University of Rajshahi

Department of Information and Communication Engineering

B. Sc. (Honors) Part – IV Examination, 2014

Course Code: **ICE-401**

Course Title: **Computer Networks and Communications**

Full Marks: **100** Time: **4 Hours**

[Figures in the right margin indicate full marks. Answer any **FIVE** questions.]

1. (a) Draw and explain the general structure of PDU. 5
   (b) Explain public circuit-switched network. 6
   (c) Compare between virtual circuit-switching and datagram switching technique. 5
   (d) Define protocol. Write down the key elements of protocol. 4

2. (a) Draw the conceptual view of ISDN and explain it. 5
   (b) Draw the functional architecture of ISDN and explain it. 5
   (c) Compare ISDN with B-ISDN. 4
   (d) Write a short note on B-ISDN.

3. (a) Explain Flag bytes method. 4
   (b) Draw the diagram of error correction and error detection process. 5
   (c) Explain selective-reject ARQ. 5
   (d) Name different data transfer modes of HDLC and explain them. 6

4. (a) What are the key differences between frame relay and X.25 packet switching? 4
   (b) What are the features of frame relay? Briefly explain the architecture of frame relay. 6
   (c) What are the design goals of ATM? Discuss about the switching in ATM. 6
   (d) Explain the function of header error control field of ATM cell. 4

5. (a) Write down the goals that the network layer services have been designed for. 2
   (b) Explain the implementation of connectionless service in network layer design issue. 4
   (c) What is routing algorithm? How does a router learn about its neighbors in link state routing? 1+3=4
   (d) Define multicasting and multicast routing. Write down the multi-destination routing method in broadcast routing. 2+3=5
   (e) Draw and explain each field of route reply packet in Ad hoc On-demand Distance Vector (AODV) routing. 5

6. (a) Draw an ARP packet format and explain first five fields of it. 5
   (b) What types of messages are available in Internet Control Message Protocol (ICMP)? Briefly explain one of them. 5
   (c) Define client and server in client/server paradigm. Describe multiplexing and de-multiplexing process in process to process delivery. 2+3=5
   (d) Draw user datagram header and explain each field of it. 5

7. (a) Define Transmission Control Protocol (TCP)? Why does TCP need buffer for storage? 1+1=2
   (b) What kind of buffer is used in stream delivery service? Briefly explain one of them with necessary figures. 4
   (c) Briefly explain the tool that is used to achieve error detection and correction in TCP. 3
   (d) Briefly explain about the backpressure in closed-loop congestion control. 3
   (e) Draw the figure of connection establishment using three-way handshaking in TCP. 3
   (f) Draw and explain the hierarchy of name server. How does recursive resolution differ from iterative resolution? 5

8. (a) Draw the protocol stack of e-mail. 4
   (b) What are the types of facilities available with e-mail? 5
   (c) What do you mean by Cookies? 3
   (d) Briefly explain the message structure of HTTP. 8

University of Rajshahi
Department of Information and Communication Engineering
B.Sc (Engineering) Part-IV Odd Semester Examination, 2015
Course Code: ICE-4111
Course Title: Computer Networks & Communications
Full Marks: 52.5 Time: 3 Hours

N.B.: 1. Answer SIX questions taking any THREE from each section.
2. Use separate answer script for each section.
3. Figures in the right margin indicate full marks.

Section-A

1.(a)	Draw and explain data communication model.	4
(b)	Distinguish between datagram and virtual-circuit switching approach.	3.5
(c)	Draw the structure of a public telecommunication network.	1.25
2.(a)	Draw the conceptual view of ISDN and explain.	5
(b)	Compare ISDN with B-ISDN.	3.75
3.(a)	What are the methods for framing?	1
(b)	Draw and explain error correction process.	3
(c)	Explain stop and wait flow control for condition R < S, where R = propagation time and S = transmission time.	4.75
4.(a)	What are the differences between pure ALOHA and slotted ALOHA?	2.25
(b)	What are the five key assumptions for dynamic channel allocation in LAN and MAN?	3
(c)	Draw and explain the frame structure of IEEE 802.11 standard.	3.5

