UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2020

Course: IoT Devices (ECEG3020) **Semester: V**
Program: B Tech ECE
Time: 03 hrs. **Max. Marks: 100**
 No. of page/s: 2

Instructions:
- The question paper contains three sections namely Section-A, Section-B and Section-C.
- Attempt all questions. The number of marks for each question is mentioned on the right side of it.
- Assume any data if required and indicate the same clearly. Unless otherwise indicated symbols and notations have their usual meanings.

SECTION A (30 Marks)

S. No.		Marks	CO
Q 1	What is meant by IoT device? Write the characteristics of IoT devices.	**5**	**CO1**
Q 2	Write the technical characteristics of ZigBee network.	**5**	**CO2**
Q 3	What is localization in IoT/wireless sensor networks? Write the properties of the localization and position.	**5**	**CO3**
Q 4	Write the features of Smart Grid.	**5**	**CO4**
Q 5	Why we need standardizations? Name at least four standardizing bodies of IoT.	**5**	**CO2**
Q 6	What are IoT enabling technologies? Briefly discuss any one of them.	**5**	**CO1**

SECTION B (50 Marks)

Q 1	How are the following devices or techniques: sensors, smart phones, RFID labels/readers, bar code are used for data collection and sensing in IoT applications?	**10**	**CO1**
Q 2	Explain each component in IoT node with neat block diagram.	**10**	**CO2**
Q 3	Describe any two of the following device to device communication protocols: UART, I2C and RS-485	**10**	**CO2**
Q 4	Explain the problems (challenges) associated with five "V's" of big data characteristics. (1) Volume, (2) Velocity, (3) Value, (4) Variety, and (4) Veracity. Discuss the resources demand and associated processing requirement and limitations.	**10**	**CO3**
Q 5	(a) Three nodes A, B, and C are known to be positioned at locations $(0, 0)$, $(10, 0)$, and $(4, 15)$, respectively. Node D is estimated to be a distance of 7 from A, a distance of 7 from B, and a distance of 10.15 from C. Determine the location of D using trilateration.	**5+5**	**CO3**

	(b) Briefly describe the security system model IoT/ wireless sensor networks.		
	SECTION-C (20 Marks)		
Q 1	Explain the design of a healthcare system which consists of body sensors and wearable devices to collect human physiological signals. This system should possess the following functions: real-time monitoring, disease prediction and early detection of chronic diseases. **Or** Explain the design of an intelligent vehicle management system based on IoT, especially RFID technology. The system should enable automatic payment, such that a vehicle can go through an intersection without stopping. When the vehicle exits, the parking fee is deducted automatically.	**20**	**CO4**