

COM 300: INTRODUCTION TO COMPUTER SYSTEMS
EXAMINATION (DEC 2016) – UOK
MAIN EXAM

QUESTION ONE (COMPULSORY) [30 MARKS]

- a) Discuss the following computer system categories:
- (i) Supercomputers
 - (ii) Mainframes
 - (iii) Midrange computers
 - (iv) Servers
 - (v) Workstations
- (10 marks)
- b) Describe three kinds of buses that link the CPU, Main memory and I/O Module. (3 marks)
- c) Distinguish between DRAM and SRAM. (3 marks)
- d) Describe the types of transfers that must be supported by the interconnection structure. (4 marks)
- e) With the aid of an appropriate diagram, describe a cache-based memory system. (4 marks)
- f) Describe the virtual memory concept (*use an appropriate diagram to illustrate your answer*). (4 marks)
- g) Describe a distributed computing system. (2 marks)

QUESTION TWO [20 MARKS]

- a) Describe the following memory types:
- (i) PROM
 - (ii) EPROM
- (4 marks)
- b) Compare and contrast the following memory types:
- (i) EEPROM
 - (ii) Flash
 - (iii) NVRAM
- (6 marks)
- c) Describe any four typical control lines. (4 marks)
- d) Compare and contrast traditional bus and high-performance bus architectures. (6 marks)

QUESTION THREE [20 MARKS]

- a) With the aid of an appropriate diagram, describe multiple levels of cache memory. (5 marks)
- b) Distinguish between latency and bandwidth. (4 marks)
- c) Describe address translation (*use an appropriate diagram to illustrate your answer*). (5 marks)
- d) In a system that contains a TLB, there are three possible scenarios for handling memory reference. Discuss (*use an appropriate diagram to illustrate your answer*). (6 marks)

QUESTION FOUR

[20 MARKS]

- a) Describe the primary and secondary goals of an operating system. (4 marks)
- b) Distinguish between batch and timesharing operating systems. (4 marks)
- c) One function of an operating system is process management: Discuss. (4 marks)
- d) Describe the DMA system (*use an appropriate diagram to illustrate your answer*). (4 marks)
- e) Describe the SCSI protocol and outline its advantage and disadvantage. (4 marks)

QUESTION FIVE

[20 MARKS]

- a) Describe the activities of an operating system in connection with file management. (4 marks)
- b) Explain the disadvantages of an I/O Bus. (4 marks)
- c) Describe the arbitration policy in an I/O bus. (3 marks)
- d) Polling has disadvantages that make Interrupts a better choice for handling asynchronous events in most systems. Discuss. (4 marks)
- e) Describe memory-mapped I/O. (5 marks)

Data bus - moves data from primary storage
Address bus - transmit signals for locating a given address in primary storage
control bus transmit signal to specify whether read/write to and from a given primary storage