



'সমানো মন্ত্র: সমিতি: সমানী'

UNIVERSITY OF NORTH BENGAL

B.Sc. Honours 3rd Semester Examination, 2022

SEC1-P1-COMPUTER SCIENCE (35)

Time Allotted: 2 Hours

Full Marks: 60

The figures in the margin indicate full marks.

**The question paper contains SEC35-E1, SEC35-E2 and SEC35-E3.
The candidates are required to answer any *one* from the *three* courses.
Candidates should mention it clearly on the Answer Book.**

SEC35-E1

DIGITAL ELECTRONICS AND SYSTEM MAINTENANCE

GROUP-A

Answer any *four* questions from the following

3×4 = 12

1. Simplify the following expression: $AB + ABC + ABCD + ABCDE + ABCDEF$ 3
2. Write short notes on PLA. 3
3. Draw full adder circuit using only NAND gates. 3
4. Write short notes on propagation delay. 3
5. Implement using NOR gates only, $F = xyz + x'y'$ 3
6. Convert: 3
 - (a) $1010101_2 = (?)_8$
 - (b) $174_{10} = (?)_2$

GROUP-B

Answer any *four* questions from the following

6×4 = 24

7. State and prove De-Morgan's theorem using two variables. 2+4
8. Simplify the boolean function in Sum of Products (SOP). 6
$$F(A, B, C, D) = \sum m(0, 1, 2, 5, 8, 9, 10)$$
9. Draw the diagram of T flip flop and explain how it works. 6

10. Explain half adder with suitable diagram. 6
11. Give the logic diagram of a 4-bit shift register. 6
12. Explain NAND Gate with symbol, logic expression and truth table. 6

GROUP-C

Answer any two questions from the following

12×2 = 24

13. What is Priority Encoder? With a truth table and logic diagram, discuss the operation of four input Priority Encoder. 3+9
14. What do you mean by don't care condition? Reduce the given equation using K-Map. $F(A, B, C, D) = \sum(0, 2, 4, 6, 7, 8, 10, 12, 13, 14) + d(5, 15)$, where d indicates don't care term. 2+10
15. What is De-multiplexer? Explain 8:1 De-multiplexer with the help of truth table and logic circuit. 3+9
16. Implement 4×1 multiplexer using 2×1 multiplexer. What do you mean by race condition? How it can be avoided? 6+3+3

SEC35-E2

WEBSITE DESIGN WITH HTML AND PHP

GROUP-A

Answer any four of the following

3×4 = 12

1. What are the compulsory tags in HTML? What are the basic HTML data types? 1+2
2. Differentiate between static web pages and dynamic web pages. 3
3. How will you upload files using forms in HTML? 3
4. How do you use comments in PHP? 3
5. What are sessions? How will you invoke a session in PHP? 1+2
6. Discuss different variable scopes in PHP. 3

GROUP-B

Answer any four of the following

6×4 = 24

7. What is the full form of PHP? State any five features of PHP. 2+4
8. Write procedure for creating the record addition mechanism. 6

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|-----|-----------------------------------------------------------------------------|-------|
| 9. | Define XML. What are the advantages of XML? Why are attributes used in XML? | 2+2+2 |
| 10. | Distinguish HTML and XHTML. Define naming rules in XML. Define XML Schema. | 2+2+2 |
| 11. | Define DTD. Explain the purpose of DTD. | 2+4 |
| 12. | Define Table tag and their attributes with an example. | 6 |

GROUP-C

Answer any two of the following

12×2 = 24

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|-----|-------------------------------------------------------------------------------------------------------------------------------------------|------|
| 13. | Explain the structure of the HTML webpage with an example. Define List Tag with an example. | 8+4 |
| 14. | Define form tag. Design a Registration page by using all form controls. | 2+10 |
| 15. | Explain about various types of XML parsers. | 12 |
| 16. | What are the differences between Get and Post methods in form submitting? Give the case where we can use get and we can use post methods? | 6+6 |

SEC35-E3

PYTHON PROGRAMMING

GROUP-A

Answer any four questions from the following

3×4 = 12

1. What is the function of identifiers in Python?
2. Demonstrate the use of bitwise operators.
3. What is the difference between break and continue in Python?
4. Discuss interpreted languages with the help of an example.
5. What is scope in Python?
6. Discuss the structure of a Python program.

GROUP-B

Answer any four questions from the following

6×4 = 24

7. Demonstrate operator precedence with the help of an example.
8. Write down different features of Python.

9. Write a program in Python to sum up three digits of a number.
10. Write a program in Python to generate first n prime numbers.
11. Discuss different types of errors in Python.
12. What are the different elements of Python? Discuss.

GROUP-C

Answer any two questions from the following

12×2 = 24

13. Explain top-down and bottom up programming with the help of examples.
14. What are operators? Explain different types of operators used in Python with the help of examples.
15. Write a program in Python to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be taken as inputs by the programmer. Assign grades according to the following criteria.
 - (a) Grade A: Percentage ≥ 80
 - (b) Grade B: Percentage ≥ 70 and < 80
 - (c) Grade C: Percentage ≥ 60 and < 70
 - (d) Grade D: Percentage ≥ 40 and < 60
 - (e) Grade E: Percentage < 40
16. Write a program in Python to generate the following number triangle:

```

                1
              1 2
            1 2 3
          1 2 3 4
        1 2 3 4 5
          ⋮
          ⋮
          ⋮
          n-rows
        —x—
```