CBCS SCHEME

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15CS/IS52

Fifth Semester B.E. Degree Examination, June/July 2023
Computer Networks

Time: 3 hrs. Max. Marks: 80

Note: ***Answer FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Explain the networks applications architectures briefly. **(07 Marks)**
b. Discuss proxy – server architecture with a suitable diagram. **(05 Marks)**
c. Illustrate the basic operations of SMTP with an example. **(04 Marks)**

OR

2 a. Describe HTTP with persistent and non-persistent connections. **(07 Marks)**
b. Discuss how files are distributed in a peer – to – peer application. **(05 Marks)**
c. With a diagram, explain how application processes communicate through a socket. **(04 Marks)**

Module-2

3 a. Briefly explain TCP sits services with TCP segment structure. **(08 Marks)**
b. Illustrate the principles of reliable data transfer with FSM over a channel with bit errors (rdt2.0). **(08 Marks)**

OR

4 a. Explain with an example : i) GO – Back – N protocol ii) Selective repeat ARO protocol. **(08 Marks)**
b. Compute estimated RTT, DevRTT and TCP Timeout interval for the given data x = 0.125, y = 0.25, sample RTT's are 106ms, 120ms and (Estimated RTT was 100ms and DevRTT was 5ms). **(08 Marks)**

Module-3

5 a. With neat diagram explain router architecture. **(08 Marks)**
b. Draw IPV6 datagram format, mention the significance of each fields. **(08 Marks)**

OR

6 a. Suppose that host application needs to transmit a packet of 3,500 bytes. The physical layer has an MTU of 1500 bytes. The packet has an IP header of 20 bytes plus another attached header of 20 bytes. Fragment the packet, specify the 1D, MF and offset fields of all fragment. **(08 Marks)**
b. Illustrate Routing Information Protocol (RIP) with suitable diagram. **(08 Marks)**

Module-4

7 a. With neat diagram explain the components of GSM 2G Cellular network architecture. **(08 Marks)**

b. Explain agent advertisement and mobile IP registration with a neat diagram. **(08 Marks)**

OR

8 a. Explain in brief how mobility is managed in cellur networks and write a note on indirect routing to mobile node. **(08 Marks)**

b. What is handoffs? Explain steps involved when a base station does decide to handoff a mobile user. **(08 Marks)**

Module-5

9 a. Elaborate the properties of video and audio summarize the limitations of Best effort IP services. **(08 Marks)**

b. Categorize the streamlining of stored videos and explain briefly. **(08 Marks)**

OR

10 a. With a diagram, explain content distribution network operation. **(08 Marks)**

b. With the general format, explain various fields of Real – Time protocol. **(08 Marks)**

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15CS52

Fifth Semester B.E. Degree Examination, Feb./Mar. 2022
Computer Networks

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Discuss the two application architectures. **(08 Marks)**

b. Distinguish between non-persistent HTTP and persistent HTTP. **(08 Marks)**

OR

2 a. Discuss the File Transfer Protocol (FTP). **(08 Marks)**

b. Explain DNS name resolution, with an example. **(08 Marks)**

Module-2

3 a. Explain the reliable data transfer 2.0 (rdt 2.0). **(08 Marks)**

b. Explain Go-Back N protocol. **(08 Marks)**

OR

4 a. Explain the flow control mechanism in TCP. **(08 Marks)**

b. Explain the TCP Tahoe Congestion Control mechanism. **(08 Marks)**

Module-3

5 a. Explain the architecture of router. **(08 Marks)**

b. Apply the link state routing protocol algorithm to find shortest path from source node A to all other nodes on the following Fig.Q.5(b). **(08 Marks)**

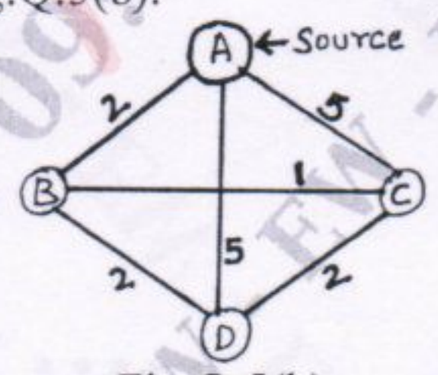

Fig.Q.5(b)

