UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2018 – 2nd Year Examination – Semester 4

IT4405 – Computer Networks
Part 1 - Multiple Choice Question Paper

30th September, 2018
(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 **07 pages**.

- All questions are of the MCQ (Multiple Choice Questions) type.

- All questions should be answered.

- Each question will have 5 (five) choices with <u>**one or more**</u> correct answers.

- All questions will carry equal marks.

- There will be a penalty for incorrect responses to discourage guessing.

- The mark given for a question will vary from 0 (*All the incorrect choices are marked & no correct choices are marked*) 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.**

- Calculators are **not** allowed.

1)   Consider the following statements about data transmission.

     i.   In a layered model headers are added as a data packet moves from lower layers to upper layers,

     ii.   A set of rules that govern data representation and communication is referred to as a protocol.

     iii. A physical path used for data transmission is referred to as a medium.

Which of the above statement(s) is/are **true**?

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

2)   Optical Carrier transmission rates are a standardized set of transmission bandwidth specifications for Synchronous Optical Networking (SONET) fiber optic networks. The designation OC-3 refers to a bandwidth of;

(a) 51.84 Mbps	(b) 155.52 Mbps	(c) 1.244 Gbps
(d) 10 Gbps	(e) 40 Gbps	

3)   Last mile solutions refer to how a customer is connected to a wide area network. Consider the following.

     i.   ADSL operates over standard telephony copper cables and provides a high speed down-link and a slower speed up-link.

     ii.   FTTH operates over fiber optic cables.

     iii. FTTH is affected by electromagnetic interference (EMI), while ADSL is not.

Which of the above statements is/are **true**?

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

4)   The following statements describe functions of some layers in the Open Systems Interconnection (OSI) 7 layer networking model.

     i.   Structuring and managing a multi-node network, including addressing, routing and traffic control.

     ii.   Reliable transmission of data segments between points on the network, including segmentation, acknowledgment and multiplexing.

     iii. Translation of data between a networking service and an application, including character encoding, data compression and encryption/decryption.

These layers in correct order refer to;

(a) Transport, Network, Session
(b) Data link, Network, Transport
(c) Data link, Transport, Presentation
(d) Network, Transport, Presentation
(e) Network, Transport, Application

5) Which of the following statements is/are **true** regarding the TCP/IP layered architecture?

> (a) It is defined as a 4 layer model – Link, Internet, Transport and Application
>
> (b) Link layer defines end-to-end networking methods across multiple hosts
>
> (c) Internet layer allows the exchange of datagrams across network boundaries from a source host to a destination host
>
> (d) Transport layer provides end-to-end communication services for applications, on either the same or different hosts
>
> (e) ARP is an application layer protocol

6) Eight 4 Kbps connections are multiplexed together using Time Division Multiplexing (TDM). Which of the following statements is/are **true** regarding the resulting multiplexed channel?

> (a) Duration of 1 bit is 31.25 microseconds   (b) Duration of 1 bit is 250 microseconds
>
> (c) Rate of the link is 4 Kbps   (d) Rate of the link is 32 Kbps
>
> (e) Duration of a frame is 250 microseconds

7) Which of the following statements regarding TCP congestion control is/are **not true**?

> (a) Congestion control is largely a function of internet hosts and not the network itself
>
> (b) Congestion windows are maintained by the receiver
>
> (c) Slow start is part of the congestion control strategy
>
> (d) TCP does not support congestion control
>
> (e) Tahoe and Reno are variants of TCP congestion control algorithms

8) The following diagram shows the Ethernet frame structure as defined in the IEEE 802.3 standard.

Preamble	SFD	Destination Address	Source Address	Type	Data + Padding	FCS
7 bytes	1 byte	6 bytes	6 bytes	2 bytes	46 – 1500 bytes	4 bytes

Which of the following statements is/are **true**?

> (a) The preamble informs the receiving system that a frame is starting and enables synchronization
>
> (b) Source address and destination address contain the IP addresses of the source and destination hosts
>
> (c) Type defines the protocol inside the frame, for example IPv4 or IPv6
>
> (d) Padding data is added to the payload to make the field size always fit 1500 bytes
>
> (e) Frame Check Sequence (FCS) contains a 32 bit CRC for detection of corrupted data

9) Which of the following statements is/are **true**?

> (a) Address Resolution Protocol (ARP) is used for discovering the network address (typically an IPv4 address) given the link layer address (such as a MAC address)
>
> (b) Reverse Address Resolution Protocol (RARP) is used for discovering the network address (typically an IPv4 address) given the link layer address (such as a MAC address)
>
> (c) Dynamic Host Configuration Protocol (DHCP) is a network management protocol where the DHCP server dynamically assigns IP address and other network configuration parameters to devices on the network
>
> (d) IGMP protocol is used by network devices to send error messages and other operational information
>
> (e) Point to Point Protocol (PPP) is a link layer protocol used for establishing a direct connection between two network nodes

10) Two network devices (A and B) on an IP network have the addresses 172.16.17.30/20 and 172.16.28.15/20. Which of the following is/are **true**?

> (a) Device A is on subnet 172.16.16.0
>
> (b) Device A is on subnet 172.16.0.0
>
> (c) Device B is on subnet 255.255.240.0
>
> (d) Devices A and B are on different subnets
>
> (e) Devices A and B are on the same subnet

11) Which of the following statements is/are **true** about IPv4 and IPv6?

