Roll No.										

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)
B.E. (Full Time) End SEMESTER EXAMINATIONS, DECEMBER 2023

BIOMEDICAL ENGINEERING
V Semester
BM5024 – Internet of Things in Medicine
R-2019

Time:3 Hrs **Max.Marks: 100**

CO1	Explain the concept of IoT.
CO2	Analyse various protocols for IoT.
CO3	Design a PoC of an IoT system using Raspberry Pi / Arduino.
CO4	Apply data analytics and use cloud offerings related to IoT.
CO5	Analyse applications of IoT in real time scenario.

BL – Bloom's Taxonomy Levels
(1- Remembering, 2- Understanding, 3 – Applying, 4 – Analyzing, 5 – Evaluating, 6 -Creating))

(Answer all questions)
Part-A (10 X 2 = 20 Marks)

Q.No.	Questions	Marks	CO	BL
1.	What are the projections on IoT Global Healthcare Market?	2	1	1
2.	What are the major components of IoT?	2	1	1
3.	List some of the IoT technologies and protocols.	2	2	1
4.	Distinguish the terms Data analytics and Network analytics.	2	2	2
5.	Distinguish between Arduino and Raspberyy Pi.	2	3	2
6.	Read an analog input using Arduino board and print the results in the monitor.	2	3	3
7.	What is the role of AI and ML in medicine?	2	4	2
8.	Define the term smart object and how are they characterized?	2	4	1
9.	Name some of the applications of IoT in medicine.	2	5	1
10.	What is cloud computing? and explain its role in medicine.	2	5	2

Part-B (5 X 13 = 65 Marks)

Q.No.		Questions	Marks	CO	BL
11.	a	What is One M2M IoT architecture and explain with a neat functional lay out?	13	1	3
		OR			
	b	What are the evolutionary phases of IoT? What are the IoT requirements that drive the network architecture and the adjustments needed therein?	13	1	3
12.	a	Where and when are the standards IEEE 802.15.4, IEEE 802.15.4g and IEEE 802.15.4e are being used?	13	2	3
		OR			

	b	What are the various communication criterion considered while dealing with connected objects and briefly explain them?	**13**	**2**	**3**
13.	a	With neat hardware circuit diagram write necessary code for Heart rate monitoring using Arduino board.	**13**	**3**	**3**
		OR			
	b	With neat hardware circuit diagram and relevant codes develop a IMU shock detector using Arduino board.	13	3	3
14	a	Write short notes on a. Pattern recognition b. Neural Network	13	4	2
		OR			
	b	Write short notes on a. Cloud computing b. Machine and deep learning	13	4	2
15.	a	Explain the role of Artificial Neural Networks in the diagnosis of chest diseases.	13	5	4
		OR			
	b	Suggest an IoT model to improve cognitive skills of student learning experience using neuro sensors.	13	5	4

Part-C (1 X 15 = 15 Marks)

Q.No.		Questions	Marks	CO	BL
16		With a neat diagram indicating various functional and application capabilities of Raspberry Pi, bring out its new innovative roles in IoT applications.	15	3	5