Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent institution of MAHE, Manipal)

II SEMESTER M.TECH. (COMPUTER NETWORKING AND ENGINEERING)

END SEMESTER EXAMINATIONS, APRIL 2018

SUBJECT: ADVANCED COMMUNICATION NETWORK TECHNOLOGIES [ICT 5202]

REVISED CREDIT SYSTEM
(19/04/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer ALL the questions.
- Missing data, if any, may be suitably assumed.

1A. In a SONET network for synchronization, byte stuffing is adopted. Discuss the concept of positive stuffing and negative stuffing. A SONET network allows byte stuffing (positive or negative) to take place at most once every 32 frames. Calculate the minimum and maximum rates of the payload that can be carried within a STS-1 SPE. Given that the Payload rate = 50.112 Mbps. 5

1B. Prove that the modular switch fabric design using 3 stage SNB clos network is efficient and cost effective when compared to single stage crossbar switch design. Also justify with an example. 3

1C. Using the principle of WDM, show with an example that the physical ring topology of optical transmission system can support any logical topology such as mesh or fully connected. 2

2A. ATM supports very small fixed packet size (53 byte cell) for data transfer through the network. Why? Write the schematic showing procedure for converting data from different services(voice, video, data) into 53 byte cells. Identify and write the AAL process for Constant Bit Rate(CBR) service category of ATM. 5

2B. Show with an example that PNNI routing in ATM is different from OSPF routing. Discuss the role of Designated Transit List (DTLs) in PNNI routing. 3

2C. Discuss the different reservation styles defined in RSVP. 2

3A. Consider a sample Adhoc network of 8 nodes. Describe the operation of Adhoc On Demand Distance Vector Routing(AODV) algorithm highlighting the mobility management mechanisms. Compare its performance with OLSR. 5

3B. The MIB object in a MIB tree is defined by five parameters for a managed object. Specify a sample managed object using these parameters. Consider a simple tree of 5 objects and explain the traversal of object using lexicographic ordering. 3

3C. Show the encoding of the following record (sequence) using TLV format. 2

Integer	Octet string	Object Id
10000	DISK	1.3.6.1.2.1.7

4A. Calculate the delay incurred per MSDU in IEEE 802.11 medium access mechanism using CSMA/CA without and with RTS/CTS. 5
Given: SIFS=10μs, length of ACK=14bytes, length of RTS=20 bytes, length of CTS =18 bytes DATA=1000bytes, DIFS=50μs. The channel data rate is 8 Mbps. Sketch the time diagram showing the frames transmitted including the final ACK frame. Show the appropriate interframe spacings and NAV values.

4B. Given a GPS receiver device, write the procedure to develop a mobile application that provides location based taxi service. 3

4C. Explain the operation of location based application " WAAS/SBAS". 2

5A. The polling frequency computation give us an indication of usage of network resources(overhead) for network monitoring in SNMP. For the given information below, show that one management station can monitor more than 500 stations. 5
Given:

The duration between consecutive polling is 25 minutes.
Network delay is 500 ms(no congestion).
Processing time is of the order of 50ms.

Assume full-time management station and polling only one station at a time.

5B. Consider an 8 X 8 Banyan switch and Benes switch. Compute the number of cross points required in each switch fabric. Compare the merits and demerits. 3

5C. Compare the similarities and the differences between MPLS and ATM network. 2