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**Question Paper Code: U9475**

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2025

Open Elective

Electronics and Communication Engineering

21UEC975 - WEARABLE DEVICES

(Regulations 2021)

(Common to All Engineering Branches)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (10 x 2 = 20 Marks)

1. What is radiant thermal sensors? CO1-U
2. Differentiate between inductive and impedance plethysmography. CO1-U
3. What is the sampling frequency preferred in Oximeter and Accelerometer? CO1-U
4. What are the various wearability issues related to health care? CO1-U
5. What are hybrid thermoelectric-photovoltaic systems? CO1-U
6. Illustrate Seebeck effect in thermoelectricity CO1-U
7. How does a BAN improve patient mobility and care? CO1-U
8. What is the role of security in body area networks? CO1-U
9. Describe gait analysis and its use in rehabilitation. CO1 -U
10. How can wearable systems assist in neural recording? CO1 -U

PART – B (5 x 16= 80 Marks)

11. (a) Describe in detail about various categorization of wearables in detail with neat diagram. CO1 -U (16)
- Or
- (b) Explain in detail about Wearable GRF Sensor System in detail with neat diagram. CO1 -U (16)
12. (a) Discuss the challenges and limitations associated with how effectively a wearable device can be worn on a human body. CO1 -U (16)
- Or
- (b) Discuss in detail about types of sampling used in various sensors with its wearability concern. CO1 -U (16)

13. (a) Compare and contrast different energy harvesting techniques used in wearable devices. CO1 -U (16)
- Or
- (b) Explain the construction, working, and application of thermopiles in wearable systems. CO1 -U (16)
14. (a) Discuss in detail about challenges faced by WBAN and explain how effectiveness of the WBAN is important from both patients and healthcare perspective. CO1 -U (16)
- Or
- (b) Explain about typical WBAN communication. Draw the work flow chart of WBAN and explain its working in detail. CO1 -U (16)
15. (a) Describe the role of wearable systems in chronic disease management with appropriate case studies. CO1 -U (16)
- Or
- (b) Describe the role of smart clothing in modern sports medicine and illustrate with two examples. CO1 -U (16)