SEAT No. :

P764

[5870]-1069
T.E. (E & TC)
CELLULAR NETWORKS
(2019 Pattern) (Semseter - 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 fequency 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

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^2. Total traffic is 38.4E. **[9]**

b) Define and explain : **[8]**
   i) Grade of service
   ii) Offerred 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 Adoptation Schemes at physical and MAC loyers. **[10]**

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