BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: B.TECH **SEMESTER : VII**
BRANCH: ECE **SESSION : MO/2022**

SUBJECT: EC449 WIRELESS SENSOR NETWORKS

TIME: 3:00 Hours **FULL MARKS: 50**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 10 marks and total 50 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)	What are the design challenges that affects the performance of Ad-hoc networks?	[2]
Q.1(b)	Compare 3G cellular phone standards cdma2000 and WCDMA.	[3]
Q.1(c)	Derive the expression for baseband impulse response of multipath channel.	[5]
Q.2(a)	Write the differences between sensor networks and Ad-hoc networks.	[2]
Q.2(b)	What are the sources of energy consumption in a sensor node? Write the expression to evaluate over all energy consumption in a sensor node and explain each terms in the expression.	[3]
Q.2(c)	Discuss a generic protocol stack model that can be utilized to describe the communication in sensor networks.	[5]
Q.3(a)	What are the causes of energy inefficiency at MAC layer protocols in WSNs? Explain.	[2]
Q.3(b)	Compare contention based and contention free MAC protocols in WSNs. How to perform schedule exchange in TRAMA protocol? Explain.	[3]
Q.3(c)	Describe the functionality of IEEE802.15.4 MAC protocol in beacon enabled mode with the help of superframe structure.	[5]
Q.4(a)	How address centric routing approaches shifts the emphasis towards data centric routing approach for WSNs? Explain.	[2]
Q.4(b)	What are the problems that make traditional TCP and UDP unsuitable for WSNs? Explain.	[3]
Q.4(c)	Classify transport layer protocols in WSNs. How congestion detection and avoidance (CODA) regulates a multisource rate through end-to-end approach? Write the disadvantages of CODA.	[5]
Q.5(a)	Write the properties of localization and positioning procedures in WSNs.	[2]
Q.5(b)	Discuss ranging based techniques: ToA, TDoA and RSS.	[3]
Q.5(c)	Discuss the mathematical model for lateration problem. The position of three anchor and the distance between anchors and an unknown node is given as (x1,y1)=(2,1), (x2,y2)=(5,4), (x3,y3)=(8,2) , r1=10^(1/2), r2=2 and r3=3 respectively. Find the position of unknown node.	[5]

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