OR

6 a. Discuss hierarchical routing protocol. **(08 Marks)**

b. Apply the distance vector routing protocol algorithm to find the shortest path from source node A to all other nodes on the following Fig.Q.6(b). **(08 Marks)**

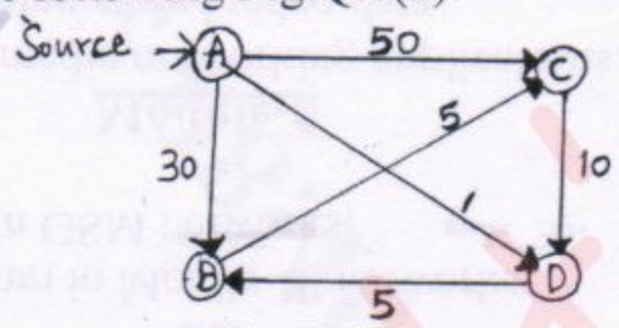

Fig.Q.6(b)

Module-4

7 a. Explain 3G (voice and data) cellular network architecture. **(08 Marks)**

b. Explain the vocabulary of Mobile-IP networks. **(08 Marks)**

OR

8 a. Discuss any one routing algorithm in Mobile-IP networks. **(08 Marks)**

b. Discuss the handoff procedure in GSM networks. **(08 Marks)**

Module-5

9 a. Discuss the three types of multimedia networking applications. **(08 Marks)**

b. Explain the challenges in streaming stored video data. **(08 Marks)**

OR

10 a. Illustrate the content delivery in Netflix. **(08 Marks)**

b. Explain the differentiated service architecture for QoS. **(08 Marks)**

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15CS52

Fifth Semester B.E. Degree Examination, Jan./Feb. 2021
Computer Networks

Time: 3 hrs. Max. Marks: 80

Note: ***Answer any FIVE full questions, choosing ONE full question from each module.***

Module-1

1 a. Explain the following terms : Reliable Data Transfer , Loss tolerant applications , Bandwidth sensitive applications , Elastic applications. **(08 Marks)**

b. Explain how recursive queries are resolved in Domain Name System. Illustrate DNS record structure and list any two types of records. **(08 Marks)**

OR

2 a. Discuss Socket Communication between two processes that communicate over Internet with a block diagram. **(08 Marks)**

b. Explain (HTTP) Hyper Text Transfer Protocol request – response behavior. **(08 Marks)**

Module-2

3 a. Describe why an application developer might choose to run an application over UDP rather than TCP. **(08 Marks)**

b. Draw finite state machines for both sender side and receiver side of Go – back – N protocol and explain. **(08 Marks)**

OR

4 a. Explain the structure of UDP and illustrate with an example the checksum calculation. **(08 Marks)**

b. Explain TCP connection management with time line diagrams. **(08 Marks)**

Module-3

5 a. Describe a high level view of a generic router architecture. **(08 Marks)**

b. Find the least cost path using Link – State Routing Algorithm in the network given in Fig.Q5(b). Assume node 'u' as the source node. Also state the algorithm. **(08 Marks)**

