C **Reg. No. :** | | | | | | | | | | | | |

Question Paper Code: U4601

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

Professional Elective

Electronics and Communication Engineering

21ECV601- WEARABLE ELECTRONICS

(Regulations 2021)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Which refers to the variety of fast moving data from individuals and groups? CO1-U

   (a) Complex Data (b) Big data (c) Continuous data (d) Both (a) and (b)

2. Thin Film transistors commonly used in CO1-U

   (a) LED (b) LCD (c) OLED (d) Both (a) and (b)

3. Wearable inertial sensors are the most wearable devices for the measurement of _____and _____activities associated with daily living CO1-U

   (a) Motion, physical (b) Physical, Chemical

   (c) Velocity, physical (d) motion, chemical

4. Energy Transducer performance depends on? CO1-U

   (a) Size of the system (b) Type of storage element

   (c) Voltage of the electrical load (d) ambient energy source

5. The diameter of the E-fiber is approximately_____ CO1-U

   (a) 5 mm (b) 10 mm (c) 15 mm (d) 20mm

PART – B (5 x 3= 15 Marks)

6. How human skin act as the ultimate sensor? CO2-App

7. Draw the Transfer and output Characteristics diagram of IGZO. CO1-U

8. Define Hall Effect. CO1-U

9. Mention the usage of thermopiles in wearable devices. CO1-U

10. How the embroidered textile- lung sensor used in healthcare monitoring? CO4-Ana

PART – C (5 x 16= 80 Marks)

11.	(a)	Explain the challenges and opportunities of wearable Devices.	CO1-U	(16)
		Or		
	(b)	Outline the architecture of wearable motherboard involved in textile.	CO1-U	(16)
12.	(a)	Examine characteristics between drain current& trans conductance and functions of gate source voltage of TFT.	CO4 - Ana	(16)
		Or		
	(b)	Discover the challenges associated with embedding NIRS sensors into textiles, such as flexibility, durability, signal accuracy, and skin contact.	CO4 - Ana	(16)
13.	(a)	Analyze various tools for assessment of subjective and objective falling risk and give the suitable assessment with Rehabilitation Battery.	CO4 - Ana	(16)
		Or		
	(b)	How do wearable inertial sensors work, and how do they contribute to the functionality of wearable devices in terms of motion tracking and activity recognition?	CO4 - Ana	(16)
14.	(a)	Interpret the role of semiconductors in photovoltaic cells.	CO1 -U	(16)
		Or		
	(b)	Illustrate the basic theory and functional principles as well as the state-of-the-art technologies of wireless energy transmission.	CO1 -U	(16)
15.	(a)	Illustrate the Basic concept of embroidered antenna and describe how it creates impact in textiles.	CO1 -U	(16)
		Or		
	(b)	Explain the role of a multiband antenna in improving the performance of body-worn communication systems, and how does it support communication across different frequency bands?	CO1 -U	(16)