CBNST- TMA-402

Subjective

Marks- 40

Time: 1 hour

Attempt all Questions

Q.1 Evaluate $\int_0^{\frac{\pi}{2}} \sqrt{\cos\theta}\, d\theta$ using Simpson's $\frac{1}{3}$ rul

by taking, 9 ordinates.

Q.2 Using Runge-Kutta method of fourth order, solv

$$\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$$ with $y(0) = 1$ at $x = 0.2, 0.4$

Q.3 fit a second degree Parabola $y = a + bx + cx^2$ in the following data $(x; y)$: $(-1, 2), (0, 0), (0, 1), (1, 2)$

Q.4 Suppose that $f(x) = \sin x$ to be approximated on $[0, 1]$ by an interpolating Polynomial on $n+1$ equally spaced points. What Step size h ensure that linear interpolation gives an absolute error of at most 10^{-6} $\forall$ $x \in [0, 1]$