

Visvesvaraya Technological University, Belagavi

MODEL QUESTION PAPER – Set I

6th Semester, B.E (CBCS) EC/TC

Course: 15EC654-Digital Switching System

Time: 3 Hours

Max. Marks: 80

Note: (i) Answer Five full questions selecting any one full question from each Module.

(ii) Question on a topic of a Module may appear in either its 1st or/and 2nd question.

| | | Module-1 | Marks |
|---|----|---|-------|
| 1 | a. | Explain in brief the operation of a four wire circuit used in two way transmission. | 10 |
| | b. | Explain in brief regulations, standards in a telecommunication network | 6 |
| | | OR | |
| 2 | a. | Explain in brief PCM primary multiplex group. | 8 |
| | b. | Define the terms dB, dBW and dBm. | 3 |
| | c. | An amplifier has an input resistance of 600 and a resistive load of 75 . When it has an r.m.s input voltage of 100mV, the r.m.s output current is 20mA. Find the gain in dB. | 5 |
| | | Module-2 | |
| 3 | a. | List out the difference between Message and circuit switching | 6 |
| | b. | What is the significance of distribution frames? Explain the operation of distribution frames. | 10 |
| | | OR | |
| 4 | a. | What are the functions of Switching System? | 8 |
| | b. | Explain the basic call processing in DSS. | 8 |
| | | Module-3 | |
| 5 | a. | Derive the Erlang's second distribution equation in case of switching systems for a Finite queue capacity. | 10 |
| | b. | During the busy hour a group of trunks is offered 100 calls having an average Duration of 3 min; one call fails to find a disengaged trunk. Find the traffic offered to the group and the traffic carried by the group. | 6 |
| | | OR | |
| 6 | a. | Find the grade of service when a total of 30E is offered to the 2 stage switching network and the traffic evenly distributed over the 10 outgoing routes. Also find | 6 |

| | | | |
|----|----|---|----|
| | | traffic capacity if $B \leq 0.01$. | |
| | b. | Define: a) GOS b) Busy hour c) CCR d) BHCA | 4 |
| | c. | Design a 3 stage fully interconnected network for 600 incoming trunks and 100 outgoing trunks that will make use of switches of size 5 x 5. Determine the number of cross points required. | 6 |
| | | Module-4 | |
| 7 | a. | An S-T-S network has 10 incoming and 10 outgoing highways. Each of which conveys 32 PCM channels between incoming and outgoing space switches; there are 20 lines containing time switches. During the busy hour, the network is offered 200E of traffic and it can be assumed that this is evenly distributed over the outgoing channel. Estimate the grade of service obtained if, <ul style="list-style-type: none"> i) Connection is required to a particular free channel on a selected outgoing highway (mode 1) ii) Connection is required to a particular outgoing highway, but any free Channel on it may be used (mode 2) | 10 |
| | b. | With flow diagram, discuss call forwarding feature. | 6 |
| | | OR | |
| 8 | a. | With a neat diagram, explain the operation of time switch implementation and bilateral synchronization system. | 8 |
| | b. | Explain in brief, basic software architecture used in DSS. | 8 |
| | | Module-5 | |
| 9 | a. | Explain in brief the software process matrices and describe the defect analysis with an example. | 10 |
| | b. | Explain the concept of embedded patcher. | 6 |
| | | OR | |
| 10 | a. | Explain in brief system outage and its impact on DSS reliability. | 8 |
| | b. | Explain in brief generic switch hardware architecture. | 8 |