



Sardar Patel Institute of Technology
Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India
(Autonomous College Affiliated to University of Mumbai)

Online-End Semester Examination

December 2021

Max. Marks: 60

Class: B.E./BTech.

Course Code: ELE 73B

Name of the Course: Computer and Communication Networks

Duration: 2 hrs, 10 mins.

Semester: VII

Branch: ETRX

Instructions:

- (1) All questions are compulsory.
- (2) Draw neat diagrams with dark **pencil only** with proper labeling
- (3) Assume suitable data wherever required; clearly state the same.

Q. No.		Max. Marks	CO-BL-PI
1 a)	1) Recognize relevant port numbers with respect to the following services: A) E-Mail B) Availability of data over a LAN C) Monitoring SCADA systems remotely D) Web Browsing.	4	1-2-2.1.2
	2) Draw a neat labelled diagram of the 7 layer OSI model highlighting the significance of encapsulation and decapsulation process of data.	3	1-2-2.1.2
b)	Discuss the solution to hidden node problem in CSMA/CA problem in Wireless Networks. Also discuss how 1 persistent, non-persistent and p-persistent works to handle delay (idle/waiting period) in case of CSMA/CD.	8	2-3-2.2.4
	(OR)		
b)	What is Availability? Explain in brief. A data failure was observed wrt an ISP services the details of which are as follows: The first failure occurred on December 20, 2020 at 12:05:10 in 1 minute 38 seconds. The second failure occurred on December 25, 2020 at 21:33:20 in 2 minutes 3 seconds, and the third failure occurred on December 28, 2020, at 10:07:29 in 15 minutes 17 seconds. Find: Mean Time To Repair, Mean time Between Failure and service availability	8	2-3-2.2.4

2 a)	Discuss roles and responsibilities of the following OSI layers: 1) Transport layer 2) Data Link layer	7	1-2-2.1.2
b)	1) For a given class C IP address <u>(refer table attached at the end)</u> design equal subnets in such a way that each subnet has at least 60 host. 2) What is the subnet address if the destination address is 200.45.34.56 and subnet mask is 255.255.240.0?	6 2	3-3-3.1.6 3-3-3.1.6
3a)	A company is granted a site address <u>(refer table attached at the end)</u> . The company needs 6 subnets. Design the subnets.	7	3-3-3.1.6
b)	1) There are 6 friends are in an online meeting room and each one of them wishes to talk to another secretly. How many unique keys shall be required to maintain the confidentiality among the 6 users? Justify your answer with appropriate explanation. 2) Suppose a key length of 4 is used in a 26-character alphabet. Find the key space and Average number of attempts needed to break. (OR)	6 2	4-3- 2.2.3 4-3- 2.2.3
b)	Using simple substitution cipher, show the enciphering and deciphering process for the message <u>(refer table attached at the end for the message)</u> . Assume the key as “HOME”.	8	4-3- 2.2.3
4a)	Using Priority Bit concept, identify the classes and range of IP addressing scheme.	8	3-3-3.1.6
b)	1) Vivek and Ayush are making use of keys generated at their respective ends for a confidential communication to take place. These keys are computed mathematically and hence not shared with each other. However, they are able to exchange information secretly. Which algorithm is used and how it works? 2) Gaurav chooses private key $x=3$ whereas Karan chooses private key $y=6$. If both of them use the primitive root $g=7$ for prime $p=23$, what is the key exchanged between both? Is algorithm used Symmetric/Asymmetric?	3 4	4-3- 2.2.3 4-3- 2.2.3

Sr. No.	UCID No.	Q -2 b)1) & Q- 3a)-IP address	Q-3b)-Message
1	2018110011	195.188.65.1	WELCOME
2	2018110016	192.168.1.1	GOODBYE
3	2018110020	193.168.1.1	ELECTRONICS
4	2018110023	194.168.1.1	TELECOMMUNICATION
5	2018110027	192.168.1.2	COMPUTER
6	2018110032	193.168.1.2	INFORMATION
7	2018110034	194.168.1.2	TECHNOLOGY
8	2018110051	196.188.65.1	ARTIFICIAL
9	2018110001	192.168.1.3	INTELLIGENCE
10	2018110002	193.168.1.3	INTELLIGENT
11	2018110003	194.168.1.3	SECRET
12	2018110004	192.168.1.4	PASSWORD
13	2018110005	193.168.1.4	ENGLISH
14	2018110006	194.168.1.4	FRENCH
15	2018110007	197.188.65.1	HINDI
16	2018110008	198.188.65.1	MARATHI
17	2018110009	199.188.65.1	ENGINEERING
18	2018110013	197.189.65.1	PHARMACY
19	2018110012	197.190.65.1	DOCTOR
20	2018110014	197.188.66.1	ENGINEER
21	2018110015	197.188.67.1	GUJARATI
22	2018110017	200.188.65.1	GERMAN
23	2018110018	201.188.65.1	SARDAR
24	2018110021	202.188.65.1	PATEL
25	2018110022	203.188.65.1	INSTITUTE
26	2018110024	204.188.65.1	MUMBAI
27	2018110025	200.189.65.1	GUJARAT
28	2018110028	201.190.65.1	RAJASTHAN
29	2018110029	202.188.60.1	HIMACHAL
30	2018110031	203.188.61.1	PUNJAB
31	2018110033	204.188.62.1	ANDHRA
32	2018110035	202.188.63.1	MEGHALAYA
33	2018110037	203.188.64.1	ODISHA
34	2018110038	204.188.65.1	BENGAL
35	2018110039	205.189.65.1	DELHI
36	2018110041	206.190.65.1	NETWORKING
37	2018110043	207.188.60.1	EMBEDDED
38	2018110044	208.188.61.1	ROBOTICS
39	2018110045	209.188.62.1	AUTOMATION
40	2018110046	210.188.63.1	SIGNALS
41	2018110047	211.188.64.1	SYSTEMS
42	2018110048	212.188.65.1	ELECTRICITY
43	2018110049	196.188.65.1	POWER
44	2018110050	193.170.1.1	CONSUMER
45	2018110052	193.171.1.1	TELVISION

46	2018110053	194.172.1.1	MOBILE
47	2018110054	192.173.1.2	WIRELESS
48	2018110055	193.174.1.2	OPTICAL
49	2018110056	194.175.1.2	MAGNETICS
50	2018110057	196.188.65.0	LINEAR
51	2018110058	192.168.1.0	INTEGRATED
52	2018110059	193.168.1.0	CIRCUITS
53	2018110060	194.168.1.0	ANALOG
54	2018110061	192.168.2.0	DIGITAL
55	2018110062	193.168.2.0	DISCRETE
56	2018110063	194.168.2.0	GRADUATE
57	2019210064	197.168.65.1	DOCTORATE
58	2019210065	198.168.65.1	PROCESSING
59	2019210066	199. 168.65.1	SHIMLA
60	2019210067	197. 168.65.1	MANALI
61	2019210068	197. 168.65.1	KERALA
62	2019210069	197. 168.66.1	INDIA
63	2019210070	197. 168.67.1	AMERICA
64	2019210071	200. 168.65.1	AUSTRALIA
65	2019210072	201. 168.65.1	CANADA
66	2019210073	202. 168.65.1	JUNGLE
67	2017110037	203. 168.65.1	MANAGEMENT
68	2017110049	204. 168.65.1	HEAVEN
69	2016110004	200.169.65.1	EARTH
70	2016110039	201.168.65.1	SATURN
71	2016110043	202.169.60.1	JUPITER
72	2016310063	203.169.61.1	UNIVERSE

BEST OF LUCK
