Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2018**

**Subject Code: 2171008 Date: 03/12/2018**

**Subject Name: Data Communication and Networking**

**Time: 10:30 AM TO 01:00 PM Total Marks: 70**

**Instructions:**

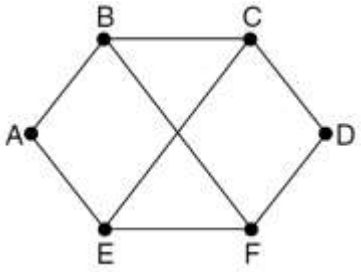
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

| | | | |
|---|---|---|---|
| **Q.1** | **(a)** | What are two reasons for using layered protocols? What is one possible disadvantages of using layered protocols? | **03** |
| | **(b)** | Give Comparison among Circuit switching, Packet switching and Message Switching. | **04** |
| | **(c)** | List the Data Link Layer design issues. What is framing? List all methods used for framing and explain any two methods used for framing in detail. | **07** |
| **Q.2** | **(a)** | Discuss Remote Procedure Call in Transport Layer. | **03** |
| | **(b)** | Suppose that a message 1001 1100 1010 0011 is transmitted using Internet Checksum (4-bit word). What is the value of the checksum? | **04** |
| | **(c)** | Properly Explain the channel allocation problem. Also explain its solution in detail. | **07** |
| | | **OR** | |
| | **(c)** | Explain Slotted ALOHA in Detail | **07** |
| **Q.3** | **(a)** | What is the length of a contention slot in CSMA/CD for (i) 2-km twin-lead cable (signal propagation speed is 82% of the signal propagation speed in vacuum) and (ii) a 40-km multimode fiber optic cable (signal propagation speed is 65% of the signal propagation speed in vacuum). | **03** |
| | **(b)** | Explain The Count-to-infinity Problem. | **04** |
| | **(c)** | Explain The 802.11 Architecture and Protocol Stack. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | A group of N stations share a 56-kbps pure ALOHA channels. Each station outputs a 1000-bit frame on average once every 100 sec, even if the previous one has not yet been sent (e.g., the stations can buffer outgoing frames). What is the maximum value of N? | **03** |
| | **(b)** | Define following: (i) Session Routing (ii) Forwarding (iii) Flooding (iv) Admission Control | **04** |
| | **(c)** | Explain in Detail with diagram, Why it is required to define the Maximum and Minimum Frame size of Ethernet? What is Binary Exponential Back off and why it is used in Ethernet? | **07** |

| | | | |
|---|---|---|---|
| **Q.4** | **(a)** | Assuming that all routers and hosts are working properly and that all software in both is free of all errors, is there any chance, however small, that a packet will be delivered to the wrong destination? | **03** |
| | **(b)** | How Resolver looking up remote name in DNS? | **04** |
| | **(c)** | Explain Connection Release in Transport Layer. Discuss the Two-army problem and show how to resolve it. | **07** |

**OR**

| | | | |
|---|---|---|---|
| **Q.4** | **(a)** | Justify the Sentence: "RTP is just another variant of UDP" | **03** |
| | **(b)** | Consider the network of Fig.1. Distance vector routing is used, and the following vectors have just come in to router C: from B: (5, 0, 8, 12, 6, 2); from D: (16, 12, 6, 0, 9, 10); and from E: (7, 6, 3, 9, 0, 4). The cost of the links from C to B, D, and E, are 6, 3, and 5, respectively. What is C's new routing table? Give both the outgoing line to use and the cost. | **04** |




**(Fig. 1)**

| | | | |
|---|---|---|---|
| | **(c)** | What is Quality of Service? What is its significance? List the techniques available to improve Quality of Service and Explain any two of them in detail. | **07** |
| **Q.5** | **(a)** | Explain Streaming of media using the web and media server. | **03** |
| | **(b)** | Explain Domain Resource Records. Describe Following DNS Resource Records.<br>**I.** cs.vu.nl 86400 IN MX 1 zphyr<br>**II.** flits 86400 IN A 130.37.20.10 | **04** |
| | **(c)** | What is Digital Signature? List the methods used for Digital Signature and explain them in detail. | **07** |

