B.E / Sem VIII / EIT / Aug. 25 / 21.08.25

Duration: 3hrs **[Max Marks:80]**

N.B. : (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1 Attempt any **FOUR** [20]
- a Classify wireless networks and state their applications.
- b Explain applications of Wireless Body Area Networks.
- c List features of Zigbee
- d Compare IoT and M2M communication
- e Explain the characteristics of Wireless Mesh Networks.

2 a Explain different network topologies of ZigBee with its components. [10]
b Describe Hidden and Exposed Node Problem in WLAN. Explain how to alleviate these problems. [10]

3 a Describe communication establishment states in Bluetooth with suitable diagram. [10]
b Compare WiFi and WiMax w.r.t network architecture, communication technologies, coverage and applications. [10]

4 a Explain the features of 6LoWPAN. List out its advantages, disadvantages and Applications. [10]
b Describe Wireless Sensor Network Architecture and its applications. [10]

5 a Explain the WMAN architecture. Also state the characteristics and benefits of WMAN. [10]
b Using the following data for a GSM1800 network, calculate (1) average busy hour traffic per subscriber, (2) traffic capacity per cell, (3) required number of base stations per zone, and (4) the hexagonal cell radius for the zone. [10]
- Subscriber usage per month = 150 minutes
- Days per month =24
- Busy hours per day = 6
- Allocated spectrum = 4.8 MHz
- Frequency reuse plan = 4/12
- RF channel width = 200 kHz (full rate)
- Present number of subscribers in the zone = 60,000
- Subscriber growth = 5% per year
- Area of the zone = 500 km2
- Initial installation based on a four-year design
- Capacity of a base station transceiver (BTS) = 30 Erlangs

From Erlang B table
For 2% GOS and Channels = 14 Traffic capacity = 8.2 Erlangs
For 2% GOS and Channels = 16 Traffic capacity = 9.8 Erlangs

6 Write Short note (**Any 2**) [20]
- a VANET
- b NFC
- c RFID

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