UNIVERSITY OF COLOMBO, SRI LANKA

UNIVERSITY OF COLOMBO SCHOOL OF COMPUTING

DEGREE OF BACHELOR OF INFORMATION TECHNOLOGY (EXTERNAL)

Academic Year 2019 – 2nd Year Examination – Semester 4

IT4405 – Computer Networks
Part 1 - Multiple Choice Question Paper

24th November, 2019
(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 correct answer**.
- 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 (*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.
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Answer questions 1 to 4 using the following information.

A machine in a network is configured with the IP address 192.248.16.132 and the netmask 255.255.255.192.

1) What is the subnet mask in CIDR notation?

(a) /16	(b) /24	(c) /25
(d) /26	(e) /32	

2) What is the broadcast address of this network?

(a) 192.248.16.191	(b) 192.248.16.255
(c) 255.255.255.0	(d) 192.248.16.128
(e) 192.248.255.255	

3) What is the network address of the network?

(a) 192.248.16.128	(b) 192.248.16.0
(c) 192.248.0.0	(d) 192.248.16.192
(e) 192.248.16.255	

4) How many IP addresses can be allocated to machines in this network?

(a) 252	(b) 65	(c) 62
(d) 32	(e) 30	

5) A web server on machine X listens to TCP connections on port 80. Another program, P, running on X wants to send UDP packets with the source port 80. Which of the following statements is correct regarding this situation?

(a) The program P will also receive messages that come to the web server
(b) Port 80 is a TCP port and therefore it cannot be used by P
(c) The web server and P can send and receive messages on port 80
(d) TCP packets have a higher priority than UDP packets.
(e) If the Web server started first, then P cannot be started at all.

6) Select an application layer protocol that uses UDP as the transport protocol.

(a) HTTP	(b) DNS	(c) SMTP
(d) HTTPS	(e) POP	

7) There is a TCP connection between machines M1 and M2. A client application named C on M1 and the server application named S on M2 send and receive messages over this connection. Assume that M1 and M2 have public IP addresses. What are the parameters required to globally uniquely identify this TCP connection?

(a) IP addresses of M1 and M2
(b) IP addresses of M1 and M2 and C and S
(c) IP address of M2 and C
(d) IP addresses of M1 and M2 and the port numbers at the two end points
(e) IP address of M1 and S

8) An application writes the contents of a 1GB file into a TCP connection starting from the first byte in the file in the order bytes appear in the file. Another application at the other end of the TCP connection has received the $10{,}000^{th}$ byte sent. What is the most appropriate statement regarding this situation?

(a) The receiver is guaranteed to receive the full content of the file
(b) The receiver has received all the bytes up to and including the 9999^{th} byte in the same order as they were sent
(c) The receiver is guaranteed to receive the byte 10001 immediately
(d) The receiver is guaranteed to receive the byte 10001 eventually
(e) The receiver may or may not have received any byte up to byte 9999

9) A TCP segment header **<u>does not</u>** contain the

(a) IP address
(b) Source port
(c) Destination port
(d) Sequence number
(e) Checksum

10) The protocol used in the ping utility is

(a) TCP
(b) ICMP
(c) UDP
(d) HTTP
(e) IMAP

11) ARP

(a) is the protocol used by a device to configure the network interface
(b) is an application layer protocol
(c) uses UDP as the transport layer protocol
(d) is not used by routers
(e) is used to discover the MAC address of an interface with a given IP address

12) What is the most abbreviated form of the following IPv6 address?

8000:0000:0000:0000:0123:4567:89AB:CDEF

(a) 8:123:4567:89AB:CDEF	(b) ::4567:89AB:CDEF
(c) ::123:4567:89AB:CDEF	(d) 8000::123:4567:89AB:CDEF
(e) 8::::::123:4567:89AB:CDEF	

13) Select the most appropriate statement regarding the following

::192.248.16.80

(a) It is a MAC address
(b) Private IPv4 addresses are written in this format.
(c) Private IPv6 addresses are written in this format.
(d) It is an IPv4 address written in IPv6 notation
(e) It is not an IP address

14) Select the most appropriate statement regarding IPv6

(a) Routers may fragment IPv6 packets
(b) The source may fragment IPv6 packets
(c) IPv6 packet contains a CRC checksum
(d) IPv6 addresses are 48 bits long
(e) IPv6 does not fit into any layer in the traditional TCP/IP model

15) Which of the following statements is true regarding IP multicast?

