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UNIVERSITY OF NORTH BENGAL
BCA Honours 1st Semester Examination, 2024

CC2-BACHELOR OF COMPUTER APPLICATION (13)

DIGITAL ELECTRONICS

Time Allotted: 2 Hours

Full Marks: 60

The figures in the margin indicate full marks.

GROUP-A

Answer any four questions

3×4 = 12

1. Draw a XOR gate and explain its operation.
2. Prove the following identity $B'D' + BC + C'D' = D' + BC$.
3. Find the decimal equivalent of the following binary number ; 100.1011 .
4. Explain the De Morgan's Law and prove it with the help of a truth table.
5. Which gates are called universal gates and why?
6. Differentiate between flip-flop and latch.

GROUP-B

Answer any four questions

6×4 = 24

7. Describe NAND gate as universal gate. Implement AND, OR and NOT gate using NAND.
8. Write a short note on the different types of computers.
9. Construct a full adder using two half adders.
10. Add the following numbers using 2's complement system 11011 and 10110. Explain 4×1 MUX in detail.
11. Discuss the SR flip-flop along with its truth table and circuit diagram.
12. Discuss the block diagram of a Computer.

GROUP-C

Answer any two questions

12×2 = 24

13. What is a decoder? Design a 3×8 decoder having enable input and explain its operation. State one application of a decoder.
14. Simplify the following Boolean function using K-maps. Draw the truth table and design the logic circuit for the minimized expression.
$$F(w, x, y, z) = \sum(0, 1, 2, 4, 5, 6, 8, 9, 12, 13, 14)$$
15. What is race condition? Draw the JK master slave flip-flop and explain its operation.
16. Write a note on Generations of Computers.

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UNIVERSITY OF NORTH BENGAL

B.Sc. Major 1st Semester Examination, 2024

COMSMAJ101-COMPUTER SCIENCE

DIGITAL DESIGN AND ANALYSIS

Time Allotted: 2 Hours 30 Minutes

Full Marks: 60

The figures in the margin indicate full marks.

GROUP-A

Answer any four questions from the following

3×4 = 12

1. Discuss the methods to represent signed binary number with examples.
2. Explain the operation of a XOR gate.
3. Explain minterms and maxterms.
4. State De Morgan's theorem.
5. Differentiate between combinational and sequential circuits.
6. Convert $(64.2)_{10}$ into Octal number system.

GROUP-B

Answer any four questions from the following

6×4 = 24

7. Explain how full adder can be built using two half adders.
8. Convert the given expressions in canonical SOP form $Y = AC + AB + BC$.
9. What is a full subtractor? Draw the block diagram of a full subtractor and explain it.
10. Minimize the given function using K-map $f(A, B, C) = \sum (1, 2, 3, 5, 7)$.
11. What is a decoder? Explain with the help of a truth table and circuit diagram.
12. Describe a T flip flop with its block diagram and characteristics equation.

GROUP-C

Answer any two questions from the following

12×2 = 24

13. Derive all the other gates using NOR gate. Draw the diagram and explain the derivation.
14. Discuss the working principle of 16×1 multiplexer with proper diagram.
15. Describe the parallel-in parallel and parallel-in serial out shift register with neat logic diagram.
16. For the logic function $f = \overline{A}\overline{B}D + \overline{A}BC + \overline{B}\overline{C}\overline{D}$
 - (a) Obtain the standard sum of product equation
 - (b) Make a truth table
 - (c) Simplify using K-map
 - (d) Draw the circuit diagram.

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UNIVERSITY OF NORTH BENGAL

B.Sc. Major 1st Semester Examination, 2024

COMSMAJ102-COMPUTER SCIENCE

PROGRAMMING IN C

Time Allotted: 2 Hours 30 Minutes

Full Marks: 60

The figures in the margin indicate full marks.

GROUP-A

Answer any four questions from the following

3×4 = 12

1. Explain initialization of a variable in C.
2. What do you mean by scope and extent of a variable?
3. Explain the statement: $a+ = 10$ in C.
4. Name the different storage classes available in C.
5. What is a key word? Differentiate between keywords and reserved words.
6. Explain pointers in C.

