



**MANIPAL INSTITUTE OF TECHNOLOGY**  
MANIPAL  
(A constituent unit of MAHE, Manipal)

**SEVENTH SEMESTER B.TECH. (INSTRUMENTATION AND CONTROL ENGG.)**  
**END SEMESTER DEGREE EXAMINATIONS, NOVEMBER - 2019**

**SUBJECT: COMPUTER NETWORKS AND PROTOCOLS [ICE 4017]**

TIME: 3 HOURS

MAX. MARKS: 50

**Instructions to candidates :Answer ALL questions and missing data may be suitably assumed.**

- 1A. Describe the ISO – OSI reference model of a computer network. Discuss the function of each layer in detail.
- 1B. Classify network based on scale and discuss all the types in short. (5+5)
- 2A. Discuss the four key properties of a virtual machine.
- 2B. An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to 2600 customers as follows:
- The first group has 200 medium-size businesses; each needs approximately 128 addresses.
  - The second group has 400 small businesses; each needs approximately 16 addresses.
  - The third group has 2000 households; each needs 4 addresses.
- Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations.
- 2C. Write a note on special addresses. (4+4+2)
- 3A. Two different packets arrives at the router shown in Fig.Q3A with destination address 145.14.192.71 and 135.11.80.21. Show how it is forwarded.
- 3B. Describe in detail about the Link State Routing algorithm with appropriate example. (5+5)
- 4A. Explain the principle of FDM and its hierarchy.
- 4B. Generate a CRC code for the data word 110101010 using the divisor 10101. (5+5)
- 5A. Explain the basics of cryptography and discuss the working of any two types with examples.
- 5B. Discuss the different type of services provided by cloud computing.
- 5C. What are the function areas of a datacentre? Explain. (4+3+3)

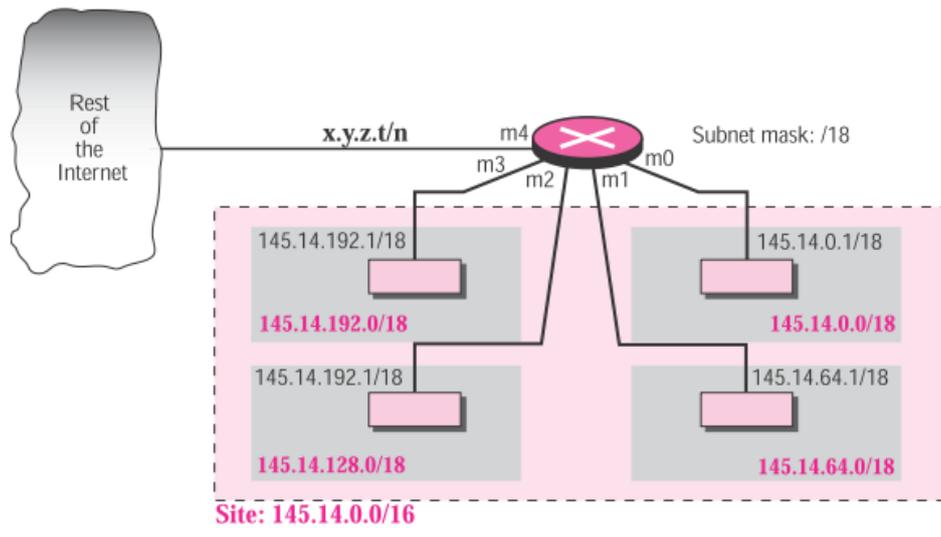


Fig. Q3A

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