Question Paper Details					
Course	Stream	Semester	Subject	Paper Code	Chapter
B.Tech	ECE	6th	Telecommunication Systems	EC603	1 Introduction to Telephone System

Paper Setter Details			
Name	Designation	Mobile No	Email Id
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MCQ [Type-1]   **[Maximum marks: 1]**

1. For a fully connected network of 10 subscribers the number of links required are
a)10   b) 5   c) 45   d)   55.
The inter digit gap between two digits in pulse dialing is at least
a)   200 ms b)   200 ns
c)   200 s   d)   none of these.
2. Traditional telephone lines can carry frequencies between
a)   400 and 3400 Hz   b)   300 and 3600 Hz
c)   300 and 3400 Hz   d)   300 and 3800 Hz.
3. Loudspeaker is an end instrument of
a)   transmitter side   b)   receiver side
c)   both (a) and (b)   d)   none of these.
4. A switching network with unequal number of inlets and outlets is called
a)   Symmetric Network   b)   Asymmetric Network
c)   Folded Network   d)   None of these.
5. The original telephone network, which is referred to as the plain old telephone system
(POTS), was an _____ system.
A) analog   B) digital   C) digital as well as analog   D) none of the above

Short Question [Type-2]   **[Maximum marks: 2]**

1. What is point to point Communication?
2. Mention the disadvantages of the point to point communication.
3. If the number of nodes in point-to-point communication is 770, find out the total number of links required for total connectivity.
4. What are the differences between common control and direct control?
5. Define Simplex Communication and Half-Duplex and Full-Duplex communication.
6. Define symmetric network and folded network.
7. Define Trunk lines and subscriber lines.

Subjective question [Type-3]   **[Maximum marks: 3]**
1. What are the advantages of automatic switching exchanges over manual exchanges?
2. Explain the touch dial arrangement with proper diagram.
3. Draw the pulse dialing waveform for the number 42.
4. What is the significance of side tone in telephone conversation?
5. What are the advantages of automatic switching exchanges over manual exchanges?

Broad Question [Type-4]   **[Maximum marks: 5]**

1. Explain the various signalling tones with diagram.
2. Draw the rotary dial telephone parts and explain the mechanism.
3. Explain the elements of an electrical and optical communication system.
4. Classify the switching systems. Compare the electromechanical and electronic switching systems.

Question Paper Details					
Course	Stream	Semester	Subject	Paper Code	Chapter
B.Tech	ECE	6th	Telecommunication Systems	EC603	2 Telecommunication Transmission Lines

Paper Setter Details			
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MCQ [Type-1]   **[Maximum marks: 1]**

1. In an optical fiber, the concept of Numerical aperture is applicable in describing the ability of _____.
a. Light Collection   b. Light Scattering   c. Light Dispersion   d. Light Polarization
2. _____ cable consists of an inner copper core and a second conducting outer sheath.
  a) Twisted-pair   b) Shielded twisted-pair   c) Coaxial   d) Fiber-optic
3. What is the major factor that makes coaxial cable less susceptible to noise than twisted-pair cable?
A) insulating material   B) inner conductor
C) diameter of cable   D) outer conductor
4. A(n) _____ medium provides a physical conduit from one device to another.
A) unguided   B) guided   C) either (a) or (b)   D) none of the above
5. The local loop has _____ cable that connects the subscriber telephone to the nearest end office.
A) fiber-optic B) coaxial   C) twisted-pair   D)   none of the above
6. Transmission media are usually categorized as _____.
A) determinate or indeterminate   B) fixed or unfixed
C) guided or unguided   D) metallic or non-metallic
7. Which of the following primarily uses guided media?
A) radio broadcasting   B) satellite communications
C) local telephone system   D) cellular telephone system

Short Question [Type-2]   **[Maximum marks: 2]**

1. Define guided media and unguided media.
2. What are the different transmission media?
3. Name the different guided media.
4. Define various types of twisted pair cable.

Subjective question [Type-3]   **[Maximum marks: 3]**

1. Describe the merits and demerits of fibre optic vs copper and co-axial cables for telecommunication transmission media.
2. In what way multi-mode and single-mode fibers differ?
3. State the advantages and disadvantages of coaxial cable.
4. State the advantages and disadvantages of fiber optic cable.

Broad Question [Type-4]   **[Maximum marks: 5]**

1. How many types of transmission media are used in telecommunication? What are the advantages of twisted pair cable over parallel wire cable? What are step index fibre and graded index fibre?
2. Explain the operation of 2-wire to 4-wire hybrid system.
3. Explain different propagation mode of fiber optic cable.