GROUP-B

Answer any four questions from the following

6×4 = 24

7. Explain type casting in detail.
8. Differentiate between a structure and a union.
9. What is nesting of loops? Explain with the help of an example.
10. What do you mean by an array? What are the different types of arrays available in C?
11. Discuss the different branching statements available in C.
12. What is operator precedence and associativity? Explain.

GROUP-C

Answer any two questions from the following

12×2 = 24

13. Discuss "call by value" and "call by reference" techniques of parameter passing.
14. Explain in detail six string handling functions in C.
15. Explain the looping constructs available in C, with their syntax and example.
16. What is a file? Write a small program code to copy the content of one file to another.

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UNIVERSITY OF NORTH BENGAL
BCA Major 1st Semester Examination, 2024

BCAPMAJ101-BACHELOR OF COMPUTER APPLICATION
COMPUTER FUNDAMENTALS

Time Allotted: 2 Hours 30 Minutes

Full Marks: 60

The figures in the margin indicate full marks.

GROUP-A

Answer any four questions from the following

3×4 = 12

1. Define Computer. Explain different characteristics of a computer.
2. Draw and explain the block diagram of a Computer.
3. What are CPU and ALU?
4. Explain BIOS.
5. Differentiate between RAM and ROM.
6. Explain System software and Application software.

GROUP-B

Answer any four questions from the following

6×4 = 24

7. Explain input /output devices in detail.
8. What is a primary storage? Explain.
9. Explain EPROM and EEPROM.
10. Discuss MICR.
11. Explain space complexity.
12. Discuss different types of symbols used in a flowchart.

GROUP-C

Answer any two questions from the following

12×2 = 24

13. Explain asymptotic notations with suitable graphical representations.
14. Discuss structured programming.
15. Explain the generations of computers with examples.
16. Define an algorithm and discuss its essential features.

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UNIVERSITY OF NORTH BENGAL

BCA Major 1st Semester Examination, 2024

BCAPMAJ102-BACHELOR OF COMPUTER APPLICATION**PROGRAMMING FUNDAMENTALS USING C**

Time Allotted: 2 Hours 30 Minutes

Full Marks: 60

*The figures in the margin indicate full marks.***GROUP-A****Answer any four questions from the following**

3×4 = 12

1. What is a variable? Write the rules of naming a variable.
2. Convert the following mathematical expressions into C expressions.

$$(i) \quad \frac{x}{b+c} + \frac{y}{b-c}$$

$$(ii) \quad r = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$
3. Discuss break and continue statement in C program.
4. Write a C program to find the area of a rectangle.
5. What is a header file? What are its uses?
6. Explain implicit and explicit type conversion with example.

GROUP-B**Answer any four questions from the following**

6×4 = 24

7. Explain any three string handling functions in C.
8. What is recursion? Write a program in C to compute factorial of a number using recursion.
9. What is function? Discuss different types of functions with example.
10. Discuss actual and formal parameters with example.
11. Explain switch statement with syntax and example.
12. What is structure? Explain the syntax of structure declaration with example.

GROUP-C**Answer any two questions from the following**

12×2 = 24

13. Discuss various types of loops in C language with example.
14. Discuss various types of operators used in C language with example.
15. What is file? Write a C program to copy the content of one file into another.
16. Discuss different types of Control statements available in C programming with suitable example.

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UNIVERSITY OF NORTH BENGAL

SEC 1st Semester Examination, 2024

SEC - POOASEC105-COMPUTER SCIENCE

BASIC PROGRAMMING IN PYTHON

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

GROUP-A

Answer any five questions

1×5 = 5

1. What is the extension of Python source file?
2. Write a code in Python to print "Hello, World!"
3. What is the error given in the following code?
if 5 > 2:
print ("Five is greater than two!")
4. What is a variable?
5. What is an assignment operator?
6. How do you create a comment in Python?
7. What is casting?
8. Define Python interpreter.

GROUP-B

Answer any three questions

5×3 = 15

9. Discuss at least five data types in Python.
10. Discuss looping in Python.
11. Discuss exception handling in Python.
12. Write a program in Python to check if a number is odd or even.
13. Write a program in Python to sum first five natural numbers.

