

INSTITUTE OF AERONAUTICAL ENGINEERING

(AUTONOMOUS)

Code No: **BES002**

MODEL QUESTION PAPER - II

M.Tech I Semester Regular Examinations, February 2017

WIRELESS LANS AND PANS

(Embedded Systems)

Time: 3 hours

Max. Marks: 70

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the question must be answered in one place only

UNIT – I

- 1 (a) With the help of block diagram explain the operation of cellular systems and write a short notes on first, second, third and fourth generation of cellular mobile communications [7M]
- (b) Explain in detail the operation of slotted ALOHA. Consider the delay of pure ALOHA versus slotted ALOHA at low load. Which one will provide less delay? [7M]
- 2 (a) Assume CSMA/CD protocol. Find the minimum frame length for a 1Mbps bit rate and maximum network span of 10 kilometers with no repeaters. Assume a medium propagation delay of 4.5 nanoseconds per meter. Is CSMA/CD a reasonable protocol for a network of this span and bit rate. [7M]
- (b) Briefly explain about ALOHA, CSMA, CSMA/CD and CSMA/CA protocols and compare their performances. [7M]

UNIT – II

- 3 (a) Classify wired media and wireless media and explain infrared, microwave and radio systems corresponding to ISM bands. [7M]
- (b) How many categories does digital wireless transmission techniques divided according to their applications. Explain each one of them briefly. [7M]
- 4 (a) Discuss Fast frequency hopping spread spectrum technology with neat block diagram and relate it with slow frequency hopping spread spectrum technology. [7M]
- (b) Generate the pseudo noise sequence using four bit D-flipflop shift register and verify the balance property. [7M]

UNIT – III

- 5 (a) With neat sketch explain the network topologies of Basic Service Set (BSS) mode and Extended Service Set (ESS) mode. [8M]
- (b) What is the significance of physical layer? With design flow diagram explain different sub layers present within the physical layer. [6M]
- 6 (a) Interpret IEEE 802.11 Distributed Coordination Function(DCF) protocol with backoff mechanism with example consider two nodes and backoff intervals. [7M]
- (b) Discuss in detail about the energy efficiency and congestion control corresponding to IEEE 802.11 MAC layer issues. [7M]

UNIT – IV

- 7 (a) What is Adhoc networking? Distinguish bluetooth piconet architecture and bluetooth scatternet architecture with neat block diagram. [7M]
- (b) Mention the specifications of voice and data transmission in bluetooth and explain the two types of data and voice applications. [7M]
- 8 (a) With neat sketch draw the high level overview of bluetooth security architecture together with the security components. [7M]
- (b) Explain bluetooth star architecture with neat diagram. what are the security modes in bluetooth generic access profile. [7M]

UNIT – V

- 9 (a) Classify ZigBee technology with Wi-Fi and bluetooth. What are the IEEE 802.15.3 wireless personal area network standard applications. [7M]
- (b) Explain the architecture of ZigBee technology with ZigBee components and network topologies. [7M]
- 10 (a) Explain ZigBee frame structure with different fields. Summarize the various ZigBee application profiles? [8M]
- (b) Discuss IEEE 802.15.4 LR-WPAN Device architecture with block diagram and what are the drawbacks present in this architecture. [6M]