

W'05 : 2 FN : AN 203/AD 303 (1403)

COMPUTING AND INFORMATICS

Time : Three hours

Maximum marks : 100

*Answer FIVE questions, taking ANY TWO from Group A,
ANY TWO from Group B and ALL from Group C.*

*All parts of a question (a, b, etc) should be
answered at one place.*

*Answer should be brief and to-the-point and be supple-
mented with neat sketches. Unnecessary long answers
may result in loss of marks.*

*Any missing data or wrong data may be assumed suitably
giving proper justification.*

Figures on the right-hand side margin indicate full marks.

Group A

1. (a) With reference to C++ programming, explain the concept of inheritance and polymorphism using suitable examples. Write an example of a derived class 'Account_holder' from a base class 'Account' having name, account_no. and balance. 10
- (b) Write a C++ program to generate a Fibonacci sequence up to 150. Adequately comment your program. 10

2. (a) What is meant by information systems? How are they different from a file system? 6
- (b) What is a LAN? What are different LAN topologies? Explain briefly a LAN protocol. 10
- (c) What is Electronic Data Interchange (EDI)? Explain its salient features. 4
3. (a) Write a C++ program to calculate a factorial of a number, where the upperbound for the input is limited to 10,00,000. 6
- (b) Write a C++ program function which will sort the floating point array numbers as:
 Float $a[] = \{55.5, 22.5, 99.5, 66.6, 44.4, 88.8, 33.3, 77.7\}$
 input and arrange them in ascending order. 8
- (c) Differentiate between Ink-Jet and Laser printers with reference to their working. 6
4. (a) What is DBMS? What are different types of DBMS? Compare there different types of DBMS. 10
- (b) What is Client-Server technology? What are their advantages and disadvantages? Discuss them briefly. 10
- (b) Write a C++ program that simulates a simple calculator. It reads two integers and a character. If the character is a +, sum is printed; if -, then difference is printed and so for the *, / and % as multiplication, division and remainder operation. Comment your program adequately. 10
6. (a) Why is NAND gate considered as a universal gate? Implement an EX-OR (2 input) logic using NAND gates. 10
- (b) What is a D-type flip-flop? Construct a D-type latch using RS inputs. 6
- (c) What is meant by spooling? Briefly explain. 4
7. (a) Differentiate between compilers, assembler and translator. Explain their working and the situations where each is useful. 10
- (b) What are the functions of an operating system? Differentiate between multiprogramming, multiprocessing. Which OS are single user and multiusers? Give examples of each. 10
8. (a) Convert the following from one number system to another: 2×5

$$(i) (1267.3125)_{10} = (\quad)_2$$

$$(ii) (10110.101)_2 = (\quad)_{10}$$

$$(iii) (1234)_8 = (\quad)_{16}$$

$$(iv) (B2C)_{16} = (\quad)_2$$

$$(v) (10110111.1)_2 = (\quad)_8$$

Group B

5. (a) Write a C++ program to do the following: It should read student data (name, roll number, marks), sort the records based on marks and print out the details. Comment your program adequately. 10

(b) What is meant by a Strategic Information System? Explain briefly where such a system is used and the important components of such a system. 6

(c) What is meant by memory hierarchy? Is it possible to have a computer system without any secondary storage? Explain your answer. 4

Group C

9. Choose the *correct* answer: 2 x 10

(i) Which one of the following is not a valid C++ identifier?

- (a) `_temp`
- (b) `break`
- (c) `BREAK`
- (d) `_brk`

(ii) Which one of the following is correct?

- (a) The formal and actual parameter names in function should have different names
- (b) The local and global variables can have same name
- (c) the contents of an uninitialized character array cells will contain zeros
- (d) The contents of external variables are stored in interval registers of CPU

(iii) The output of the following program segment will be

```
int main ( )
{
    increment ( );
    increment ( );
}
void increment ( )
{
    static x=5;
    cout << "x=" << x;
    x = x+5;
}
```

- (a) 5 10
- (b) 6 10
- (c) 10 5
- (d) 0 5

(iv) A program segment defines :

```
int i=8, j=5;
what will be the value of expression ( i>0 ) && ( j<5 ) ?
```

- (a) 8
- (b) 5
- (c) 0
- (d) 1

(v) Which one of the following numerical values is not a valid constant?

- (a) `0xAB12`
- (b) `199`
- (c) `07891`
- (d) `0321`

(vi) Which of the following converts a high level program to machine executable code?

- (a) Translator
- (b) Assembler
- (c) Interpreter
- (d) Compiler

(vii) A 32-bit address bus can address up to

- (a) 4 Megabytes
- (b) 4 Terabytes
- (c) 4 Gigabytes
- (d) 32 Gigabytes

(viii) Which of the following is an accounting software package?

- (a) Focus
- (b) Windows 2000
- (c) FoxPro
- (d) Tally

(ix) In relational databases, a relation is represented by

- (a) Field
- (b) Record
- (c) Table
- (d) Primary key

(x) Which of the following is a volatile memory?

- (a) Hard disk
- (b) Floppy disk
- (c) ROM
- (d) RAM.