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Monash University

SAMPLE EXAM

Faculty Of Information Technology

EXAM CODES: BUS3150

TITLE OF PAPER: Computer Facilities and Network Management

EXAM DURATION: 2 hours writing time

READING TIME: 10 minutes

THIS PAPER IS FOR STUDENTS STUDYING AT: (tick where applicable)

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| <input type="checkbox"/> Berwick | <input type="checkbox"/> Clayton | <input type="checkbox"/> Malaysia | <input type="checkbox"/> Off Campus Learning | <input type="checkbox"/> Open Learning |
| <input type="checkbox"/> Caulfield | <input type="checkbox"/> Gippsland | <input type="checkbox"/> Peninsula | <input type="checkbox"/> Enhancement Studies | <input type="checkbox"/> Sth Africa |
| <input type="checkbox"/> Pharmacy | <input type="checkbox"/> Other (specify) | | | |

During an exam, you must not have in your possession, a book, notes, paper, calculator, pencil case, mobile phone or other material/item which has not been authorised for the exam or specifically permitted as noted below. Any material or item on your desk, chair or person will be deemed to be in your possession. You are reminded that possession of unauthorised materials in an exam is a discipline offence under Monash Statute 4.1.

AUTHORISED MATERIALS

- CALCULATORS: YES NO
- OPEN BOOK: YES NO
- SPECIFICALLY PERMITTED ITEMS: YES NO
- if yes, items permitted are:**

INSTRUCTIONS TO CANDIDATES

The final examination is worth 75% of your overall mark. Please read each question carefully. There are 30 multiple choice questions worth 30 marks, and 7 short answer questions worth 70 marks for a total of 100 marks. You should attempt to answer all questions. This exam paper must be returned with your answer booklet.

Question 1 – Please answer the following 30 multiple choice questions. Note that each question has only **one** correct answer. Answer the questions in your script book with one answer per line. **[30 marks]**

1.1 – The _____ layer of the OSI model can use the trailer of the frame for error detection.

- (a) physical
- (b) data link
- (c) transport
- (d) presentation

1.2 – When data are transmitted from device A to device B, the header from A's layer 4 is read by B's _____ layer.

- (a) Physical
- (b) Transport
- (c) Application
- (d) None of the above

1.3 – In the OSI model, as a data packet moves from the lower to the upper layers, headers are _____ .

- (a) added
- (b) removed
- (c) rearranged
- (d) modified

1.4 – In a _____ connection, more than two devices can share a single link.

- (a) point-to-point
- (b) multipoint
- (c) primary
- (d) secondary

1.5 – In _____ transmission, the channel capacity is shared by both communicating devices at all times.

- (a) simplex
- (b) half-duplex
- (c) full-duplex
- (d) half-simplex

1.6 – When one of the components of a signal has a frequency of zero, the average amplitude of the signal _____ .

- (a) is greater than zero
- (b) is less than zero
- (c) is zero
- (d) a or b

- 1.7** – What is the bandwidth of a signal that ranges from 1 MHz to 4 MHz?
- (a) 4 MHz
 - (b) 1 KHz
 - (c) 3 MHz
 - (d) none of the above
- 1.8** – The _____ of a composite signal is the difference between the highest and the lowest frequencies contained in that signal.
- (a) frequency
 - (b) period
 - (c) bandwidth
 - (d) amplitude
- 1.9** – PCM is an example of _____ conversion.
- (a) digital-to-digital
 - (b) digital-to-analog
 - (c) analog-to-analog
 - (d) analog-to-digital
- 1.10** – The outer metallic sheath in coaxial cable functions as _____ .
- (a) a connector
 - (b) a second conductor
 - (c) a shield against noise
 - (d) b and c
- 1.11** – In an optical fiber, the inner core is _____ the cladding
- (a) more dense than
 - (b) less dense than
 - (c) the same density as
 - (d) another name for
- 1.12** – Manchester and differential Manchester encoding are both types of _____ encoding.
- (a) unipolar
 - (b) NRZ
 - (c) biphasic
 - (d) bipolar
- 1.13** – The minimum bandwidth of Manchester and differential Manchester is _____ that of NRZ.
- (a) the same as
 - (b) twice
 - (c) thrice
 - (d) none of the above

- 1.14** – The data rate is sometimes called the _____ rate.
- (a) baud
 - (b) bit
 - (c) signal
 - (d) none of the above
- 1.15** – _____ addresses on headers change as a packet moves from network to network but the _____ addresses do not.
- (a) Logical; port
 - (b) Logical; network
 - (c) Logical; physical
 - (d) Physical; logical
- 1.16** – A simple parity-check code can detect _____ errors.
- (a) an even-number of
 - (b) two
 - (c) no errors
 - (d) an odd-number of
- 1.17** – Which of the following would not be found in a data message in a bit stuffed protocol like HDLC?
- (a) 1010101010
 - (b) 01111110101
 - (c) 0000000111
 - (d) 111000011110000
- 1.18** – In the _____ Protocol, if no acknowledgment for a frame has arrived, we resend all outstanding frames.
- (a) Stop-and-Wait ARQ
 - (b) Go-Back-N ARQ
 - (c) Selective-Repeat ARQ
 - (d) none of the above
- 1.19** – _____ augments the CSMA algorithm to detect collision.
- (a) CSMA/CA
 - (b) CSMA/CD
 - (c) either (a) or (b)
 - (d) both (a) and (b)
- 1.20** – In Go-Back-N ARQ, if frames 4, 5, and 6 are received successfully, the receiver may send an ACK _____ to the sender.
- (a) 5
 - (b) 6
 - (c) 7
 - (d) any of the above