Question Paper Details					
Course	Stream	Semester	Subject	Paper Code	Chapter
B.Tech	ECE	6th	Telecommunication Systems	EC603	3 Subscriber Loop Systems

Paper Setter Details			
Name	Designation	Mobile No	Email Id
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MCQ [Type-1]   **[Maximum marks: 1]**

1. Attenuation can be reduced in subscriber loop by using
a)   higher diameter in copper wire   b)   series of inductance in line
c)   lower diameter in copper wire   d)   series of capacitance in line.

2. The supply voltage used in telephone exchange is
a) 24 V   b) 48 V   c) 12 V   d) 5 V.digit

3. In 100 line exchange the subscriber number must be
a) 100 digit   b) 2 digit   c) 10 digit   d) 3 digit

Short Question [Type-2]   **[Maximum marks: 2]**

1. What is BORSCHT function? Why is this important in electronic exchange?
2. Explain subscriber local loop architecture.
3. Write down the differences between In Channel signalling and Common Channel Signalling.
4. Explain subscriber local loop architecture.

Subjective question [Type-3]   **[Maximum marks: 3]**

1. Discuss about different switching networks. What is transit exchange? What are the advantages of automatic switching system over manual switching system
2. Explain the advantages of Common Channel Signaling over In Channel signaling.
3. Explain associated and non-associated common channel signaling.
4. Explain the hierarchical routing with suitable diagram.
5. What is SS7 signaling system? Explain its protocol.
6. Explain level -1 and level-2 functions of a SS7 signaling systems.
7. An exchange uses - 48 V battery, a resistance of 300 ohm is placed in series with the battery. If the telephone set resistance is 50 ohm, calculate the loop resistance limit for the minimum current requirement of 23 mA for carbon microphone. Calculate dc loop resistance, for the loop length of 10 km.

Broad Question [Type-4]   **[Maximum marks: 5]**

1. Define subscriber loop. Explain switching hierarchy and routing with a neat diagram.
2. How are the signaling techniques classified? What are the disadvantages of a inband signaling?
3. Define the following: (i) Switching Capacity, (ii) Cost Capacity Index (CCI) (iii)Equipment Utilization Factor, (iv) Traffic Handling Capacity.

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MCQ [Type-1]   **[Maximum marks: 1]**

1. In DTMF tone the frequency used is
a)   697/1209 Hz   b) 900/1400 Hz   c) 10/100 Hz   d) 220/1477 Hz.
2. Crossbar switching system is
a)   Electromechanical   b)   Electronic   c) Analog   d) Digital switching system.
3. Switching capacity of a 6 × 6 crossbar switching system is
a)   6   b)   3   c)   12   d)   36.
4. In 100 line exchange the subscriber number must be
a)   100 digit   b)   2 digit   c)   10 digit   d)   3 digit.
5. ESS stands for
a)   Electronic Switching System   b)   Effective Electronic Switching System
c)   Early Electronic Switching System   d)   none of these.

6. Outband signaling uses
a)   0-3400 Hz   b)   300-1200 Hz
c)   3400-4000 Hz   d)   5000-6000 Hz.
7. When the control sub-system is outside the switching network, then the system is called
a)   Direct Control   b)   Common Control
c)   Stored Program Control   d)   None of these.
8. If PCM binary samples are switched, switching is known as
a)   analog time division switching   b)   digital time division switching
c)   time division switching   d)   none of these.
9. A local telephone network is an example of a _____ network.
A) packet-switched   B) message-switched
C) circuit-switched   D) none of the above
10. The protocol that is used for signalling in the telephone network is called _____.
A) SSS   B) SS7   C) POP   D) none of the above
11. In _____signalling, a portion of the bandwidth is used for signalling and another portion for data.
A) mixed   B) in-band   C) out-of-band   D) none of the above
12. Circuit switching takes place at the layer of
a) data line   b) physical   c) network   d) transport
13. If PCM samples are switched, switching is known as
a) analog time division switching   b) digital time division switching
c) time division switching   d) none of these

Short Question [Type-2]   **[Maximum marks: 2]**

1. Explain the differences between circuit switching and packet switching.
2. What is the difference between time switch and space switch.
3. Explain the difference between circuit switching and store & forward (S&F) switching technologies.

