Luck --

PHYS 800	**MSC Physiology**	**Tanta University**
Time allowed three Hours	**First Paper**	**Faculty of Medicine**
Total marks : 270		**Date: 30 /10/2021**

All the questions must be answered :-

1. **Discuss: Physiological basis concerned with dynamics of brain inhibitory circuits and its significance on performance of cerebral cortex. (40 marks)**
2. **Discuss: Hormonal control of growth. (40 marks)**
3. **Discuss : The proposed role of calcium in skeletal muscle and smooth muscle performance . (30 marks)**
4. **Discuss: The proposed role of olfactory system in perception and discrimination of different odours with special reference to olfactory adaptation. (30 marks)**
5. **Discuss: Physiological factors concerned with metabolic rate. (30 marks)**
6. **State: Physiological signs indicating occurrence of ovulation. (30 marks)**

7. **Case study . (25 marks)**

40 years old patient admitted to neurological department with complete loss of all sensations and motor reflexes of left upper limb. Medical investigation reveals nervous lesion.

Which of the following sites of lesions will be expected to be found.

a. Damage to dorsal columns of left cervical and thoracic segments.
b. Massive lesion affecting left cerebral cortex.
c. Damage to cerebellum of left side.
d. Damage to dorsal horns of left cervical and thoracic segments.

8. Choose only one choice (45 marks for 15 MCQ)

1- Beta wave in electroencephalogram indicates which of the following:

a. Light sleep.
b. Deep sleep.
c. Deep anesthesia.
d. Mental work.

2- Which of the following could mediate synaptic transmission between pain fibers:

a. Endorphin.
b. Somatostatin.
c. Substance P.
d. Serotonin.

3- Which of the following is CORRECT regarding spinocervical tract:

a. Cross to opposite side at spinal cord level.
b. Cross to opposite side at brain stem level.
c. Ascend ipsilateral without crossing.
d. Ascend in ventral column of the spinal cord.

4- Which of the following is function of parathormone :

a. Decrease calcium serum level.
b. Decrease calcium absorption from gut.
c. Increase calcium deposition in bone.
d. Increase renal 1,25 DHCC formation.

5- Which of the following is CORRECT regarding insulin :

a. Its secretion is inhibited by arginine.
b. Increase potassium entry into cells.
c. It stimulates lipolysis.
d. Having protein catabolic effect.

6- Which of the following is characteristic for secretion of seminal vesicles:

a. Rich in fibrinolysin.
b. Has high fructose content .
c. Rich in phospholipid.
d. Represent 10% of total volume of semen.

7- Simple and facilitated diffusion share which of the following characteristics:

a. Require transport protein.
b. Does not require energy.
c. Transport solutes against concentration gradient.
d. Can be blocked by specific inhibitors.

8- Which of the following is CORRECT regarding positive feedback mechanism:

a. Does not involve generation of action potential.
b. Usually it promotes system instability .
c. Usually it promotes system stability
d. It controls secretion of adrenal gland.

9- Which of the following is characteristic for cones of the retina:

a. Need low threshold of stimulation.
b. Less sensitive to light.
c. Remain inactive in bright light.
d. More numerous than rods.

10- Which of the following is CORRECT regarding object located in temporal half of visual field of left eye :

a. It will be detected by temporal half of left retina.
b. It will be detected by temporal half of right retina.
c. It will generate impulses travel in right optic tract.
d. It will generate impulses travel in right optic nerve.

11- Which of the following events occur when foot plate of stapes move outward:

a. The round window bulge inward.
b. The round window bulge outward.
c. Downward displacement of basilar membrane.
d. Increase pressure of perilymph of scala vestibuli.

12- During which phase of nerve action potential the membrane potential is closest to potassium equilibrium potential:

a. Over shoot.
b. Rapid depolarization.
c. Negative after potential.
d. Positive after potential.

13- Which of the following is CORRECT regarding outer activation gate of sodium channel in nerve cell membrane:

a. Closed during rapid depolarization .
b. Closed during positive after potential.
c. Opened during positive after potential.
d. Opened during rest.

14- Which of the following could increase oxygen consumption:

a. Increase enviromental temperature.
b. Increase body temperature.
c. Increase oxygen concentration of inspired air.
d. Decrease metabolic rate.

15- Which of the following is CORRECT regarding nitrogen balance :

a. Become more positive when dietary protein is increased.
b. Become more positive in late stage of starvation.
c. Become positive in childhood.
d. Become negative in childhood.