- 1.21** – In Stop-and-Wait ARQ, for n information frames sent by the transmitter, the receiver must also respond with the following number of acknowledgements:
- (a) n
 - (b) $2n$
 - (c) $n - 1$
 - (d) $n + 1$
- 1.22** – The IEEE 802.3 Standard defines _____ CSMA/CD as the access method for first-generation 10-Mbps Ethernet.
- (a) 1-persistent
 - (b) p-persistent
 - (c) non-persistent
 - (d) none of the above
- 1.23** – The _____ layer of Ethernet consists of the LLC sublayer and the MAC sublayer.
- (a) data link
 - (b) physical
 - (c) network
 - (d) none of the above
- 1.24** – _____ uses four twisted-pair cables that connect each station to a common hub.
- (a) 10Base5
 - (b) 10Base2
 - (c) 10Base-T
 - (d) 10Base-F
- 1.25** – The IEEE 802.11 standard for wireless LANs defines two services: _____ and _____.
- (a) BSS; ASS
 - (b) ESS; SSS
 - (c) BSS; ESS
 - (d) BSS; DCF
- 1.26** – For SNMP, _____ defines the general rules for naming objects, defining object types, and showing how to encode objects and values.
- (a) MIB
 - (b) BER
 - (c) SMI
 - (d) none of the above
- 1.27** – IP is _____ datagram protocol.
- (a) an unreliable
 - (b) a connectionless
 - (c) both a and b
 - (d) none of the above

- 1.28** – The term _____ means that IP provides no error checking or tracking. IP assumes the unreliability of the underlying layers and does its best to get a transmission through to its destination, but with no guarantees.
- (a) reliable delivery
 - (b) connection-oriented delivery
 - (c) best-effort delivery
 - (d) none of the above
- 1.29** – In ATM, a virtual connection is defined by _____ .
- (a) VPI
 - (b) VCI
 - (c) DLCI
 - (d) a combination of (a) and (b)
- 1.30** – In ATM, connection between two endpoints is accomplished through _____ .
- (a) TPs
 - (b) VPs
 - (c) VCs
 - (d) all of the above

Question 2 – The OSI reference model is a seven layer protocol stack. **[3+7=10 marks]**

- (a) Briefly discuss one reason why a layered network architecture model is used to construct a communications network.
- (b) Briefly describe one service provided by each of the seven layers of the OSI protocol stack and explain how this service is used by the layer above.

Question 3 – A LAN can be configured using various types of guided and unguided transmission media. Explain two advantages and two disadvantages of each type of transmission media. **[10 marks]**

Question 4 – In relation to modulation and data encoding. **[2+3+2+3=10 marks]**

- (a) Define the term modulation.
- (b) Given a bit string, 001110101, show via a diagram how it can be encoded on to a sine wave analog signal using Amplitude Shift Keying (ASK).
- (c) The encoding rules for NRZ-L are a 0 is encoded using a high level and a 1 is encoded using a low level. Briefly describe the encoding rules for Manchester.
- (d) Define and discuss in detail, using an example to illustrate each, the following transmission modes:
 - (i) Simplex
 - (ii) Half-Duplex
 - (iii) Full-Duplex

Question 5 – Two common wired LAN implementations have been standardised by the IEEE 802 model, Ethernet (802.3) and Token Ring (802.5). **[4+4+2=10 marks]**

- (a) What is the main downfall of the Carrier Sense Multiple Access (CSMA) method? How do Collision Detection (CD) methods help alleviate this problem?
- (b) Briefly explain how Token Rings access control to the transmission medium differs from Ethernets.
- (c) Which layer of the IEEE 802 projects protocol stack uses CSMA/CD and token passing?

Question 6 – An audio signal has a frequency spectrum that ranges from 400 Hz to 4800 Hz is to be encoded into a pulse amplitude modulation (PAM) signal. **[5 + 5 = 10 marks]**

- (a) At what rate should the signal be sampled for perfect reconstruction?
- (b) If the PAM signal is then converted into a pulse code modulated (PCM) signal, is perfect reconstruction possible? Explain the reason for your answer.

Question 7 – In relation to routing in switched networks. **[4+3+3=10 marks]**

- (a) Explain the routing technique known as flooding.
- (b) What are the main advantages of this technique?
- (c) What are the main disadvantages?

Question 8 – In relation to switching networks.

[4+6=10 marks]

- (a) When considering the transmission of digital data, briefly describe three advantages of a packet switching network when compared with a circuit switching network.
- (b) Packet switching employs two approaches to transmitting packets through a network: datagram and virtual circuit. Briefly explain the differences between these two approaches and cite one example of each.

END OF EXAMINATION

[Total marks: 100]