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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2018

B.Tech. (CSE/ECE), 8th Semester

COURSE CODE: 15B1WCI831 MAX. MARKS: 25

COURSE NAME: Wireless Sensor Networks-Protocols and Applications(OE)

COURSE CREDITS: 3 MAX. TIME: 1.5 HR

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

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1. Show the ISM bands for the radio frequencies of Wireless Channel. [2 marks]

2. What is the significance of channel models in WSN? Explain Signal model and Digital Model in Brief for WSN. [3 marks]

3. Differentiate between the direct sequence spread spectrum and frequency hopping spread spectrum? [3 marks]

4. Identify the most crucial points influencing the Physical Layer Design in Wireless Sensor Networks? [3 marks]

5. Differentiate between the Contention based protocols and schedule based protocols? Show the schematic diagram to show the functionality of CSMA Protocol. [3 marks]

6. How does the LEAC protocol works? Write down the merit and demerits of LEACH, SMACS and TRAMA protocols in context to WSN. [3 marks]

7. Consider the following model describing the required energy E(X,Z) to send a packet from node X to node Z: $E(X,Z) = d(X,Z)^{\alpha}$. Here, d(X,Z) is the distance between node X and Z and α is a system parameter with $\alpha > 2$. Assume that we are allowed to place a number of equidistant relay nodes between the source S and destination node D. Here, relay nodes serve as

intermediate nodes to route the packets from S to D. For instance, if S and D would use the relay nodes X and Y, the message would be sent from S to X, from X to Y and finally from Y to D. How much energy would be consumed in transmission and receiving an 8-bit packet at each node when the energy supplied to each node is 3 Joules. Also find the total energy consumption in the network? **[8 Marks]** Assumptions [α_{amp} =0.05 J, β_{amp} = 0.005 J, P_{tx}= 0.06 J, P_{rx}= 0.06 J, R=0.01, R_{code}=0.02 , $E_{decibits}$= 0.03 J] [8 Marks]