

2023

**FUNDAMENTALS OF COMPUTER — HONOURS**

**Paper : DSE-5.1eBH**

**(Fundamentals of Computer)**

**Full Marks : 80**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words  
as far as practicable.*

**Group - A**

1. Differentiate between mainframe, mini, and microcomputers. Provide examples of each. 5

*Or,*

Explain the significance and functions of SMPS (Switched-Mode Power Supply) in a computer. 5

2. Discuss the types of memory chips used in computers. How do they contribute to the overall performance of the system? 5

**Group - B**

3. Provide examples of multimedia applications and describe how they leverage various multimedia elements to enhance user experience. 6

*Or,*

Discuss the Integration of Multimedia in Business Communication. 6

4. Discuss the functions of cache memory in detail. What are its limitations? 3+3

5. Compare different types of printers, such as inkjet and laser printers, and analyze their suitability for specific tasks. 3+3

6. How does an operating system act as an intermediary between hardware and software components? 6

*Or,*

Compare and contrast the characteristics of real-time operating systems (RTOS) and network operating systems (NOS). Explain their specific functions and applications. 6

7. Discuss situations where flow charts may not be the most suitable representation. 6

**Please Turn Over**

8. A car dealership offers discounts on its vehicles based on certain criteria. The discount structure is as follows :

- (i) For electric cars, a flat rate discount of 12% is applicable to all customers.
- (ii) For cars with a price exceeding ₹ 30,000, senior citizens receive a 15% discount, and veterans receive a 10% discount.
- (iii) For cars with a price between ₹ 20,000 and ₹ 30,000, senior citizens get a 10% discount, and veterans receive a 5% discount.
- (iv) For cars with a price below ₹ 20,000, senior citizens and veterans both receive a 5% discount. The above rules do not apply to luxury cars.

For luxury cars, regardless of the price, a flat rate discount of 8% is applicable to all customers.

Prepare a mixed-entry decision table to determine the applicable discount for each customer based on the car type, price, senior citizen status, veteran status, and luxury status. 6

9. Compare synchronous and asynchronous transmission. Discuss scenarios, where one is preferred over the other. 3+3

*Or,*

Analyze the advantages and disadvantages of a mesh topology in data communication. In what situations would a mesh topology be preferred? 2+2+2

10. Discuss the concept of processors with multiple cores. How does multicore processing contribute to improved performance in modern computers? 6

11. A company XYZ Ltd. has implemented a new policy for approving employee expenses. The policy is as follows: (i) For travel expenses, employees are eligible for a reimbursement of 80% of the total amount. (ii) Meals and entertainment expenses are reimbursed at a flat rate of 50%. (iii) Other miscellaneous expenses are reimbursed based on specific criteria: 70% for expenses related to training, and 30% for general miscellaneous expenses.

Design a flow chart to represent the expense approval process. The flow chart should include decision points based on the type of expense and the corresponding reimbursement percentages. Additionally, consider the requirement that any expense above ₹ 500 requires approval from a manager before reimbursement. Ensure that the flow chart provides clarity on the workflow, including the decision-making process and actions taken for each type of expense. 6

### Group - C

12. Discuss the role of the transport layer in the TCP / IP model. How does it ensure reliable and efficient data transfer between devices in a network? 4+4

*Or,*

Describe the concept of multiplexing in data communication. How does it improve the efficiency of data transmission? Provide examples of multiplexing techniques. 5+3

13. Describe the sequencing process within the Control Unit (CU) during the execution of instructions. How does the CU ensure the orderly execution of instructions in a program? 5+3