

B.E. Computer Science and Engineering Third Year Second Semester Examination 2025

Time: 3 hours

Full Marks: 100

INTERNET TECHNOLOGY

Group A [CO1: Total Marks: 10 (=5X2)]

Answer Any 5 questions from Q1

1. Answer any five questions from the following: [5X2=10]

- a) How was the idea of Internet formed?
- b) What is the role of the Internet Service Providers (ISPs)?
- c) What speeds are in offer by the ISPs?
- d) What are the core components of the Internet infrastructure?
- e) What is meant by protocol?
- f) How did TCP and IP evolve?
- g) What is meant by 5G?

Group B [CO2: Total Marks: 40 (=10X1+1X30)]

Question no. 2 is COMPULSORY [Marks: 10]

Answer Question No. 3 OR Question No. 4 [Marks: 30]

2. Pick the correct answer. [10X1=10]

- a) Mobile IP registration request contains:
 - i) Home agent and COA
 - ii) home address and home agent
 - iii) home address, home agent and COA
- b) In Snooping TCP, Foreign Agent (FA) detects loss of segment by looking into the
 - i) sequence number
 - ii) timestamp
 - iii) NACK
 - iv) None of these
- c) Correspondent Node is i) communication partner ii) home agent iii) foreign agent
- d) First two bytes of Class B address are in the range of:
 - i) 128-191
 - ii) 128-190
 - iii) 191-223
 - iv) 192-223
- e) Who sends the acknowledgement to the Correspondent Node in I-TCP?
 - i) Mobile Host
 - ii) Access Point
- f) IPv6 addresses can be:
 - i) unicast, multicast and anycast
 - ii) only unicast
 - iii) only anycast
 - iv) only multicast
- g) Address length of IPv4 is
 - i) 16 bits
 - ii) 32 bits
 - iii) 64 bits
 - iv) 128 bits
- h) The address [11000001 10000011 00011011 11111111] is:
 - i) Class E
 - ii) Class D
 - iii) Class C
 - iv) Class B
- i) IPv6 does not have a broadcast address.
 - i) True
 - ii) False
- j) In Transaction Oriented TCP, number of packets required:
 - i) 2 to 3
 - ii) 7 to 8

[Turn over

Group B contd..

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- 3.
- a) How is IP datagram formed? [2]
 - b) How is a message sent and subsequently received? [3]
 - c) How does Fast Retransmit mechanism work in TCP? [3]
 - d) How is agent advertisement utilized and by whom? [3]
 - e) Distinguish between IP in IP Encapsulation and Minimal Encapsulation. [2]
 - f) What does Flow Label in IPv6 header identify? Who sets it and can it be changed during routing? [2+2]
 - g) What is classful addressing? How can the first and last addresses in a block be found in IPv4 addressing? [2+4]
 - h) What is subnet mask? What is the subnet mask of 202.39.47.9? Is there subnet mask for Class E addresses? Why/why not? [2+1+1+1]
 - i) What is QoS object in new IPv6? [2]
- 4.
- a) What are the types of unicast address in IPv6? [2+3]
Mention the respective fields of any one type.
 - b) What does the Traffic class in IPv6 header identify? How does it help in routing? [2+2]
 - c) How does M-TCP protocol work? [4]
 - d) Explain reverse tunneling with the help of a suitable diagram. [3]
 - e) Who sends binding update to whom? Who maintains binding cache? What is binding acknowledgement? [3+2+2]
 - f) How does smooth handover differ from fast handover? [2]
 - g) What is DHCP lease? [2]
 - h) What is the subnet mask of 217.39.47.9? [1]
 - i) A block of address is assigned to an institution. One of the addresses is 205.16.37.39/28. What is the first address in the block? [2]

Group C [CO3: Total Marks: 25 (=5X1+2X10)]

Question no. 5 is COMPULSORY [Marks: 05]

Answer ANY TWO Questions from No. 6, Question No. 7, Question No.8

5. Pick the correct answer. [5X1=5]
- a) Response code 5XX in HTTP means i) successful ii) redirection iii) server error iv) client error
 - b) Adaptive Streaming is a hybrid of progressive download and streaming. i) True ii) False
 - c) Real Time Streaming Protocol (RTSP) is dependent on transport protocol. i) False ii) True
 - d) Major Entities of Session Initiation Protocol (SIP) include
i) Proxy Server ii) User agent iii) Redirect Server iv) all of the above
 - e) Record types of DNS include A and AAAA. i) False ii) True
- 6.
- a) What do the following methods: PUT, PATCH, CONNECT perform? [3]
 - b) How is Round Trip Delay calculated in Real-Time Control Protocol (RTCP)? [3]
 - c) What is the role of the Resolver in DNS? What is iterative query in DNS? [4]

Group C Contd.

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- 7.
- a) What happens if header is missing in HTTP? [1]
 - b) What are the differences between GET and POST? [3]
 - c) Why are sequence nos. used in Real-Time Protocol (RTP) header?
Mention any three payload types used in RTP. [4]
 - d) What are the fields in the query message header of DNS protocol? [2]
- 8.
- a) What are the major components of DNS? What is recursive query in DNS? [4]
 - b) What does mdat denote? [1]
 - c) What happens if Header is missing in HTTP? [2]
 - d) How does a receiver using RTP find out packet loss? [3]

Group D [CO4: Total Marks: 10]

Answer Question No. 9 OR Question No. 10 [Marks: 10]

9. Consider an NGO that accepts donations in cash or kind [clothes/any usable items]. Design and develop a module for registering a possible donor user. [10]
10. Consider a digital platform that is used by students to buy old books and sell used books. Design and develop a module for registering a possible buyer/seller student. [10]

Group E [CO5: Total Marks: 15]

Answer Question No. 10 OR Question No. 11 [Marks: 15]

- 10.
- a) In what type of network communication is Tunnel mode generally used? [2]
 - b) What is the difference in the authentication provided by AH and ESP in IPsec? [3]
 - c) How can sequence nos. be used to identify replay attack in IPsec? [3]
 - d) How is the server's certificate checked by the client? [3]
 - e) What are Change Cipher Spec protocol and Alert protocol? [4]
- 11.
- a) How is message transmitted in Transport mode? [2]
 - b) Can AH and ESP be used together in IPsec? Why or Why not? [3]
 - c) What is security association in IPsec? How is it identified? [3]
 - d) How is sequence no. used in TLS? [3]
 - e) What are the different steps in the TLS Handshake protocol? [4]
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