Section-B

5.(a)	Write the necessity of Network Layer.	1.75
(b)	Explain with diagram the Shortest Path Routing Algorithm.	5
(c)	Compare Virtual-Circuit with Datagram Subnets.	2
6.(a)	Write down the general principles of congestion control and explain.	4
(b)	Briefly Explain the interior Gateway Routing Protocol (OSPF).	4.75
7.(a)	Explain TCP segment header.	3
(b)	What is UDP? Explain UDP header.	4
(c)	What is the subnetwork address if the destination address is 200.45.34.56 and the subnet mask is 255.255.240.0?	1.75
8. (a)	What is DNS? Briefly Explain it.	6
(b)	Write down the problems of the multipurpose internet mail extensions for sending and receiving a mail.	2.75

University of Rajshahi

Department of Information and Communication Engineering

B.Sc. (Engg), **Part – IV**, Odd Semester, Examination **2016**

Course code: **ICE 4111**

Course Title: **Computer Network and Communications**

Full Marks: **52.50** Time: **3**Hours

[Answer ***Six*** questions taking any ***Three*** from each section. Use separate answer script for each section.]

Section: A

Q1.a)	What is protocol? What are the key elements of protocol?	2.5
b)	What are the differences between Bus topology and Ring topology?	1.5
c)	Draw the block diagram of X.25 interface.	0.75
d)	Suppose you want to transmit a 16 bit data from station A to station B. Draw and explain the effect of packet size on transmission time, where each packet size is 4 bit.	4
Q2.a)	Write down the evaluation of ISDN?	4
b)	Explain different types of ISDN channel.	4.75
Q3.a)	What are the methods of framing? Explain Flag byte with byte stuffing method.	2.5
b)	Draw and explain the frame structure of HDLC.	5.5
c)	Draw the figure of Stop-and-Wait flow control with transmission time, T1 and propagation time T2.	0.75
Q4.a)	Draw the frame structure of IEEE 802.11 standard.	0.75
b)	What are the services provided by wireless LAN? Explain in detail.	4.5
c)	Draw and explain the user-network interface protocol architecture.	3.5

Section: B

Q5.a)	Write the necessity of Network Layer.	1.75
b)	Explain the diagram the Shortest Path Routing Algorithm.	5
c)	Compare Virtual-Circuit with Datagram Subnets.	2
Q6.a)	Write the ideas of the link state routing algorithm.	2
b)	Explain hierarchical routing algorithm with necessary diagram.	6.75
Q7.a)	What is IP address? Classify classful IP-address with their range.	3
b)	Write the TCP connection establishment procedure.	2
c)	What is congestion? Write the causes of congestion.	3.75
Q8.a)	Explain web model with necessary figure.	6
b)	Write the built-in HTTP request methods with description.	2.75

University of Rajshahi

Department of Information and Communication Engineering

B.Sc. (Engineering) Part-IV (Even Semester), 2017

Course Code: **ICE-4211**

Course Title: **Computer Networks**

Full Marks: 70 Time: 3 Hours

[Answer **THREE** questions from each section. Use separate answer script for each section.]

Section-A

1.	a)	Draw the block diagram of a communication model and explain about it.	4
	b)	Write down the phases of circuit switching and explain them.	$4\frac{2}{3}$
	c)	Compare between circuit-switching and packet-switching.	3
2	a)	Draw and explain the physical structure of Coaxial cable.	3.5
	b)	Write down the application of Terrestrial Microwave.	2
	c)	Explain different types of guided transmission media.	$2\frac{2}{3}$
	d)	Explain the standard of ISDN.	3.5
3.	a)	What are the methods for framing?	0.5
	b)	Draw the frame structure of HDLC and explain its each field.	$5\frac{2}{3}$
	c)	Draw the figure of Go-Back-N ARQ and explain its operation.	5.5
4.	a)	What are the five key assumptions for dynamic channel allocation in LAN and MAN?	4
	b)	Draw and explain the frame structure of IEEE 802.11 standard.	4
	c)	Draw and explain the protocol architecture of frame relay.	$3\frac{2}{3}$