GROUP-C

Answer any two questions

10×2 = 20

14. Write a program in Python to create a menu driven program. Use user defined functions to perform calculations to find area of rectangle, square, circle and triangle based on user inputs.
15. Discuss different types of operators used in Python.
16. Write a program in Python to generate Fibonacci series.
17. Explain different types of control structures used in Python.

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UNIVERSITY OF NORTH BENGAL

BCA Major 1st Semester Examination, 2024

UBCAMAJ11001-BACHELOR OF COMPUTER APPLICATION

DIGITAL ELECTRONICS

Time Allotted: 2 Hours

Full Marks: 40

The figures in the margin indicate full marks.

GROUP-A

Answer any five questions from the following

1×5 = 5

1. Convert the binary number 101101 into its decimal equivalent.
2. Define BCD (Binary-Coded Decimal) and provide an example.
3. List the universal gates and their importance in logic circuit.
4. What is the ASCII code and where is it commonly used?
5. Define the term "Min term" in Boolean algebra.
6. State De-Morgan's Theorem.
7. What is the difference between a half-adder and full-adder?
8. Name one advantage of CMOS logic over TTL.

GROUP-B

Answer any three questions from the following

5×3 = 15

9. Explain the interconversion process between binary, octal, and hexadecimal number systems with suitable example.
10. Simplify the following Boolean expression using K-map:

$$f(A, B, C) = \sum m(1, 3, 5, 7)$$
11. Describe the difference between synchronous and asynchronous counters. How are ripple counters implemented in digital circuit?
12. Explain the working of a Multiplexer and provide an example circuit for 4×1 multiplexer.
13. Compare the different digital logic families (RTL, DTL, TTL, CMOS). Discuss their performance characteristics and applications.

GROUP-C

Answer any two questions from the following

10×2 = 20

14. Discuss the different types of flip-flops (R-S, J-K, D, and T) provide truth tables for each and explain their application.
15. Write short notes on:
 - (a) BCD to Seven Segment Decoder
 - (b) Parallel Adder
 - (c) Serial-in/Parallel-out shift register.
 Illustrate each concept with a simple diagram.
16. Explain the concept of fixed-point and floating-point number representation in digital systems. Discuss the advantages and disadvantages of both.
17. Design a 4-bit binary adder-subtractor circuit. Explain its working, provide the circuit diagram.

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UNIVERSITY OF NORTH BENGAL

SEC 1st Semester Examination, 2024

SEC - UBCASEC11001-BACHELOR OF COMPUTER APPLICATION**SYSTEM TOOLS & PERIPHERAL AND OFFICE AUTOMATION**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.***GROUP-A****Answer any five questions from the following****1×5 = 5**

1. What is workbook?
2. Explain the need of Cache Memory.
3. Define Computer.
4. Define the term assembler.
5. What are the text alignment options are there in MS-WORD?
6. What is slide master in PowerPoint?
7. What is the purpose of OCR?
8. What is the key difference between low level language and high level language?

GROUP-B**Answer any three questions from the following****5×3 = 15**

9. Describe different types of chart in MS-Excel.
10. Describe the process of creating a custom template in MS PowerPoint. How does creating a template benefit repetitive task?
11. Describe the steps to create and format a table in MS-Word. What are the key formatting options available for tables?
12. Explain the characteristics of a Computer and how these characteristics make it a powerful tool in various field.
13. What are the key benefits and challenges of implementing office automation in an organization? Provide example of each.

GROUP-C**Answer any two questions from the following****10×2 = 20**

14. Describe the components of a computer system with the help of block diagram. Explain the classification of computers and the characteristics that differentiate different generations. **4+6**
15. What is mail-merge? Write down the steps involved in mail-merge. **2+8**
16. What is conditional formatting? Write down the steps to remove duplicate data. Describe any five functions available in MS-Excel. **1+4+5**
17. Explain different types of view available in MS-PowerPoint. Discuss the difference between a Command-Line user Interface and Graphical user Interface.

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