

GURU NANAK INSTITUTE OF TECHNOLOGY

An Autonomous Institute under MAKAUT

2020-2021

TELECOMMUNICATION SYSTEMS (BACKLOG)

EC504C

TIME ALLOTTED: 3 Hours

FULL MARKS: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

(Multiple Choice Type Questions)

Answer any *ten* from the following, choosing the correct alternative of each question: **10×1=10**

		Marks	CO No.
1(i)	For a fully connected network of 10 subscribers the number of links required are a) 10 b) 5 c) 45 d) 55	01	CO1
1(ii)	The interdigit gap between two digits in pulse dialing system is a) 200ms b) 200 ns c) 200 μ s d) none of these	01	CO2
1(iii)	Bandwidth of optical fiber is _____. a) 200MHz b) 0 c) ∞ d) 1 KHz	01	CO5
1(iv)	In time division multiplexing 24 channel are to be multiplexed each with 2.5 Mbps data rates. The data rate of a given channel after multiplexing is a) 60 Mbps b) 48 Mbps c) 30 Mbps d) none of these	01	CO2
1(v)	MODEM stands for a) Modulator demodulator b) MUX DEMUX c) DTE device d) none of these.	01	CO5

B. TECH/ECE/ODD/SEM-V/EC504C/R16/2020-2021

1(vi)	If PCM binary samples are switched, switching is known as a) analog time division switchin b) digital time division switching c) time division switching d) none of these	01	CO2
1(vii)	Blocking probability is a) time congestion b) call congestion c) both (a) and (b) d) none of these	01	CO3
1(viii)	Switching capacity of a 6×6 crossbar switching system is a) 6 b) 3 c) 12 d) 36	01	CO4
1(ix)	Outband signaling uses a) 0-3400 Hz b) 300-1200 Hz c) 3400-4000 Hz d) 5000-6000 Hz	01	CO5
1(x)	In a diagonal cross-point matrix switching system, if the number of cross-point switches 136, then the number of subscriber is a) 27 b) 17 c) 14 d) 30	01	CO4
1(xi)	Bandwidth of digital transmission media is expressed in a) Hz b) Bits per second c) Decibel d) Erlang	01	CO3
1(xii)	A telephone set requires bias current of a) 1 – 2 mA b) 4 – 6 mA c) 20 – 30 mA d) 50 – 100 mA	01	CO1

GROUP – B

(Short Answer Type Questions)

(Answer any *three* of the following) **3 x 5 = 15**

		Marks	CO No.
2.	Draw the block diagram of Step-by-step switching system and explain.	5	CO2
3.(a)	What is DTMF?	2	CO1
3.(b)	What is sidetone and how it is minimized?	5	CO1

B. TECH/ECE/ODD/SEM-V/EC504C/R16/2020-2021

4.	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 subscriber and average subscriber traffic.	5	CO1
5.	Describe merits and demerits of fibre optic cables vs copper coaxial cables for telecommunication transmission medium.	5	CO3
6.(a)	Explain the operation of carbon microphone.	3	CO1
6.(b)	Why event monitoring has highest priority in telecommunication system?	2	CO2

GROUP – C

(Long Answer Type Questions)

(Answer any *three* of the following)

3 x 15 = 45

		Marks	CO No.
7.(a)	Show that $GOS = PB$, where $PB =$ Probability of blocking.	5	CO2
7. (b)	Describe the operation of basic Time division time switching	5	CO5
7. (c)	If the no. of calls during the busy hour is 3700 & the particular exchange is designed to handle 1700 calls during busy hour. Then what will be resulting GOS ?	5	CO4
8.(a)	Make a comparative study between circuit, message and packet switching.	6	CO2
8.(b)	Explain subscriber loop system with proper diagram.	5	CO3
8.(c)	Describe Standby Mode of Centralised SPC with the operation.	4	CO2
9.(a)	Describe time division switching and calculate the switching capacity of systems with respect to data and control memory access time.	10	CO5
9.(b)	Given $MTBF=2000$ hr and $MTTR= 4$ hr calculate unavailability of single and dual processor system	5	CO2
10.(a)	Describe switching hierarchy using routing.	5	CO3
10.(b)	What is ISDN? Explain transmission channel in ISDN.	5	CO5
10.(c)	What are drawbacks of ISDN? How does B-ISDN overcomes it?	5	CO5
11.	Write short notes on any three		
11.(a)	SONET	5	CO5
11.(b)	B-ISDN	5	CO5
11.(c)	Reed relay cross point switch	5	CO2
11.(d)	BORSCHT	5	CO3
11.(e)	Components of Telecommunication	5	CO1