Subjective question [Type-3]   **[Maximum marks: 3]**

1. Define side tone. How side tone can be minimized?
2. State the working principle of carbon microphone for simplex mode of communication.
3. Describe how an uniselector rotary switch can be used as selector hunter.
4. Design a 4x4 crossbar switching system with minimum number of crosspoints.
5. Compare Time Division Space Switching and Space Division Switching.
6. Describe the operation of basic time division time switching.

Broad Question [Type-4]   **[Maximum marks: 5]**

1. Explain the principle of DTMF dialling.
2. Draw the configuration of Step by Step Switching System.
3. Explain the operation of two motion selector. Explain the configuration and working of Strowger Switching System.
4. Explain the working principle of 6 by 6 Crossbar Switching System with neat diagram.

5. What is Step by Step Switching? Describe the selector hunter based access mechanism in Strowger System.

Question Paper Details					
Course	Stream	Semester	Subject	Paper Code	Chapter
B.Tech	ECE	6th	Telecommunication Systems	EC603	5 Stored Program Control

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MCQ [Type-1]   **[Maximum marks: 1]**

1. MTTR means
a) Mean Time To Repair   b) Maximum Time To Repair
c) Most Time To Repair   d) Mean Time To Represent.
2. Blocking probability is
a) call congestion   b) time congestion   c) both (a) and (b)   d) none of these.
3. Compared to single processor based, dual processor based SPC exchange offers
a)Higher unavailability   b)Higher availability
 c) Higher reliability   d)Higher reliability & availability
4. CHILL is a
a) CCITT language   b) IEEE language   c) IEE language   d) ANSI language

Short Question [Type-2]   **[Maximum marks: 2]**

1. What is stored program control?
2. In SPC systems MTBF=4000Hr and MTTR=4Hr. Calculate the unavailability for single and dual processor systems for 30 years.
3. How centralized SPC differs from distributed SPC?

Subjective question [Type-3]   **[Maximum marks: 3]**
1. Explain Digital PABX.
2. Explain the different modes of centralized SPC.
3. Describe centralized SPC system. What
4. Calculate the unavailability of single and dual processor systems in stored program control systems.
5. What is distributed SPC system?

Broad Question [Type-4]   **[Maximum marks: 5]**

1. Describe the centralized SPC organization system.
2. How load sharing mode is superior to synchronous duplex mode?

Course	Stream	Semester	Subject	Paper Code	Chapter
B.Tech	ECE	6th	Telecommunication Systems	EC603	6 Traffic Engineering

Paper Setter Details

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MCQ [Type-1]   **[Maximum marks: 1]**

1. GOS in India is
a) 0.002   b) 0.02   c)0.2   d) 2.
2. The unit of traffic intensity is
a) ampere   b) ohm   c) erlang   d) meter.
3. One Erlang is equal to
a)   36 CCS b)   3600 CCS   c)   60 CCS d)   none of these.
4. The 60 minute interval in a day in which the traffic is the highest is called the
a) Busy hour   b) Peak busy hour   c) Time consistent busy hour   d) None of these.
5. The ratio of the number of successful calls to the total No. of calls attempt is called
a)   Busy Hour Call Attempt   b)   Call Completion Ratio
c)   Busy Hour Calling Rate   d)   Traffic Load.
6. In a Strowger system the high value of CCI indicates
a) good design   b) poor design   c) no impact on design   d)none of these.
7. A subscriber makes 3 phone calls of 3 minutes, 4 minutes and 2 minutes duration in one hour period. Calculate the subscriber traffic in Erlangs.
a) 0•15 E   b) 0•2 E   c) 0•5 E   d) 0•7 E.
8. High bandwidth for short duration is needed for
a)   data traffic   b) voice traffic c) both (a) and (b)   d) neither (a) nor (b).

Short Question [Type-2]   **[Maximum marks: 2]**

1. Define GOS and Blocking Probability.
2. Show that GOS = PB, where PB is the blocking probability.
3. Define Call Completion Rate (CCR).
4. Define Busy Hour and Busy Hour Call Attempts (BHCA).
5. An exchange serves 2000 subscribers. If the average BHCA is 10,000 and CCR is 60%, calculate the busy hour calling rate.

Subjective question [Type-3]   **[Maximum marks: 3]**

1. Derive Erlang B formula.
2. During 1200 calls offered to a group of trunks 12 calls were lost. The average call duration was 3 minutes. Find out the traffic offered and traffic carried in Erlang. Also find out the value of GOS and the total duration of period of congestion.

