B.E. C(Comp) Elex) - 7 - CBGS

(3 Hours) FR. AGNEL ASHRAM BANDRA MUMBAI-50 [Total Marks: 80] 22/11/19
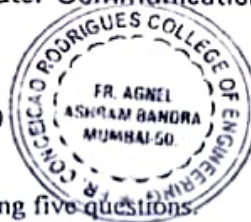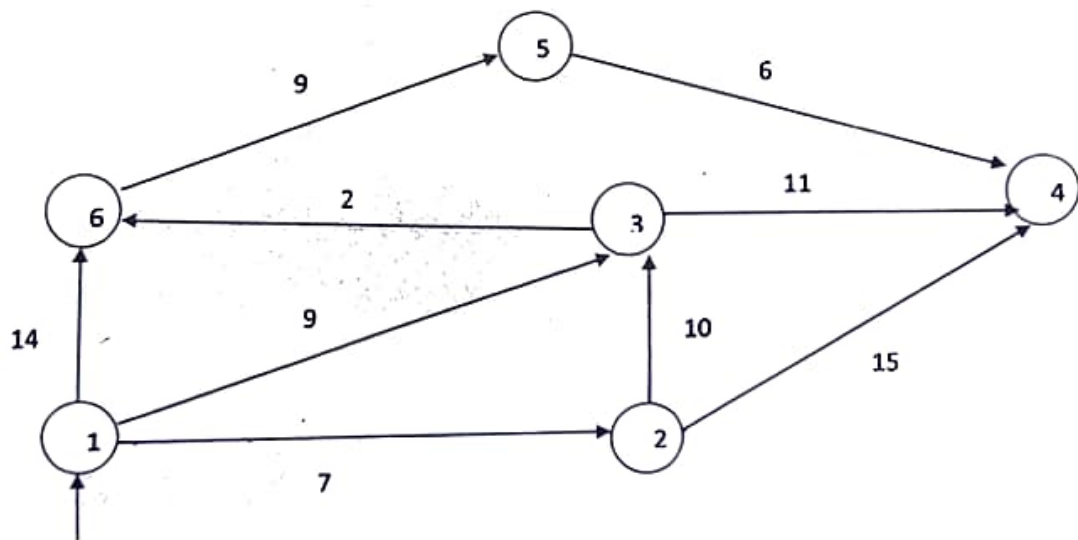
N.B.: (1) Question No. 1 is compulsory.
(2) Solve any three questions from remaining five questions.
(3) Draw neat diagrams and assume suitable data wherever necessary. Justify your assumptions.

1. Attempt any four: 20
   (a) What do you mean by multiple access? Compare between CSMA/CD and CSMA/CA.
   (b) Compare between circuit switching and packet switching.
   (c) What are the different type of network addresses ? Explain each with an example.
   (d) Explain xDSL with a neat diagram.
   (e) Compare IPv4 and IPv6.

2. (a) Describe in detail physical transmission media for computer communication networks. 10
   (b) Explain ISO-OSI reference model with a neat diagram. 10

3. (a) Explain with neat diagram the connection establishment and connection termination in 10
      TCP using Three way Handshaking
   (b) Explain IPv6 datagram format with a neat diagram. Also explain transition from IPv4 to 10
      IPv6

4. (a) What are the conditions to be satisfied by a good CRC generator polynomial? 10
      For P= Predetermined divisor= 110101 (LSB) and
          D= K bit block of data= 1010001101 (LSB). Find the CRC.

   (b) Explain different types of ARQ techniques . Compare their merits and demerits 12

5. (a) Apply Dijkstra's and Bellman Ford Algorithm to the given network and find the least cost 10
      path between the source node 1 to all other nodes:

Source Node

6. (a) Explain LAN protocol architecture with IEEE 802 reference. Sketch the general MAC 10
      frame and LLC PDU structure. Explain the functions of different fields.
   (b) Draw HDLC frame format. Explain each frame in detail. Also explain data transparency 10
      and Data transfer modes in HDLC

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ELECT – VI – CBC
05/12/2019

(3 Hours)

[Total Marks: 80]

N.B.: (1) Question No. 1 is compulsory.
(2) Solve any three questions from remaining five questions.
(3) Draw neat diagrams and assume suitable data wherever necessary. Justify your assumptions.

