

Preparation :- Ministry of Education

Duration:- Three hours

- ❖ Answer all the four questions on this paper itself.

Part A- Structured essay

- [See page two.

(v) Represent the fractional part in bits.

(vi) Represent the value -123.75 in IEEE 32 .

- (2) (a). Classify the software given below as ‘Operating system’, ‘Application software’ or ‘Utility Software’

Software	Classification
Disk Defragmentation	
Opera	
Mac	
Screen Server	
Joomla	
Mint	

- (b). Briefly explain the following terms which are the main functions of memory management in a computer operating system.

(i) Memory allocation

(ii) Memory swapping

- (c). A computer has an 18-bit virtual memory address space where eight bits are used for a page address.

(i) Calculate the total number of pages defined by the above addressing scheme.

(ii) Consider the following virtual memory address 010111010100111101. What is the page and displacement (Offset) of this address?

(d). Write 2 differences of NTFS and FAT32 file systems.

(3) Consider the following scenario.

An organization maintains details of employees with the employee number, Employee name, date of birth, age and telephone number. Employee name consists of 3 parts First name, Middle name and Last name. And also an employee can have more than one telephone number. The employees are directed to professional development courses. Course number and Course name are considered. Each employee participate pre-defined number of hours in a course. An employee can follow more than one course and for a particular course there can be more than one employee.

(a). Draw the ER diagram for the above scenario.

(b). Identify and state the entities, which are related to many to many (m:m) cardinality in above (a) and draw the part of the ER diagram after removing the m:m relationship.

(c). "ER diagrams allow attributes to be assigned on relationships". Write the name of this type of attribute. Explain your answer by using the given scenario.

(d). Write the relational schema which are mapped, with related to the 3rd normal form for the above scenario.

- (4) (a). Variation of physical sizes of computer memories are numbered as 1 to 5 in the given table in ascending order. Study the table and number them in accordance with the criteria in each column heading.

Memory type	Criteria				
	Physical size	Access time	Access speed	Capacity	Cost per byte
Register	1				
Cache memory	2				
Secondary storage memory	4				
Remote secondary storage memory	5				
Random access memory	3				

- (b) (i) Compare two differences of Dynamic random access memory and Static random access memory.

Dynamic random access memory (DRAM)	Static random access memory (SRAM)
1	
2	

(ii) SRAM is most suitable to be used for registers and cash memory. Give reasons ?

(c)

Student

Ad_No	Std_Name	Grade	Gender
A001	Samanthi	12 Art	Female
A002	Kamal	12Art	Male
A003	Sanjeeva	12Com	Male
A004	Sanduni	12Art	Female

(i) Write SQL statements to develop a database table as in above figure.

(ii) Write SQL statements to input the value (A005, Nimal, 12, 12Sci, Male) in to the table.

(iii) Write the SQL statement to enter a new field as 'Tel No' VARCHAR (10).