

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – SUMMER 2024****Subject Code: 3173212****Date:24-05-2024****Subject Name: Telecommunication Engineering****Time:02:30 PM TO 05:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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|------------|---|-----------|
| Q.1 | (a) Explain Time Division Time Switch in detail. | 03 |
| | (b) Given that MTBF = 2000 hrs and MTTR = 4 hrs. Calculate the unavailability for single and dual processor systems for 10 years and 30 years. | 04 |
| | (c) List the difference between Single stage and Multi stage switching network. | 07 |
| Q.2 | (a) What is SPC? Discuss operations of Standby mode and synchronous duplex mode of stored program control. | 03 |
| | (b) An exchange serves 4000 subscribers. If the average BHCA is 24000 and the CCR is 50%, calculate the busy hour calling rate. | 04 |
| | (c) Explain in detail LCC system with finite subscribers with derivation of blocking probability and GOS. | 07 |
| | OR | |
| | (c) Compare level 3, level 2 and level 1 processing. | 07 |
| Q.3 | (a) Draw and explain the basic scheme for Common Channel Signalling. | 03 |
| | (b) With the help of block diagram explain Input controlled time division space switch. | 04 |
| | (c) Classify Signaling technique & Discuss the architecture of SS7. | 07 |
| | OR | |
| Q.3 | (a) Explain in detail with diagrams of Time slot interchange switch (TSI). | 03 |
| | (b) Explain briefly with neat diagrams, the centralized switching and distributed switching. | 04 |
| | (c) Draw and explain the block diagram of a pulse code modulation system for Speech communication. | 07 |
| Q.4 | (a) At certain exchange a total of 5000 calls are originated during the busy hour. If the average holding time of a call is 2.5 minutes, calculate the flow of traffic during this period. | 03 |
| | (b) What are the broad categories of the enhanced services? | 04 |
| | (c) Explain the N X N three stage switching network with Lee's graph. | 07 |
| | OR | |
| Q.4 | (a) Write a short note on subscriber loop system. | 03 |
| | (b) Explain DMS-100 switching system. | 04 |
| | (c) Explain the classification of switching systems & In what way is stored program control superior to hard wired control. | 07 |

- Q.5** (a) During the busy hour, 1200 calls were offered to a group of trunks and six calls were lost. The average call duration was 3 minutes. Calculate the Grade of Service of the network. **03**
- (b) Discuss Birth-death processes in detail with example. **04**
- (c) Compare circuit switching and message switching with suitable diagram also. **07**
- OR**
- Q.5** (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. **03**
- (b) Explain VOCODER system in detail. **04**
- (c) Draw and explain Time Multiplexed Space Switching. **07**
