

Paper Code-010202

M.B.B.S. 1<sup>st</sup> professional Annual University Examination

PHYSIOLOGY

PAPER-II

Time: 3 Hours

Maximum Marks: 100

Note:

- ❖ The candidates must limit their answers to the answer book (30 Pages) issued to them. No supplementary/Continuation answer sheet shall be provided
- ❖ Attempt all questions sequentially.
- ❖ Attempt Part-A & Part-B in separate answer books and Part-C in OMR sheet. Illustrate your answers with suitable diagrams, graphs and flow charts.
- ❖ OMR sheets shall be collected 20 minutes after starting of examination.

Section A

Total =40 Marks

Q1. Based on the above clinical scenario answer the following questions: (2+4+4=10)

A young boy of 8 year old complained of a swollen knee after he fell from the bicycle. He also complained of some bluish discoloration of the skin of right arm. His past history is suggestive of prolonged bleeding even after minor injury. On examination he was found to have a hematoma of the knee. His lab investigations show prolonged CT, APTT with normal BT and PT. His hemoglobin is 9.0 g%.

- a) What is the probable diagnosis?
- b) Why is the bleeding time normal in this patient despite a prolonged CT and APTT?
- c) What is the physiological basis of the clinical symptoms?

Q2. Write short notes on: (4X5=20)

- a) Cardiac output and factors regulating it.
- b) Compensatory mechanisms for hypovolemic shock.
- c) Temperature regulative mechanisms.
- d) Cardiac cycle and its components

Q3. Short answer question: (2X5=10)

- a) Regulating factors of coronary circulation
- b) Differentiate between functions of B and T lymphocytes.
- c) Mismatch blood transfusion
- d)  $\text{VO}_2$  max
- e) Reynold's number

**Section B**

Total =40 Marks

**Q1.** A 43 years old man visits your OPD with chief complaints of pain in epigastria region which increase after taking food. He has past history of frequent intake of pain killers for this pain. He is started on a medication that inhibits the proton pump of the stomach.

(5x2=10)

- What is your provisional diagnosis?
- What is the proton pump that is referred to above?
- What are the probable causes for his problem?
- What is post prandial alkaline tide?
- What is the rationale for managing this case?

**Q2. Write short notes on:**

(4X5=20)

- Chemical regulation of respiration
- O<sub>2</sub>- Hb Dissociation curve
- GFR and factors regulating it.
- Factors regulating tubular reabsorption at DCT

**Q3. Short answer question:**

(5X2=10)

- Creatinine clearance
- Clinical significance of Timed Vital Capacity
- Hering -Breuer reflex — *L. Carney ↑ mids 6*
- Cholecystokinin
- What are the prerequisite for a good Doctor- Patient relationship.

**Section C**

20x1=20 Mark

**Q1.** Erythropoietin increases RBC count by all of these process except:

- Early differentiation of stem cells in the bone marrow
- Increased release of reticulocytes from bone marrow
- Increased synthesis of hemoglobin in already existing normoblast
- Increased formation of erythropoietinogen from liver

**Q.2** Cyanosis does not occur in severe anemia because –

- Hypoxia stimulates erythropoietin production
- Oxygen carrying capacity of available Hb is increased
- Critical concentration of Hb required to produce cyanosis is reduced
- Oxygen Hemoglobin curve shift to the right

(2)

**Q3.** Eosinophilia is caused by all except:

- a) Stress
- b) Urticaria
- c) Allergic rhinitis
- d) Ascariasis infestation

**Q4.** Aspirin inhibits:

- a) Platelet activating factor
- b) Prostacyclin synthesis
- c) Thromboxane A<sub>2</sub>
- d) Phospholipase A<sub>2</sub>

**Q5.** Closure of the semilunar valves occurs during:

- a) Isovolumetric ventricular contraction phase
- b) Rapid ejection phase
- c) Protodiastole
- d) Isovolumetric ventricular relaxation phase

**Q6.** During heavy exercise the cardiac output (CO) increases upto fivefold while pulmonary arterial pressure rises very little. This physiological ability of the pulmonary circulation is best explained by-

- a) Increase in the number of open capillaries
- b) Sympathetically mediated greater distensibility of pulmonary vessels
- c) Large amount of smooth muscle in pulmonary arterioles
- d) Smaller surface area of pulmonary circulation

**Q7.** Vagal stimulation causes increase in:

- a) Heart rate
- b) R-R interval in ECG
- c) Cardiac output
- d) Force of contraction

**Q8.** Heart rate increases with inspiration, a phenomenon called:

- a) Marey's Law
- b) Cushing reflex
- c) Sinus arrhythmia
- d) Bainbridge reflex

**Q9.** Windkessel effect is seen in

- a) Large elastic vessels
- b) Capacitance vessels
- c) Resistance vessels
- d) Capillaries

**Q10.** Intra-pleural pressure:

- a) It is 3 mmHg above the atmospheric pressure.
- b) It is the pressure within the lung parenchyma.
- c) It increases with the inspiration.
- d) It can easily be measured from oesophageal lumen.

**Q11.** J-receptors which are responsible for rapid shallow breathing are located in

- a) Thoracic cage and lung
- b) Carotid artery
- c) Alveoli-capillary junction
- d) Respiratory muscles



Q12. Hypoxia causes vasoconstriction in

- a) Muscle
- b) Lungs
- c) Liver
- d) Spleen

Q13. Nitrogen washout method is used for estimating

- a) Dead space volume
- b) Functional residual capacity
- c) Tidal volume
- d) Diffusion capacity

Q14. Which is seen in high altitude

- a) Respiratory alkalosis
- b) Metabolic alkalosis
- c) Respiratory acidosis
- d) Metabolic acidosis

$H^+ < 35$   
 $pCO_2 \uparrow$

Q15. Which of the following is not a function of stomach?

- a) Reservoir for the food ingested
- b) Provided HCL for initial digestion of proteins
- c) Release of food at a controlled rate into the duodenum
- d) Absorbs vitamin B12

Q16. Secretin

- a) Reduces the action of CCK PZ
- b) Reduces Gastric acid secretion
- c) Increases Gastric acid secretion
- d) increases Secretion of pancreatic juice rich in enzyme

Q17. Iron absorption takes place in which part of intestine

- a) Duodenum
- b) Ileum
- c) Jejunum
- d) Colon

Q18. Tubular maximum for kidney in practice is actually less than the calculated value because:

- a) Different nephrons have different transport maximum
- b) Depends on GFR
- c) Depends on renal blood flow
- d) Depends on blood pressure

Q19. The part of nephron most impermeable to water is:

- a) PCT
- b) DCT
- c) Ascending loop of Henle
- d) CT

Q20. Major portion of glomerular filtrate is absorbed in

- a) Loop of Henle
- b) Distal convoluted tubule
- c) Collecting duct
- d) Proximal segment