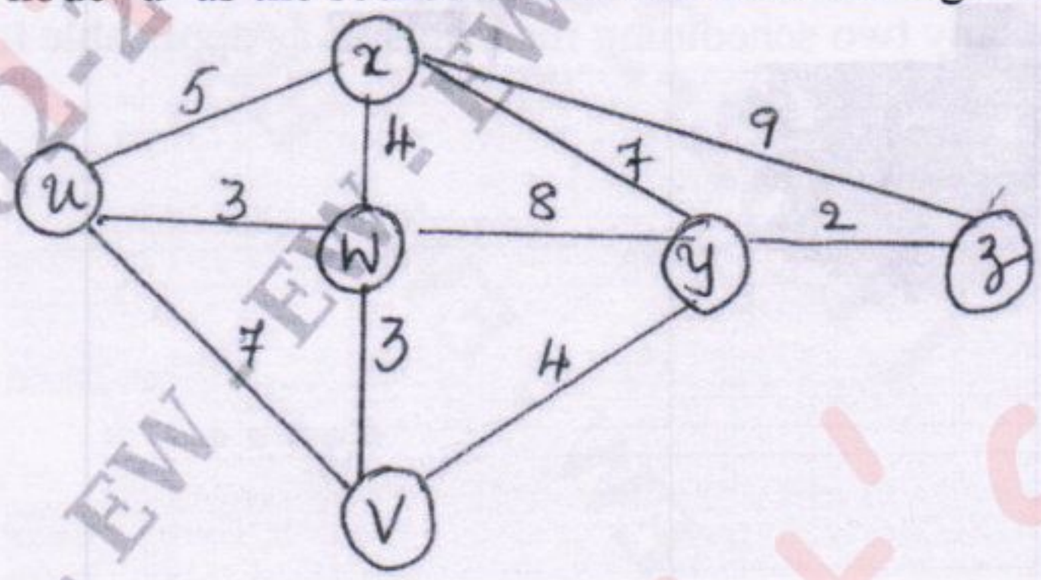

Fig.Q5(b)

OR

6 a. Explain the IPV4 datagram format. **(08 Marks)**

b. Discuss Distance Vector Routing algorithm. Find the least cost by using Distance Vector algorithm with 'u' as the source node in the network given in Fig. Q6(b). Show the routing table for node 'W'. **(08 Marks)**

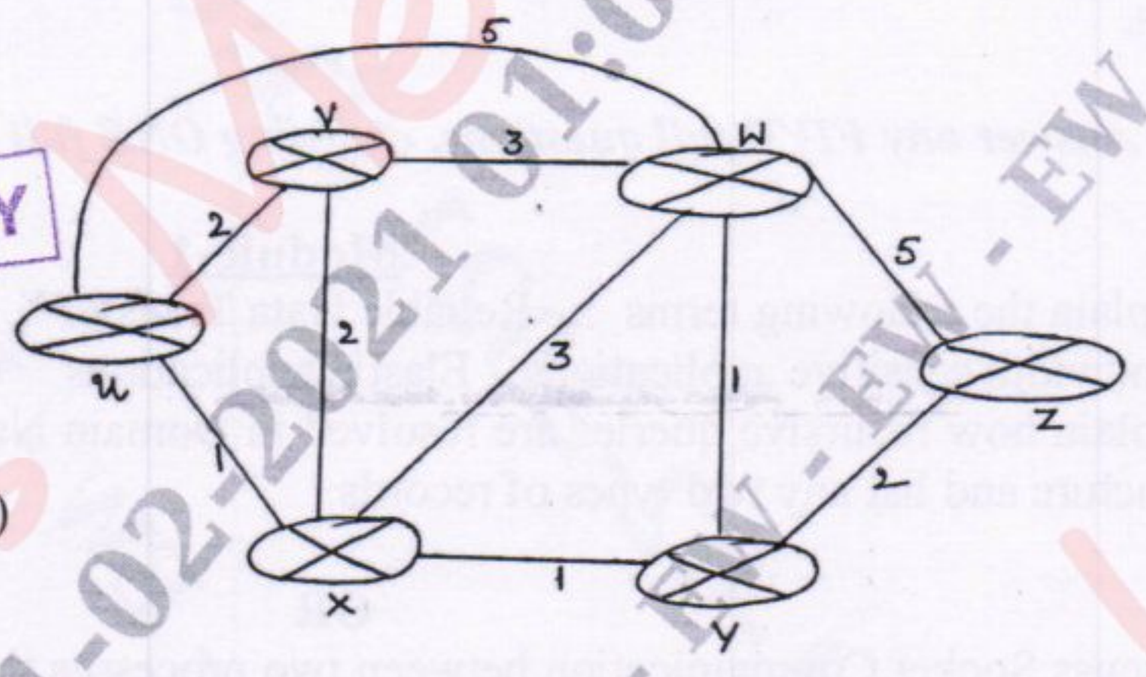

Fig.Q6(b)

