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SEE MODEL PAPER-2

I/II Semester Examination
ENGINEERING MATHEMATICS

Duration: 3Hours

Max. Marks:100

- Note:** i) Answer any 5 questions from SECTION-A, each question carries 4 marks.
 ii) Answer any 10 questions from SECTION-B, each question carries 5 marks.
 iii) Answer any 5 questions from SECTION-C, each question carries 6 marks.
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SECTION -A

Sl no	QUESTIONS	Marks	CO-Course Outcome
1	If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix}$, then find $3A + B$.	4	1
2	If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$, find $A + A^T$.	4	1
3	If $\begin{vmatrix} 2 & 1 \\ 4 & x \end{vmatrix} = 0$, then find the value of 'x'.	4	1
4	Find the slope and x-intercept of the line $3x+4y+7=0$.	4	2
5	Find the slope of the straight line passing through the points (2, 3) and (4, 6).	4	2
6	Convert 150° into radian and $\frac{3\pi}{4}$ in to degree.	4	3
7	If $y = x + \sin x + e^x + 3$, then find $\frac{dy}{dx}$.	4	4
8	Find the slope of the tangent to the curve $y = \cos x$ at (0, 1).	4	4
9	Integrate $2x^2 + \frac{1}{x} + e^x + 2$ with respect to x.	4	5
10	Evaluate $\int_0^\pi e^x dx$.	4	5

SECTION -B

Sl no	QUESTIONS	Marks	Course Outcome
11	If $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ and $B = \begin{bmatrix} 3 & 2 \\ 1 & 4 \end{bmatrix}$, find AB matrix and also find $(AB)^T$ matrix.	5	1
12	Find the inverse of the matrix $A = \begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix}$.	5	1
13	Find the characteristic equation of the matrix $A = \begin{bmatrix} 3 & 2 \\ 4 & 5 \end{bmatrix}$.	5	1
14	Find equation of the straight line passing through the point (3,2) and having slope 5.	5	2
15	Find the equation of the straight line passing through the points (4,2) and (6,4).	5	2
16	Show that the two lines $2x + 3y + 1 = 0$ and $4x + 6y + 3 = 0$ are parallel.	5	2
17	Find equation of straight line whose x-intercept and y-intercepts are 5 and 6 respectively.	5	2
18	Find the x-intercept, y-intercept and the slope of the line $6x+5y+10=0$	5	2
19	Find the value of $\sin 150^\circ + \cos 120^\circ$.	5	3
20	Write the formula of $\sin(A + B)$ then find the value of $\sin 75^\circ$.	5	3
21	Prove that $\cos 2A = \cos^2 A - \sin^2 A$.	5	3
22	Simplify: $\cos\left(\frac{\pi}{2} - \theta\right) + \sin(\pi + \theta) + \tan(\pi + \theta) + \cot\left(\frac{3\pi}{2} + \theta\right)$	5	3
23	If $y = x^3 + x^2 + x + 9$, then find $\frac{d^2y}{dx^2}$ at $x = 0$.	5	4
24	If $y = xe^x$, then find $\frac{dy}{dx}$.	5	4
25	If $y = \frac{1+x^2}{1-x^2}$, then find $\frac{dy}{dx}$.	5	4
26	Evaluate $\int (x + 1)(x - 1)dx$.	5	5
27	Evaluate $\int_0^1 (3x^2 + 1)dx$.	5	5
28	Evaluate $\int (x \log x)dx$.	5	5

SECTION -C

Sl no	QUESTIONS	Marks	Course Outcome
29	Solve the system of linear equations $3x + y = 4$ & $x + 3y = 4$ by using Cramer's rule.	6	1
30	Show that $A^2 - 5A - 2I = 0$ for the matrix $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$.	6	1
31	Find equation of line passing through the point (3,2) and perpendicular to the line $3x + 4y + 7 = 0$.	6	2
32	Prove that $\cos 3A = 4 \cos^3 A - 3 \cos A$.	6	3
33	Find the value of $\tan(15^\circ)$ and $\tan(75^\circ)$.	6	3
34	Apply product rule to find the derivative of the function $y = e^x \log x \cos x$.	6	4
35	If y is the distance traversed in meters by a particle in time x sec is given by $y = 2x^3 - x^2 + 5x + 3$, then find the velocity and acceleration when $x=2$ sec.	6	4
36	Find equation of tangent to the curve $y = 2x^2$ at the point (1, 2).	6	4
37	Find the area under the curve $y = 2x + 1$ with x-axis and ordinates $x = 0$ & $x = 2$.	6	5
38	Find the volume of solid generated by revolving the curve $y^2 = 3x^2 + 1$ about the axis between $x = 0$ & $x = 2$.	6	5