



Name : .....

Roll No. : .....

Invigilator's Signature : .....

**CS/B.Tech (BME)/SEM-3/BME-302/2009-10**

**2009**

**HUMAN PHYSIOLOGY – I**

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) In A blood group the agglutinins present in serum is

- a)  $\alpha$     b)  $\beta$   
c)  $\alpha$  and  $\beta$     d) no agglutinins.

ii) The time required for one normal cardiac cycle is

- a) 0.4 sec    b) 0.2 sec  
c) 0.8 sec    d) 0.7 sec.

iii) Einthoven's triangle is associated with

- a) EEG    b) ECG  
c) EMG    d) none of these.



- iv) Antigen responsible for blood grouping is found on
- a) RBC surface                      b) WBC surface  
c) platelet surface                  d) Hb surface.
- v) When there is addition of one or more chromosomes to complete chromosomal complement the chromosomal variation is called
- a) euploidy                              b) allopolyploidy  
c) autopolyploidy                      d) hyperploidy.
- vi) Contractile protein responsible for calcium binding for muscle contraction is
- a) actin                                      b) myosin  
c) troponin                                d) tropomyosin.
- vii) Water reabsorption from the renal tubules to the peritubular spaces through the junctions of the tubular cells is called
- a) paracellular transport              b) transcellular transport  
c) antiport                                d) uniport.
- viii) Juxtaglomerular apparatus is responsible for the secretion of
- a) heparin                                b) serum  
c) hemoglobin                            d) renin.
- ix) Deficiency of blood coagulation factor VIII causes
- a) thalassaemia                        b) hemophilia  
c) anaemia                                d) polycythemia.
- x) Gaseous exchange occurs between blood and surroundings body tissues through
- a) venules                                b) arterioles  
c) capillaris                              d) none of these.



**GROUP – B**  
**( Short Answer Type Questions )**

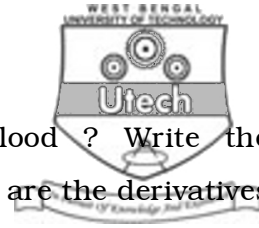
Answer any *three* of the following.  $3 \times 5 = 15$

2. What is chronaxie and rheobase ? What is the significance of refractory period in nerve impulse transmission ?  $2 + 3$
3. Describe the morphological modifications of chromosomes during chromosomal aberration giving emphasis on deletion, duplication translocation & inversion.  $5$
4. What do you mean by tetanus, clonus, muscle fatigue and rigor mortis ?  $5$
5. With the help of suitable diagram write microscopic structure of the structural & functional unit of kidney.  $5$
6. Describe physiological process of erythropoiesis.  $5$
7. What is ESR ? What are the normal rates of ESR in normal men and women ? Briefly explain anaemia.  $2 + 1 + 2$

**GROUP – C**  
**( Long Answer Type Questions )**

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

8. What is neuromuscular junction ? Describe the microscopic structure of neuromuscular junction with suitable diagram. How is nerve impulse transmitted through this junction ?  $2 + 7 + 6$



9. How is Haemoglobin synthesized in blood ? Write the chemical structure of haemoglobin ? What are the derivatives of this respiratory pigment ? Write two important functions of Haemoglobin.  $3 + 3 + 7 + 2$
10. Write anatomical position of human heart and describe the structure of the heart with a neat sketch. Show how blood is circulated through the four chambered human heart.  $2 + 6 + 7$
11. Define cardiac output and cardiac index. What are the different controlling factors of cardiac output ? How can cardiac output be measured using Fick's principle ?  $3 + 7 + 5$
12. Write briefly the process of Wallerian degeneration and regeneration of nerve fibres. What are the practical applications of mutation ?  $8 + 7$
13. Write short notes on any *two* of the following :  $2 \times 7 \frac{1}{2}$
- ABO system of blood group
  - E-C coupling, Chronaxie, Rheobase
  - EMG
  - Sympathetic and Parasympathetic Nervous System.

=====