

COMPUTATIONAL PHYSICS (PH 3304)
AUTUMN SEMESTER (2021-22)
DEPARTMENT OF PHYSICS
NATIONAL INSTITUTE OF TECHNOLOGY, JAMSHEDPUR

TUTORIAL-1

Q.1: Find a real root of $f(x) = x^3 + x^2 + x + 7 = 0$ correct to three decimal places using bisection method.

Q.2: Find a root lying between 0 and 0.5 of the equation $4e^{-x} \sin x - 1 = 0$ correct to three decimal places using bisection method.

Q.3: Use the method of iteration to find a positive root of the equation $xe^x = 1$, given that a root lies between 0 and 1.

Q.4: Use the iterative method to find a real root of the equation $\sin x = 10(x-1)$. Give your answer correct to three decimal places.

Q.5: Find a root of the equation $x \sin x + \cos x = 0$ using the Newton-Raphson method.

Q.6: Given the equation $4e^{-x} \sin x - 1 = 0$, find the root between 0 and 0.5 correct to three decimal places using Newton-Raphson method.

Q.7: Given that the equation $x^{2.2} = 69$ has a root between 5 and 8. Use regula-falsi method to determine it.

Q.8: The equation $2x = \log_{10} x + 7$ has a root between 3 and 4. Find this root, correct to three decimal places, by regula-falsi method.

Q.9: Find the real root of the equation $f(x) = x^3 - 5x + 1 = 0$ using secant method.

Q.10: Use the secant method to determine the root of the equation $\cos x - xe^x = 0$.
