B. Tech. – IIIrd sem

Semester Assignment-I (26/10/24)

Course :- Applied Mathematics-III

Section/Branch – _____ **Due Date of Submission: Unit I&II,**   **11/11/2024**

Note:
1) Attempt all questions.
2) Answer each question to the points and avoid unnecessary lengthy writing.
3) Write your answer in A4 size paper and mail scanned PDF to personal e-mail of your course teacher on or before due date of submission.

Q. No.	Question	CO	BL	PI
1	Solve: $\dfrac{\partial^2 z}{\partial x^2} - \dfrac{\partial^2 z}{\partial x\,\partial y} = \cos x \cos 2y$.	CO1	L3	1.1.1
2	Solve: $(mz - ny)p + (nx - lz)q = (ly - mx)$.	CO1	L3	1.1.1
3	(a) Solve $z = y^2 + 2f\left(\frac{1}{x} + \log y\right)$ (b) Solve $(D^2 + 3DD' + 2d'^2)z = 24xy$	CO1	L3	1.1.1
4	Solve $(z^2 - 2yz - y^2)p + (xy + zx)q = (xy - zx)$.	CO1	L3	1.1.1
5	Using method of separation of Variable solve $\dfrac{\partial u}{\partial x} = 4\dfrac{\partial u}{\partial y}$, Where $u(0,\ y) = 8e^{-3y}$	CO1	L3	1.1.1
6	Find the Fourier series of $f(x) = x^2,\ -\pi \le x \le \pi$. Hence show that $\sum \dfrac{1}{(2n-1)^2} = \dfrac{\pi^2}{8}$	CO2	L3	1.1.1
7	Find the Half-Range Sine series of $f(x) = \begin{cases} \frac{1}{4} - x, & \text{for } 0 < x < \frac{1}{2} \\ x - \frac{3}{4}, & \text{for } \frac{1}{2} < x < 1 \end{cases}$	CO2	L3	1.1.1

8	Show that for the range $-\pi < x < \pi$, $$\sin ax = \frac{2 \sin a\pi}{\pi}\left[\frac{\sin x}{1^2 - a^2} - \frac{2 \sin 2x}{2^2 - a^2} + \frac{3 \sin 3x}{3^2 - a^2} \dots\right]$$	CO2	L3	1.1.1
9	Obtained a half range cosine series for $f(x) = kx$ for $0 \leq x \leq \frac{1}{2}$, $f(x) = k(l-x)$ for $\frac{1}{2} \leq x \leq l$	CO2	L3	1.1.1
10	(1)Write the Dirichlet's condition. (2) The turning moment T is given for a series of values of the crank angle $\theta°$. Obtain the first four terms in a series of sines to represent T and calculate T for $\theta° = 75°$.	CO2	L3	1.1.1

$\theta°$	0	30	60	90	120	150	180
T	0	5224	8097	7850	5499	2626	0

CO – Course Outcomes, BL – Bloom's Taxonomy Levels

(L1-Remembering, L2- Understanding, L3-Applying,

L4- Analysis, L5- Evaluating, L6-Creating).

PI – Performance Indicator Code

(Please See: https://www.aicte-india.org/sites/default/files/ExaminationReforms.pdf)