Name:

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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, Dec 2021

Course: Wireless Sensor Networks & IoT Standards **Semester: V**
Program: B. Tech. CSE-IoT **Duration: 03 hrs.**
Course Code: CSIS3001 **Max. Marks: 100**

SECTION A

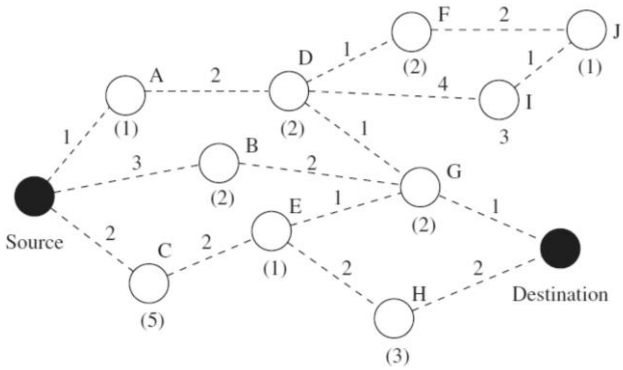
(5Qx4M=20 Marks)

	Question	CO	MM
Q1	Differentiate between active sensors and passive sensors. Give an example for each of the two types of sensors.	**CO1**	**4**
Q2	Briefly describe the following terms: (a) Channel encoding (b) Source encoding	**CO2**	**4**
Q3	List any four reasons for energy inefficiency in Wireless Sensor Networks.	**CO2**	**4**
Q4	Write any two points describing the role of ZigBee for power constrained networks.	**CO3**	**4**
Q5	List any three points justifying the need of IoT standards.	**CO4**	**4**

SECTION B

(4Qx10M=40 Marks)

Q1	Differentiate between TinyOs and Contiki on the following parameters: a) Scheduling b) Memory Allocation c) System Calls	**CO1**	**10**
Q2	Elaborate the process of following operations in Traffic Adaptive Medium Access Control protocol for Wireless Sensor Networks a) Exchange of Schedules between transmitting nodes b) Determination of a node's priority at time *t* **OR** Discuss the causes and implications of the following problems in wireless sensor networks: a) Hidden-terminal problem b) Exposed-terminal problem	**CO2**	**10**

Q3	Consider the sensor network shown in the below figure. Each edge is marked with the energy required to transmit through it. Each node is marked with remaining energy capacity. A path has to be selected from the Source to the Destination.  Provide the best suitable path if the selection criterion is: a) Minimum hop b) Minimum energy consumed per packet c) Maximum average energy capacity d) Maximum minimum energy capacity	**CO3**	**10**
Q4	Elaborate over the IoT standardization for the following technologies: a) Smart Machine-to-machine (M2M) communications b) IoT Semantic Interoperability c) Context Information Management	**CO4**	**10**
	SECTION C **(2Qx20M=40 Marks)**		
Q1	Take an example of your choice for an application of Wireless Sensor Networks and explain the complete sequence of steps. (Steps may include but not limited to Sensing, ADC, Signal Processing, Network protocols, actuators etc).	**CO4**	**20**
Q2	a) List any two advantages of data-centric routing in Wireless Sensor Networks. b) Discuss how the following issues are addressed in SPIN-PP (point-to-point) protocol i. Implosion ii. Overlap iii. Resource-blindness **OR** a) Provide a comparative review of SPIN protocols and Directed Diffusion. b) Illustrate the working of Rumor Routing Protocol with the help of a suitable example.	**CO3**	**20**