

JK LAKSHMIPAT UNIVERSITY, JAIPUR

INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination (Regular/Backlog), November 2017
B. Tech-M. Tech in Computer Science & Engineering, Semester: V

Roll No.....

MTCS122 : Internet Technologies

Time: 3 hours

Max. Marks: 100

Instructions to students:

1. Do not write anything other than your roll number on question paper.
 2. Assume suitable data wherever required and mention it clearly.
 3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
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Q.1A Objective type multiple choice questions (10 questions @ 1 mark)

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- i. The concept of allowing a single route entry to represent many network addresses is known as _____.
(A) CIDR
(B) Route aggregation
(C) VLSM
(D) classless addressing
- ii. Given network 176.200.0.0/16 and a subnet that supports 4,387 hosts, what is the most likely mask for the subnet?
(A) /20
(B) /17
(C) /21
(D) /19
- iii. Which of the following is not a match criteria that can be used with IP filters?
(A) Source or destination IP address
(B) Source or destination port number
(C) ICMP message type
(D) Originating host name
- iv. Which of the following TCP flags is not matched with the correct definition?
(A) SYN – Indicates the start of a TCP connection.
(B) ACK – Acknowledges that a TCP segment has been received.
(C) FIN – Indicates the closing of a TCP session.
(D) RST – Re-sets the sequence numbers for a TCP session.
- v. The forwarding of packets on a router is a function of the data plane. The use of a routing protocol to build routing tables is a function of _____.
(A) The routing plane
(B) The control plane
(C) The OSPF plane
(D) The protocol plane

- vi. If an OSPF router receives an LSA with a sequence number that is equal to the sequence number it already has for that LSA, it will _____.
 - (A) Silently drop the LSA.
 - (B) Send a rejection notice to the sending router.
 - (C) Drop the LSA and send an acknowledgement.
 - (D) Drop the LSA and forward it to its adjacent routers.
- vii. In the event that a previously advertised network becomes unreachable, BGP will _____.
 - (A) Advertise the route with a null AS-path.
 - (B) Tear down the peer connection.
 - (C) Send a withdraw message.
 - (D) Update its route table but take no other action.
- viii. Which of the following is false regarding ASes?
 - (A) The assignment of public AS numbers is controlled by RIRs.
 - (B) 65,001 is a private AS number.
 - (C) An IGP is required for routing within the AS.
 - (D) They usually contain routers under the control of different administrative groups
- ix. Which one is not a building blocks in Neo4j?
 - (A) Node
 - (B) Relationship
 - (C) Label
 - (D) Entity
- x. What the following Cypher query is performing:
 MATCH (s:Supplier)-->(:Product)-->(c:Category)
 RETURN s.companyName as Company, collect(distinct c.categoryName) as Categories
 - (A) List the company name which in the unique category.
 - (B) List the product categories provided by each supplier.

Q.2 Short answer type questions (4 questions @ 2.5 marks)

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- i. How is HTTP related to WWW?
- ii. Describe the addressing system used by SMTP.
- iii. Why do we need POP3 or IMAP4 for electronic mail? Provide proper reasoning.
- iv. Describe the functions of the two FTP connections.

Q.3A Describe the following Session Initiation Protocol (SIP) Network Elements:

05

- (A) User Agent
- (B) SIP Server

Q.3B Provide the overview of Request method and Response method employ in the Session Initiation Protocol (SIP) with example.

05

- Q.4 This question is about virtual circuits and the Transmission Control Protocol (TCP) and User Datagram Protocol (UDP). 03
- Define the concept of virtual circuit. 03
 - Explain the three-way handshake process used by TCP to establish a virtual circuit. 05
 - Explain how the TCP protocol would be able to detect errors and data loss, and how it would ensure that the lost data is re-transmitted, whilst transmitting data over a TCP virtual circuit. 04
 - In contrast to TCP, UDP is described as a connectionless protocol. Briefly explain how data is transmitted between two computers using the UDP protocol. 03
- Q.5A Outlines the mandatory attributes to implement BGP policies. 05
- Q.5B When should you use BGP? Keep in mind, there are several considerations you need to account for when making a decision to use BGP. 05
- Q.6A If your network address is 10.1.0.0/16 and you have subnetworks that all support at least 300 hosts, how many subnets do you have? 05
- Q.6B What is Network Address Translation (NAT) and Port Address Translation (PAT) and why they are used? 05
- OR
- Q.6B What do you think would happen if the control connection were accidentally severed during an FTP transfer? 05
- Q.7A Explain the benefits of a dynamic routing protocol over static routes? 05
- Q.7B How Link State Updates are flooded through an OSPF network in response to a network change? 05
- OR
- Q.7B What is a proxy server and how is it related to HTTP? 05
- Q.8A Explain any three *Infrastructure Protocols* used in Internet-of-things: 15
- Routing Protocol for Low Power and Lossy Networks (RPL)
 - 6LowPAN
 - IEEE 802.15.4
 - Bluetooth Low-Energy (BLE)
 - EPCglobal
- Q.9A Write a Cypher queries to Load CSV data which has headers and create nodes. 05
- Data file has three fields separated by |. First two fields are autonomous system numbers which are connected together. The last field tell the relationship between the autonomous systems.
- Sample data field in the CSV file:
- ```

2|45714|0
2|52685|-1
3|293|0
3|23248|-1
.....

```

- Q.9B Explain the objective of the following Cypher queries: 05
- (A) MATCH (tom {name: "Tom Hanks"}) RETURN tom
  - (B) MATCH (cloudAtlas {title: "Cloud Atlas"}) RETURN cloudAtlas
  - (C) MATCH (people:Person) RETURN people.name LIMIT 10
  - (D) MATCH (nineties:Movie) WHERE nineties.released > 1990 AND nineties.released < 2000 RETURN nineties.title
  - (E) MATCH (tom:Person {name: "Tom Hanks"})-[:ACTED\_IN]->(tomHanksMovies) RETURN tom,tomHanksMovies
- OR
- Q.9B What are the indexing capabilities of Neo4J? List out the difference between Neo4J Graph Database and MySQL Database? 05