Tribhuvan University
Institute of Science and Technology
2081
✡

Bachelor Level / First Year/ First Semester/ Science
Bachelors in Information Technology (BIT 101)
(Introduction to Information Technology)

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Section A

Long Answer Questions.
Attempt any TWO questions. **(2×10=20)**

1. What are the components of general-purpose computer? Draw the block diagram of general-purpose computer? Explain function of PC, IR and AC registers. (10)
2. What is Softwre? What are different categories of Software and explain their functions? (10)
3. Define Database management System. What are the advantages of database management system? (3+7)

Section B

Short Answer Questions.
Attempt any EIGHT questions. **(8×5=40)**

4. What is computer? Explain the Characteristics of Computer. (5)
5. Add number +7 and -17 using 2's complement method. (5)
6. Define a packet. Explain the working of the packet switching technique. (5)
7. What is security mechanism? Explain in brief about the technologies used for implementing the security mechanisms. (5)
8. What is IT? Explain the Applications of IT in education. (5)
9. Explain different memories available in the computer in order of their hierarchy based on access time and capacity. (5)
10. Explain the purpose of utility software. (5)
11. What is computer network? Explain the importance of networking. (5)
12. Write short notes on: (2×2.5=5)
    a) Smart city
    b) Big data

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Bachelor Level / First Year/ First Semester/ Science
Bachelors in Information Technology (BIT102)
(C Programming)

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Section A

Long answer questions.
Attempt any TWO questions. **[2×10=20]**

1. What is loop? Differentiate between break and continue statement. Write a program to find sum of first N natural numbers. [2 + 4 + 4]

2. What is pointer? How it differs from array? Write a program to add two 2D matrices. [2 + 2 + 6]

3. What is string? Explain any three string function in "string.h" header file in C with example. Write a program to check whether a word is palindrome or not. [2 + 3 + 5]

Section B

Short answer questions.
Attempt any EIGHT questions. **[8×5=40]**

4. What are conversion specifiers? Explain the compilation of C program in brief. [2 + 3]

5. What is structure? Write a program to read roll, name and marks of 10 students using structure and then display all records. [1 + 4]

6. Explain if else ladder with syntax and semantic. Write a program to find largest among 3 different numbers. [2 + 3]

7. Write a program to check whether a given number is Armstrong number or not. [5]

8. What is operator precedence? Explain assignment and logical operator. [1 + 4]

9. Explain call by reference of a function with suitable example. [5]

10. Write a program to write N numbers in file "number.txt" and then read it and display only even numbers. [5]

11. What is constant? Explain basic data types in c programming along with their range. [1+4]

12. Write short notes on:
    a) Union
    b) Switch statement

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Bachelor Level / First Year/ First Semester/ Science
Bachelors in Information Technology (BIT103)
(Digital Logic)

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Section A

Long Answer Questions.
Attempt any TWO questions. **[2×10= 20]**

1. Design a combinational circuit with three inputs. The output is 1 when the binary value of the input is odd. [10]

2. Define magnitude comparator? Design a 4-bit magnitude comparator circuit. [2+8]

3. What is counter? Design a 3-bit synchronous up-down counter along with state diagram and timing sequence. [2+8]

Section B

Short Answer Questions.
Attempt any EIGHT questions. **[8×5=40]**

4. Convert $(257)_8$ into hexadecimal and decimal number system. [2.5 + 2.5]

5. Perform following arithematic operation. [2.5+2.5]
   a) 101101 + 011011
   b) 101111 - 010101

6. Simplify(using K-map): F = (A + B + C + D') (A + B + C' + D) (A + B' + C' + D') (A + B' + C' + D) (A' + B' + C' + D) (A' + B + C + D') (A' + B + C' + D). [2.5 + 2.5]

7. Define multiplexer. Implement 8 x 1 multiplexer using 2 x 1 multiplexer. [1 + 4]

8. What is Flip Flop? Differentiate between Combinational circuit and Sequential Circuit. [2 + 3]

9. Realize JK flip-flop fromRS flip-flop. [5]

10. Define shift register. Explain the operation of 4-bit Serial-In Serial-Out Shift register with data input 1011. [1 + 4]

11. Define shifter. Design a 4-bit shifter circuit. [1 + 4]

12. Write short notes on: [2 × 2.5 =5]
    a) De-Multiplexer
    b) Excitation table

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Bachelor Level / First Year/ First Semester/ Science
Bachelors in Information Technology (MTH104)
(Basic Mathematics)

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

Section A $(2 \times 10 = 20)$.

