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Question Paper Code: UB601

B.E./B.Tech. DEGREE EXAMINATION, APRIL / MAY 2025

Professional Elective

Biomedical Engineering

21BMV601- MEDICAL WEARABLE DEVICES

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. Summarize the components of wearable systems. CO1- U
2. Tell about the various method of measuring respiration rate. CO1- U
3. What do you mean by signal Interference? CO1- U
4. Outline the usage of thermopiles in wearable devices. CO1- U
5. List different types of wireless communication techniques. CO1- U
6. Define reliability in the context of BAN systems. CO1- U
7. Write some common applications of smart textiles in healthcare and fashion. CO1- U
8. Mention the materials commonly used to make conductive fibers. CO1- U
9. Name three medical conditions that can be monitored using wearable devices. CO1- U
10. What are the key parameters measured in gait analysis? CO1- U

PART – B (5 x 16= 80 Marks)

11. (a) Summarize the challenges faced by users of conventional monitoring systems. CO1- U (16)
Or
(b) Explain how wearable systems benefit the healthcare industry. CO1- U (16)
12. (a) Explain the process by which solar cells convert light into electrical energy in wearable devices. CO1- U (16)
Or
(b) Summarize the conditions under which photovoltaic energy harvesting is most effective in wearables. CO1-U (16)

13. (a) Demonstrate how wireless monitoring can be used in healthcare. CO3- App (16)
Or
(b) Develop the BAN architecture to improve data transmission in wearable health devices. CO3- App (16)
14. (a) Analyze the impact of active smart textiles on athletic performance monitoring. CO4-Ana (16)
Or
(b) Analyze the effect of fabric conductivity and electrode placement on ECG signal accuracy. CO4-Ana (16)
15. (a) Compare the benefits of hospital-based monitoring vs. home-based monitoring for elderly patients. CO5-Ana (16)
Or
(b) Analyze the effectiveness of lab-based medical monitoring vs. wearable field monitoring for athletes. CO5-Ana (16)