1B1N22291(B) (Pages : 2) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Computer Science Degree Examination, November 2022

BMT1C01(CS) – Mathematics – I

(2022 Admission onwards)

Time : 2 hours Max. Marks : 60

Section A
All questions can be attended
Each question carries 2 marks

1. Let the set A = {x: x is a positive prime number less than 10} and B = {x : x is positive odd number less than 10} . Then find A-B and B-A.
2. Define symmetric relation. Give example of a symmetric relation on the set of integers.
3. Draw the Venn Diagram of $(A \cap B)^c$.
4. Give the truth table of $\neg(p \rightarrow q)$. ($\neg$ denote negation)
5. Differentiate Inclusive OR and Exclusive OR .
6. Write down Demorgan's Laws in logic.
7. Evaluate $\lim_{x \to 0} \frac{\sqrt{x+4}-2}{x}$.
8. Find the slope of tangent to the graph of $f(x) = x^8 + 2x^2 + 1$ at the point (1,4).
9. Give example of a function that is discontinuous at x = 0 and x = 1.
10. State the Mean value theorem.
11. Find the derivative of the function $x^3(x^{1/2} + 1)$.
12. What are the critical points of the curve $x^{2/3}(x+2)$?

(Ceiling: 20 Marks)

Section B
All questions can be attended
Each question carries 5 marks

13. Show that the relation P defined on the set of real numbers R by xPy iff $(x - y)$ is an integer. Show that P is an equivalence relation on R.
14. Show that $\neg(p \vee q) \vee (\neg p \wedge q)$ is logically equivalent to $\neg p$.
15. Does the function $f(x) = \begin{cases} \frac{|x|}{x}; & if\ x \neq 0 \\ 0; & if\ x = 0 \end{cases}$ is continuous? Justify your answer.

16. For what values of a,m and b, does the function

$$f(x) = \begin{cases} 3, & x = 0 \\ -x^2 + 3x + a, & 0 < x < 1 \\ mx + b, & 1 \le x \le 2 \end{cases}$$ satisfy the hypothesis of mean value theorem

on [0 , 2].

17. Determine the interval where the function $f(x) = x + \frac{1}{x}$ is increasing and decreasing.

18. i) Evaluate $\lim_{x \to \frac{\pi}{4}} \frac{\sin x - \cos x}{1 - \tan x}$ ii)If $\sqrt{5 - 2x^2} \le f(x) \le \sqrt{5 - x^2}$,-1≤ $x \le 1$.

Find $\lim_{x \to 0} f(x)$.

19. Find the absolute maximum and minimum of the function

$f(x) = 3x^4 - 4x^3 - 8 \, on \, [-1, 2]$

(Ceiling: 30 Marks)

Section C
Answer any one question
Question carries 10 marks

20. i) Comment on the concavity of the curve $f(x) = x^4 - 4x^3 + 12$ on various intervals.

ii) Find the relative maximum and relative minimum of the function

$f(x) = 2\cos x - \cos 4x$ on the interval $[0 , \pi]$

21. i)Prove that $[(p \rightarrow q) \wedge p] \rightarrow q$ is a tautology.

ii)Find the slop of the tangent to the curve $x^2 y^3 - xy = 10$ at the point ((-1,2).

(1 x 10 = 10 Marks)

4B1N22249 (Pages : 1) Reg. No:.....

Name: .....

FAROOK COLLEGE (AUTONOMOUS), KOZHIKODE

First Semester B.Sc Computer Science Degree Examination, November 2022

BCS1B01 – Computer Fundamentals

(2022 Admission onwards)

Time: 2 hours Max. Marks : 60

PART - A
Answer all questions
Each question carries Two marks
Ceiling - 20 Marks

1. What is EPROM?
2. What is Unicode?
3. What is format specifier?
4. What is an interpreter?
5. Explain vi editor?
6. What is man pages?
7. Define algorithm with suitable example.
8. How to compile and run a C program in Linux.
9. What is token in C language.
10. Write the syntax of conditional operator.
11. Differentiate between RAM and ROM.
12. Explain increment and decrement operators.

PART - B
Answer all questions
Each question carries Five marks
Ceiling - 30 Marks

13. What is flowchart? Explain different symbols used for flowchart.
14. Write short notes on : (a) Dos (b) Linux (c) Windows.
15. Explain top- down design.
16. Write an algorithm to convert a decimal number to binary.
17. Draw a flowchart to find the smallest among three numbers?
18 With a diagram explain the components of a computer?
19 What are the control structures available in C?

PART - C
Answer any one questions
Each question carries ten marks

20. Write detailed notes on C data types.
21. Write an algorithm and draw flow chart to find the roots of a quadratic equation.

(1 x 10 =10 Mar