

CITY COLLEGE

B.Sc General Tutorial Assessment - 2021

MTMG, Semester - VI

F.M = 15

Paper: DSE - B

Answer any 3 questions of the following:

3 x 5 = 15

(1) Prove that the series $\sum_{n=1}^{\infty} (-1)^n \cdot \frac{x^n}{n}$ converges uniformly but not absolutely on $[0, 1]$.

(2) Prove that $\{f_n(x)\} = \left\{ \frac{x}{nx+1} \right\}$ converges uniformly to 0 on $0 \leq x \leq 1$.

(3.) Show that $\mathcal{L}^{-1} \left(\frac{1}{p^2 - 6p + 10} \right) = e^{3t} \sin t$

and $\int_0^{\infty} \frac{e^{-3t} - e^{-6t}}{t} dt = \log 2$

(4.) Solve the boundary value Problem using Laplace method

$y'' + 2y' + y = 0$, given $y(0) = 0$ and $y(1) = 2$,
where $y'' = \frac{d^2 y}{dt^2}$ and $y' = \frac{dy}{dt}$

(5) Expand $f(x) = x$ in Fourier series on the interval $-\pi \leq x \leq \pi$.

N.B: Last date of Submission is 20/07/2021