Module-4

7 a. Explain 2G Cellular Architecture. **(08 Marks)**

b. What are the initial elements of a Mobile Network Architecture? Bring out the role of Care – of – address, permanent address and foreign address. **(08 Marks)**

OR

8 a. Describe how a call is placed to a mobile GSM user in a visited network. **(08 Marks)**

b. Explain Indirect routing to a mobile node. **(08 Marks)**

Module-5

9 a. Explain the service requirements and design issues in multimedia network applications. **(08 Marks)**

b. Explain Streaming of Stored video over HTTP/TCP. **(08 Marks)**

OR

10 a. What is a Content Distribution Network (CDN)? Explain how DNS is involved in CDN operation. **(08 Marks)**

b. Explain any two scheduling mechanisms as applicable to networks. **(08 Marks)**

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15CS52

Fifth Semester B.E. Degree Examination, July/August 2022
Computer Networks

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. List the major challenges that future P_2P applications are facing. **(03 Marks)**

b. List some common HTTP response status codes and associated phrases. **(05 Marks)**

c. Discuss with example how HTTP allows a cache to verify that its objects are up-to-date. **(04 Marks)**

d. Suppose that institutional LAN is 100Mbps link and a router in the institutional network and router in the Internet are connected by a 15Mbps link.
i) Calculate traffic intensity on the LAN.
ii) Calculate traffic intensity on the access link (from the internet router to institutional router). **(04 Marks)**

OR

2 a. Compare SMTP and HTTP. **(03 Marks)**

b. Discuss DNS message format. **(08 Marks)**

c. Design and develop a client-server application using TCP to implement that server converts string to uppercase. **(05 Marks)**

Module-2

3 a. Explain the connectionless multiplexing and demultiplexing. **(04 Marks)**

b. Design RDT 2.1 sender and receiver protocol (reliable data transfer). **(08 Marks)**

c. Assume that RTT is approximately 30 milliseconds. Suppose that two systems are connected by a channel, supporting stop and wait protocol with a transmission rate of 1Gbps with a packet size of 1000 bytes per packet including both header fields and data.
i) Calculate the time needed to actually transmit the packet into the 1Gbps link.
ii) Calculate sender utilization. **(04 Marks)**

OR

4 a. Explain in brief selective repeat operation. **(08 Marks)**

b. Explain the congestion scenario that two connections sharing a single hop with infinite buffers. **(08 Marks)**

Module-3

5 a. Explain different ways of switching. (06 Marks)

b. Consider the following network and compute the shortest path from 'x' to all network nodes using link-state algorithm. (10 Marks)

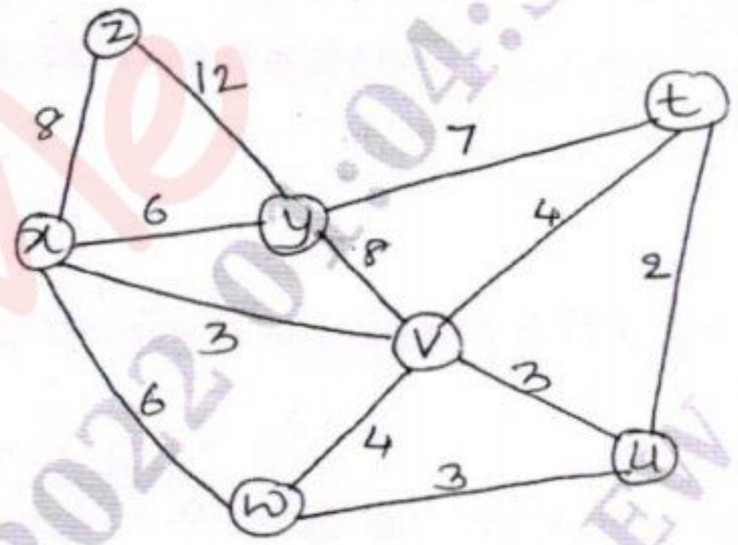

Fig.Q.5(b)

