Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

SECOND SEMESTER M.Tech. (INDUSTRIAL AUTOMATION AND ROBOTICS) DEGREE
END SEMESTER EXAMINATION
April /May 2017
SUBJECT: COMPUTER NETWORKING AND COMMUNICATION PROTOCOLS (MTE-5134)

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates
- Answer **ANY FIVE** full questions.
- Missing data may be suitably assumed.

1A. Describe the three types of networks based on coverage of area, with a suitable diagram. (3)

1B. The INTERBUS technology is known as mature and solidly and is standardized in the IEC 61158 and IEC 61784. Describe the structure of the INTERBUS system with a suitable diagram and its principle of data transmission. (7)

2A. How is it possible for twisted pair cables to remove the interference of noise in their communication? Demonstrate with an example. (5)

2B. In its thirty ninth flight (PSLV-C37), ISRO's Polar Satellite Launch Vehicle successfully launched the 714 kg Cartosat-2 Series Satellite along with 103 co-passenger satellites on February 15, 2017 from Satish Dhawan Space Centre SHAR, Sriharikota. After a flight of 16 minutes 48 seconds, the satellites achieved a polar Sun Synchronous Orbit of 506 km inclined at an angle of 97.46 degree to the equator.

Based on the above information, explain about the type of orbit into which these 104 satellites were launched. Also elaborate on the advantages and disadvantages of this orbit. (5)

3A. Figure 3A, shows the image of a mother carrying her dead child, which is taken using a thermal imaging camera. What type of waves are used here for the imaging? Describe the data frame format for this form of communication. (4)

3B. Differentiate between TDM, FDM and CDM with suitable examples for each type of multiplexing. (6)

4A. Illustrate and explain the Modbus query response cycle. (3)

4B. What is the network id, broadcast id, first usable IP address and last usable IP address of which 192.168.1.15/26 is a part of? (7)

5A. Sketch the superheterodyne receiver diagram used in radio communication. (3)

5B. The SITRANS TF280 shown in figure 5 B, is a WirelessHART temperature transmitter that provides all measured process values as well as diagnostic information, parameters and functions via radio.

Discuss the WirelessHART system architecture in which 3 of such SITRANS TF280 devices are deployed. (7)

6A. Elaborate upon the bus access method of the Profibus PA protocol. (5)

6B. Optical fiber communication is the backbone to any form of communication in the world today. Figure 6 B illustrates the mesh of optical fibers laid under the oceans to connect the various continents on the globe. Draw and explain the different components of an optical fiber communication system, considering a single transmitter-receiver pair. (5)

Figure 3A

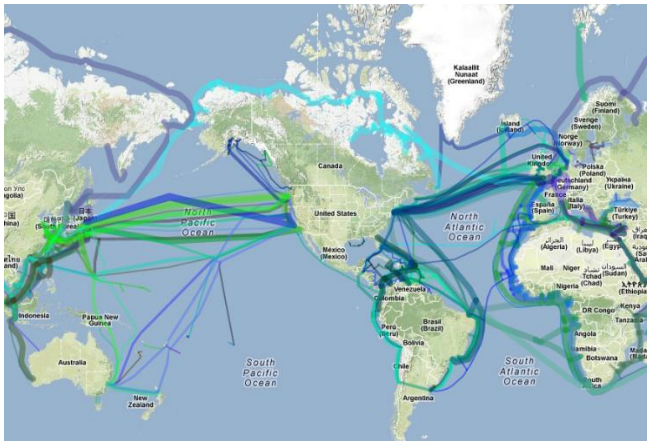

Figure 6 B

Figure 5B