> (a) IPv6 default route ::/0 corresponds to the IPv4 default route 0.0.0.0/0
>
> (b) IPv6 loopback localhost address ::1/128 corresponds to the IPv4 address 127.0.0.1
>
> (c) IPv4 devices can handle IPv6 traffic without any modifications as IPv6 is backward compatible with IPv4
>
> (d) IPv4 uses 32 bit addresses while IPv6 uses 64 bit addresses
>
> (e) The IPv6 address 2001:0db8:3c4d:0015:0000:0000:1a2f:1a2b can be abbreviated as 2001:db8:3c4d:15::1a2f:1a2b

12) Which of the following routing protocols is/are designed to be used between autonomous systems?

> (a) RIP
>
> (b) BGP
>
> (c) OSPF
>
> (d) IGRP
>
> (e) IDRP

13) Which of the following statements is/are **true** regarding Virtual LANs (VLAN)?

> (a) A VLAN is a broadcast domain that is partitioned and isolated in a computer network at the data link layer
>
> (b) VLANs membership can be configured through software
>
> (c) Connectivity between VLANs is not possible
>
> (d) Connectivity between VLANs require a layer 3 device
>
> (e) VLANs cannot span multiple switches

14) Which of the following statements is/are **not true** regarding Virtual Private Networks (VPN)?

> (a) A VPN can extend an organization's private network across a public network (such as the Internet), creating a secure private network
> (b) Point to Point Tunneling Protocol (PPTP) is a preferred method of creating a VPN
> (c) IPSec can be used for establishing a VPN
> (d) Traffic on a VPN is not accessible from an unauthorized public network
> (e) A VPN cannot provide secure remote access to a corporate network

15) Which of the following communication technologies are suitable for a low power IoT device that needs a range of around 30 meters and a minimum data rate of 200 Kbps?

> (a) 3G
> (b) Bluetooth / Bluetooth Low Energy
> (c) DSL
> (d) ZigBee
> (e) WiMAX

16) Which of the following is/are core concepts in Software Defined Networks (SDN)?

> (a) Directly programmable
> (b) Agile
> (c) Central management
> (d) Decentralized management
> (e) Open standards based and vendor neutral

17) Which of the following statements is/are **not true** about Bluetooth technology?

> (a) Bluetooth is a wireless technology for personal area networks
> (b) A piconet is an adhoc network formed by a set of devices using Bluetooth
> (c) A set of interconnected piconets is called a micronet
> (d) Bluetooth transceivers operate in the 2.4 GHz ISM band
> (e) Bluetooth supports wireless communication over very long distances

18) A computer has 19.5 MB to send on a network and transmits the data in a burst at 6 Mbps. The maximum transmission rate across routers in the network is 4 Mbps. If this transmission is shaped using a leaky bucket algorithm, how much capacity must the queue in the bucket hold so that no data is discarded?

> (a) 2 MB
> (b) 4 MB
> (c) 6 MB
> (d) 6.5 MB
> (e) 19.5 MB

19) Which of the following protocol(s) is/are used on an IPv4 network for establishing multicast group membership?

> (a) ICMP
> (b) IGMP
> (c) MLD
> (d) OSPF
> (e) GIMP

20) Which of the following statements is/are **true** regarding Wireless Local Area Networks (WLAN)?

> (a) IEEE 802.11 standard for wireless LAN uses CSMA/CD as a multiple access technique
>
> (b) Wireless networks mostly use Time Division Multiplexing (TDM)
>
> (c) Wireless networks mostly user Orthogonal Frequency Division Multiplexing (OFDM)
>
> (d) Acknowledgment of data frames is not possible on wireless networks
>
> (e) WEP and WPA are security protocols for wireless networks

21) What is/are the benefit(s) of using Network Address Translation (NAT)?

> (a) NAT protects networks because private networks are not advertised
>
> (b) NAT accelerates the routing process because no modifications are made to packets
>
> (c) Dynamic NAT facilitates connections from the outside of the network
>
> (d) NAT facilitates end to end communication when IPSec is enabled
>
> (e) NAT eliminates the need to re-address all hosts that require external access

22) Structured wiring systems often use Category 5 (or better) cables for voice and data, and RG6 coaxial cables for video. Which component(s) in a structured wiring system supports an Ethernet network?

(a) 66 block	(b) 110 block	(c) Smart jack
(d) 25 pair cable	(e) RJ11 jack	

23) Consider the following statements regarding networking devices.
    i. A device that forwards data packets along networks, connected to at least two networks, and uses protocols to find the best routes.
    ii. A device that filters and forwards packets between LAN segments, operating at layer 2 and sometimes at layer 3 in OSI.
    iii. A device that provides a common connection point for devices on a network, contains multiple ports and copies packets arriving at one port to all other ports.

    The above statements in correct order refer to;

(a) Router, Switch, Hub	(b) Switch, Router, Hub
(c) Router, Hub, Bridge	(d) Router, Gateway, Hub
(e) Hub, Switch, Router	

24) The Domain Name System (DNS) database contains the following types of records.

    i.   NS - Name server records.
    ii.   A - Host name to address mapping records.
    iii. CNAME – Alias of one name to another.

Which of the above statements is/are **true**?

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

25) Which of the following application protocol(s) use TCP as the transport layer protocol?

(a) TFTP – Trivial File Transfer Protocol	(b) SMTP – Simple Mail Transfer Protocol
(c) HTTP – Hypertext Transfer Protocol	(d) POP – Post Office Protocol
(e) NTP – Network Time Protocol	

******