**DEPARTMENT OF PHYSIOLOGY**  
**Ananya College of Medicine and Research**  
**Pratap Pura Village, Kalol, Dist. Gandhinagar**  
**First MBBS Physiology – second internal Examination of Academic Year 2024-25**

**Date:** 17/04/2025 **Time:** 9:30 AM to 12:30 PM **Duration:** 3 Hours **[Max. Marks: 100]**

**Instructions: (1) Answer to the point. (2) The figure to the right indicates marks. (3) Draw diagrams wherever necessary. (4) Write legibly. (5) Use separate answer books for each section**.

**SECTION I**

**Q1.** Structured Long Question. (Any 1 out of 2) **[10 Marks]**

1. Define GFR and write the normal value in adults. Describe various factors affecting GFR.

or

1. Describe the role of the Renin Angiotensin Aldosterone system in the regulation of blood pressure.

**Q2 (a).** Case-Based Scenario/Applied Short Notes. (Any 2 out of 3)  **[12 Marks]**

1. A Hindu male patient, 55 years age, working as CEO in a leading company, came to your OPD with a complaint of recurrent retrosternal chest pain, especially on physical and mental stress. He has a history of Hypertension and Diabetes mellitus for the last 5 years.

TPR was normal: 160/90

CVS: Gallop rhythm with S4; and RS Normal

Laboratory investigation;

Total S. Cholesterol- 375 mg% %

S.LDL-C 185 mg %

Answer the following

1] What is the likely cause of chest pain?

2. What changes are found in the ECG during severe myocardial ischemia?

3] What advice will you give to your patient?

1. Describe the hormones that act on the Kidney
2. Nephrotic syndrome

**Q2(b).** Write Short Notes. (Any 3 out of 4) **[18 Marks]**

**A.** counter-current mechanisms in the kidney

**B**. Non-excretory functions of the kidney

**C.** SA node

**D.** Baroreceptor reflexes

**Q3.** Explain with Reasons in 2-3 Sentences (Any 5 out of 6) **[10 Marks]**

1. What is the normal PH of urine?
2. What renal threshold for plasma Glucose?
3. Name the hormone secreted by the kidney that helps in the regulation of the calcium level of blood.
4. Name any four properties of the heart
5. What is ejection fraction?
6. What is OSPE? What is the benefits of OSPE?

**SECTION II**

**Q4.** Structured Long Question. (Any 1 out of 2) **[10 Marks]**

1. Classify hormones secreted by the Adrenal cortex and describe the anti-inflammatory and immunosuppressant actions of cortisol

**OR**

1. What normal values of partial pressure and volume of CO2 in arterial and venous Blood? Describe methods of carbon dioxide transport in blood

**Q5(a).** Case-Based Scenario/Applied Short Notes. (Any 2 out of 3)

**12 Marks]**

A Hindu female patient, age 36 came to your OPD with a complaint of difficulty in breathing, gasping for air since this morning. She has had similar episodes of breathlessness in the past three years, and her doctor has told her that she has bronchial asthma.

O/E

Temperature Normal. Pulse 140/min. Respiratory rate 28/min and BP 140/86 mm of Hg

RS: Bilateral generalised whistling sound and rhonchi are heard.

There is cyanosis on the tongue and lips

CVS: Tachycardia

You advised immediate admission to the Intensive Care Unit (ICU)

Answer the following:

1. Why do you advise admission to the ICU?
2. What do you expect the FEV1/ FVC ratio to be in this condition?
3. Why will you prescribe Glucocorticoid steroid hormones as an emergency drug ?

**B.** compliance of the lung and thoracic wall

**C.** Vital capacity

**Q5(b).** Write Short Notes (Any 3 out of 4) **[18 Marks]**  
**A.** Compare and contrast adrenaline vs. noradrenaline

**B.** Describe the mechanisms of action of the peptide hormones

**C.** surfactantsin lung   
**D.** Oxygen dissociation curve

**Q6.** Explain with Reasons in 2-3 Sentences (Any 5 out of 6) **[10 Marks]**

1. What is the role of the tracheo-bronchial tree in the defence mechanism
2. What is oxygen debt?
3. What is the ventilation-perfusion ratio?
4. Why is there a moon-like face in Cushing's syndrome?
   1. What are alpha and beta adrenergic receptors?

6 Why do doctors wear a white coat?