BACHELOR OF TECHNOLOGY (CBCS) (2021-COURSE)
B. Tech. Sem - II CS&E-A&M : WINTER: 2025
SUBJECT: MATHEMATICS FOR COMPUTING-II

Day : Thursday
Date : 20/11/2025

W-23929-2025

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat and labelled diagrams **WHEREVER** necessary.
4) Assume suitable data, if necessary.

Q. 1 Find the Fourier series to represent $f(x) = \pi^2 - x^2 \ (-\pi \le x \le \pi)$. **(10)**

OR

Q. 1 Find the Fourier expansion for $f(x) = \sqrt{1 - \cos x} \quad (0 \le x \le 2\pi)$. **(10)**

Q. 2 Find the Fourier cosine transform of $f(x) = e^{-2x}$. **(10)**

OR

Q. 2 Find the Fourier sine transform of $f(x) = \dfrac{e^{-ax}}{x}$. **(10)**

Q. 3 Obtain the Laplace transform of $f(t) = t^2 \cos at$. **(10)**

OR

Q. 3 Find the inverse Laplace transform of $\dfrac{1}{(s+1)(s-7)}$. **(10)**

Q. 4 Evaluate $\iint \dfrac{1}{x^4 + y^2} dxdy$ over the region $y \ge x^2$, $x \ge 1$. **(10)**

OR

Q. 4 Solve $\int_0^1 \int_0^{\sqrt{1+x^2}} \dfrac{dxdy}{1 + x^2 + y^2}$ **(10)**

Q. 5 Find the directional derivative of $\phi = 4xz^3 - 3x^2y^2z$ at $(2, -1, 2)$ in the direction of $2\bar{i} - 3\bar{j} + 6\bar{k}$. **(10)**

OR

Q. 5 Evaluate $\nabla^2(r^2 \log r)$. **(10)**

Q. 6 Evaluate $\int_c \bar{F}.d\bar{r}$ for $\bar{F} = 3x^2\bar{i} + (2xz - y)\bar{j} + z\bar{k}$ along the straight line joining $(0, 0, 0)$ and $(2, 1, 3)$. **(10)**

OR

Q. 6 Verify Green's theorem for the field $\bar{F} = 2xy\bar{i} + y^2\bar{j}$ over the region R enclosed by $y^2 = x$ and $y = x$. **(10)**

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