UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2014/2015 –2nd Year Examination – Semester 4

IT4405: Computer Networks

PART 1: Multiple Choice Question Paper

2nd August, 2015
(ONE HOUR)

Important Instructions :

- The duration of the paper is **1 (one) hour.**
- The medium of instruction and questions is English.
- The paper has **25 questions** and **6pages**.
- All questions are of the MCQ (Multiple Choice Questions) type.
- All questions should be answered.
- Each question has 5 (five) choices with **<u>one or more</u>** correct answers.
- All questions carry equal marks.
- There will be a penalty for incorrect responses to discourage guessing.
- The mark given for a question will vary from 0 to +1 (*All the correct choices are marked & no incorrect choices are marked*).
- Answers should be marked on the special answer sheet provided.
- Note that questions appear on both sides of the paper.
  If a page is not printed, please inform the supervisor immediately.
- Mark the correct choices on the question paper first and then transfer them to the given answer sheet which will be machine marked.
- **Completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**
- **No calculators are allowed.**

For each of the questions, identify the correct statement(s) from among the statements given.

1) Which of the following parameter(s) *cannot* be used to characterise a digital communication channel?

(a)	bandwidth
(b)	signal to noise ratio
(c)	delay distortion
(d)	sampling rate
(e)	modulation type

2) Which of the following statement(s) is/are true about in-building copper wiring standards?

(a)	for a given data rate, attenuation per unit length decreases with higher category cabling
(b)	data rates beyond 1Gbps are possible only over Cat 6 and above cabling
(c)	tighter twisting of wires reduces crosstalk
(d)	shielding is expensive but enables higher data rates
(e)	voice and data integration is possible on Cat 5 and above cabling

3) Consider the following statements about Twisted Pair copper cables.
   (i)   Shielded twisted pair cable has improved noise reduction qualities than unshielded twisted pair cables.
   (ii) Unshielded twisted pair (UTP) is more expensive than shielded twisted pair cables for a given length.
   (iii) Coaxial cable is a type of Twisted Pair Cable.

   Which of the above statements is/are true?

(a)	(i) only
(b)	(i) and (ii) only
(c)	(iii) only
(d)	(i) and (iii) only
(e)	All of (i), (ii) and (iii)

4) Consider the following statements about the Token Rings:
   (i)   A token ring employs active monitoring for detecting and compensating for network faults and multiple tokens circulating in a token ring network.
   (ii) When a host has data to send it sets the token bit to 1 in the frame and then sends the data.
   (iii) A destination host in the token ring removes the frame addressed to it from the ring.

   Which of the above is/are true?

(a)	(i) only
(b)	(ii) only
(c)	(iii) only
(d)	(i) and (ii) only
(e)	(ii) and (iii) only

5) The proper order of corresponding OSI layers having functionalities of end to end error recovery, media access resolution, flow metering by buffering, and translation between heterogeneous data representations is

(a) network, data link, presentation, application
(b) network, data link, transport, presentation
(c) transport, data link, application, presentation
(d) transport, data link, network, presentation
(e) transport, network, application, presentation

6) Which of the following characterises a source to destination (end-to-end) virtual circuit (VC)?

(a)   The packet header contains an end point identifier to identify a particular virtual circuit
(b)   VC guarantees delivery of a packet with a return acknowledgement
(c)   A connection establishment phase precedes data transfer
(d)   There is no guarantee of packet delivery
(e)   A packet may traverse different physical paths from source to destination

7) Which of the following is/are correct regarding Internet Protocol?
(i)   It is a best effort hop by hop packet delivery protocol.
(ii)   It is a connectionless protocol.
(iii)   It runs on Layer2 of IP protocol stack.

(a)   (i) only
(b)   (ii) only
(c)   (i) and (ii) only
(d)   (i) and (iii) only
(e)   All of (i), (ii) and (iii)

8) Which of the following is/are true with regard to dynamic routing algorithms used in packet networks?

(a) Dijkstra's algorithm finds the least cost path between any two nodes
(b) Bellman-Ford algorithm finds the least cost path between any two nodes with a minimum number of hops
(c) Bellman-Ford algorithm requires each node to be aware of the overall topology of the network
(d) Dijkstra's algorithm only requires each node to be aware of neighbor nodes
(e) RIP is a distance vector algorithm

9) To deliver a message to the correct application program running on a host, which of the following must be consulted?

(a)   MAC address
(b)   Domain Name Service
(c)   Port address
(d)   IP address
(e)   Portmapper

10) Which of the following is/are correct regarding DHCP protocol?
   (i)   DHCP messages *Request to join* and *offer* are sent using broadcasting
   (ii) DHCP runs on port 67
   (iii) DHCP enables hosts to move from one network to another

   (a) (i) only
   (b) (ii) only
   (c) (iii) only
   (d) (ii) and (iii) only
   (e) All of (i), (ii) and (iii)

11) Which of the following statement(s) is/are true?

   (i)   Digitised real time traffic is sensitive to channel errors but not sensitive to network delay variations
   (ii)   Digitised real time traffic requires bandwidth reservation or buffering and play back when transported on data networks
   (iii)   Digitised real time traffic can be efficiently sent over virtual circuits compared to over datagram mode

(a)   (i) only
(b)   (ii) only
(c)   (iii) only
(d)   (i) and (ii) only
(e)   (ii) and (iii) only

12) Which of the following statements is/are correct about IP multicasting?