**OR**

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | How E-mail is delivered from sender to receiver? Explain with diagram. | **03** |
| | **(b)** | Explain a multithreaded web server with a font end and processing modules. | **04** |
| | **(c)** | Explain the Data Encryption Standard (DES) in details. | **07** |

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Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE – SEMESTER VII (NEW SYLLABUS) EXAMINATION- SUMMER 2018**

**Subject Code:2171008 Date: 08-05-2018**

**Subject Name: Data Communication and Networking (Department Elective-II)**

**Time: 02:30 pm to 05:00 pm Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | Give differences between bridge, router and gateway. | **03** |
| | **(b)** | Which layer / layers performs following functions?<br>1. Adding trailer bits.<br>2. Error and flow control.<br>3. Encrypting files<br>4. Providing IP address | **04** |
| | **(c)** | Define protocol and layer. Also explain OSI Model. | **07** |
| **Q.2** | **(a)** | What is piggybacking? How it works? | **03** |
| | **(b)** | Define topology. Describe any two types of network topology. | **04** |
| | **(c)** | What is Public Switch Telephone Network? Explain it with its various parts | **07** |
| | | **OR** | |
| | **(c)** | Describe Ethernet. What are the differences between Bridged Ethernet, Fast Ethernet and Gigabit Ethernet | **07** |
| **Q.3** | **(a)** | Give differences between Frame, Packet and TPDU. How encapsulation is done? | **03** |
| | **(b)** | Differentiate between<br>a. Pure ALOHA and Slotted ALOHA protocols.<br>b. 1-persistent and P-persistent CSMA | **04** |
| | **(c)** | List the design issues of data link layer. Explain various methods of framing. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Compare Frame relay and X:25 network. | **03** |
| | **(b)** | How Bluetooth works? Describe Bluetooth architecture. | **04** |
| | **(c)** | What is the need of sliding window? Explain Go back N protocol. | **07** |
| **Q.4** | **(a)** | What is the need of IP address? Explain classful IP address. | **03** |
| | **(b)** | Describe IPv4 Header. | **04** |
| | **(c)** | How leaky bucket algorithm and Token bucket algorithm works? | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain symmetric key algorithm. | **03** |
| | **(b)** | Describe any two elements of transport protocols. | **04** |

| | | | |
|---|---|---|---|
| | **(c)** | Explain Link state Routing algorithm. Also give the differences between link state routing and distance vector routing routing. | **07** |
| **Q.5** | **(a)** | Describe World Wide Web. | **03** |
| | **(b)** | What is Domain Name System? Explain it with resource records. | **04** |
| | **(c)** | Describe TCP Header. Also compare TCP and UDP. | **07** |

**OR**

| | | | |
|---|---|---|---|
| **Q.5** | **(a)** | How RSA algorithm works? | **03** |
| | **(b)** | Explain email architecture and email protocols. | **04** |
| | **(c)** | What is digital signature? Explain various methods of digital signatures. | **07** |

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Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER– VII (New) EXAMINATION – WINTER 2019**

**Subject Code: 2171008** **Date: 30/11/2019**

**Subject Name: Data Communication and Networking**

**Time: 10:30 AM TO 01:00 PM** **Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | Explain the limitations of OSI model. | **03** |
| | **(b)** | Write note on network topology. | **04** |
| | **(c)** | Explain ISO-OSI model in detail. | **07** |
| **Q.2** | **(a)** | Explain character count and bit stuffing mechanism of data link layer. | **03** |
| | **(b)** | Explain the concept of piggybacking. | **04** |
| | **(c)** | Write note on sliding window protocol. | **07** |
| | | **OR** | |
| | **(c)** | Write note on HDLC protocol of data link layer. | **07** |
| **Q.3** | **(a)** | Explain the fragmentation in network layer. | **03** |
| | **(b)** | Explain the following terms: 1.) Router, 2.) Switch, 3.) Supernetting and 4.) Subnetting. | **04** |
| | **(c)** | Write note on distance vector routing. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Explain the concept of subnet mask. | **03** |
| | **(b)** | Explain classful routing. | **04** |
| | **(c)** | Write note on link state routing. | **07** |
| **Q.4** | **(a)** | Enlist the protocols used at network layer. | **03** |
| | **(b)** | Write note on firewall. | **04** |
| | **(c)** | Write note on leaky bucket algorithm. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Differentiate between physical address and logical address. | **03** |
| | **(b)** | Explain hierarchical routing in network layer. | **04** |
| | **(c)** | Draw and explain IPv4 packet. | **07** |
| **Q.5** | **(a)** | Explain Congestion. | **03** |
| | **(b)** | Explain Slotted ALOHA. | **04** |
| | **(c)** | Write note on UDP. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Explain DES algorithm. | **03** |
| | **(b)** | Write note on Adhoc network. | **04** |
| | **(c)** | Explain RSA algorithm. | **07** |