1.   Attempt any **four**:   20
 (a) Explain the four levels of addresses used in computers.
 (b) Coaxial cable is much less susceptive to interference and cross talk than twisted pair. Why?
 (c) What is sliding window? Where is it applicable?
 (d) Explain leaky bucket to control congestion in network traffic.
 (e) Identify the class of each addresses.
      i)14.23.120.8 ii)252.5.15.111 iii)200.58.20.165 iv)128.167.23.20 v) 205.16.37.32

2. (a) Draw the OSI layer architecture. Explain the function of each layer and show the path of   10
        actual and virtual communication between the layers.
   (b) What is a transparent bridge? How the process of learning in this bridge takes place.   10
        Explain the Spanning tree algorithm to solve looping problem.

3. (a) Explain Persistence methods with neat diagram.   04
   (b) Explain CSMA/CD with a flow diagram.   06
   (c) What are the two common configurations used in HDLC? Draw and explain the HDLC   10
        frame format with separate diagram for control field format for each different frame.

4. (a) Compare Stop and Wait, Selective Repeat and Go-Back-N protocols for a noisy channel   10
   (b) Compare Circuit Switching, Packet Switching and Message Switching   10

5. (a) List three transition strategies to move from IPV4 to IPV6. Explain the difference   10
        between tunneling and dual stack during transition period.
   (b) What is Fragmentation in IPV4? Explain the fields related to fragmentation in head   06
        format.

   (c) Find the first addresses, last addresses and number of addresses of the following IP   04
        addresses:- i) 205.16.37.39/28 ii) 123.56.77.29/27

6.   Write Short note on (any four)   20

        i)   DSL
        ii)   FDDI
        iii) TCP header format
        iv)   Distance Vector Routing
        v)   Congestion Control

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(3 hours)   [Total marks: 80]

N.B: (1) Answer any four questions out of six questions
     (2) Question No:1 is compulsory
     (3) Assume suitable data if necessary

1. Answer any four questions briefly: (20)
    a) Explain PPP header format.
    b) Compare TCP and UDP.
    c) List the categories of UTP cables. How is noise interference minimized in twisted pair
        cables?
    d) Distinguish between OSPF and BGP.
    e) What is sub netting? List advantages and disadvantages of the same.

2. a) List and explain different ARQ techniques. Specify the maximum window size for   (10)
       each with justification.
    b) What is piggybacking? Give an example of Piggybacked frame   (10)
       Sketch the appropriate HDLC frames for the following scenario involving Primary
       station 'A' and two Secondary stations B and C:
         i.   Primary station A wishes to establish a Normal Response mode link with
               Secondary stations B and C.
         ii.   Both the stations B and C send positive acknowledgements to A.
         iii. Station A sends a polling command to B and B sends 4 data frames.
               The third frame is lost during transmission.
         iv.   Assuming Selective repeat ARQ, station A sends negative acknowledgement
               to station B.
         v.   Station B resends the frame and A sends positive acknowledgement.
         vi.   Station A now polls station C and station C responds with ready response.
               A sends three data frames to C and C sends positive acknowledgement
               to indicate the receipt of error free data frames.

3. a) Differentiate between IPv4 and IPv6.   (10)
       Determine the class and network address for the following IP addresses (Assuming
       subnetting is not being used and use default mask)
       i) 84.42.52.11 ii) 195.38.14.13 iii) 144.62.12.9
    b) What is meant by 'blocking' in circuit switching networks? Bring out the advantages (04)
       of multi stage space division switching over single stage switching.
    c) Sketch three stage space division switch for N=15, n=S and k=2   (06)
       What is the condition required to make it non blocking?
       For the same specifications, sketch three stage TST switch using TSI modules.

