

001/26

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation),
February – March 2026

Subject: Physiology
Paper: I

Full Marks: 100
Time: 3 hours

Attempt all questions. The figures in the margin indicate full marks.

1. What are junctional tissues of heart? How they differ from working myocardial cells? Which is the natural pacemaker in cardiac tissues and why? Give the ionic basis of Action Potential seen in junctional tissues. How sympathetic and vagal stimulation affect the pacemaker potential?

2+3+2+4+4

2. Explain the following statements:

5x3

- i) Normal saline is effective in hypovolemia.
- ii) Cyanosis is absent in severe anaemia.
- iii) Fetal death may occur in Rh-ve women.
- iv) Clay colored stool occurs in obstructive jaundice.
- v) Low dose aspirin is prescribed in patients with coronary thrombosis.

3. Short questions (Applied aspect):

4x5

- i) Chemical regulation of respiration.
- ii) Compensatory changes in acclimatization.
- iii) Mechanisms regulating homeostasis.
- iv) Factors influencing cardiac output.

4. Short notes:

3x6

- i) Megaloblastic anemia.
- ii) Myasthenia gravis.
- iii) Hazards of blood transfusion.

5. Write short notes on the following:

4x5

- i) Timed vital capacity.
- ii) Bile salts.
- iii) Duties of an IMG (Indian Medical Graduate).
- iv) Frank-Starling law of heart.

6. Choose the correct option among each of the following:

12x1

- i) All the following are related to electrical activity of intestinal smooth muscle except:
a) Slow waves b) Generator potential c) Spike potential d) Basal electric rhythm
- ii) A 60 year old man undergoes total gastrectomy for gastric carcinoma. Which long term abnormality is expected in this patient?
a) Decrease in glucose absorption b) Iron overload
c) Impaired protein digestion d) Impaired absorption of vitamin B12

- iii) A 50 year old woman was brought in Emergency with complaints of severe chest pain and profuse sweating. The immediate first line treatment would be:
- a) IV fluid to be started immediately
 - b) Oral aspirin and antacids
 - c) Thrombolytics to be started immediately
 - d) ECG to be done immediately
- iv) A middle aged woman presented some blood reports to the doctor in OPD. ESR was found to be high (ESR: 40mm). All of the following are true except:
- a) Anemia may be a cause
 - b) Pregnancy may cause increase in ESR
 - c) She may have chronic infection like Tuberculosis
 - d) Normal finding
- v) Which type of blood vessel has greatest total cross-sectional area?
- a) Aorta
 - b) Arterioles
 - c) Capillaries
 - d) Vena Cava
- vi) During a bacterial infection, macrophages present antigens to helper T-cells. This leads to activation of the T-cells and subsequent cytokine release, affecting neighboring immune cells. Which type of intercellular signaling is primarily involved in cytokine action here?
- a) Endocrine
 - b) Juxtacrine
 - c) Autocrine
 - d) Paracrine
- vii) An experimental physiology set-up involves repeated stimulation of a motor neuron at short intervals. After an action potential, the neuron fails to fire again immediately when stimulated. The phenomenon is due to which property of action potentials?
- a) Accommodation
 - b) Saltatory conduction
 - c) Absolute refractory period
 - d) Summation
- viii) Pulmonary function changes seen in emphysema is:
- a) Increased TLC
 - b) Decreased RV
 - c) Increased FEVI
 - d) Increased VC
- ix) A 6 year old boy bruises easily and has previously bleeding gums. The maternal grandfather also has a bleeding disorder. You suspect the deficiency of:
- a) Prothrombin activator
 - b) Factor II
 - c) Factor VIII
 - d) Factor X
- x) Features of hereditary spherocytosis include all of the following except:
- a) Increase osmotic fragility
 - b) Increase MCHC
 - b) Increase MCV
 - d) Decrease surface area per unit volume
- xi) A person with heart rate 40 shows irregular P waves and wide QRS complex in ECG, P wave rhythm not bearing any relation to QRS complexes. He is most probably suffering from:
- a) Complete AV dissociation
 - b) Sinus node dysfunction
 - c) Atrial arrhythmia
 - d) Second degree heart block
- xii) A 19 year old patient developed respiratory muscle weakness, hypoxia and hypercapnia. What may be the cause of hypercapnia?
- a) Reduced diffusion capacity
 - b) Ventilation perfusion mismatch
 - c) Hypoventilation
 - d) Physiological shunt