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Sr. No. of Question Paper : 1045 E Your Roll No.....

Unique Paper Code : 249601

Name of the Course : B.Sc. (Hons.) Bio-Chemistry

Name of the Paper : BCHT-611 : Molecular Physiology

Semester : VI

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt five questions in all including Q. No. 1 which is compulsory.

1 (a) Give one term for the following.

- (i) Maintained contraction in response to repetitive stimulation.
- (ii) Increase in the ratio of carbon dioxide production to alveolar ventilation.
- (iii) Groups of neuron cell bodies in the peripheral nervous system.
- (iv) Volume of blood ejected from each ventricle during systole.
- (v) Young erythrocytes in bone marrow. (5×1)

(b) Give reasons for the following statements.

- (i) Nervous system codes the stimulus intensity to distinguish strong stimulus from a weak one.
- (ii) Reversal of albumin globulin ratio (A/G) in plasma takes place during hepatic insufficiency.
- (iii) Heparin is a powerful anticoagulant.
- (iv) Hemoglobin facilitates the diffusion of O₂ from alveoli into the plasma.
- (v) ECG is a tool for evaluating the electrical currents within the heart.

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- (vi) Osteoblasts are bone forming cells.
- (vii) Sertoli cells form blood testis barrier. (7×2)
2. (a) Differentiate between parasympathetic and sympathetic nervous system.
- (b) How is the pain stimulus transmitted and modulated?
- (c) Give a diagrammatic representation of neural pathways involved in knee jerk reflex. (6,4,4)
3. (a) Show how changes in the plasma membrane permeability result in the generation of action potential.
- (b) What are the causes and consequence of hypertension? Name two drugs used for the treatment of hypertension.
- (c) Give a schematic diagram showing intrinsic and extrinsic blood clotting pathways. (4,5,5)
4. (a) Draw the structure of GI tract wall and explain what constitutes the enteric nervous system.
- (b) Differentiate between cause and consequence of:
- (i) Vomiting and Diarrhea.
- (ii) Hepatic and post hepatic jaundice. (6,8)
5. (a) Show how changes in alveolar, intrapleural and transpulmonary pressure result in air flow in and out of lungs during inspiration and expiration.
- (b) Define Vital capacity. How is vital capacity affected in Asthmatic patients?
- (c) Explain the mode of CO₂ transport in blood. (5,4,5)
6. (a) How does Henle's loop function as counter current multiplier to generate hyperosmotic urine.
- (b) Draw a diagram of juxtaglomerular apparatus.

- (c) Explain how stimulation of Renin-Angiotensin system restores plasma volume. (6,3,5)
7. (a) Explain the role of T-tubules and sarcoplasmic reticulum in initiation of skeletal muscle Contraction.
- (b) What are the different factors that contribute to muscle fatigue?
- (c) Differentiate between:
- (i) Single unit and multiunit smooth muscle fibers.
 - (ii) Isotonic and isometric contraction (5,4,3,2)
8. (a) Describe the sequence of events that result in the development of male reproductive system from primordial fetal gonads.
- (b) Explain how newly fertilized egg blocks polyspermy?
- (c) Write short notes on:
- (i) Feto-placental unit
 - (ii) Capacitation of sperm (5,3,6)