2019

B.Sc.

3rd Semester Examination

MATHEMATICS (Honours)

Paper - C7-P

[PRACTICAL]

Full Marks : 20 Time : 2 Hours

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

Group - A

*Answer any **one** question.*

*Each question carries **7 marks**. The question must be allotted by lottery.*

1. Write a program to compute $\int_0^{\pi/2} \sqrt{\cos\theta}\, d\theta$ by using Simpson's $1/6$ rule with six sub intervals.

[Turn Over]

2. Write a program to find the real root of $3x-\cos x-1=0$ by Newton-Raphson method. Correct to four significant figure.

3. Write a program to find the sum of the following series :

$1+\frac{1}{2}+\frac{1}{3}+\frac{1}{4}+...+\frac{1}{n}$, where $n = 29$.

4. Find a real root of the equation $xe^x=3$ using Regula-Falsi method, correct to four decimal plans.

5. Write a program to solve $y'=x+y$, $y(0)=1$ for $x = 1$ with step length $h = 0.2$.

6. Using Bisection method, find a real root of the equation $f(x)=3x-\sqrt{1+\sin x}=0$.

7. Evaluate $\int_0^1 e^{-x^2}dx$ using Trapezoidal Rule with 10 subintervals.

8. Fit a straight line to the following data

Years (x):	1961	1971	1981	1991	2001
Production : (in tons)	8	10	12	10	16

and find the expected production in 2006.

29. From the following data, estimate the number of persons having incomes between 2000 and 2500.

Income	*Below* 500	500 – 1000	1000 – 2000	2000 – 3000
No. of persons	6000	4250	3600	1500

using Newton's backward formula.

30. From the following table of half yearly premium for policies maturing at different ages, estimate the premium for policies maturing at age 46 using Newton's forward formula.

Age (x)	45	50	55	60	65
Premium (y)	114.84	96.16	83.32	74.48	68.48