



UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

*Academic Year 2013/2014 – 2<sup>nd</sup> Year Examination – Semester 4*

***IT4504: Data Communication and Networks***  
***PART 1: Multiple Choice Question Paper***

**20<sup>th</sup> July, 2014**  
**(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. **Please completely read and follow the instructions given on the other side of the answer sheet before you shade your correct choices.**

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

**(Some questions contain preceding text which provides the context in which the said statements should be considered.)**

- 1) Select the correct statement(s) regarding jitter, latency and bandwidth on a network with respect to applications mentioned below.

- (a) Email is very sensitive to jitter.
- (b) Videoconferencing is sensitive to latency.
- (c) Email requires a very high bandwidth
- (d) IP telephony (VoIP) applications are not sensitive to jitter or latency.
- (e) Web browsing is very sensitive to latency.

- 2) Consider the following statements on security technologies:

- i. A basic packet filter firewall can prevent a virus being download by a user.
- ii. MAC ID filtering is used in wireless networks as a basic security technique.
- iii. VPN (Virtual Private Network) provides a secure channel to transfer data.

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) (ii) and (iii) only

- 3) Select the correct statement/s regarding USB interfaces.

- (a) USB 1.0 standard allows devices to transfer data up to 15Mbits/s.
- (b) USB 2.0 allows data transfer rates of 480Mbit/s up to a 100 m distance.
- (c) USB 3.0 is supposed to achieve 400 MB/s or higher.
- (d) Standard A and B type USB 1.x/2.0 use 4 pins to transfer data.
- (e) A mini /micro type USB 1.x/2.0 interface has 5 pins but use only one pair to transfer data.

- 4) Consider the following statements regarding DHCP messages.

- i. A DISCOVER message is transmitted by the client to identify a DHCP server.
- ii. A REQUEST message is sent by the client to get a new IP or to renew an IP address.
- iii. A RELEASED message is sent by the DHCP server to acknowledge that it has released an IP for a DHCP Client.

Which of the above statements is/are true?

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

- 5) What is the frequency spectrum allocated for the HF band?

- (a) 3MHz- 30MHz
- (b) 30MHz-300MHz
- (c) 300MHz- 3GHz
- (d) 3GHz-30GHz
- (e) 30GHz-300GHz

- 6) Consider the following statements about wireless Data networks.
- i. GPRS can provide data rates of up to 20 Mbps.
  - ii. UMTS and HSPA+ can provide data rates above 2 mbps.
  - iii. GPRS is used in MMS and P2P applications.

Which of the above statements is/are true?

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

- 7) Which layer of the 7-layer OSI reference model refers to basic packet filter operations?

- (a) Layer 1
- (b) Layer 2
- (c) Layer 3
- (d) Layer 5
- (e) Layer 7

- 8) Which of the following is/are belonging to data flow layers in the OSI model?

- (a) Transport layer
- (b) Session layer
- (c) Network layer
- (d) Presentation layer
- (e) Physical layer

- 9) Which of the following IP addresses is/are in the private IP address range according to RFC 1918?

- (a) 10.1.8.5
- (b) 192.160.22.1
- (c) 172.8.1.1
- (d) 172.16.5.11
- (e) 192.168.4.142

- 10) How many layers are present in the TCP/IP reference model?

- (a) Two (2) layers
- (b) Three (3) layers
- (c) Four (4) layers
- (d) Five (5) layers
- (e) Seven (7) layers

- 11) Which of the following aspects is/are needed to be considered in implementing a network solution?

- (a) Test Platform
- (b) Performance
- (c) Expandability
- (d) Permissible error rate
- (e) Reliability

- 12) Consider the following statements about Category 5/5e/6 cable standards,
- i. Category 5 can operate at 100Mhz.
  - ii. Category 5e can operate at 250 Mhz.
  - iii. Category 6 can operate at 500 Mhz.

