

Total No. of Questions : 8]

SEAT No. :

PE-2563

[Total No. of Pages : 2

[6583]-92

T.E. (E & TC)

CELLULAR NETWORKS

(2019 Pattern) (Semester - VI) (304192)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Answer Q.1 or Q.2, Q.3. or Q.4, Q.5 or Q.6, and Q.7 or Q.8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume suitable data if necessary.
- 5) Use of calculators is allowed.

- Q1) a) Define Interference and explain different types of interference in mobile Cellular System. [5]
- b) Explain the concept of cell sectoring. [5]
- c) Consider a cellular network with $N=48$ channels per cell and blocking probability 2%. The traffic per user $A_0=0.04E$, cell radius = 1km of 1 user, city area = 603km. Calculate number of users and number of cells. [7]

OR

- Q2) a) What are the reasons for choosing Hexagonal cells? List the methods to improve coverage and capacity in cellular systems. [5]
- b) Briefly discuss the process of channel assignment in cellular networks. [6]
- c) If a total of 33MHz of a bandwidth is allocated to a particular cellular telephone system, which uses two 25KHz simplex channels to provide a full duplex voice and control channels. Compute number of channels per cell if a system uses: [6]
- i) Four cell reuse
 - ii) Seven cell reuse
 - iii) Twelve cell reuse

P.T.O.

- Q3) a)** Explain the following terms : [8]
 i) Trunking
 ii) Blocking probability
 iii) Grade of service
 b) How does SNR affect Link budget? Explain with example. [10]

OR

- Q4) a)** Explain in detail about the link budget design equation using path loss models. [8]
 b) Determine relationships between the following three factors : [10]
 - quality of service
 - traffic load
 - system capacity

- Q5) a)** List out and explain in brief Disruptive technologies for 5G. [8]
 b) What is the main role of LTE? Explain the standards of LTE. [9]

OR

- Q6) a)** With a neat block diagram, explain the LTE network architecture. [9]
 b) List out various challenges and requirements for 5G service. [8]

- Q7) a)** Compute the hamming code for the given data, 1001101 for even parity.

11	10	9	8	7	6	5	4	3	2	1
1	0	0	1	1	1	0	0	1	0	1
			P4				P3		P2	P1

- b) What is the full form of MAC? What is the main purpose of MAC layer in mobile communication?

OR

- Q8) a)** Explain the layer that performs scheduling and mapping of logical channel data onto the transport channels provided by the physical layer. [9]
 b) Explain the significance of scheduling algorithm in improving the communication quality of wireless network. [9]

