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MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

VI SEMESTER B.TECH. (INFORMATION TECHNOLOGY)

END SEMESTER EXAMINATIONS, APRIL/MAY 2017

SUBJECT: ADVANCED COMPUTER NETWORKS [ICT 304]

REVISED CREDIT SYSTEM
(29/04/2017)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ANY FIVE** full questions.
- Missing data if any may be suitably assumed.

1A. With the help of a neat diagram explain the following:
   i. MPLS architecture
   ii. Integrated Service Router Model — 5

1B. Explain the following terms:
   i. Dispersion
   ii. Attenuation
   iii. Wavelength Continuity Requirement — 3

1C. Differentiate between Local and Remote Login in Telnet. — 2

2A. A certain user enters domain name "www.abcxy.com" in the address bar. The resolver running on this host machine looks for the IP address of this website by sending a DNS Query message. It fetches the reply as "210.64.38.59" from an authoritative DNS Server. In addition, it receives the IP address of the authoritative server as "200.45.36.4", in the authoritative record. Depict the DNS Query and Response message that is sent and received by the resolver using the format shown in Fig. Q.2A. — 5

2B. Design a three stage switch with N=120, 10 crossbars at the first stage and third stage and 4 crossbars at the middle stage. Calculate the total number of cross points supported by this design. Does this system support a non-blocking condition? Justify your answer. — 3

2C. What are the user data rates of STS-3 and STS-12? — 2

3A. With a neat diagram explain in detail the SONET architecture. — 5

3B. Illustrate with a neat diagram the various fields in IPv4 and Ipv6 Headers. — 3

3C. List and explain various Switch Performance Measures. — 2

4A. Draw and explain the various layers of SS7 Protocol Stack. Also state the steps involved in the process of setting the call. — 5

4B. Explain in detail how AAL-2 supports the service that requires transfer of information at variable data rate. How does this operation differ from that of AAL-1 that support constant data rate? 3

4C. Show the sequence of messages exchanged between Telnet Client and Telnet Server to change the mode of operation from character mode to default mode. 2

5A. Explain the source routing process in IPv6 using a suitable example. Also describe the fields in source routing option header. 5

5B. What is Digital Subscriber Line Access Multiplexer (DSLAM)? How is it different from Asymmetric Digital Subscriber Line (ADSL) modem? 3

5C. Encode the following using Basic Encoding Rules:

i. OCTET STRING "HELLO"

ii. OBJECT IDENTIFIER 1.3.6.1 2

6A. State the drawbacks of BOOTP that led to usage of DHCP. Briefly describe different address allocation processes involved in DHCP. 5

6B. Explain the process of uploading and downloading in 56K or V.90 modems. 3

6C. Justify how network management on the Internet is done through the cooperation of SNMP, SMI, and MIB. 2

DNS Header Format

Identification	Flags
Number of question records	Number of answer records (all 0's in query message)
Number of authoritative records (all 0's in query message)	Number of additional records (all 0's in query message)

DNS Flag Field

QR	Opcode	AA	TC	RD	RA	Three 0s	rCode

DNS Query and Response Message

Header
Question section

Header
Question section
Answer section
Authoritative section
Additional section

DNS Question Section

Query name	
Query type	Query class

DNS Answer Section

Domain name	
Domain type	Domain class
Time to live	
Resource data length	Resource Data

Fig.Q.2.A