OLD

Part–III 3-Tier

2017

MATHEMATICS

(Honours)

PAPER—VIII

(PRACTICAL)

Full Marks : 30

(PROBLEM – 24 + PNB & VIVA – 6)

TIME — 2 HOURS

Group—C

Answer *two* questions : 2×12

The questions must be allotted by Lottery.

Program must be written either in FORTRAN-*l*anguage or in C-*l*anguage.

Set—V

1. Write a program to evaluate $\int_{1.2}^{3} (x\log 2x + \sin 2x)dx$ by trapezoidal rule taking 140 subintervals.

2. The terms of the Fibonacci series is defined as

   F(0) = 1

   F(1) = 1

   F(n+2) = F(n) + F(n+1), n = 0– 1, 2, ...

   Write a program to find the first 50 Fibonacci numbers.

3. Write a program to find the L.C.M. between two integers. Demonstrate your program for the integers 12012 and 35544.

4. Write a program to find the value of y(0.2) from the differential equation

$\frac{dy}{dx} = x^2 + y$, x(0.1)=1 by second order Runge-Kutta methods.

5. Write a program to test the orthogonality of a matrix.

6. Write a program to find the length (i.e. the number of characters including blank spaces) of a string. Demonstrate your program for the string 'I am very strong in Computer Programming'.

7. Write a program to find a real root of the equation $x^5 - 3x^3 + 10x - 14 = 0$ using Newton-Raphson method, correct up to 5 decimal places.

8. Write a program to determine whether a matrix of order 5×5 is singular or not.

9. Write a program which will converts lowercase characters of a string to uppercase characters.

10. Write a program to compute the value of sine series up to 15 and 20 terms and compare the result when x = 0.75 (Write only one program)

11. Write a program to find the values of ${}^nC_r$ for given values of n and r. Demonstrate your program for n = 19, r = 9.

12. Write a program to evaluate $\int_0^1 (23x + e^{\cos x})\,dx$ by Simpson 1/3rd rule taking 500 subintervals.

13. Write a program to find a root of x = cos x by bisection method, correct up to 5 decimal places.

14. Write a program to find the value of y(0.1) from the differential equation

$\frac{dy}{dx} = x + y + 100$, x(0) = 1.2 by second order Runge-Kutta methods.

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