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Question Paper Code : 20348

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2023.

Fifth Semester

Biomedical Engineering

CBM 341 — BODY AREA NETWORKS

(Common to : Electronics and Communication Engineering/Electronics and Telecommunication Engineering/Medical Electronics)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define Body Area Network.
2. What is biocompatibility?
3. Name any two power sources for BAN.
4. What is an antenna?
5. What is the frequency band that is used for BAN?
6. Name any two wireless technology used for BAN.
7. What are the interferences that you come across, during the data transfer?
8. Name a few threats that are faced during the processing of secured data.
9. How do you monitor multiple patients in ICU?
10. Name any two application of BAN.

PART B — (5 × 13 = 65 marks)

11. (a) (i) State how BAN is used in health care monitoring? (5)
(ii) Explain in details about BSN architecture. (8)
- Or
- (b) (i) Explain the placement of optimal node. (5)
(ii) Summarize the technical challenges that are faced in establishing a secured BAN. (8)

12. (a) (i) What are the different processors that are used in hardware construction of BAN? (5)
(ii) Discuss the merits and demerits of low power MCUs. (8)

Or

- (b) (i) List the sensor interfaces that are used in BAN. (5)
(ii) Explain in detail about various antenna that are used in BAN. (8)
13. (a) (i) Discuss about the Network topology. (5)
(ii) Write in detail about Wireless personal Area Network Technologies. (8)

Or

- (b) (i) Explain the constraints related to antenna design and testing. (5)
(ii) Describe the RF communication in Body. (8)
14. (a) (i) What are the measures that are there to counter the coexisting issues of BAN? (5)
(ii) Bring out the regulatory issues related with BAN. (8)

Or

- (b) (i) How do you self-protect the BAN? (5)
(ii) Explain the secured protocols that are to be adapted on BAN. (8)
15. (a) (i) Explain the need of BAN in hospital. (5)
(ii) How does BAN help on effective Monitoring of patients with chronic diseases? Explain with examples. (8)

Or

- (b) (i) Name a few medical conditions that can be monitored using BAN. (5)
(ii) Write short notes on Multichannel Neural recording and Gait analysis using BAN. (8)

PART C — (1 × 15 = 15 marks)

16. (a) (i) Explain the merits and demerits of PCB antenna and ceramic antenna. (4)
(ii) Explain in detail about Zigbee communication using suitable examples. (6)
(iii) Discuss in detail about the differences in medical device regulation in USA and Asia. (5)

Or

- (b) (i) Discuss any two conditions that requires multichannel neural recording and how is that established in hospital setup? (7)
(ii) Elaborate the construction and function of the electronic pill. (8)
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