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Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER–VII(NEW) EXAMINATION – SUMMER 2019**

**Subject Code:2171008 Date:18/05/2019**

**Subject Name:Data Communication and Networking**

**Time:02:30 PM TO 05:00 PM Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

| | | | |
|---|---|---|---|
| **Q.1** | **(a)** | Briefly explain uses of computer networks. | **03** |
| | **(b)** | What is data communication? List and explain fundamental characteristics of data communication system. | **04** |
| | **(c)** | Explain OSI reference model in detail. | **07** |
| **Q.2** | **(a)** | Briefly explain co-axial cable with diagram. | **03** |
| | **(b)** | What is framing. List and explain types of framing. | **04** |
| | **(c)** | Write short note on digital subscriber line. | **07** |
| | | **OR** | |
| | **(c)** | Explain Go-Back-N ARQ using neat and clean flow diagrams. | **07** |
| **Q.3** | **(a)** | Explain fundamental difference between CSMA/CA and CSMA/CD. | **03** |
| | **(b)** | Comparatively explain vulnerable time and throughputs of pure and slotted ALOHA. | **04** |
| | **(c)** | Write short note on standard Ethernet. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | What is Gateway? | **03** |
| | **(b)** | Explain addressing mechanism in IEEE 802.11 standard for wireless LAN. | **04** |
| | **(c)** | Explain Bluetooth layers in detail. | **07** |
| **Q.4** | **(a)** | Write full forms: ARP, RARP, DHCP, DNS, ISDN and ATM. | **03** |
| | **(b)** | Define: Repeater, Hub, Bridges and Router. | **04** |
| | **(c)** | Explain UDP operation. Also enlist the uses of UDP. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | Explain TCP connection establishment process with neat figure. | **03** |
| | **(b)** | Briefly explain virtual LAN. | **04** |
| | **(c)** | Explain ICMP error reporting in detail. | **07** |
| **Q.5** | **(a)** | Explain duties performed by network layer. | **03** |
| | **(b)** | Explain process of public key distribution. | **04** |
| | **(c)** | Write short note on Voice Over IP. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | Enlist and explain services provided by network security. | **03** |
| | **(b)** | Comparatively explain symmetric and asymmetric key cryptography. | **04** |
| | **(c)** | Explain in detail: Digital signature. | **07** |

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Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2020**

**Subject Code:2171008 Date:28/01/2021**

**Subject Name:Data Communication and Networking**

**Time:10:30 AM TO 12:30 PM Total Marks: 56**

**Instructions:**

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

| | | | MARKS |
|---|---|---|---|
| **Q.1** | **(a)** | Explain Physical address, Logical address and Port number with example. | **03** |
| | **(b)** | Identify which layer of TCP/IP protocol suite will perform following function?<br>a) Transmission of frames from one computer to another<br>b) Ensures end to end delivery<br>c) Data security<br>d) Internetworking | **04** |
| | **(c)** | Explain the 802.11 Architecture and Protocol Stack. | **07** |
| **Q.2** | **(a)** | A computer network consists of 20 stations. Determine number of links required if<br>a) Mesh topology is used<br>b) Suppose that four stations are designated as hubs, each fully interconnected with the others. The remaining 16 stations are equally distributed to the hubs such that any one station is connected to only one hub. Determine the number of links. | **03** |
| | **(b)** | For the following applications which of you would select from TCP/UDP as transport layer protocol?<br>a) Packet voice<br>b) File Transfer<br>c) Remote login<br>d) Multicast communication | **04** |
| | **(c)** | Explain HLDC Protocol with modes of operation, Frame structure and Frame types. | **07** |
| **Q.3** | **(a)** | Which protocol will be used in the following scenario?<br>a) If host ‘A’ on network is trying to identify “whether host ‘B’ is live”<br>b) At the time of booting host receives IP address from the server<br>c) Translate MAC address into IP address | **03** |
| | **(b)** | Explain RSVP—The Resource reservation Protocol. | **04** |
| | **(c)** | Explain framing. Enlist all four methods of generating frames and discuss any two methods with diagram and their limitations. | **07** |

