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Question Paper Code: U9407

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2024

Professional Elective

Electronics and Communication Engineering

21ECV307-SMART SENSOR NETWORKS

(Regulations 2021)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5x 1 = 5 Marks)

1. The propagation technique in WSN between hops of network can be CO1-U
(a) Routing (b) Flooding (c) Connecting (d) Both (a) & (b)
2. Identify the coordination models of mobile agents in their current CO1-U
Internet-motivated world _____.
(a) Client/server model
(b) Meeting oriented model
(c) Blackboard-based model & Linda-like model
(d) All of the above
3. Cluster head will elected to perform _____. CO1-U
(a) Filtering (b) aggregation (c) fusion (d) All of the above
4. Error Control Mechanism used in _____ Communication Networks. CO1-U
(a) FEC (b) ARQ (c) Both (a) & (b) (d) None of the above
5. Strong ARM SA-1100 processor has _____ power modes. CO1-U
(a) run, idle (b) run, sleep (c) sleep, idle (d) run, idle, sleep

PART – B (5 x 3= 15Marks)

6. Sketch the model for Resource request and reply mechanism in NRM. CO1-U
7. Imagine a sensor network in a room that measures temperature and light CO3-App
status. Create a query to fetch data from sensors.
8. Draw the schematic of wireless sensor network. CO1-U

9. Consider the wireless sensor network where node D is interested in receiving CO2-App pressure values from node A. Route the data from node A to node D using a network layer protocol. CO1-U
10. Differentiate Idle and active power management. CO1-U

PART – C (5 x 16= 80 Marks)

11. (a) Elaborate the Implementation of “request-reply-mechanism” to manage assignments and resources in a wireless sensor network. CO1-U (16)
Or
(b) Illustrate how a network resource manager is utilized in sensor networks, which need to be highly fault tolerant, reliable in gathering data, performing in real time, and being autonomous. CO1-U (16)
12. (a) Consider a user who wishes to monitor the occupancy of the conference rooms on a particular floor of a building. She chooses to do this by using microphone sensors attached to motes, and looking for rooms where the average volume is over some threshold (assuming that rooms can have multiple sensors). Illustrate how the query could be expressed in detail with neat diagram CO3-App (16)
Or
(b) Mango trees are planted in a farmer's one acre land. A location with the coordinates (50, 60) that was found to be dry. A farmer submits a query to view the location's moisture content. Show the diagram depicts the request and response between user and server. CO3-App (16)
13. (a) Describe the architectural and design objectives based on application requirements and technology constraints. CO1-U (16)
Or
(b) Discuss in detail about the individual components of SN nodes. CO1-U (16)
14. (a) Address the issues in implementing TCP and UDP in Wireless sensor networks for monitoring the environmental conditions. CO2-App (16)
Or
(b) Assume that 100 motes with minimum battery lifetime are placed in a crop field which form clusters and transfer the sensor data (temperature, Humidity and moisture level) to sink. Design an energy efficient routing protocol to improve the life time of a wireless sensor network. CO2-App (16)
15. (a) Discuss in detail about SPINS protocols suite with neat diagram. CO1-U (16)

Or

(b) Explain about sensor OS architecture with neat diagram

CO1-U (16)