[TURN OVER]

(3 Hours) [Total Marks : 100

N.B. : (1) Q. 1 is **compulsory**.

(2) Answer any **four** from remaining **six** questions.

1. Answer the following briefly: 20
   - (i) Explain CSMA/CD protocol.
   - (ii) What are the various transmission impairments? Explain.
   - (iii) Explain the working of TSI Switch.
   - (iv) Explain the bit stuffing with an example.

2. (a) Draw the OSI Reference model architecture for a network and Bring out the 10 functions of each layer.

   (b) Bring out the significance of the following networking components: Router, 10 Switch, Hub, Repeater, Bridges, Gateways

3. (a) What is meant by flow control? Explain Sliding window Flow control with 10 neat diagram.

   (b) Explain ADSL with respect to Channel configuration and modulation technique. 10 Compare the different DSL technologies.

4. (a) Explain the different ARQ techniques and compare them. 10

   (b) With reference to HDLC, explain the Data transfer modes, frame structure, 10 and different types of -Frames, Data transparency, significance of P/F bit

5. (a) What is meant by 'blocking' in circuit switching networks? For a 3-stage Space 10 division switch,.what is the condition required to make it non-blocking? Sketch a three-stage STS switch with N=10, n=5, K=2.

   (b) With reference to IEEE 802.3, explain the LAN Protocol architecture and MAC 10 layer frame format.

6. (a) What is meant by Congestion Control in Packet switching? Explain the different 10 methods of Congestion control Implementation

   (b) Compare Circuit switching , Datagram switching and Virtual circuit Packet 10 switching.

7. Write short notes on: 20
   - (i) SONET
   - (ii) Berkeley API
   - (iii) Network topologies
   - (iv) Routing strategies.

QP Code : 30027

(3 Hours)   [Total Marks : 100]

N.B.   (1) Question No.1 is compulsory.

(2) Answer any **four** out of the remaining **six** questions.

(3) Figures to the right indicates marks

(4) Illustrate answers with sketches whenever required

Q.1   Answer any four

a)   Explain how microwave communication work   (5)

b)   Explain various LAN topology   (5)

c)   Explain congestion control in communication network   (5)

d)   Compare circuit switching and packet switching.   (5)

e)   Describe piggy backing in brief.   (5)

Q.2   a) Explain UTP, STP, coaxial cable and fibre optic cable. Also give their applications,

limitations and general properties.   (10)

b) Explain XDSL technology in detail.   (10)

Q.3   a) Explain various frame types in HDLC.   (10)

b) Explain in detail OSI model   (10)

Q.4   a) Draw the block diagram of SONET and explain its operation also. Explain SONET frames (10)

b) Explain in detail any one routing algorithm   (10)

Q.5   a) Explain CSMA/CD in detail.   (10)

b) Explain datagram and packet switching   (10)

Q.6   a) Write a note on Congestion control   in Packet switching network   (10)

b) Explain leased line concept and ISDN technology   (10)

Que.7   a) Explain the following network connecting devices   (10)

I) switches   II) routers   III) gateway   IV) hub   V) bridge

b) Explain flow control and framing in communication network   (10)

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GE-Con. 12148-16.

(3 hours)

[Total marks: 80]

N.B: (1) Answer any four questions out of six questions
   (2) Question No:1 is compulsory
   (3) Assume suitable data if necessary

1. Answer any four questions briefly: (20)
   a) Compare OSI reference model and the TCP/IP reference model
   b) Explain the authentication protocols of PPP
   c) How does Token Bucket algorithm work?
   d) Explain 'bit stuffing' in bit oriented protocols.
   e) Sketch and explain construction of graded index optical fiber