| | | | |
|---|---|---|---|
| **Q.4** | **(a)** | Explain Flooding. | **03** |
| | **(b)** | Discuss function of following protocols.<br>a) ARP<br>b) ICMP<br>c) SMTP<br>d) RTP | **04** |
| | **(c)** | What do you mean by collision? Explain CSMA/CD protocol. | **07** |
| **Q.5** | **(a)** | A computer on a 6 Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 1 Mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the full 6 Mbps? | **03** |
| | **(b)** | Discuss count to infinity problem of Distance vector routing. | **04** |
| | **(c)** | Explain IPv4 Header fields with necessary diagrams. | **07** |
| **Q.6** | **(a)** | Explain fragmentation with appropriate example. | **03** |
| | **(b)** | Let IP address: 154.16.52.16, and subnet mask: 255.255.240.0 Find:<br>(a) Number of subnets possible on this network.<br>(b) Number of hosts possible on each subnet.<br>(c) Host 154.16.52.16 is on which subnet?<br>(d) Range of addresses of the subnet consisting host. | **04** |
| | **(c)** | Explain Link state Routing algorithm. Also give the differences between link state routing and distance vector routing. | **07** |
| **Q.7** | **(a)** | Explain email architecture and email protocols. | **03** |
| | **(b)** | Discuss Voice over IP and Video streaming in briefly. Also comment on their QoS requirements. | **04** |
| | **(c)** | Draw and explain all fields of TCP segment header. Also state functions of each flag. | **07** |
| **Q.8** | **(a)** | Explain UDP protocol. | **03** |
| | **(b)** | Discuss TCP connection establishment with appropriate diagram. | **04** |
| | **(c)** | List various authentication mechanisms. Explain any one mechanism in detail. | **07** |

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Seat No.: _____ Enrolment No._____

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2020**

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**Subject Name:Data Communication and Networking**

**Time:10:30 AM TO 12:30 PM Total Marks: 56**

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| **Q.2** | **(a)** | A computer network consists of 20 stations. Determine number of links required if<br>a) Mesh topology is used<br>b) Suppose that four stations are designated as hubs, each fully interconnected with the others. The remaining 16 stations are equally distributed to the hubs such that any one station is connected to only one hub. Determine the number of links. | **03** |
| | **(b)** | For the following applications which of you would select from TCP/UDP as transport layer protocol?<br>a) Packet voice<br>b) File Transfer<br>c) Remote login<br>d) Multicast communication | **04** |
| | **(c)** | Explain HLDC Protocol with modes of operation, Frame structure and Frame types. | **07** |
| **Q.3** | **(a)** | Which protocol will be used in the following scenario?<br>a) If host ‘A’ on network is trying to identify “whether host ‘B’ is live”<br>b) At the time of booting host receives IP address from the server<br>c) Translate MAC address into IP address | **03** |
| | **(b)** | Explain RSVP—The Resource reservation Protocol. | **04** |
| | **(c)** | Explain framing. Enlist all four methods of generating frames and discuss any two methods with diagram and their limitations. | **07** |

| | | | |
|---|---|---|---|
| **Q.4** | **(a)** | Explain Flooding. | **03** |
| | **(b)** | Discuss function of following protocols.<br>a) ARP<br>b) ICMP<br>c) SMTP<br>d) RTP | **04** |
| | **(c)** | What do you mean by collision? Explain CSMA/CD protocol. | **07** |
| **Q.5** | **(a)** | A computer on a 6 Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 1 Mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the full 6 Mbps? | **03** |
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