

Reg. No. :

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

**Question Paper Code: 99B19**

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Professional Elective

Biomedical Engineering

19UBM919 -MEDICAL EMBEDDED SYSTEM

(Regulation 2019)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Summarize the main components of an embedded system. CO1 -U
2. Label the various types of memory in embedded systems. CO1- U
3. List the different standard versions for CAN. CO1- U
4. List out the standards for I2C bus with different speed level. CO1- U
5. What are the computational models commonly used in embedded system design? CO1- U
6. Outline the state machine model. CO1 -U
7. Give the purpose of ECG in medical diagnosis and treatment. CO1-U
8. Outline about the blood pressure measurement sensor and how does it work? CO1-U
9. Define the term demand pacemaker. CO1-U
10. Can you tell the difference between pacemaker and defibrillator? CO1-U

PART – B (5 x 16= 80Marks)

11. (a) Draw the neat diagram and explain the interconnections using the DMAC. CO1- U (16)

Or

- (b) What is the role of each structural unit in an embedded processor and how do they interact with each other? CO1 -U (16)

12. (a) Compare the serial communication protocols RS232, RS422 and RS485. CO1 -U (16)
- Or
- (b) Explain the Serial peripheral Interface [SPI] bus in detail. CO1 -U (16)
13. (a) Illustrate with functional description about the different phases of Embedded design life cycle model. CO1 -U (16)
- Or
- (b) Elaborate the different computational models in embedded design. CO1- U (16)
14. (a) Construct an effective EEG amplifier in capturing and amplifying the brain signals in a patient monitoring system. CO2- App (16)
- Or
- (b) Design a pulse oximeter to improve more accurate, efficient and user friendly for a patient monitoring system? CO2- App (16)
15. (a) Design a new type of pacemaker that incorporates P wave detection technology in a novel way. CO3- App (16)
- Or
- (b) How might advances in pacemaker technology lead to the development of new types of fixed-rate pacemakers with improved features or capabilities? CO3- App (16)