OR

6 a. What is hot-potato routing? Explain with an example. (05 Marks)

b. Discuss IPv6 packet format. (05 Marks)

c. Explain different controlled flooding mechanisms. (06 Marks)

Module-4

7 a. Explain 3G system architecture. (08 Marks)

b. Bring out the mechanism of indirect routing to a mobile node in mobility management. (08 Marks)

OR

8 a. What is agent discovery in mobile node? Illustrate some of the key fields in the agent advertisement message. (08 Marks)

b. Define handoff. Explain the steps in accomplishing a handoff between base stations with a common MSC. (08 Marks)

Module-5

9 a. Discuss the properties of video and audio. (04 Marks)

b. Discuss the following

i) UDP streaming

ii) HTTP streaming. (06 Marks)

c. Explain the steps involved in operations of Content Distribution Networks (CDN). (06 Marks)

OR

10 a. Discuss FIFO and priority queuing scheduling mechanism. (08 Marks)

b. Explain the Diffserv internet architecture. (08 Marks)

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15CS52

Fifth Semester B.E. Degree Examination, July/August 2021
Computer Networks

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions.

1 a. Explain the general format of an HTTP request message with a neat diagram. **(08 Marks)**

b. With a neat diagram, explain the architecture of P_2P. What are the major challenges of P_2P? **(08 Marks)**

2 a. Explain a client server application over TCP using a socket program. **(08 Marks)**

b. Explain the working of DNS server. **(08 Marks)**

3 a. Why does an application developer would choose to build an application over UDP rather than over TCP? Give reasons. **(08 Marks)**

b. Discuss the Go-Back-n protocol and compare with selective repeat. **(08 Marks)**

4 a. With a neat diagram, explain the TCP segment structure. **(08 Marks)**

b. List the TCP congestion control algorithms. Explain any one method with a neat diagram. **(08 Marks)**

5 a. Explain the various switching techniques used in a router. **(08 Marks)**

b. What are the various approaches used for transition from IPV4 to IPV6? Explain tunneling. **(08 Marks)**

6 a. Explain Dijkstra's algorithm and find the shortest path for the graph given below using Link State algorithm.

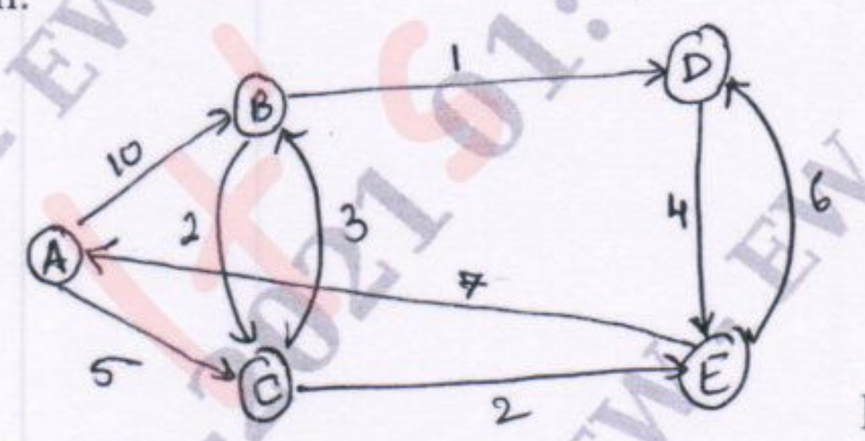

Fig.Q6(a) **(08 Marks)**

b. How does BGP use the Next-Hop attribute? How does it use the AS-PATH attribute? **(08 Marks)**

7 a. Explain the 3G System Architecture with a neat diagram. **(08 Marks)**

b. List the approaches used in Routing to a Mobile node. Explain Direct routing to a Mobile Node. **(08 Marks)**