2. a) With a suitable sketch explain the transition/connection phases in Point to Point (10)
      Protocol (PPP). Also explain the supported sets of protocols in the PPP stack.
   b) Distinguish between Go Back N ARQ and Selective Reject ARQ. (10)
      Sketch the frame flow diagram for Go Back N ARQ and with 3 bit sequence number field and
      window size of 5, showing the following events:
      i.   Frame 0 is sent ; Frame 0 is acknowledged.
      ii. Frames 1 and 2 are sent ;Frames 1 and 2 are acknowledged
      iii. Frames 3,4,5 are sent ; Frame 4 is damaged.
      iv. Timer for frame 5 expires

3. a) Explain the different classes of IP addresses. Identify the class of the following (05)
      IP addresses and give their default subnet masks:
      1) 227.56.83.0 2) 114.22.43.21 3) 129.14.12
   b) Explain TCP connection establishment and release. (05)
   b) Draw TST switch and three stage space division switch for N=20, n=5 and k=2 (10)
      and estimate the number of crosspoints required for both cases .
      If the above space division switch is to be made non- blocking, calculate the minimum
      number of crosspoints required.

4. a) Explain ADSL with respect to spectrum allocation and modulation technique (10)
   b) What are the conditions to be satisfied by a good CRC generator polynomial? (10)
      For P = predetermined divisor = 110101(LSB) and D = K bit data block= 1010001101(LSB),
      find the CRC .

5. a) Apply Dijkstra's and Bellman Ford algorithm to the given network and find the least (10)
      cost path between source node 1 to all other nodes
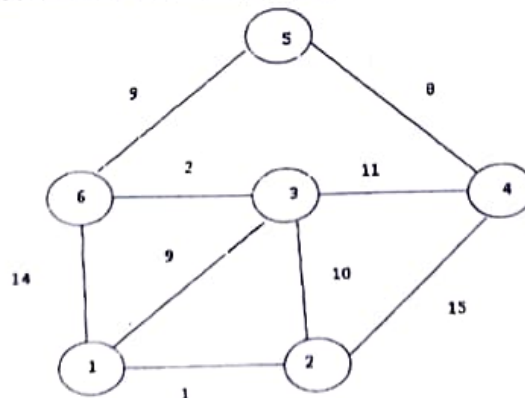
   b) Explain how TCP handles error control and flow control (10)

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FW-Con.11654-16.

Instructions to candidates

1) Q.No. 1 is compulsory.
2) Solve any 3 questions from the remaining 5 questions.
3) Figures on the right side indicate full marks.
4) Make suitable assumptions where required.

Q.No 1 **Answer any four.**

a) Explain the various categories of networks .   05
b) .Give any four functions of Data Link Layer.   05
c) What are GEO, MEO and LEO satellites ?   05
d) How does Token Ring work ?   05
e) Explain the concept of Pseudoheader used in UDP.   05

Q.No 2
a) Explain the various physical media with the help of neat diagrams .   10
b) Compare Circuit Switching, Packet Switching and Message Switching.   10

Q.No 3
a) What is Traffic shaping? Explain "Leaky bucket" technique of traffic shaping.   10
b) Explain the different Options used in IP Datagram.   10

Q.No.4
a) Five equal-size datagrams belonging to the same message leave for the destination   10
one after another. However, they travel through different paths as shown in Table

Datagram	Path Length	Visited Switches
1	3200Km	1.3.5
2	11.700 Km	1.2.5
3	12.200 Km	1.2.3.5
4	10.200 Km	1.4.5
5	10.700 Km	1.4.3.5

We assume that the delay for each switch (including waiting and processing) is 3, 10,
20, 7, and 20 ms respectively. Assuming that the propagation speed is 2 x 108 m/s ,
find the order the datagrams arrive at the destination and the delay for each. Ignore
any other delays in transmission.

b) Explain the various implementations of Standard Ethernet with neat diagrams.   10

Q.No.5
a) Draw the TCP segment header format and explain each field in brief..   10
b) Explain the recursive resolution and iterative resolution methods of resolving the   10
Domain names.

Q.No.6   **Write short notes on any 4 .**

a) CSMA/CA.   05
b) PPP frame format.   05
c) Three Way Handshakes.   05
d) World Wide Web.   05
e) IPv6.   05

Total Marks: 80

Duration:3 Hrs

N.B.   1) Question no. 1 is compulsory

2) Attempt any THREE questions out of the remaining FIVE questions.

