BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-II Computer Science & Engineering : SUMMER : 2025
SUBJECT: ENGINEERING MATHEMATICS-II

Day : Thursday
Date : 22/05/2025

S-27693-2025

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) Assume suitable data **WHEREVER** necessary.

Q.1 Solve $\frac{dy}{dx}=\frac{y-x+1}{y+x-5}$. **(10)**

OR

Q.1 $(x^2+y^2+1)dx-2xydy=0.$ **(10)**

Q.2 Water at temperature 100^0c cools in first 10 minutes to 88^0c in a room at temperature 25^0c. Find the temperature of water in 20 minutes. **(10)**

OR

Q.2 A pipe 20 cm in diameter contains steam at 150^0c and is protected with a covering 5cm thick material for which k = 0.0025. If the temperature of the outer of the covering is 40^0c, find the temperature half-way through the covering under steady state conditions. **(10)**

Q.3 Obtain the Fourier series for $f(x)=x\sin x$ *in* $(-\pi,\pi)$. **(10)**

OR

Q.3 Find the Fourier series for $f(x)=x^3$ *in* $(-\pi,\pi)$. **(10)**

Q.4 If $U_n=\int_0^{\pi/4}\tan^n\theta d\theta$. Show that $n(U_{n+1}+U_{n-1})=1$. **(10)**

OR

Q.4 Evaluate $\int_0^1\frac{dx}{\sqrt{x\log\left(\frac{1}{x}\right)}}$. **(10)**

Q.5 Find the equation of sphere passing through (1,0,-1), (2,1,0), (1,1,-1) and (1,1,1). **(10)**

OR

Q.5 Find the equation of right circular cylinder of radius 2 and equation of axis is $\frac{x-1}{2}=\frac{y-2}{-3}=\frac{z-3}{6}$. **(10)**

Q.6 Evaluate $\iint_R\frac{xydxdy}{\sqrt{1-y^2}}$ over the positive quadrant of the circle $x^2+y^2=1$. **(10)**

OR

Q.6 Evaluate $\int_0^a\int_0^{a-\sqrt{a^2-y^2}}\frac{xy\log(x+a)}{(x-a)^2}dxdy$. **(10)**

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