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) (ii) and (iii) only

- 13) Consider the following statements about typical network topologies.
- I. Bus topologies are widely used as it is easy to troubleshoot than other (ring, star) topologies.
  - II. The bandwidth or the network throughput in a star topology depends only on the capabilities of the end devices.
  - III. Ring topology is widely used in fibre to home (FTH) and metropolitan area networks due to low material cost compared to star networks.

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

- 14) Which of the following factors is/are considered in developing a routing algorithm?

- (a) Standardization
- (b) Correctness
- (c) Simplicity
- (d) Open Source
- (e) Optimality

- 15) Consider the following statements about Domain Name System (DNS).

- i. DNS is based on client server architecture.
- ii. A zone is a sub-tree of the DNS database that is administered as a single separate entity.
- iii. DNS is a hierarchical system.

Which of the above statement/s is/are true?

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

- 16) Which of the following activities are associated with the application layer of the OSI 7 layer model?
- (a) Establishing an HTTPS connection from a server to the web Client
  - (b) A client establishing a secure tunnel using IPSec to transfer data
  - (c) A DHCP server responding to a client request to release an IP address
  - (d) A desktop sending a request to the name servers to resolve the address [www.bit.lk](http://www.bit.lk)
  - (e) An RSVP receiver sending a "Reservation message" (resv) message to reserve resources during data transfer
- 17) Consider the following statements about multiple access methods of networks.
- I. Fixed assignment (Channel partitioning) is a multiple access method used in mobile technologies
  - II. Ethernet uses both random access and token based multiple access methods.
  - III. CSMA/CD is an example for Random access multiple access method
- 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
- 18) Which layer(s) refer(s) to the IP routing operations of a manageable switch in the OSI 7 layer model?
- (a) Layer 2
  - (b) Layer 3
  - (c) Layer 4
  - (d) Layer 6
  - (e) Layer 7
- 19) Select the correct statement(s) about VLAN.
- (a) The trunk port is an access port which carries untagged VLAN data.
  - (b) Hosts in different VLANs (Implemented using IP based VLAN) can communicate using a Layer 3 device.
  - (c) By implementing a VLAN we can reduce broadcast traffic.
  - (d) Implementing a large network decreases its performance and security.
  - (e) Frame tagging functions at Layer 2 reduce the processing and administrative overhead in VLAN setup.
- 20) Which of the following is a/are connection oriented protocol/s?
- (a) ftp
  - (b) telnet
  - (c) UDP
  - (d) SSH
  - (e) IPv4
- 21) Which of the following is a/are mail transfer protocol/s used by email clients?
- (a) SMTP
  - (b) POP
  - (c) TFTP
  - (d) IMAP
  - (e) RTP

- 22) Consider the following definitions about the three types of impairments related to signal transmission in a medium. Which of them is/are true?
- i. Attenuation is the loss of signal strength when it travels through a media.
  - ii. Noise is added to the signal due to thermal or cross talk interference.
  - iii. Delay distortion occurs when multiple components of a signal travel to the destination with different attenuation levels.

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

- 23) Which of the following is a/are goal/s of network monitoring and auditing in an enterprise environment?

- (a) To detect faults of the network
- (b) To perform usage analysis and investigations
- (c) To control damage control & recover from disaster
- (d) To increase download speed to clients
- (e) To optimize routing protocols

- 24) Consider the following statements about NAT (Network Address Translation) on a network

- I. The application level gateways are used in networks to overcome protocol specific errors generated by NAT.
- II. Static NAT provides facilities to map an internal IP address to an outside address.
- III. Router is the only device which can implement NAT in your network.

Which of the above is/are true?

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

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

- (a) A client can have IPv6 and IPv4 addresses at the same time.
- (b) Smallest routable subnet size In IPv6 is considered as /64.
- (c) A /128 address can be routed in an IPv6 network.
- (d) NAT is a key feature supported in IPv6.
- (e) You cannot implement IPv6 and IPv4 in the same network.

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