Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**B. E. - SEMESTER – VII • EXAMINATION – WINTER 2012**

**Subject code: 173204 Date: 01-01-2013**

**Subject Name: Telecommunication Engineering**

**Time: 10.30 am - 01.00 pm Total Marks: 70**

**Instructions:**

1. **Attempt any five questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | (i) Define Grade of service. | **02** |
| | | (ii) Define folded network. | **02** |
| | | (iii) Define Sampling theorem. | **02** |
| | | (iv) For a 25 entity in a fully connected network, how many links are required? | **01** |
| | **(b)** | What are the broad categories of the enhanced services? | **07** |
| **Q.2** | **(a)** | Discuss Single-stage Vs Multi-stage Network. Draw N x N, 3 stage switching network & Give total number of switching elements used in it. | **07** |
| | **(b)** | Compare centralized SPC and distributed SPC. With the help of block diagram explain in detail about typical centralized SPC organization. | **07** |
| | | **OR** | |
| | **(b)** | A three stage switching network supports 64 inlets and outlets. It is supposed to use 8 first stage and third stage matrices.<br>(i) What is the number of switching elements in the network if it is Non-blocking?<br>(ii) Determine switch advantage ratio. | **07** |
| **Q.3** | **(a)** | Explain time multiplexed time (time slot interchange) switch. | **07** |
| | **(b)** | Calculate the maximum access time that can be permitted for the data and control memories in a TSI switch with a single input and single output trunk multiplexing 2500 channels. Also, estimate the cost of the switch and compare it with that of a single stage space division switch. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | With help of the schematic, explain input controlled time division space switch. | **07** |
| | **(b)** | Explain in detail time multiplexed space switching with diagram. | **07** |
| **Q.4** | **(a)** | With help of a bar graph, explain typical telephone traffic pattern of an urban area on a working day and define different busy hours. | **07** |
| | **(b)** | (i) Over a 20 minute observation interval, 40 subscribers initiate calls. Total duration of the calls is 4800 seconds. Calculate the load offered to the network by the subscribers and the average subscriber traffic. | **04** |
| | | (ii) An exchange serves 2000 subscribers. If the average BHCA is 10,000 and the CCR is 60%, calculate the busy hour calling rate. | **03** |
| | | **OR** | |
| **Q.4** | **(a)** | List charging plan for telecommunication and discuss any two. | **07** |

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|---|---|---|---|---|
| | **(b)** | (i) | During 2 hours of busy period 2400 calls arrived at an exchange, average holding time per call is 2 minutes. What is traffic load in (1)Erlangs (2) CCS? | **04** |
| | | (ii) | In a group of 10 Servers, each is occupied for 30 minutes in an Observation interval of two hours. Calculate the Traffic carried by each and by the group. | **03** |
| **Q.5** | **(a)** | | Discuss the international numbering plan for telephone network. | **07** |
| | **(b)** | | Draw and explain the block diagram of a pulse code modulation system for speech communication. | **07** |

**OR**

| | | | |
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| **Q.5** | **(a)** | Write a short note on Vocodor. | **07** |
| | **(b)** | Classify signalling technique & compare Inchannel Vs Common Channel Signalling. | **07** |

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