Total No. of Questions : 8]

SEAT No. :

PF-4963

[Total No. of Pages : 3

[6626]-98
T.E. E & T.C. Engg.
Cellular Network
(2019 Pattern) (Semester - VI) (304192)

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Answer any questions from Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***
5) ***Use of logorithmic tables slide rule, mollier charts, electronic pocket calculator and steam tables is allowed.***

Q1) a) Compare 1G to 5G cellular service progression on following points. **[5]**

i) Data Bandwidth

ii) Multiplexing Technique used.

iii) Type of switching used

iv) Services provided

v) Speed

b) Draw detailed cellular mobile and network architecture and explain function of each components. **[12]**

OR

Q2) a) State and explain different approaches to increase cell capacity. **[8]**

b) Determine total channel capacity and number of channels per cluster for cellular telephone, which have 20 clusters with 6 cells in each cluster and 10 channels in each cell. **[4]**

c) Draw and explain **[5]**

i) Inter BSC handover

ii) Inter MSC handover

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Q3) a) Think about scenario where wireless signals are propagating with cell radius of 8 km, carrier frequency of 2.1GHz,transmitter antenna height of 40m and reception antenna height of 2m. To reach a reliability of 95%, Let set the standard deviation for the long normal shadowing at 6dB, with 5dB noise figure and Bandwidth of 30 kgs at Temperature 20ºc. The wirelesslink also has cabling losses of 3dB, a receiver antenna gain of 5dB and transmitter antenna gain of 12dB. Think about the situation where interference level is same as the noise power and average power of Rayleigh fading channel is unity. Calculate transmit power necessary to achieve a bitter error rate of 10^{-4} by link budget analysis at receiver for BPSK modulation. **[10]**

b) Define the following terms: **[8]**

i) Traffic Intensity

ii) Lost call

iii) Holding time

iv) Grade of service

v) Blocking probability

vi) Erlang

vii) Busy hour call attempt

viii) Busy hour

OR

Q4) a) State and explain assumptions used to erlang determined grade of service of lost call system of finite number of trunks. **[6]**

b) During busy 1000 calls were offered to a group of trunks and 5 calls were lost. The average call duration was 2 minute find- **[6]**

i) Traffic offered

ii) Traffic carried

iii) Traffic Lost

iv) Grade of service

v) Total duration of period of congestion

c) Draw state transition diagram and explain B-D process. **[6]**

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Q5) a) Draw and Explain E-UTRAN Architecture **[5]**

b) Write note on

i) Global system for mobile communication **[3]**

ii) General packet Radio service **[3]**

iii) Enhanced data Rates for GSM evolution **[3]**

c) State and explain any four standards proposed to improve the performance of wireless LAN **[4]**

OR

Q6) a) Draw and explain coordinated multiple point transmisson and reception. **[4]**

b) Draw overall LTE Architecture with proper lables **[4]**

c) Compare LTE with LTE -A on following parameters. **[10]**

i) Peak data rate (uplink & Downlink)

ii) Modulation (uplink & Downlink)

iii) Access Technology (uplink & Downlink)

iv) Peak spectrum efficiency (uplink & Downlink)

v) Channel bandwidth

Q7) a) State and Explain scheduling algorithm for realtime traffic **[6]**

b) State and explain transport layer services? What are the challenges and issues in design of transport layer? **[7]**

c) State and explain broad diversity of direct QoE matrix? **[4]**

OR

Q8) a) What are the transmission challenges? How to mitigate these to maintain high quality media delivery in wireless IP network. **[6]**

b) State and explain key network performance parameters used to manage service performance **[5]**

c) State important parameters in scheduling decision and explain scheduler design. **[6]**