(a) IP multicast is implemented on TCP
(b) IP multicast is a link layer protocol
(c) The intended recipients of an IP multicast packet are identified by a multicast group address
(d) All multicast packets must be acknowledged by the receiver
(e) IPv4 does not have multicast addresses

16) The bandwidth of a channel is 1 KHz and the Signal to Noise ratio is 1023. What is the maximum possible data rate in this channel?

(a) 1023 Mbps	(b) 1023 Kbps	(c) 10 Kbps
(d) 1 Kbps	(e) 1023 bps	

17) A communication system adds a single parity bit to every 7 bits of data it sends on a channel. What is the purpose of the parity bit?

(a) It is used to correct errors at the receiver
(b) It is used to detect errors at the receiver
(c) Parity bit is added to increase the bandwidth
(d) Data bits are encrypted using the parity bit
(e) Parity bit is used for synchronization

18) A cable consists of a copper wire in the middle surrounded by isolation material which in turn is surrounded by a braided outer conductor. All these are encased in a protective plastic covering running along the cable. What is the type of this cable?

(a) Fiber optic cable
(b) Coaxial cable
(c) UTP cable
(d) CAT 5 twisted pair cable
(e) A cable used for domestic wiring

19) A sender S in a wireless network starts a transmission to receiver R. Another station X also starts a transmission at the same time. S is within the range of X, but R is not within the range of X. Which of the following is the most appropriate statement regarding this situation?

(a) R receives the transmission from S without any collision
(b) R receives the combined signal from S and X
(c) R receives the signal from X after the signal from S
(d) R should send a message to X requesting it to stop the transmission
(e) The signal from X changes the signal from S and the changed signal reaches R

20) Consider the following statements regarding wireless networks

(i) WiFi networks interfere with cellular GSM network

(ii) WiFi networks may interfere with Bluetooth networks

(iii) WiFi operates in the ISM band

Which of the above statements is/are correct?

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

21) A data packet of 100 bytes is transmitted over a communication line with a data rate of 1Kbps. The straight line distance between the sender and the receiver is 3000Km. What is the minimum amount of time required for the receiver to completely receive the packet? Select the most appropriate answer. The speed of light is 300000Km per second.

(a) 8000 ms	(b) 810 ms	(c) 405 ms
(d) 220 ms	(e) 110 ms	

22) Which of the following statements is true regarding Virtual Private Networks (VPN)?

(a) An isolated physical point-to-point link is required for a VPN
(b) A VPN is transparent to user software
(c) A special hardware interface is required to connect to a VPN
(d) ISP's do not provide VPNs as a service and end users must establish their own VPN's
(e) It is not possible to establish a VPN between two remote offices if they are connected to the Internet through different ISP's

23) Which of the following statements regarding the DNS **is not** true?

(a) There can be multiple MX records associated with a single domain name
(b) A PTR record associates a name with an IP address
(c) The record type A maps an IPv4 address to a name
(d) The record type AAAA maps an IPv6 address to a name
(e) It is not possible for two names to resolve to the same IP address

24) An organization has a single public IP address allocated to it. It wants to allow 10 users in its LAN to access web sites. The users usually access the same set of web sites. What is the most appropriate technology/device that the organization should use for this purpose?

(a) An HTTP proxy
(b) A firewall
(c) An L2 switch
(d) A DHCP server
(e) A Network Address Translator

25) What is the most appropriate statement regarding the Unshielded Twisted Pair (UTP) cables?

(a) Category 5 (CAT 5) cables have more twists per inch than category 3 (CAT 3) cables.
(b) UTP cables do not radiate any electromagnetic energy at all.
(c) UTP cables are not affected by interference from nearby electrical appliances.
(d) A home user cannot get ADSL service if UTP cables are used for the telephone line.
(e) The only reason to have twists in the UTP cables is to strengthen the cable.

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