Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code : 40456

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

Seventh Semester

Electronics and Communication Engineering

EC 8702 – AD HOC AND WIRELESS SENSOR NETWORKS

(Regulations 2017)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Outline the hidden vs. exposed terminal problem in ad hoc networks.

2.   State any two applications of ad hoc networks.

3.   Name the basic components of a sensor node.

4.   State any two applications of wireless sensor networks.

5.   What is data dissemination in a wireless sensor network?

6.   Why wireless sensor networks need localization protocols?

7.   What is security provisioning?

8.   Define a black hole attack.

9.   Present an outline of berkeley motes.

10. Name any two node-level simulators for wireless sensor networks.

PART B — (5 × 13 = 65 marks)

11. (a)   What is a routing protocol? Outline the issues in designing a routing protocol for ad hoc wireless networks.   (13)

Or

(b)   Classify routing protocols for ad hoc wireless networks and present an outline of the same.   (13)

12. (a) What is a wireless sensor network? Elaborate the wireless sensor network architecture with a diagram. (13)

Or

(b) Present an elaborate note on the energy consumption rate for sensors in a wireless sensor network. (13)

13. (a) Outline the low energy adaptive clustering hierarchy (LEACH) protocol for wireless sensor networks. (13)

Or

(b) What is energy efficient routing? Present an outline of energy efficient routing in wireless sensor networks. (13)

14. (a) Outline the issues and challenges in security provisioning for wireless sensor networks.

Or

(b) Present an outline of SPINS, security protocol for sensor networks. (13)

15. (a) Outline the features of node-level simulators for wireless sensor networks. (13)

Or

(b) Outline the features of TinyOS and CONTIKI OS for wireless sensor networks. (13)

PART C — (1 × 15 = 15 marks)

16. (a) Present an ad hoc network design that can be used in a geographic location affected by cyclone. State the functional requirements you are considering. (15)

Or

(b) Present a wireless sensor network design that can be used for surveillance and environment monitoring in a zoo. A zoo is a facility in which animals are confined within enclosures, displayed to the public, and in which they may also be bred. State the functional requirements you are considering. (15)

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Reg. No. :

Question Paper Code : X10373

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Seventh Semester
Electronics and Communication Engineering
EC8702 – AD HOC AND WIRELESS SENSOR NETWORKS
(Regulations 2017)

Time : Three Hours   Maximum : 100 Marks

Answer ALL questions

PART – A   (10×2=20 Marks)

1. Is the 4G Cellular communication falls under an ad hoc network ? Justify.

2. How to improve the throughput of ad hoc network ?

3. Is the WSN has auto configuration ? Briefly discuss.

4. Write the formula for Noise figure and discuss when the noise figure will be lesser.

5. List any two suggestion to maximize the lifetime of WSN.

6. Draw the super-frame structure of IEEE 802.15.4.

7. What is meant by node capture ?

8. Differentiate link layer jamming and physical layer jamming.

9. What is meant by state centric programming ?

10. In WSN, the data is flooded in the network. Which IP address is used for flooding ? Is flooding, a unicast / multicast / broadcast ?

PART – B **(5×13=65 Marks)**

11. a) i) Draw protocol graph for the following network: end node (ad hoc node) -> mobile node -> wireless gateway -> end node (ad hoc node). **(5)**

   ii) The following network follows DSDV routing protocol. Draw the routing table of ad hoc network, and the source node is 'A'. **(8)**
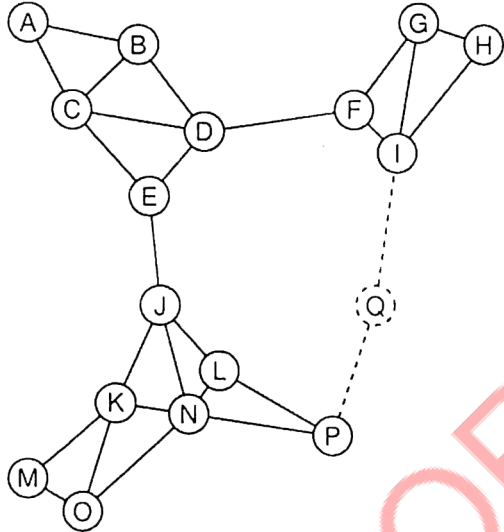
(OR)

b) Explain AODV route establishment and route maintenance with proper diagram for the following network. Consider 'A' is a source node.
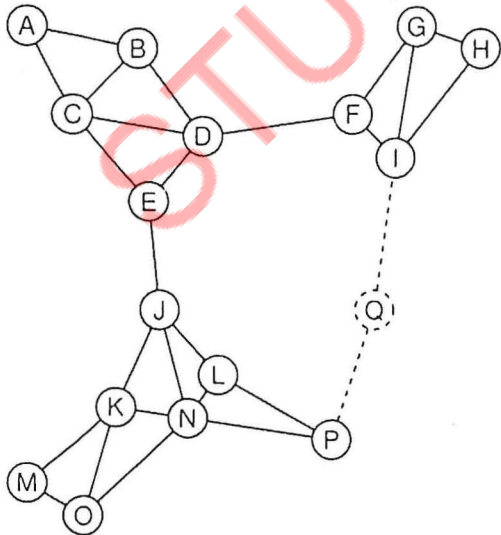
12. a) i) Explain the transceiver operational states. **(6)**

   ii) Explain the three categories of sensor with example. **(7)**

   (OR)

b) i) Discuss about the Operation states with different power consumption. **(7)**

   ii) Briefly explain the different types of mobility with proper diagram. **(6)**

13. a) Explain : SMAC with necessary diagram.

    (OR)

   b) What is the need of power aware multi-access protocol for defining WSN MAC ? Also briefly describes the working model of power aware multi-access signaling protocol.

14. a) Assume that as an attacker, you are planning to propose DoS attack. Write down the steps involved for DoS attack. Explain the effect of DoS attack in WSN.

    (OR)

   b) What is the need of security for routing protocol ? Also, explain the secured routing protocol using SPIN.

15. a) i) A researcher defined new routing protocol for WSN. In order to test the performance of the routing protocol, suggest the best approach such as simulation, emulation or real time implementation which should be cost effective. Justify your answer. **(3)**

      ii) List out: Programming language name, graphical interface name, animation window name used in NS2. **(3)**

     iii) Convert the following C code to NS2.
         int a,b,c ;
         a=5;
         b=6;
         c=a+b. **(7)**

    (OR)

   b) i) Most of the journal papers which published in network domain are displayed the result from simulation, Why they included simulation results instead of real time implementation ? Justify. **(4)**

      ii) List out and brief about any four open simulator which is used for ad hoc network and WSN. **(4)**

     iii) Analyse the methodology of cycle driven simulation and discrete event simulation. **(5)**

PART – C   **(1×15=15 Marks)**

16. a) Design and explain : WSN based border protection system in order to detect the entry of terrorist in the line of control. **(10)**
      Discuss anyone possible attack on the border protection system with solution. **(5)**

    (OR)

   b) Design and Explain: Intelligent transport system using ad hoc network. The proposed system will inform the alternate route during road traffic, and it will provide necessary guideline during accident. **(10)**
      Discuss suitable routing protocol for your intelligent transport system **(5)**

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