Broad Question [Type-4]   **[Maximum marks: 5]**

1. 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.
2. What is blocking exchange? In a group of 10 servers each is occupied for 30mins in an observation interval of two hours. Calculate the traffic arrived by the group.

Question Paper Details					
Course	Stream	Semester	Subject	Paper Code	Chapter
B.Tech	ECE	6th	Telecommunication Systems	EC603	7 Modems and Their Standards

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MCQ [Type-1]   **[Maximum marks: 1]**

1. In NT 1 interface occurs between
a)   ISDN & Customer   b)   PBX & Customer
c)   PBX & ISDN   d)   FAX & ISDN.
2..ISDN B-channel carries data and services at
a)   16 kbps   b)32 kbps   c)   64 kbps   d)   1•544 Mbps.

3. Network termination interface between a customer premises and ISDN network is called
a)   NT 1   b)   NT 2   c)   TE 1   d)   TE 2.
4. Which of the following is correct ?
a) 1E = 60 CCS   b) 1E = 36 CCS   c) 1E=3600CCS   d) None of these.

5. In B-ISDN, minimum data rate can be
a)   155 Mbps   b)   333 Mbps   c) 600 Mbps   d) 165 Mbps.

6. ISDN B-Channel carries data and services at
a) 16 kbps   b)   32 kbps   c)64 kbps   d)1.544 kbps.

7. MODEM stands for
a) Modulator demodulator   b) MUX DEMUX   c) DTE device   d) none of these.

8. ISDN means
a) Integrated Service Digital Network   b) International System Digial Network
c) Indian Supply Direct Network   d) None of these

9. In modem uploading data rates always less than downloading data rates because

   a) SNR (20dB) is very low in communication channel
   b) Quantization noise limits the channel data rates

c) During uploading extra control bits are added with the data.

d) None of these

Short Question [Type-2]   [Maximum marks: 2]

1. What is ISDN?
2. Describe transmission channels in ISDN.
3. Define DTE and DCE.
4. Define B-ISDN.

Subjective question [Type-3]   [Maximum marks: 3]

1. Write brief about user network interface in ISDN.
2. What is ISDN? Explain the services of ISDN.
3. What is "cross talk" in DSL technology?
4. What is the difference between an ADSL modem and a DSL modem?

Broad Question [Type-4]   [Maximum marks: 5]

1. Describe the functional grouping and reference points of ISDN
2. Explain how data communication takes place between DTE and DCE using RS 232C serial interface.
3. Describe the facsimile transmission and its technical details.
4. Write short note on ADSL, Principle of FAX transmission.

Question Paper Details					
Course	Stream	Semester	Subject	Paper Code	Chapter
B.Tech	ECE	6th	Telecommunication Systems	EC603	8 IP Telephony

Paper Setter Details			
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MCQ [Type-1]   [Maximum marks: 1]

1. Which of the following is the most commonly used VoIP standard?
a) SDP   b) IMS   c) SIP   d) None of the mentioned

2. Which of the following is NOT considered a VoIP protocol?
a) SIP   b) SS7   c) H.225 call signalling   d) All of the above

3. What is the bandwidth minimum that most experts recommend for good VoIP call signal quality?
a) 16 Kbps   b) 90 Kbps   c) 256 Kbps   d) None of the above

4. What does VOIP mean?
a) Venison on island pentulia   b) Voice over iguana protocol
c) Voice over internet protocol   d) Voice over internet primary

5. Session Initiation Protocol (SIP), has a mechanism that finds the _____.
a) Domain   b) System   c) IP Address   d) Terminal

6. In Voice Over IP, Term SIP stands for
a) Session Initiation Protocol   b) Session Initiation Port
c) Session Initiation Path   d) Session Initiation Packet

Short Question [Type-2]   **[Maximum marks: 2]**

1. What is VoIP and what does it stand for?
2. Who can we call if we are using a VoIP service?
3. Are there any advantages in using VoIP phone service?
4. What are the requirements for VoIP?
5. What is SIP? What are the advantages of SIP?

Subjective question [Type-3]   **[Maximum marks: 3]**

1. What are the applications of SIP?
2. What is IP Multimedia?
3. What IP Multimedia Service does?
4. What are the key features of IP Multimedia services?

Broad Question [Type-4]   **[Maximum marks: 5]**

1. What is session initiation protocol? Describe SIP message with example. How does telephone communications operate using H.323 standard protocol?
2. What is VoIP? How to make a VoIP phone call?
3. What is H.323 Signaling?