3) Assume suitable data wherever necessary.

4) Figures to the right indicate Full marks.

Q. No.   **Marks**

Q.1   Attempt any FOUR questions out of the following questions.

a)   How many hosts per network in each class of IP address can exist?   [5 Marks]
     Show with example.

b)   The Selective repeat ARQ is the most efficient protocol, explain.   [5 Marks]

c)   Compare inband signaling and outband signaling.   [5 Marks]

d)   What is the difference between network layer delivery & transport   [5 Marks]
     layer delivery?

e)   Compare the peer to peer network & client-server network.   [5 Marks]

Q.2   a)   Explain different ARQ techniques.   [10 Marks]
          b)   Explain various transmission media in brief.   [10 Marks]

Q.3   a)   Explain Berkeley API.   [10 Marks]
          b)   Explain CSMA/CD & its use. What part of 802 Project uses CSMA/CD.   [10 Marks]

Q.4   a)   Draw the OSI layer architecture. Explain the function of each layer and   [10 Marks]
               show the path of actual & virtual communication between the layers.
          b)   Compare the following: i)TCP & UDP.   ii) Router & Switch   [10 Marks]

Q.5   a)   Draw a three-stage space division switch for N=20, n=5 & k=2and   [10 Marks]
               estimate the number of cross point required. If the above switch is to
               be made non-blocking, derive an expression for the condition to be
               satisfied, also calculate the minimum cross point required for non-
               blocking.
          b)   What is DSL technology? Explain various DSL technologies & compare   [10 Marks]
               them.

Q.6   a)   With reference to HDLC protocol, explain the following;   [10 Marks]
               i)HDLC frame format
               ii)Data transfer modes
               iii)Different HDLC frames
               iv)Importance of P/F bit
               v)Balanced & Unbalanced configurations
          b)   Write short note on-   [10 Marks]
               i)FDDI
               ii)FTP

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(3 hours) Total Marks:100

Note: (1) Question **No.1 is compulsory and** Answer any **four** out of the remaining six questions.

(2)) Illustrate answers with sketches whenever required

Q.1 Answer any four of the following: (20)

a) Explain various LAN topologies.
b) Explain leased line concept with an example.
c) Explain Integrated Service Digital Network.
d) Explain general principles of congestion control in communication network.
e) Explain how microwave communication work.

Q.2 a) What is DSL technology? Explain various DSL technologies. What is difference between DSL modem and DSLAM with the following (10)

i) Downstream rate   ii) Upstream rate   iii) Distance (in ft)

iv) Number of twisted pair   v) Line codes

b) Draw the block diagram of SONET and explain its operation. Also explain SONET frames. Find the data rate of an STS-1 and STS-3. (10)

Q.3 a) State and explain various frame types in HDLC. (10)

b) Explain different types of modems. What are the protocols used by MODEMS to transfer files? (10)

Q.4 a) Explain OSI model in detail. (10)

b) Explain Fast Ethernet specifications also explain CSMA-CD in detail. (10)

Q.5 a) Explain two different approaches of packet switching. (10)

b) Explain in detail any one routing algorithm. (10)

Q.6 a) What are the different classes of IPV4 address. Give the format of each class. What are the advantages of IPV6 (10)

b) Explain TCP IP model (10)

Q.7 a) Explain different types of ARQ and compare their merits and demerits. (10)

b) Explain UTP, STP, coaxial cable and fiber optic cable. Also give their applications, limitations and general properties. (10)

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1. Explain Discuss the need for a Protocol Architecture.

2. Compare TDM & FDM

3. Draw and explain IP and IPV6 Header.

4. What is the difference b/t unshieblded twisted Pair and shielded twisted Pair.

5. Explain synchronous Time division multiplexing with diagram. (Pg 249 william stallings)

6. Explain Asynchronous Transmission & synchronous Frame Format.