

No. of Printed Pages : 8

A6-R5.1 : COMPUTER ORGANIZATION AND OPERATING SYSTEM

DURATION : 03 Hours

MAXIMUM MARKS : 100

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| OMR Sheet No. : | | | | | |
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Answer Sheet No. :

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Name of Candidate : _____ ; Signature of Candidate : _____

INSTRUCTIONS FOR CANDIDATES :

- Carefully read the instructions given on Question Paper, OMR Sheet and Answer Sheet.
- Question Paper is in English language. Candidate has to answer in English language only.
- There are **TWO PARTS** in this Module/Paper. **PART ONE** contains **FOUR** questions and **PART TWO** contains **FIVE** questions.
- **PART ONE** is Objective type and carries **40** Marks. **PART TWO** is Subjective type and carries **60** Marks.
- **PART ONE** is to be answered in the **OMR ANSWER SHEET** only, supplied with the question paper, as per the instructions contained therein. **PART ONE** is **NOT** to be answered in the answer book for **PART TWO**.
- Maximum time allotted for **PART ONE** is **ONE HOUR**. Answer book for **PART TWO** will be supplied at the table when the Answer Sheet for **PART ONE** is returned. However, Candidates who complete **PART ONE** earlier than one hour, can collect the answer book for **PART TWO** immediately after handing over the Answer Sheet for **PART ONE** to the Invigilator.
- **Candidate cannot leave the examination hall/room without signing on the attendance sheet and handing over his/her Answer Sheet to the invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
- After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question Booklet is complete in all respects.

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

PART ONE

(Answer the **all** the questions. Each question carries **ONE** mark)

1. Each question below gives a multiple choice of answers. Choose the most appropriate one and enter in the "OMR" answer sheet supplied with the question paper, following instructions therein.

(1x10)

1.1 The following is used in second generation Computers :

- (A) Transistors
- (B) Vacuum tubes
- (C) Integrated Circuits
- (D) Very Large Scale Integrated Circuits

1.2 For random access memory, the following is the time it takes to perform a read or write operation :

- (A) Access time
- (B) Memory cycle time
- (C) Transfer rate
- (D) Time to boot the Computer System

1.3 The following is a human readable device :

- (A) Magnetic disk
- (B) Magnetic tape
- (C) Video display terminal
- (D) USB drive

1.4 If two numbers with the same sign (both positive or both negative) are added, then overflow occurs in the following case :

- (A) If and only if the result is negative
- (B) If and only if the result is positive
- (C) If and only if the result is zero
- (D) If and only if the result has the opposite sign

1.5 The following is a user-visible register :

- (A) Program Counter
- (B) Instruction Register
- (C) General Purpose Register
- (D) Memory Address Register

1.6 The following is a situation concerning a set of processes in which each process in the set waits for an event that must be caused by another process in the set :

- (A) Steady state
- (B) Deadlock
- (C) Sleep state
- (D) Hibernate state

1.7 The following option of `ls` command is used to view file inode number :

- (A) `-o`
- (B) `-l`
- (C) `-i`
- (D) `-a`

- 1.8 The following is a condition that can prevent a Deadlock :
- (A) Hold and Wait
 - (B) Preemption
 - (C) Mutual Exclusion
 - (D) Circular wait
- 1.9 The following is a command that can be used to extract a column from a text file in LINUX :
- (A) get
 - (B) cut
 - (C) tar
 - (D) paste
- 1.10 The following is the interval between the time of submission of a process and the time of completion :
- (A) Turnaround time
 - (B) Waiting time
 - (C) Response time
 - (D) Throughput
2. Each statement below is either TRUE or FALSE. Choose the most appropriate one and enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein. (1x10)
- 2.1 The **touch** command is used to create empty files
- 2.2 A user on a LAN running on LINUX can delete the file of another user without any permission
- 2.3 **USER** points to the last logged out user
- 2.4 **rm** deletes files or directories
- 2.5 A **Program Counter** is a register that contains the address of the instruction being executed at the current time
- 2.6 A decimal 6.375 is equivalent of a binary 120.011
- 2.7 Applying **chmod 777** to a folder will give read, write and execute permissions for everyone
- 2.8 Shell in Linux can set up lengthy tasks to run in the background , freeing the terminal for concurrent interactive processing
- 2.9 The cache memory is slower than that of secondary memory and also has a larger capacity
- 2.10 In boolean algebra, $(AB)C = A(BC)$

