Name: **Enrolment No:**	

UPES

End Semester Examination, December 2024

Course: Anatomy and Physiology

Semester:1st

Program: B.Tech Biomedical Engineering **Duration: 3 Hours**

Course Code: HSCC1023 **Max. Marks: 100**

Instructions: Attempt all questions

S. No.	Section A Short answer questions/ MCQ/T&F (20Qx1.5M= 30 Marks)	Marks	COs
Q 1	Define anatomy and physiology and explain their interrelationship.	**1.5**	**CO1**
Q 2	What is homeostasis, and why is it important for the body?	**1.5**	**CO2**
Q 3	What is the basic structure of a cell and its functions.	**1.5**	**CO2**
Q 4	What are the different types of cell junctions, and what role do they play in tissue structure?	**1.5**	**CO1**
Q 5	What is the difference between paracrine and endocrine signaling.	**1.5**	**CO1**
Q 6	Which of the following is not a function of the cell membrane? a) Protection b) Transport c) Energy production d) Communication	**1.5**	**CO1**
Q 7	The level of structural organization that involves tissues working together to perform a specific function is called: a) Cellular level b) Tissue level c) Organ level d) Organism level	**1.5**	**CO1**
Q 8	Homeostasis refers to the body's ability to maintain a stable internal environment. (True/False)	**1.5**	**CO2**
Q 9	The endocrine system communicates through direct contact between adjacent cells. (True/False)	**1.5**	**CO2**

Q 10	What is the structure and functions of the skin.	**1.5**	**CO3**
Q 11	What are the different types of bones, and how do they differ in function?	**1.5**	**CO4**
Q 12	Veins carry oxygenated blood away from the heart. (True/False)	**1.5**	**CO3**
Q 13	The electrocardiogram (ECG) measures the electrical activity of the heart. (True/False)	**1.5**	**CO4**
Q 14	The process of blood clotting is known as: a) Hemopoiesis b) Coagulation c) Hemolysis d) Diffusion	**1.5**	**CO4**
Q 15	Which of the following structures carries oxygenated blood? a) Pulmonary artery b) Aorta c) Right atrium d) Pulmonary vein	**1.5**	**CO2**
Q 16	The parasympathetic nervous system accelerates the heart rate and prepares the body for stress. (True/False)	**1.5**	**CO2**
Q 17	Cranial nerves are primarily responsible for which of the following functions? a) Reflex actions b) Sensory and motor functions of the head and neck c) Blood pressure regulation d) Coordination of movement	**1.5**	**CO2**
Q 18	The sympathetic nervous system is responsible for: a) Rest and digest b) Fight or flight response c) Memory formation d) Balance and coordination	**1.5**	**CO2**
Q 19	What are the functions of cranial and spinal nerves?	**1.5**	**CO4**
Q 20	Anemia is caused by an excess of red blood cells. (True/False)	**1.5**	**CO3**
	Section B **(4Qx5M=20 Marks)**		
Q 1	Describe the process of cell division, including the different phases of the cell cycle. *(2.5 marks)* How do these processes contribute to growth, repair, and reproduction in the body? *(2.5 marks)*	**5**	**CO4**
Q 2	Explain the process of muscle contraction at the molecular level, focusing on the role of actin, myosin, and calcium ions in skeletal muscle fibers.	**5**	**CO3**
Q 3	Explain the mechanisms of blood coagulation. *(2.5 marks)* Describe the role of platelets, clotting factors, and fibrin in stopping bleeding and preventing excessive blood loss. *(2.5 marks)*	**5**	**CO4**

Q 4	Discuss the structure of the heart and its conduction system. *(2.5 marks)* How does the electrical conduction system regulate heartbeats and maintain proper blood circulation? *(2.5 marks)*	**5**	**CO1**
Section C **(2Qx15M=30 Marks)**			
Q 1	Discuss the concept of homeostasis in the human body. Explain how various organ systems work together to maintain homeostasis. *(10 marks)* Use examples such as body temperature regulation or blood glucose levels to illustrate your points. *(5 marks)*	**15**	**CO2**
Q2	Provide a detailed explanation of the cardiac cycle. *(5 marks)* Describe the events of systole and diastole, the role of the heart valves, and the sequence of electrical events involved in coordinating the contraction of the atria and ventricles. *(10 marks)*	**15**	**CO3**
Section D **(2Qx10M=20 Marks)**			
Q 1	Explain the anatomy and physiology of the heart, including its chambers, valves, and major blood vessels. *(5 marks)* Discuss how the heart's conduction system controls the heartbeat and how this electrical activity coordinates the mechanical actions of the heart. *(5 marks)*	**10**	**CO4**
Q2	Describe the structure and functions of the peripheral nervous system (PNS). *(5 marks)* Explain the roles of the sympathetic and parasympathetic divisions, highlighting their contrasting effects on body functions. *(5 marks)*	**10**	**CO2**