

Reg. No. :

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

**Question Paper Code: R2B04**

B.E./B.Tech. DEGREE EXAMINATION, APRIL 2024

Second Semester

Biomedical Engineering

R21UBM204- Human Anatomy And Physiology

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

1. Define Action potential. CO1-U
2. Differentiate between Active transport and Passive Transport. CO1-U
3. Interpret the primary function of the respiratory system. CO1-U
4. List the properties of heart muscle. CO1-U
5. Label the structure and function of a neuron. CO1-U
6. Differentiate sympathetic and parasympathetic nervous system. CO1-U
7. What is the role of the urinary bladder in the urinary system? CO1-U
8. Describe the function of pancreas and liver. CO1-U
9. Mention the role of the retina in the visual system CO1-U
10. Classify the different types of bones. CO1-U

PART – B (5 x 16= 80 Marks)

11. (a) (i) Explain the cell structure with its organelles with a neat sketch. CO1-U (8)  
(ii) Illustrate the event that occur during the propagation of an action potential along an axon, including the roles of ion channels and the sodium-potassium pump. CO1-U (8)
- Or
- (b) i) Explain the working of transport mechanism across the cell membrane. CO1-U (8)  
ii) Illustrate the event that occur during mitosis, including the stages of the cell cycle and the distribution of chromosomes to daughter cells. CO1-U (8)

12. (a) i) Apply the Boyle's law in thoracic cavity, describe the mechanics of breathing and the organs forming the respiratory passage way from the nasal cavity to the alveoli of the lungs. CO2-App (12)  
 ii) Briefly explain the importance of the heart valves. CO1-U (4)  
 Or
- (b) i) Examine the elements of the conduction system of the heart and describe the pathway of impulses through this system. CO2-App (12)  
 ii) Draw the graph of various respiratory volumes in a healthy man. CO1-U (4)
13. (a) i) Describe the structure, properties and functions of neuron with a neat diagram. CO1-U (8)  
 ii) Explain about the transverse section of the spinal cord. CO1-U (8)  
 Or
- (b) i) Discuss the types of receptors in autonomic nervous system and explain its functions. CO1-U (8)  
 ii) Compare and contrast the structures and functions of the central and peripheral nervous systems. CO1-U (8)
14. (a) Explain the organs of digestive system with a neat sketch. Summarize the essential activities of gastrointestinal tract and describe the functions of local hormones in digestive system. CO1-U (16)  
 Or
- (b) Interpret the mechanics of urine formation, reabsorption, secretion and acid base regulation with a neat diagram. CO1-U (16)
15. (a) i) Identify the types of bone and its function. CO1-U (8)  
 ii) A patient presents with a suspected fracture in the femur. Apply your knowledge of the femur's anatomy to identify potential fracture locations and explain how the type and location of the fracture might impact treatment decisions. CO2-App (8)  
 Or
- (b) i) With a neat diagram, describe the anatomy of the human eye. CO1-U (8)  
 ii) Consider a patient has hearing loss. Apply your knowledge of the anatomy of the ear to propose potential causes hearing loss. What diagnostic tests might you recommend to further investigate the issue? CO2-App (8)