



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Tech (BME-N)/SEM-3/BME-302/2011-12  
2011**

**ENGINEERING PHYSIOLOGY & ANATOMY**

Time Allotted : 3 Hours

Full Marks : 70

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

**GROUP – A**

**( Multiple Choice Type Questions )**

1. Choose the correct alternatives for the following :

10 × 1 = 10

- i) Biopotential generated by the muscle of the heart results
- a) EMG                                  b) EEG
- c) ECG                                    d) none of these.
- ii) Hemoglobin transports CO<sub>2</sub> by forming
- a) oxyhemoglobin                  b) carboxyhemoglobin
- c) carbaminohemoglobin        d) methemoglobin.
- iii) Blood group determining antigens are present
- a) on RBC surface                    b) on platelets
- c) in plasma                            d) in bone marrow.



- iv) The structural functional unit of nervous system is
- |                |            |
|----------------|------------|
| a) brain       | b) nephron |
| c) spinal cord | d) neuron. |
- v) Pulmonary artery carries
- |                |                        |
|----------------|------------------------|
| a) mixed blood | b) oxygenated blood    |
| c) lymph       | d) deoxygenated blood. |
- vi) The largest digestive gland of the human body is
- |                    |             |
|--------------------|-------------|
| a) liver           | b) pancreas |
| c) small intestine | d) stomach. |
- vii) The solid connective tissue of the body is
- |             |           |
|-------------|-----------|
| a) blood    | b) tendon |
| c) ligament | d) bone.  |
- viii) Cells responsible for dim light vision are
- |               |                    |
|---------------|--------------------|
| a) rod cells  | b) pyramidal cells |
| c) betz cells | d) cone cells.     |
- ix) In infants, the condition of pypothyroidism is called
- |                      |                       |
|----------------------|-----------------------|
| a) Graves disease    | b) Cretinism          |
| c) Cushing's disease | d) Addison's disease. |
- x) Freely movable joints are called
- |                    |                   |
|--------------------|-------------------|
| a) Synovial joints | b) Fibrous joints |
| c) Amphiarthrosis  | d) Synarthrosis.  |



**GROUP - B**

**( Short Answer Type Questions )**

Answer any *three* of the following.  $3 \times 5 = 15$

2. Briefly describe the structure of hemoglobin. Write the major functions of hemoglobin.  $2 + 3$
3. Describe the modern theory of blood coagulation.
4. Write the role of pancreas in digestion.
5. What do you mean by action potential ? Briefly describe the process of action potential generation.  $2 + 3$
6. What is synapse ? What are its important functions ?  $3 + 2$
7. Explain shortly on neurophysiology of vision.

**GROUP - C**

**( Long Answer Type Questions )**

Answer any *three* of the following.  $3 \times 15 = 45$

8. a) Briefly explain on fate of old RBC.  $3$   
b) What do you mean by antibody, antigen and immunity ? Briefly describe the structure of antibody. What is memory *B*-cells ?  $3 + 2 + 1$   
c) What is the significance of ESR ? How the blood group classification is made ?  $2\frac{1}{2} + 3\frac{1}{2}$
9. a) Describe the difference between skeletal, smooth and cardiac muscle.  $4$   
b) What do you mean by muscular fatigue and rigor mortis ?  $4$   
c) What are the different connective tissue layers present in a skeletal muscle ? Explain the sliding filament theory of muscle contraction.  $3 + 4$



10. How do diaphragm and intercostals muscles play role in the mechanism of respiration ? How does skin play role in the process of thermoregulation. 10 + 5
11. With suitable diagram describe the EM structure of neuromuscular junction. Write the mechanism of nerve impulse transmission through N-M junction. 7 + 8
12. What are the factors that regulate blood pressure ? How is blood pressure regulated by feedback mechanism ? 6 + 9
13. Write short notes on any *three* of the following : 3 × 5
- a) Mechanism of hearing
  - b) Synaptic transmission of nerve impulse
  - c) Heart valves and their functions
  - d) Electron microscopic structure of nephron
  - e) Erythropoiesis
  - f) Skin and sweat gland.
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