

B. TECH. (CBCS - 2014 COURSE) SEM - VIII (ELECTRONICS)

: SUMMER - 2018

SUBJECT: WIRELESS NETWORKS

Day : **Thursday**

S-2018-4683

Time: **02.30 PM TO 05.30 PM**

Date : **07/06/2018**

Max. Marks: 60

N. B. :

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labeled diagram **WHEREVER** necessary.
- 4) Assume suitable data, if necessary.

- Q. 1**
- a) Explain in detail, the various radio propagation mechanisms. **(05)**
 - b) Explain the techniques for improving coverage and capacity in cellular system. **(05)**

OR

What do you mean by wireless networks? Explain different generation of wireless networks. Also explain in brief evolution of next generation networks. **(10)**

- Q. 2**
- A mobile communication system is allocated RF spectrum of 25 MHz and uses RF channel bandwidth of 25 kHz so that a total no. of 1000 voice channels can be supported in the system. **(10)**

- i) If the service area is divided into 20 cells with a frequency reuse factor of 4, compute the capacity
- ii) The cell size is reduced to extent that the service area is now covered with 100 cells. Compute the system capacity while keeping the frequency reuse factor as 4.
- iii) Consider the cell size is further reduced so that the same service area is now covered with 700 cells with the frequency reuse factor of 7. Compute the system capacity

Comment on the results obtained.

OR

- a) What is the need for frequency reuse? Explain. **(04)**
- b) What should be relationship between call arrival rate and service rate when a cellular system is in steady state? Explain clearly. **(06)**

- Q. 3**
- a) Explain messages flow diagram for call set up by a mobile. **(05)**
 - b) Describe the frame structure of GSM. **(05)**

OR

Explain the frame structure of GSM for both traffic and control signals. **(10)**

- Q. 4**
- Explain the following for the IS-95 reverse channel:

- i) Waveform encoding **(05)**
- ii) Packets and frame formats **(05)**

OR

- a) What is direct sequence spread spectrum concept? Explain how it works in the CDMA technology. **(05)**
- b) What are the Orthogonal Walsh codes? **(05)**

- Q. 5**
- a) Explain key characteristics that distinguish 3G cellular systems from 2G cellular systems **(05)**
 - b) How Walsh codes are employed in CDMA forward and reverse channel? **(05)**

OR

- a) Describe 3G networks based on CDMA 2000 technology. **(05)**
- b) Explain in detail LTE system. **(05)**

- Q. 6**
- With the help of block diagram explain wireless sensor networks and its applications. **(10)**

OR

- a) Explain the mobility management process. **(05)**
- b) Discuss the overall architecture of Home RF system. **(05)**

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