8 a. Discuss the Agent advertisement and mobile IP registration with a neat diagram. **(08 Marks)**

b. Explain Handoffs in GSM between base stations. **(08 Marks)**

9 Write short notes on:

a. Content Distribution Network **(08 Marks)**

b. HTTP Streaming **(08 Marks)**

10 a. Write a note on Diffserv architecture. **(08 Marks)**

CBCS SCHEME

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15CS/IS52

Fifth Semester B.E. Degree Examination, Dec.2018/Jan.2019
Computer Networks

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain HTTP messages. **(08 Marks)**
b. Explain web caching with diagram. **(08 Marks)**

OR

2 a. Explain FTP with its commands and replies. **(08 Marks)**
b. Explain SMTP. **(04 Marks)**
c. Explain DNS resource record. **(04 Marks)**

Module-2

3 a. Explain Sender's view of sequence numbers and its operation in Goback N protocol. **(08 Marks)**
b. Draw TCP segment structure and explain. **(08 Marks)**

OR

4 a. Explain 3 way handshake and closing a TCP connection. **(08 Marks)**
b. Explain the causes and costs of congestion. **(08 Marks)**

Module-3

5 a. With diagram explain router architecture. **(08 Marks)**
b. Explain IP fragmentation. **(08 Marks)**

OR

6 a. Explain distance vector algorithm. **(08 Marks)**
b. Explain 4 types of hierarchical OSPF routers. **(04 Marks)**
c. Compare link state with distance vector algorithm. **(04 Marks)**

Module-4

7 a. Explain components of a cellular network architecture. **(08 Marks)**
b. Explain direct routing of a mobile node. **(08 Marks)**

OR

8 a. Explain steps of handoff a mobile user. **(08 Marks)**
b. Explain HLR, VLR, home address, care-of-address. **(08 Marks)**

Module-5

9 a. With diagram, explain naïve architecture for audio/video streaming. **(08 Marks)**
b. Explain audio compression in internet. **(08 Marks)**

OR

10 a. With diagram, explain interaction between client and server using RTSP. **(08 Marks)**
b. Explain how streaming from streaming server to a media player is done. **(08 Marks)**

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CBCS Scheme

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15CS/IS52

Fifth Semester B.E. Degree Examination, June/July 2018
Computer Networks

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. What are the different types of transport services provided by the internet? **(08 Marks)**

b. Compose logical note on proxy–server with suitable diagram. **(08 Marks)**

OR

2 a. Discuss how files are distributed in peer-to-peer application. **(08 Marks)**

b. Design network application using socket programming with UDP. **(08 Marks)**

Module-2

3 a. Describe the various fields of UDP segment. Explain how Checksum is calculated. **(08 Marks)**

b. Design rdt 2.0 protocol. **(08 Marks)**

OR

4 a. With a neat sketch, explain the TCP segment and its services. **(08 Marks)**

b. Explain how connection is established and tear down in TCP. **(08 Marks)**

Module-3

5 a. Draw IPv6 datagram format, mention the significance of each fields. **(08 Marks)**

b. Apply distance –vector algorithm for the following Fig.Q5(b). **(08 Marks)**

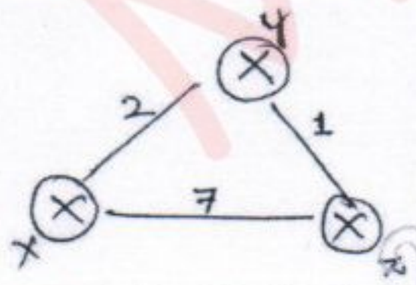

Fig.Q5(b)

OR

6 a. Illustrate Routing Information Protocol (RIP) with suitable diagram. **(08 Marks)**

b. Explain the spanning tree algorithm. **(08 Marks)**

Module-4

7 a. Define cellular network. Give the overview of GSM cellular network architecture. **(08 Marks)**

b. Explain the two different types of routing approaches to mobile node. **(08 Marks)**

OR

8 a. Explain the following concepts of mobile–IP : i) Agent discovery ii) Registration with home agent. **(08 Marks)**

b. Illustrate the steps involved when a base station does decide to hand-off a mobile user. **(08 Marks)**