3. Match words and phrases in column X with the closest related meaning / words(s) / phrase(s) in column Y. Enter your selection in the "OMR" answer sheet supplied with the question paper, following instructions therein. (1x10)

| | X | | Y |
|------|--------------------------------------------------------------------------|---|----------------|
| 3.1 | Print any text that follows the command | A | ps |
| 3.2 | Create directory | B | exception |
| 3.3 | List the running processes | C | join |
| 3.4 | Merges the lines of two files on a common field | D | shell |
| 3.5 | Interrupt | E | echo |
| 3.6 | Extract and compress files | F | karnaugh map |
| 3.7 | Outermost part of and Operating System that interacts with user commands | G | tar |
| 3.8 | Slow memory | H | mkdir |
| 3.9 | Binary number equivalent to 305 (Octal number) | I | index register |
| 3.10 | Widely used for doing array or vector operations | J | monitor |
| | | K | 011000101 |
| | | L | disk |
| | | M | 100100111 |

4. Each statement below has a blank space to fit one of the word(s) or phrase(s) in the list below. Choose the most appropriate option. Enter your choice in the "OMR" answer sheet supplied with the question paper, following instructions therein. (1x10)

| | | | | | | | |
|----|------|----|------------|----|----------------|----|--------------------|
| A. | NAND | B. | Parity bit | C. | ping | D. | grep |
| E. | API | F. | MAIL | G. | history | H. | miss |
| I. | DMA | J. | MBR | K. | Multithreading | L. | Background process |
| M. | List | | | | | | |

- 4.1 _____ happens when accessed word is not found in faster memory.
- 4.2 _____ runs independently of the user.
- 4.3 _____ can be used for moving large amounts of data.
- 4.4 _____ is a technique in which a process , executing an application, is divided into sub-processes that can run concurrently.
- 4.5 _____ contains the data to be written into memory.
- 4.6 A string in a group of files can be searched using _____.
- 4.7 By default, the _____ command will show the last five hundred commands you have entered.
- 4.8 _____ is an environment variable in Linux.
- 4.9 A _____ is a check bit.
- 4.10 Using an _____ enables application software to be ported easily, through recompilation, to other systems that support the same.

PART TWO

(Answer any **FOUR** questions)

5. (a) What is the benefit of using biased representation for the exponent portion of a floating point number ? Compute -6×7 (Multiply -6 and 7) using Booth's algorithm.
- (b) Explain the differences between Associative Mapping and Direct Mapping. (8+7)
6. (a) An instruction at address 021 in the basic computer has $I=0$, an operation code of the AND instruction and an address part equal to 083 (all numbers are in hexadecimal). The memory word at 083 contains the operand B8F2 and the content of AC is A937. Go over the instruction cycle and determine the contents of the following registers at the end of the execution phase: PC, AC, DR, and IR. Make assumptions, if needed
- (b) Explain interrupt driven I/O and DMA (Direct Memory Access). (7+8)
7. (a) Explain Computer memory hierarchy in detail.
- (b) Explain addressing modes in detail. (8+7)

8. (a) Which of the following scheduling algorithms may cause starvation ?
- (a) First-come-first-served
 - (b) Round Robin
 - (c) Priority
 - (d) Shortest process next
 - (e) Shortest remaining time first
- (i) (a), (c) and (e)
- (ii) (c), (d) and (e)
- (iii) (b), (d) and (e)
- (iv) (b), (c) and (d)

Give proper explanation for your answer.

- (b) What is meant by Paging ? Explain the process of implementation of Paging. (8+7)
9. (a) How to display information about your LINUX system ?
- (b) What are the Find and Locate Commands in Linux? Write the syntax of both commands in Linux. (8+7)

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SPACE FOR ROUGH WORK

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