Long Answer Questions
Attempt any TWO questions:

1. (a) Explain the meaning $\lim_{x \to 2} f(x) = 5$. Is it possible for this statement to be true, yet $f(2) = 3$? Explain. [3+2]

   (b) Draw a graph of the function $f(x) = x^2 + 4$ and find its domain and range. [2+1.5+1.5]

2. (a) Find the derivative of $y = \dfrac{\tan^{-1} x}{\sqrt{x}}$ with respect to x. [5]

   (b) Find the area of the region bounded by $y = -x$ and $x = y^2 + 3y$. [5]

3. (a) What is initial value problem? Find the solution of the initial value problem of $x\,y' - y = x^2,\ y(2) = 5$. [1+4]

   (b) Evaluate: $\lim_{x \to \infty} \dfrac{3x^2 - 5x + 2}{5x^2 + 8x + 7}$ [5]

Section B $(8 \times 5 = 40)$.

Short Answer Questions
Attempt any EIGHT questions:

4. Evaluate: $\int \sqrt{4 - x^2}\, dx$. [5]

5. Find the volume of the solid obtained by rotating about the y-axis the region bounded by $y = x$ and $y = x^2$. [5]

6. Evaluate: $\int_0^5 \dfrac{dx}{\sqrt{x-2}}$, if it exists. [5]

7. Test whether the series $\sum_{n=2}^{\infty} \dfrac{2}{n^2 - 1}$ converges or diverges. [5]

8. Use Newton's method to find $\sqrt[4]{10}$ correct to four decimal places. [5]

9. Find the partial derivatives f_x, f_y and f_{xy} of $f(x,y) = \sqrt{x}\,y^3 + x^4\,y$ at $(-4,1)$. [2+2+1]

10. Verify mean value theorem for the function $f(x) = x^2 + 3x + 1$ in $[-1,1]$. [5]

11. Test whether the function

$$f(x) = \begin{cases} \dfrac{x^2 - 2x}{x-2} & \text{if } x \neq 2 \\ 1 & \text{if } x = 2 \end{cases}$$

is continuous or discontinuous at $x = 2$. Explain. [5]

12. Evaluate: $\int_0^{\pi} x \sin x \, dx$. [5]

SCO105-2081 ✡

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Bachelor Level / First Year/ First Semester/ Science
Bachelors in Information Technology (SCO 105)
(Sociology)

Full Marks: 60
Pass Marks: 24
Time: 3 hours

Candidates are required to give their answers in their own words as for as practicable.
The figures in the margin indicate full marks.

SECTION A

Long Answer Questions.
Attempt any TWO questions. [2×10=20]

1. Describe sociology and explain its relationships to other sciences.
2. Explain information technology as one of the major forms of social structure in the present world.
3. Discuss the concept of culture as fundamental concept of society and also link it with the impact of ICT in today's world.

SECTION B

Short Answer Questions.
Attempt any EIGHT questions. [8×5=40]

4. Differentiate between traditional and technological society.
5. Describe briefly the development of the cultural universe and diffusion around the world.
6. List out coder and sanctions in social life.
7. Describe the key features of economic institutions.
8. Write about the social stratification in Nepali society.
9. Describe the features of globalization and the changing world.
10. List out the importance of sociology in social policy.
11. Why do IT experts require sociological knowledge to contribute to society?
12. Explain the key features of family in our society.