(a) Multicasting is useful when group activities are involved for e.g., video conferencing, gaming etc.
(b) Membership of a multicast group is static and receivers have no control of the membership of the group.
(c) Ethernet LANs do not support multicast transmissions.
(d) Routers implement group management protocols to support multicast routing.
(e) Class D IPv4 addresses can be used in sending IP multicast packets.

13) Which of the following statements is/are correct with regard to the ICMP protocol?

(a) ICMP is a support protocol for network diagnosis and error reporting.
(b) ICMP is triggered when the TTL expires.
(c) Using ICMP for network probing can reduce the amount of information available to the attackers.
(d) ICMP works at the Data Link layer.
(e) ICMP messages are delivered reliably.

14) Which of the following application protocol(s) use TCP?

(a)   SMTP
(b)   TFTP
(c)   HTTP
(d)   FTP
(e)   DHCP

15) Which of the following IP based protocol(s) can be used to receive email messages from servers?
   (i)   Simple Mail Transfer Protocol (SMTP).
   (ii)   Post Office Protocol (POP).
   (iii)   Interactive Mail Access Protocol (IMAP).

(a)   (i) only
(b)   (i) and (ii) only
(c)   (iii) only
(d)   (i) and (iii) only
(e)   All of the above

16) Which of the following statements is/are correct about the ARP protocol?

(a) It maps a host's 32 bit IP address to its 48 bit Ethernet MAC address.

(b) It uses the MAC address ff:ff:ff:ff:ff:ff to send the ARP broadcasts.

(c) ARP requests that are sent to hosts on other networks should have the default gateway address as their source address.

(d) Initially the ARP cache is consulted by the ARP protocol, which is a database of IP addresses to MAC address mappings of known hosts.

(e) ARP protocol periodically refreshes its ARP cache to reduce network latency.

17) Which of the following is/are correct regarding IPv6?

(a) Tunneling has to be done when IPv4 is used in some of hosts.

(b) IPv6 has a 32 bit length of network prefix.

(c) IPv6 provides an address length of 128 bits.

(d) IPv4 and IPv6 are compatible addressing technologies.

(e) IPv6 will provide approximately 4 billion addresses.

18) A hub based Ethernet is different to a Layer 2 Ethernet switch in that

(a) Each physical port of the switch is in a separate collision domain.

(b) All physical ports of the switch belong to one collision domain.

(c) All physical ports of the hub belong to one broadcast domain.

(d) All physical ports of the switch belong to one broadcast domain.

(e) Each physical port of the hub is a separate broadcast domain.

19) Which of the following statements is/are correct about IEEE 802.11 wireless access standard?

(a) For very short range device communications, 802.11 is preferred over Bluetooth technology.

(b) The 802.11 standard is the same as CSMA/CD access methodology.

(c) A beacon frame from the 802.11 access point in active scanning mode can help incoming nodes to join the network.

(d) The 802.11 wireless security mechanisms describe encryption and authentication.

(e) 802.11 enables the use of several physical layer techniques such as OFDM and MIMO

20) Suppose two wireless nodes A and B are involved in a CTS/RTS based data exchange. For how long does a nearby node C has to defer its transmission attempt?

(a) For a period randomly selected from the back off interval $[0, CW_{min}-1]$.

(b) For a period specified by the Network Allocation Vector field if the MAC frame from nodes A and B is decoded correctly.

(c) For a period of EIFS (Extended Inter Frame Space) if the channel is sensed as busy but the MAC frame from nodes A and B cannot be decoded correctly.

(d) For a period determined by node C and propagated to nodes A and B.

(e) Node C has to wait till either the node A or node B notifies that it has completed data transmission, in a new frame.

21) Consider the following statements about wide area wireless data networks.

    (i)   GSM uses a combination of FDM and TDM multiplex schemes.

   (ii)   UMTS and HSPA+ can provide data rates beyond 2 Mbps.

  (iii)   GPRS is an overlay service on the GSM network.

Which of the above statements is/are true?

(a) (i) and (ii) only

(b) (i) and (iii) only

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(c) (iii) only
(d) (ii) and (iii) only
(e) All of (i), (ii) and (iii)

22) Which of the following statements is/are correct with regards to routing in mobile ad hoc networks?

(a) AODV routing protocol uses sequence numbers maintained at each destination to determine the freshness of a route.
(b) DSDV routing protocol suffers from loops in path finding.
(c) DSR data packets carry the source route in the packet header.
(d) The path calculated in DSR is loop free since loops can be detected easily and erased by the source routing.
(e) In AODV the path to the destination is calculated in a hop by hop manner.

23) Select the correct statement(s) about VLAN.
(a) VLAN Trunk Protocol is used to propagate VLAN information across a trunked link.
(b) By implementing a VLAN we can reduce broadcast traffic.
(c) Membership of a VLAN can be based on the MAC addresses only.
(d) Implementing a large network without a VLAN concept reduces its performance and security.
(e) Frame tagging functions at Layer 2 reduces the management overhead in VLAN administration.

24) Which of the following objectives is/are true about network monitoring and auditing in an enterprise environment? It aims to
i.   detect faults of the network
ii.   perform usage analysis and investigations
iii. control damage, control & recover from disaster

(a) (i) only
(b) (ii) only
(c) (i) and (ii) only
(d) (ii) and (iii) only
(e) (i), (ii) and (iii)

25) Which of the following can be called as network infrastructure?
i.   Network connectivity
ii.   Routing and switching capabilities
iii. Network security
(a) (i) only
(b) (ii) only
(c) (i) and (ii) only
(d) (i) and (iii) only
(e) (i), (ii) and (iii)

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