Section-B

5.	a)	What is optimality principle? How to avoid generating a vast numbers of duplicate packets in flooding routing algorithm.	2
	b)	Write down the comparisons of *Virtual-Circuit* and *Datagram Subnets*	5
	c)	What is datagram? Draw an IPv4 datagram header format and explain any three field of it.	$4\frac{2}{3}$
6.	a)	Define cache, gateway and proxy.	3
	b)	Draw the hierarchy of Domain Name Space and explain them.	$5\frac{2}{3}$
	c)	Write a short note on HTTP.	3
7.	a)	Define node-to-node, host-to-host, and process-to-process delivery. What kind of addresses need in data link, network, and transport layer? Write the range of well known, registered, and dynamic port.	4
	b)	Briefly explain about three-way handshaking for connection establishment in TCP connection.	5
	c)	Briefly explain about the choke packet in close loop congestion control.	$2\frac{2}{3}$
8.	a)	What is the difference between Fully Qualified Domain Name (FQDN) and Partially Qualified Domain Name (PQDN)? Draw and explain the header format of query and response message in DNS message	$6\frac{2}{3}$
	b)	Define File Transfer Protocol (FTP)? Describe the communication over control and data connection in FTP.	5

University of Rajshahi

Department of Information and Communication Engineering

B.Sc. (Engineering) Part-IV (Even Semester), 2018

Course Code: ICE-4211

Course Title: Computer Networks

Full Marks: 70 Time: 3 Hours

[Answer **SIX** questions taking any **THREE** from each section]

Section-A

1. a) What is protocol? What are the key elements of protocol? 2
   b) What are the types of service provided by session layer? Write the advantages of OSI model. $5\frac{2}{3}$
   c) Draw the diagram of PDU. Explain the different phases of circuit switching. 4

2 a) What factors are responsible for successful data transmission? 1
   b) Define (i) Direct link (ii) Point-to-point link (iii) Multi-point link (iv) Simplex (v) Half-duplex and (vi) Full-duplex. 3
   c) Give some idea about the most significant transmission impairments: (i) Attenuation (ii) Delay distortion and (iii) Noise. $4\frac{2}{3}$
   d) Define Channel capacity and Error rate. Write down Shanon's Channel Capacity Formula. 3

3. a) Show the transmission characteristics of Guided media in a Table. 3
   b) Draw and explain physical structure of an optical fiber. Mention advantages of optical fiber over other guided transmission media. $5\frac{2}{3}$
   c) Give some idea about Narrowband ISDN and Broadband ISDN. 3

4. a) Draw the relationship between Packets and Frames. 1
   b) Give some examples of Unacknowledged connectionless service, Acknowledged connectionless service and Acknowledged connection-oriented services. $4\frac{2}{3}$
   c) What do you understand by Error Correcting Codes and Error Detecting Codes? Mention their names. 3
   d) Write short notes on High Speed LANs. 3

Section-B

5. a) What is the *necessity of Network layer*? $1\frac{2}{3}$
   b) Explain the diagram of the *Shortest Path Routing Algorithm*. 5
   c) Give a comparison between *Virtual-Circuit* and *Datagram Subnets*. 2
   d) Draw an *IPv4 datagram header format* and explain its any three fields. 3

6. a) Write down the five advantages of IPv_6 over IPv_4. 2.5
   b) What is the length of the base header? Describe each fields of extension header in IPv6 datagram. $4\frac{2}{3}$
   c) Describe the type of autonomous system with example. 2.5
   d) What is the difference between external BGP (E-BGP) and internal BGP (I-BGP)? 2

7. a) What is socket address? What are the sockets addresses that need for transport layer protocol. 2
   b) Draw user datagram header and explain each field of it. 4
   c) What is segment? Write the control field of the segment header 2
   d) Briefly explain about three-way handshaking for connection termination in TCP connection. $3\frac{2}{3}$

8. a) Draw DNS (Domain Name System) message header and describe its each field. $7\frac{2}{3}$

b) Describe the communication over control and data connection in FTP (File Transfer Protocol). 4