

Total No. of Questions : 8]

SEAT No. :

P764

[Total No. of Pages : 2

**[5870]-1069**  
**T.E. (E & TC)**  
**CELLULAR NETWORKS**  
**(2019 Pattern) (Semester - II)**

*Time : 2½ Hours]*

*[Max. Marks : 70*

**Instructions to the candidates:**

- 1) Answer any 4 questions form 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.

**Q1)** a) With neat diagram, describe co-channel and adjacent channel interference in cellular network. **[8]**

b) Draw and explain following Hand-off mechanism **[9]**

- i) Mobile controlled Hand-off
- ii) Network controlled Hand-off

OR

**Q2)** a) Discuss the path-loss exponent effect on frequency Reuse for a cellular system with total 500 duplex voice channel without frequency reuse. The service area is divided into 152 cells. The required signal to co-channel interference ratio is 17 dB. Considering path loss exponent is 3 to calculate : **[9]**

- i) Cell cluster size
- ii) No of cell cluster in the service Area
- iii) Maximum no of users in service at any instant

b) Explain the following terms with diagram: **[8]**

- i) Macro cell      ii) Micro cell
- iii) Pico cell      iv) Femto cell

**P.T.O.**

- Q3)** a) Define Blocking probability. With neat diagram and assumptions, explain Teletraffic system model. [9]  
 b) Derive an expression to measure required transmitted power at station with link budget expression. [8]

OR

- Q4)** a) Each side of hexagon cell is  $\frac{2}{\sqrt{3}}$ . A cellular system has  $N = 48$  channels/cell with blocking probability of 0.02. Further, traffic per user is 0.04E. the cell radius is 1km. With neat diagram, Calculate no. of users supported in a area of 900 km<sup>2</sup>. Total traffic is 38.4E. [9]  
 b) Define and explain : [8]  
 i) Grade of service  
 ii) Offered Traffic  
 iii) Delay system  
 iv) Loss system

- Q5)** a) Describe with neat diagram wireless LAN. Compare Infrastructure and Adhoc based wireless LAN. [9]  
 b) Draw and explain Radio protocol Architecture for LTE - Advanced system [9]

OR

- Q6)** a) Draw and explain in detail LTE Architecture. [9]  
 b) Compare 3G and 4G with respect to following : [9]  
 i) Data Rate supported  
 ii) Modulation Technique  
 iii) Frequency Band  
 iv) Technology used

- Q7)** a) With neat diagram, use of network coding for Content distribution in a multi - Hop network. [9]  
 b) Classify Schedulers & Explain in brief. [9]  
 i) Weighted Round Robin Scheduling  
 ii) Weighted Fair Queuing.

OR

- Q8)** a) Explain following terms with reference to Scheduler Design : [8]  
 i) Classifier ii) Channel Quality  
 b) List various Design forces for link Adaptation Schemes at physical and MAC layers. [10]

