

WIRELESS AD HOC AND SENSOR NETWORKS
(ECEN 5131)

Time Allotted : 2½ hrs

Full Marks : 60

Figures out of the right margin indicate full marks.

*Candidates are required to answer Group A and
any 4 (four) from Group B to E, taking one from each group.*

Candidates are required to give answer in their own words as far as practicable.

Group – A

1. Answer any twelve:

12 × 1 = 12

Choose the correct alternative for the following

- (i) The frequency range preferred for wireless transmission is that of
 - (a) X rays
 - (b) Gamma rays
 - (c) White visible light
 - (d) All of these.
- (ii) WRP protocol is
 - (a) Proactive
 - (b) Reactive
 - (c) Hybrid
 - (d) Flat topology based.
- (iii) Which is not a Major responsibility of TCP?
 - (a) Congestion control
 - (b) In-order delivery of packets
 - (c) Flow control
 - (d) Makes use of directional antennas.
- (iv) Major responsibility of TCP
 - (a) Set up delivery of lossless data packets
 - (b) Congestion control
 - (c) Flow control
 - (d) All of the above.
- (v) Data Packet Delivery rate by TCP
 - (a) remains constant
 - (b) is regulated by expanding or shrinking the congestion window
 - (c) is fixed by the MSS (Maximum Segment Size)
 - (d) both (b) and (c).
- (vi) Location Aided Routing reduces Control Overhead by
 - (a) Limiting the search area for finding a path
 - (b) Efficient use of geographical information
 - (c) Efficient bandwidth utilization
 - (d) All of the above
- (vii) Challenges in design of network security for Ad hoc wireless networks
 - (a) having shared radio broad cast channels
 - (b) limited resource availability as BW, battery, computation power
 - (c) lack of association of nodes due to unpredictable moves
 - (d) all of the above.

- (viii) Which is not an OS for WSN?
 (a) Linux (b) TinyOS (c) Contiki (d) FreeRTOS.
- (ix) Smart Courier vehicles communicating and delivering goods, is an example of
 (a) Static WSN (b) VANET (Vehicular ad hoc network)
 (c) SPAN (smart phone ad hoc network) (d) None of the above.
- (x) Application of Adhoc network in a smart city includes.
 (a) Real time traffic monitoring for better management.
 (b) Real time data on crime emergency, enhancing public safety.
 (c) Real time monitoring on smart grids for efficient energy distribution.
 (d) All of the above.

Fill in the blanks with the correct word

- (xi) A radio wave propagation mechanism has a wavelength of _____.
- (xii) Reactive (on demand) protocols do not maintain _____ information
- (xiii) Session hijacking is categorized as _____ security attack.
- (xiv) MACAW is an extension of _____ protocol.
- (xv) The QoS degradation of MAC can be due to _____.

Group - B

2. (a) What are the design goals of MAC protocol for Ad Hoc wireless network?
 [(C01)(Remember/LOCQ)]
- (b) What are the application areas of Ad Hoc mobile networks? Justify your answer.
 [(C02)(Analyse/IOCQ)]
- (c) Describe briefly the ISO/OSI architecture.
 [(C02)(Apply/IOCQ)]
- 4 + 4 + 4 = 12**
3. (a) Evaluate the difference between MACAW and MACA. What are their relative advantages and disadvantages?
 [(C03)(Analyse/HOCQ)]
- (b) What are the classifications of MAC protocols? Discuss in brief. [(C03)(Analyse/HOCQ)]
- (3 + 3) + (2 + 2 + 2) = 12**

Group - C

4. (a) Explain Hybrid Coordination Function.
 [(C04)(Understand/LOCQ)]
- (b) Evaluate the issues and challenges in providing QOS in Ad Hoc Wireless Networks.
 [(C03)(Evaluate/HOCQ)]
- 6 + 6 = 12**
5. (a) "TCP is the most sought-after protocol in internet today" - Justify.
 [(C03)(Analyse/HOCQ)]
- (b) What are the features of HCF?
 [(C04)(Remember/LOCQ)]
- (c) Describe briefly the problems and solutions in achieving window management system in Ad Hoc networks?
 [(C02)(Apply/IOCQ)]
- 4 + 2 + 6 = 12**

Group - D

6. (a) Explain the role the possible sources of energy waste in WSN. [[CO5](Remember/LOCQ)]
(b) How does overheating, control packet overhead affect the packet flow routing in MANETs? [[CO4](Remember/LOCQ)]
6 + 6 = 12
7. (a) Compare the role of centralized control in traditional and distributed databases. [[CO2](Analyse/HOCQ)]
(b) Write a short note on: Throughput, Fairness and Synchronization. [[CO4](Remember/LOCQ)]
6 + (2 + 2 + 2) = 12

Group - E

8. (a) Compare packet switching and packet overload. [[CO4](Analyse/IOCQ)]
(c) Describe briefly the issues in the multicast routing protocol. [[CO5](Apply/IOCQ)]
(d) Why do we need to focus deeply in the energy management part of a MANET? [[CO6](Apply/IOCQ)]
3 + 6 + 3 = 12
9. (a) What are the application areas of Ad Hoc mobile networks? Justify your answer. [[CO6](Analyse/IOCQ)]
(b) What are the challenges of Ad Hoc network in high-end surveillances? [[CO6](Remember/LOCQ)]
(c) Describe briefly the differences between WSN and MANETs. [[CO2](Apply/IOCQ)]
4 + 4 + 4 = 12

Cognition Level	LOCQ	IOCQ	HOCQ
Percentage distribution	35.4	35.4	29.16

