



Name : .....  
Roll No. : .....  
Invigilator's Signature : .....

**CS/B.TECH/BME(N)/SEM-3/BME-302/2012-13**

**2012**

**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 :  $10 \times 1 = 10$
- i) Carbohydrate is digested in buccal cavity due to the presence of
    - a) pepsin
    - b) lipase
    - c) trypsin
    - d) ptyalin.
  - ii) Double the strength of Rheobase when applied, the time required to stimulate the muscle tissue is called
    - a) Utilization time
    - b) Chronaxie
    - c) Latent period
    - d) Firing point.
  - iii) Natural pacemaker of human heart is
    - a) purkinje fibre
    - b) AV node
    - c) bundle of His
    - d) SA node.



- iv) Haemoglobin transports  $\text{CO}_2$  as
- a) carbaminohaemoglobin
  - b) carboxyhaemoglobin
  - c) oxyhaemoglobin
  - d) methaemoglobin.
- v) Blood group determining antigens are present
- a) on RBC surface
  - b) on WBC surface
  - c) on platelet surface
  - d) none of these.
- vi) Cisternal depolarization of triad structure of myofibrils causes release of
- a)  $\text{Ca}^{++}$
  - b)  $\text{K}^+$
  - c)  $\text{Na}^+$
  - d)  $\text{Fe}^{++}$ .
- vii) Glomerular filtration rate is about
- a) 120 L/day
  - b) 170 L/day
  - c) 1.5 L/day
  - d) 180 L/day.
- viii) Freely movable joints are called
- a) Synovial joints
  - b) Ligaments
  - c) Tendon
  - d) Fixed joints.
- ix) Renin is secreted from
- a) endothelial cells
  - b) lacis cells
  - c) juxtaglomerular cells
  - d) macular cells.
- x) I-band is composed of
- a) myosin
  - b) actin
  - c) troponin
  - d) tropomyosin.



**GROUP – B**

**( Short Answer Type Questions )**

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

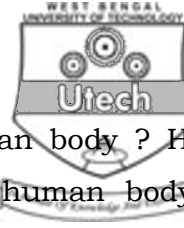
2. How is action potential generated and conducted through the nerve fibre ?
3. Write the role of skin in temperature regulation in human body.
4. Classify joints and give proper example of each type of joint.
5. Describe the mechanism of hearing along with the detailed anatomical description of the auditory pathway.
6. Describe the microscopic structure of blood vessel along with a neat sketch.
7. How is nerve impulse conducted through the synapse ?
8. What are the functions of special junctional tissues and intermodal branches ?

**GROUP – C**

**( Long Answer Type Questions )**

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

9. Describe the electron microscopic structure of neuromuscular junction. Write the systemic events of transmission of nerve impulse through *N-M* junction.  $8 + 7$
10. Write in detail the double circulation through human heart with a suitable diagram.  $8 + 7$
11. Define stroke volume index and minute volume index. What are the factors that control cardiac output ? Write any one method to measure cardiac output.  $4 + 7 + 4$



12. What is the largest digestive gland of human body ? How protein and carbohydrate are digested in human body ? What is the function of bile ? 1 + 6 + 6 + 2
13. Describe the human respiratory system with a neat diagram. How do diaphragm and intercostal muscles play important role in the mechanism of respiration ? 5 + 5 + 5
14. How does counter-current multiplier system regulate the urine concentration ? What do you mean by acidification of urine ? 10 + 5
15. With a neat sketch describe the electron microscopic structure of skeleton muscle. Write the cross bridge theory of skeletal muscle contraction giving emphasis on the T-tubule and triad structure. 8 + 7
16. How do thirteen factors play role in the blood coagulation in human body ? What do you mean by BT and CT ? 9 + 3 + 3

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