Module-5

9 a. Brief out three broad categories of multimedia network applications. **(08 Marks)**

b. Discuss the followings : i) Adaptive streaming ii) DASH. **(08 Marks)**

OR

10 a. With general format, explain the various fields of RTP. **(08 Marks)**

b. Explain the working procedure of leaky bucket algorithm. **(08 Marks)**

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CBCS SCHEME

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15CS52

Fifth Semester B.E. Degree Examination, June/July 2019
Computer Networks

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Describe in detail the services offered by DNS and explain the DNS message format. **(08 Marks)**

b. Illustrate the basic operation of SMTP and FTP. **(08 Marks)**

OR

2 a. Explain the persistent and non-persistent connection of HTTP. **(08 Marks)**

b. Define a socket. Describe the socket programming using TCP. **(08 Marks)**

Module-2

3 a. Draw and explain the FSM for sender and receiver side of rdt 2.1 protocol. **(08 Marks)**

b. Elaborate the three-way handshaking procedure used in TCP. **(04 Marks)**

c. Suppose that 2 measured sample RTT values are 106 ms and 120 ms. Compute

(i) Estimated RTT after each of these sample RTT value is obtained, Assume $\alpha = 0.125$ and estimated RTT is 100 ms just before first of the sample obtained.

(ii) Compute DevRTT, Assume $\beta = 0.25$ and DevRTT was 5 msec before first of these samples are obtained. **(04 Marks)**

OR

4 a. With an FSM, explain the three phases of congestion control. **(08 Marks)**

b. Write the TCP segment structure and explain its fields. **(04 Marks)**

c. Elaborate the working of Go-Back N protocol. **(04 Marks)**

Module-3

5 a. Give the format of IPV6 datagram and explain the fields. **(06 Marks)**

b. What are the message types used in IGMP? **(03 Marks)**

c. Write the link state routing algorithm and apply it to the following graph with source node [Refer Fig.Q5(c)] is 'u'. **(07 Marks)**

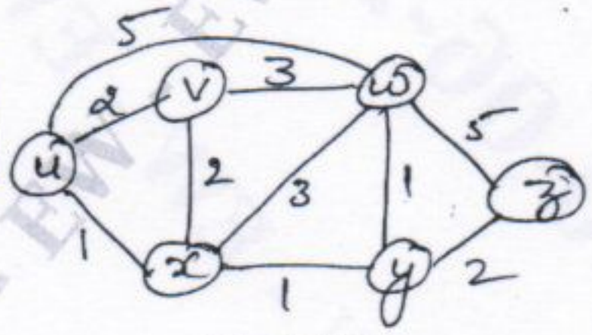

Fig.Q5(c)

OR

6 a. What is routing? Write the structure of a router. **(07 Marks)**

b. List the broadcast routing algorithms? Explain any one of them. **(04 Marks)**

c. Describe the intra-AS routing protocols in detail **(05 Marks)**

Module-4

7 a. Illustrate the two different approaches for routing to a mobile node. **(08 Marks)**

b. With a neat diagram, bring out the steps for mobile node registration to home agent. **(08 Marks)**

OR

8 a. Bring out the components of 3G Cellular Network architecture. **(08 Marks)**

b. State handoff? What are the steps involved in accomplishing handoff. **(05 Marks)**

c. Explain the three phases of mobile IP. **(03 Marks)**

Module-5

9 a. Bring out the leaky bucket mechanism for traffic policing. **(07 Marks)**

b. Classify the multimedia network applications. **(03 Marks)**

c. Describe the link scheduling mechanisms. **(06 Marks)**

OR

10 a. List the categories of streaming stored video. Explain any one of them. **(08 Marks)**

b. Explain the working of CDN. **(08 Marks)**

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CBCS Scheme

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15CS52

Fifth Semester B.E. Degree Examination, Dec.2017/Jan.2018

Computer Networks

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing one full question from each module.

