Code No: 06

FACULTY OF ENGINEERING

B.E I-Year Examination, May / June 2018

Subject: Programming in C & C++

Time: 3 Hours **Max. Marks: 75**

Note: Answer All Questions From Part-A & Any Five Questions From Part-B.

PART-A (25 Marks)

1. Draw a flowchart to find largest among three numbers (2)
2. Convert the given Binary numbers to its equivalent Octal and Hexadecimal number systems
   (i) 111100010.101 (ii) 1011111000.01 (3)
3. Define an array.
   Give the syntax and an example for declaring and initializing of 1-D array. (3)
4. What is the output of the following program? (2)

```
#include<stdio.h>
int main()
{
int fun(int);
int i=fun(10);
printf("%d\n",--i);
return 0;
    }
    int fun(int i)
    {
      return(i++);
    }
```

5. Differentiate between Structure and union. (3)
6. List out the file access modes. (3)
7. What is an inline function? (2)
8. What are different access specifiers in c++? (2)
9. Define stream. (2)
10. Give difference between overloading and overriding. (3)

PART-B (50 Marks)

11. Explain different components of a computer with a Block diagram. (10)
12. a) Write a 'C' program for arranging the strings in ascending order. (5)
    b) What are different storage classes in 'C'? Explain with example. (5)
13. a) Write a Program to copy the contents of one file to another file in 'C'. (5)
    b) Write a program to add two complex numbers using structures in 'C'. (5)
14. What are different types of constructors? Give example of each. (10)
15. What do you mean by operator overloading? Write a program for overloading increment and decrement operators using c++. (10)
16. Define a template. Write a program for finding maximum and minimum of an array using templates. (10)
17. What is exception handling? Give different types of exceptions with example of each. (10)

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Code No. 09/S

FACULTY OF ENGINEERING

B.E. I – Semester (Suppl.) Examination, May / June 2018

Subject: Engineering Mathematics – I

Time: 3 Hours **Max.Marks: 70**

Note: Answer all questions from Part A & answer any five questions from Part B.

PART – A (20 Marks)

1 Find the rank of the matrix $\begin{bmatrix} 2 & -1 & 3 & 1 \\ 1 & 4 & -2 & 1 \\ 5 & 2 & 4 & 3 \end{bmatrix}$. 2

2 Find the sum and product of the eigen values of $\begin{bmatrix} 2 & 2 & 1 \\ 1 & 3 & 1 \\ 1 & 2 & 2 \end{bmatrix}$. 2

3 Test the convergence of $\sum_{n=1}^{\infty} \frac{1}{n\sqrt{n^2-1}}$. 2

4 State Cauchy's n^{th} root test. 2

5 Verify Lagrange's mean value theorem for $f(x) = e^x$ in [0, 1]. 2

6 Find the radius of curvature of $x^4+y^4 = 2$ at the point (1, 1). 2

7 If z = f(ax + by), then show that $b\frac{\partial z}{\partial x} - a\frac{\partial z}{\partial y} = 0$. 2

8 Obtain the Taylor's series for the function $f(x,y) = 2x^2 - xy + y^2 + 3x - 4y + 1$ about the point (-1, 1). 2

9 Find the unit normal vector to the surface z = xy at (-1, -2, 2). 2

10 Show that $(2x+3y)\hat{i} + (x-y)\hat{j} - (x+y+z)\hat{k}$ is a solenoidal vector. 2

PART – B (5x10 = 50 Marks)

11 a) Solve, if consistent, the following system of equations:
x +2y+3z = 6; 2x+4y+z = 7; 3x+2y+9z = 14. 5

b) Using Cayley – Hamilton theorem, find the inverse of the matrix $\begin{bmatrix} 1 & 0 & 3 \\ 2 & 1 & -1 \\ 1 & -1 & 1 \end{bmatrix}$. 5

12 a) Test for convergence the series $\sum_{n=1}^{\infty} \frac{1.3.5....(2n-1)}{2.4.6....2n} \frac{x^{2n+1}}{(2n+1)}$. 6

b) Test for conditional convergence the series $\sum_{n=1}^{\infty} \frac{(-1)^{n-1}}{\sqrt{n}}$. 4

13 a) State Cauchy's mean value theorem and verify it for f(x) = $\sqrt{x}$ and g(x) = $\frac{1}{\sqrt{x}}$, xϵ[a,,b] a, b > 0. 5

b) Trace the curve $y^2 = x^3$. 5

14 a) Show that the function f(x,y) = $\begin{cases} \frac{x-y}{x+y}, & (x, y) \neq (0,0) \\ 0, & (x, y) = (0,0) \end{cases}$ is not continuous at (0,0). 5

b) Determine the maxima and minima of $f(x,y) = x^2 + y^2 - x - y + 1$. 5

15 a) If ϕ (x, y, z) and $\vec{v}$ (x, y, z) respectively are scalar and vector point functions, prove that $\nabla \times (\phi \vec{v}) = (\nabla \phi \times \vec{v}) + \phi(\nabla \times \vec{v})$. 5

b) Evaluate the line integral $\int_C \vec{F}.\overrightarrow{dR}$ where $\vec{F} = y\hat{i} + x\hat{j}$ and C is the curve in the xy – plane given by $y = 2x^2$, from (0,0) to (2,8). 5

16 a) Find the nature, index and signature of the quadratic form $x^2 + 3y^2 + 3z^2 - 2yz$. 5

b) If $u = x^2 - 2y$, v = x + y + z, w = x – 2y + 3z, find $\frac{\partial(u, ¬, w)}{\partial(x, y, z)}$ at (1, 1, 1). Also find $\frac{\partial(x, y, z)}{\partial(u, ¬, w)}$ at (1, 1, 1). 5

17 a) Find the envelope of the family of straight lines $\frac{x}{a} + \frac{y}{b} = 1$ where a, b are parameters given by $ab = c^2$, c is a constant. 5

b) Using Green's theorem, evaluate $\oint_C (y - \sin x)\,dx + \cos x\,dy$ where C is the plane triangle enclosed by the lines y = 0, x = $\frac{®}{2}$ and y = $\frac{2}{®}$x. 5

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