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B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E.

Branch: Medical Electronics Engineering

Course Code: 19ML5PE1WS

Course: Wearable Sensors

Semester: V

Duration: 3 hrs.

Max Marks: 100

Date: 15.09.2023

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

- 1 a) Elaborate on the characteristics of the body fluids that are used by the non-invasive sensors. **12**
b) Identify and explain the salient parts of a surface acoustic wave sensor. **08**

OR

- 2 a) Suggest a circuit design to estimate the blood parameters through fingertip photoplethysmography. **12**
b) Discuss any three issues that are encountered while fabricating a wearable sensor. **08**

UNIT - II

- 3 a) Discuss the procedure involved in cluster node addition and deletion. Depict the procedures with neat figures. **08**
b) Discuss the salient features of Internet of Things. **06**
c) Present an overview of general identity management for digital objects. **06**

OR

- 4 a) Discuss the need for light weight solutions and edge intelligence in the field of IoT. **05**
b) Discuss how the scale of 'things' and systems managed? **05**
c) Discuss the different categories of issues and threats encountered during IoT security. **10**

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - III

- 5 a) Discuss the types of communication that are employed in a wearable body sensor networks. **08**
- b) Identify and explain the specific security breaches that has to be faced by a biomedical WBSN. **12**

UNIT - IV

- 6 a) Elaborate on the different types of implantable medical devices. **12**
- b) Discuss the critical trade-offs that need to be balanced in IMD security design. **08**

UNIT - V

- 7 a) Discuss few techniques that can be employed to monitor the core body temperature. **06**
- b) Justify the following statement, "ECG satisfies the biometric requirements". **06**
- c) Briefly discuss the security requirements for healthcare system using WBSNs. **08**
