JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech-IV Semester (CSE/IT/BT/ECE)

COURSE CODE (CREDITS): 25B1WCI433 (2) MAX. MARKS: 15

COURSE NAME: FUNDAMENTALS OF SMART SYSTEMS AND IOT

COURSE INSTRUCTOR: AAYUSH SHARMA MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*

(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

(c) ***Use of calculators is allowed***

Q.No	Question	CO	Marks
Q1	Answer the following **briefly and precisely**: **(a)** Arrange the following IoT protocol stack layers in correct order from **lowest to highest**: *Physical, MAC, Network, Transport, Application* **(b)** In Arduino programming, why is **setup()** separated from **loop()**? (Answer in **maximum two lines.**) **(c)** Give **one example each** of: • a **sensor** • an **actuator**	[CO1]	[1+2+2]
Q2	**(a)** A team connects a **3.3 V Wi-Fi module** directly to **Arduino UNO digital pins**. The system works initially, but after a few hours the Wi-Fi module fails permanently. • Identify the **most likely electrical reason** for failure. *[2]* • Suggest **one correct mitigation technique**. *[1]* **(b)** Two SPI devices work correctly when connected individually. When connected together, one device always returns **garbage data**, even though each device has its own **CS line** and shares **SCLK and MOSI**. • Identify the **most likely wiring/logic mistake**. *[1]* • State the **correct fix** (hint: behavior of MISO when device not selected). *[1]*	[CO1] [CO2]	[3+2]
Q3	(a) UART runs at **9600 bps** with a frame format of **1 start bit + 8 data bits + 1 stop bit**. Calculate the **maximum number of bytes per second** that can be transmitted ideally. (b) An MQTT device publishes a message every **200 ms**. Each message contains: • Payload = **50 bytes** • MQTT overhead = **20 bytes** Calculate: • **Total bytes per second** • **Total bits per second**	[CO2]	[2+3]

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