



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 **6 pages**.
- All questions are of the MCQ (Multiple Choice Questions) type.
- All questions should be answered.
- Each question has 5 (five) choices with **one or more** 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

- (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)
