# INSTITUTE OF AERONAUTICAL ENGINEERING
## (Autonomous)
### Dundigal, Hyderabad - 500 043

MODEL QUESTION PAPER-II

B.Tech V Semester End Examinations, November - 2019
**Regulations: IARE-R16**
**TELECOMMUNICATIONSWITCHING THEORYANDAPPLICATIONS**
(Only for ECE)

**Time: 3 hours**                                                                 **Max. Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the question must be answered in one place only

## UNIT – I

1  a) Explain The classification of switching systems? In what way is stored program control superior to hardwired control? [7M]

   b) Draw and explain 3X3 crossbar switching principal in details. [7M]

2  a) What is a three stage network and derive the expression to find number of cross point in three stage network when it has  a) N incoming and N outgoing trunks b)M incoming trunks and N outgoing trunks(M >N) ? [7M]

   b) Explain the operations of a single and multistage cross bar switch. [7M]

## UNIT – II

3  a) Explain the Time Multiplexed Time switching with Parallel-in/ serial-out configuration. [7M]

   b) What are the differences between input and output controlled Time division space switch techniques. [7M]

4  a) Explain basic Time division Time Switching with Random Write and Sequential read. [7M]

   b) Compare Combination Switching with Electronic Space switching and Time Division Switching? [7M]

## UNIT – III

5  a) Explain the Open Systems Interconnection( OSI )reference model with neat diagram. [7M]

   b) Explain Configurations, Topologies and Transmission modes of a Data communication circuits. [7M]

6  a) Describe the LAN, MAN, and WAN and list advantages and disadvantages of each network. [7M]

   b) What is the need of application layer and explain the ISO/OSI reference model? [7M]

**UNIT – IV**

| 7 | a) | Draw the basic schematic of common channel signaling (ccs) and discuss the ccs signaling message formats. | [7M] |
|---|----|------|------|
|   | b) | Explain different signaling techniques in telecommunication network. | [7M] |
| 8 | a) | Explain the operation of an echo suppressor in a Transmission Plan with detail examples. | [7M] |
|   | b) | Describe the Switching Hierarchy and Routing used in telephone networks. | [7M] |

**UNIT – V**

| 9 | a) | Draw the layered architecture of OSI reference model and discuss the services provided by various layers | [7M] |
|---|----|------|------|
|   | b) | Explain in detail the charging plan for telecommunication networks and its applications. | [7M] |
| 10 | a) | Write in detail about Integrated Services Digital Network (ISDN) basic rate access architecture. | [7M] |
|   | b) | What are the advantages of Integrated Services Digital Network (ISDN)? Draw and Explain. | [7M] |

**COURSE OBJECTIVES:**

| I | Learn to consider Tele-traffic demands, quality of service, scalability, performance and cost into consideration to develop requirements and architectures. |
|---|---|
| II | Underlyingtechnologiesandapplicationsincludingwirelesscommunications, including mobility, optical communications, wave length routing, packet networks and the Internet. |
| III | CoordinatedwithCS440, computer networks, where communications protocols and the TCP/IP protocols suite a readdressed. |

**COURSE OUTCOMES:**

| CO 1 | Review,analyse,interpretandexplainthemainconceptsoftelecommunicationnetwork |
|---|---|
| CO 2 | Evaluate, compare, classify and explain the operation of fundamental telecommunication switching network configurations models. |
| CO 3 | Discuss, classify and determine the significance of basic modern signaling system. |
| CO 4 | Analyse,interpretanddiscusstheconceptsofOSI/ISOandexplainitsroleindesignoftelephone network. |
| CO 5 | Analyse,interpretanddiscusstheconceptsIntegratedServicesDigitalNetworks,typesofnetworks, chargingp roceduresandroutingmechanisms. |

**COURSE LEARNING OUTCOMES:**

| AEC523.01 | Understandbasicandsomeadvancedconceptsandtechniquesoftelecommunicationsnetworks. |
|---|---|
| AEC523.02 | Discuss the simple telephone communication. |
| AEC523.03 | Ability to analyse the characteristics of the telephone systems. |
| AEC523.04 | Ability to analyse the processes used in telecommunication. |
| AEC523.05 | Ability to make use of the parameters in designing telephones witches |
| AEC523.06 | Discussthebasicsettingsintheoperationoftelecommunicationssystemsanddevices. |
| AEC523.07 | Determine the traffic engineering and traffic load Parameters. |
| AEC523.08 | Understand the, grade of service and blocking probability predicttsoccerscores. |
| AEC523.09 | Implement the performance of a digital telephone switch. |
| AEC523.10 | Evaluate the Time Division Multiplexing services. |
| AEC523.11 | ExplainnetworkandtransportlayerfunctionsanddescribeInternetroutingalgorithmsandTCP/IP protocols. |
| AEC523.12 | Understand the concept of ISO/OSI models. |
| AEC523.13 | AcquirethepurposeoflayeringanddescribethecurrentlayeredarchitecturefortheInternet |
| AEC523.14 | Analyse the LAN and metropolitan network. |
| AEC523.15 | Apply the fiber optics into data networks |

