



ST. XAVIER'S COLLEGE
KOLKATA
(AUTONOMOUS)

2nd SEMESTER EXAMINATION
JUNE - JULY 2021
M. Sc. COMPUTER SCIENCE

CMSM4222

COMPUTER NETWORKING
AND INTERNET
TECHNOLOGIES

Monday, June 21, 2021

1:00 PM to 4:00 PM

3 hours

Full Marks : 80

PLEASE READ THESE INSTRUCTIONS BEFORE YOU START WRITING:

1. Of the questions attempted, the answers to only the first required number of questions (as stipulated in the question paper) will be evaluated. **So please do not attempt extra questions.**
2. Use fountain pen or ball-point pen of **blue or black ink.**
3. Write (**not type**) the answers legibly, in your own words as far as practicable, on A4 size sheets.
4. Save the pages of your answer sheets (hand-written document) to a single PDF file and name the document accurately i.e. **Roll No_Paper Code.PDF** (example: 147_PH36141T).
5. Send the PDF file to the following email address (**in REPLY mode**) **within 30 minutes of the completion of the examination: cmsm42222021@sxccal.edu**
6. In the subject field of your email, please write "**Answer Script – Roll No, Paper Code**" (example: "Answer Script – 147, PH36141T").
7. The scanned answer scripts should have **enough clarity** to enable evaluation.
8. On top of each page **handwrite** the following information: **Name, Roll Number, Paper Code , Date, and Page Number**
9. No multiple submissions would be allowed.

The marks are given in **brackets []** at the end of each question or part question.

The question paper consists of **2** pages.

Of the questions attempted, the answers to only the first required number of questions (as stipulated in the question paper) will be evaluated.
So, PLEASE DO NOT ATTEMPT EXTRA QUESTIONS.

GROUP A

Answer **QUESTION 1** and **ANY THREE** from the rest.

1. Answer **ANY THREE** of the following. **[5×3=15]**
 - (a) Explain the advantages of controlled access protocols over random access protocols.
 - (b) Explain the reasons for using dynamic channel allocation techniques in LAN.
 - (c) Explain the purpose of various time registers in FDDI.
 - (d) State the advantages of flooding algorithm for the purpose of routing.
2.
 - (a) Discuss a routing algorithm that should be used if the number of hosts is too many.
 - (b) Discuss the purpose of the following ICMP messages:
Source Quench, Time exceeded, Parameter problems. **[9+6=15]**
3.
 - (a) Explain the process of pruning the spanning tree for multicast routing.
 - (b) “ARP request is broadcast whereas ARP reply is unicast”. Critically comment.
 - (c) Explain the difference between leaky bucket and token bucket algorithms for congestion control. **[6+4+5=15]**
4.
 - (a) Explain the purpose of the field ‘sequence number’ in link state packets.
 - (b) Discuss how choke packets may be used in congestion control in a subnet,
 - (c) Explain how bridge tables are constructed in transparent bridges with an example. **[5+5+5=15]**
5.
 - (a) Explain the reverse path forwarding algorithm as applicable to broadcast routing.
 - (b) Explain the process of registration of mobile hosts in a network. **[8+7=15]**

GROUP B

Answer **QUESTION 6** and **ANY ONE** from the rest.

6. Answer **ANY ONE** of the following. **[5×1=5]**
 - (a) How does the IPv6 datagram header resolve the problems faced by the IPv4 datagram header?
 - (b) Explain the purpose of the Service Type field of IPv4 datagram header.
7.
 - (a) The address of a class C host is to be split into subnets with a 4-bit subnet number. What is the maximum number of subnets and the maximum number of hosts in each subnet? Explain.
 - (b) Illustrate the difference between the direct broadcasting technique and the limited broadcasting technique.
 - (c) Explain the steps to forward an IPv4 packet using classful addressing scheme.
 - (d) State the differences between a direct delivery and an indirect delivery of an IP packet. **[(2+2)+3+6+2=15]**
8.
 - (a) What is Multi-Protocol Level Switching approach? Explain with an example.
 - (b) An address in a block assigned to an organization is given as 180.111.64.35. Find the number of addresses in this block, the first address and the last address of this block.
 - (c) What is the use of loopback address? How is this address represented in IPv6?
 - (d) What are the different ways of representing an IPv6 address? Explain with proper examples.
 - (e) How is an IPv6 address made compatible with an IPv4 address? Illustrate. **[4+(1+1+1)+(1+1)+3+3=15]**