Module-1

1 a. Compare client server and Perl-to-Peer architecture. **(05 Marks)**

b. Describe HTTP with persistent and non-persistent connections. **(08 Marks)**

c. What are the services provided by DNS? **(03 Marks)**

OR

2 a. Demonstrate socket implementation using TCP. **(08 Marks)**

b. Write a note on web caching. **(04 Marks)**

c. Illustrate the basic operation of SMTP with an example. **(04 Marks)**

Module-2

3 a. Elaborate the three way handshaking in TCP. **(05 Marks)**

b. Discuss Go-Back N protocol. **(06 Marks)**

c. Explain the connection-oriented multiplexing and de-multiplexing. **(05 Marks)**

OR

4 a. State congestion and discuss the cause of congestion. **(04 Marks)**

b. With a neat diagram, explain the TCP segment structure. **(08 Marks)**

c. Suppose that two measured sample RTT values are 106 ms and 120 ms. Compute:

i) Estimated RTT after each of these sample RTT value is obtained. Assume $\alpha = 0.125$ and estimated RTT is 100 msec just before first of the samples obtained.

ii) Compute DevRTT.

Assume $\beta = 0.25$ and DevRTT was 5 msec before first of these samples are obtained. **(04 Marks)**

Module-3

5 a. Write the link-state routing algorithm. Solve the following graph using link-state algorithm with source node 'u'.

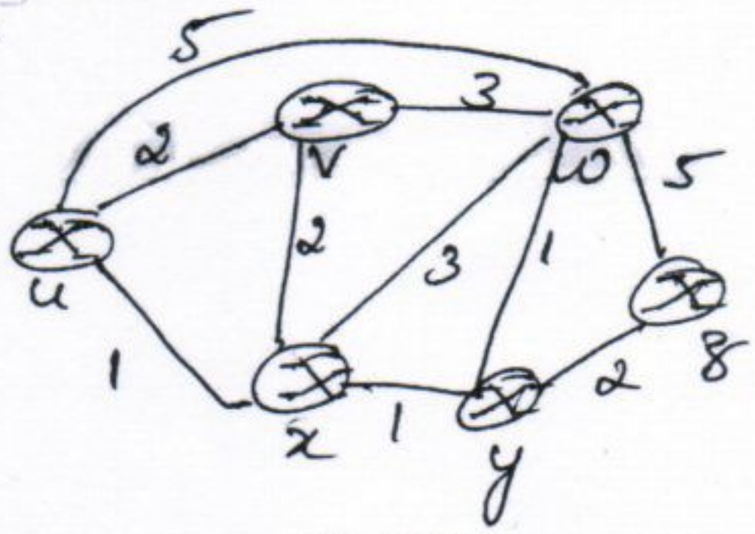

Fig.Q5(a) **(08 Marks)**

b. What is routing? Explain the structure of a router. **(08 Marks)**

OR

6 a. Discuss the IPV6 packet format. **(05 Marks)**
b. Elaborate the path attributes in BGP and steps to select the BGP routes. **(05 Marks)**
c. List the broadcast routing algorithms. Explain any one of them. **(06 Marks)**

Module-4

7 a. Show the components of GSM 2G cellular network architecture with a diagram. **(07 Marks)**
b. Illustrate the steps involved in mobile IP registration with home agent. **(05 Marks)**
c. Write a note on mobile IP. **(04 Marks)**

OR

8 a. Define Handoff. Explain the steps accomplishing a handoff. **(07 Marks)**
b. Bring out the mechanism of direct routing to mobile node in mobility management. **(06 Marks)**
c. Compare the 4G LTE standard to 3G systems. **(03 Marks)**

Module-5

9 a. Elaborate the features of streaming stored video. **(03 Marks)**
b. With a neat diagram, explain the CDN operation. **(08 Marks)**
c. Summarize the limitations of Best-effort IP service. **(05 Marks)**

OR

10 a. Explain the diffserv internet architecture. **(05 Marks)**
b. Describe the leaky bucket policing mechanism. **(06 Marks)**
c. Discuss the round-robin and waited fair queuing scheduling mechanism. **(05 Marks)**

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