COLLEGE OF ENGINEERING, PUNE

(An Autonomous Institute of Government of Maharashtra.)
SHIVAJI NAGAR, PUNE - 411 005

END SEMESTER EXAMINATION
(ET-401) Mobile Communication TH

Course: B.Tech
Semester: VII
Year: 2014-2015
Duration: 3 Hours

Branch: Electronics & Telecommunication Engineering
Max Marks: 60
Date: 20 NOV 2014
Time: 02.00 pm - 05.00 pm
MIS no:

Instructions:

1. Figures to the right indicate the full marks.
2. Mobile phones and programmable calculators are strictly prohibited.
3. Writing anything on question paper is not allowed.
4. Exchange/Sharing of anything like stationery, calculator is not allowed.
5. Assume suitable data if necessary.
6. Write your MIS Number on Question Paper

Q.1 A. Determine the design parameters of three stage switch with inlet utilization of 0.1 to achieve a blocking probability as 0.002, for N= 128, 2048 and 8192. How the blocking probability can be altered? **3**

B. Explain in detail **any two** enhanced services that can be made available to subscribers by SPC: **4**

1. Abbreviated dialing
2. Malicious call tracing
3. Conference call facility
4. Call forwarding

C. Considering a typical example, discuss important parameters which are to be considered while framing the 'Charging plan' for PSTN subscribers by the exchange. **3**

OR

C. What is the objective of 'Numbering plan'? **3**
Explain different fields included in telephone number structure, support your answer with appropriate example.

D. Explain subscriber loop system with the help of four levels of cabling for telephone networks. **2**

Q.2 A. In time division switching, illustrate the effect of following on switching capacity (SC), **3**
a) overlapping control memory and data memory operation,
b) dual port memory chips.
Which type of switching is most preferred in multistage electronic exchange?

B. Related to traffic engineering in telecommunication switching system, state the steady state equations of B-D (birth death) process, giving significance of various parameters used in it. **3**

OR

Q.2 B. For telephone traffic analyses obtain the 'Poisson arrival' process equation, mention its significance and terms incorporated in it. **3**

C. Over a 20 minute observation interval, 40 subscribers initiate calls. Total duration of calls is 4800 sec. Calculate the load offered to the network by subscribers and average subscriber traffic. **2**

D. Referring to protocol architecture of SS7, state the functionality of the following, SCCP, OA & M, ISUP, TUP **4**

Q.3 A. Justify the statement, 'Reduction of cochannel interference is possible by means of a notch in the tilted Antenna Pattern'. **3**

B. What is adjacent channel interference? What are its effects on system performance? How this can be reduced? **3**

C. In GSM explain 'Frequency reuse' and 'Handover technique' illustrating need, method of achieving, advantages and disadvantages. **4**

D. Consider a GSM TDMA system with following parameters: **2**
Nr = 2, Nt = 24 frames of 120 ms with 8 time slots per frame, R_{rf} = 270.833 kbps,
br = 148 bits in each of 8 time slots, bp = 34 bits in each of 8 time slots,
bg = 8.25 bits in each of 8 time slots, T_f = 120 ms, R = 22.8 kbps,
Calculate frame efficiency and number of channels per frame.

Q.4 A. In GSM explain significance of 'Common Control Channel' and 'Dedicated Control Channel' and their types. **4**

B. Referring to MSC in GSM protocol architecture and mapping of GSM layers onto the corresponding OSI layers, explain the role of following: **4**
i) BSSAP, ii) MAP iii) CM iv) MM

C. Illustrate **any one** flow scenarios in GSM, **4**
a) Call release mobile initiated
b) Intra MSC Handover

Q.5 A. Describe in detail the forward link operation for IS-95 CDMA. **5**

B. In CDMA system, how multipath signal arrival problem is handled? **2**

C. Calculate the process gain, 'Gp' for DSSS CDMA system with 10 Mcps code clock rate and 4.8 kbps information rate. How it can be improved? **2**

D. In CDMA call processing process, explain functioning of the following: **3**
i) system initialization state, ii) traffic channel state.

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