| AEC523.16 | Design network synchronization and network management |
|---|---|
| AEC523.17 | Understand the cellular communication networks. |
| AEC523.18 | Develop problem solving approaches as applied in telecommunications networking areas. |
| AEC523.19 | Abletoanalyseperformanceofbasiccommunicationnetworksusingbothanalyticalandsimulation techniques. |
| AEC523.20 | Applythetelecommunicationnetworkdesigntechniquesandpracticalimplementationissues |
| AEC523.21 | Understand the network and protocol architecture. |
| AEC523.22 | Determine the voice data integration. |
| AEC523.14 | Analyse the LAN and metropolitan network. |

## MAPPING OF SEMESTER END EXAMINATION TO COURSE LEARNING OUTCOMES:

| SEE Question No. | | CLO Code | Course learning Outcomes | CO Code | Blooms Taxonomy Level |
|---|---|---|---|---|---|
| 1 | a | AEC523.01 | Explain The classification of switching systems? In what way is stored program control superior to hardwired control? | CO 1 | Understand |
| | b | AEC523.01 | Draw and explain 3X3 crossbar switching principal in details. | CO 1 | Understand |
| 2 | a | AEC523.02 | What is a three stage network and derive the expression to find number of cross point in three stage network when it has a) N incoming and N outgoing trunks b)M incoming trunks and N outgoing trunks(M >N) ? | CO 1 | Understand |
| | b | AEC523.04 | Explain the operations of a single and multistage cross bar switch. | CO 1 | Understand |
| 3 | a | AEC523.10 | Explain the Time Multiplexed Time switching with Parallel-in/ serial-out configuration. | CO 2 | Remember |
| | b | AEC523.10 | What are the differences between input and output controlled Time division space switch techniques. | CO 2 | Understand |
| 4 | a | AEC523.12 | Explain basic Time division Time Switching with Random Write and Sequential read. | CO 2 | Understand |
| | b | AEC523.05 | Compare Combination Switching with Electronic Space switching and Time Division Switching? | CO 2 | Understand |
| 5 | a | AEC523.12 | Explain the Open Systems Interconnection( OSI )reference model with neat diagram. | CO 3 | Remember |
| | b | AEC523.06 | Explain Configurations, Topologies and Transmission modes of a Data communication circuits. | CO 3 | Understand |
| 6 | a | AEC523.14 | Describe the LAN, MAN, and WAN and list advantages and disadvantages of each network. | CO 3 | Remember |
| | b | AEC523.12 | What is the need of application layer and explain the ISO/OSI reference model? | CO 3 | Understand |
| 7 | a | AEC523.17 | Draw the basic schematic of common channel signaling (ccs) and discuss the ccs signaling message formats. | CO 4 | Understand |
| | b | AEC523.06 | Explain different signaling techniques in telecommunication network. | CO 4 | Remember |
| 8 | a | AEC523.13 | Explain the operation of an echo suppressor in a Transmission Plan with detail examples. | CO 4 | Understand |
| | b | AEC523.09 | Describe the Switching Hierarchy and Routing used in telephone networks. | CO 4 | Understand |
| 9 | a | AEC523.12 | Draw the layered architecture of OSI reference model and discuss the services provided by various layers. | CO 5 | Remember |
| | b | AEC523.12 | Explain in detail the charging plan for telecommunication networks and its applications. | CO 5 | Understand |

| SEE Question No. | | CLO Code | Course learning Outcomes | CO Code | Blooms Taxonomy Level |
|---|---|---|---|---|---|
| 10 | a | AEC523.20 | Write in detail about Integrated Services Digital Network (ISDN) basic rate access architecture. | CO 5 | Remember |
| | b | AEC523.21 | What are the advantages of Integrated Services Digital Network (ISDN)? Draw and Explain. | CO 5 | Understand |

**Signature of Course Coordinator**                                                        **HOD, ECE**