M-301

Unit Test I

Subject name: **Engineering Mathematics-II**

Sub Code: **A/AA/C/EE/M/MET/MNG/TT-301**

Time: 90 minutes **Max. Marks: 40**

Part-A **16 Marks**

Instructions: (1) Answer **all** questions.

(2) First question carries **four** marks and the remaining questions carry **three** marks each.

1. Answer the following:

   a. $\int x^6 dx =$ _____. **(CO1)**

   b. $\int \frac{1}{16+x^2} dx =$ _____. **(CO1)**

   c. $\int e^x \left(f(x)+f'(x)\right)dx = e^x f(x)+c$: State TRUE/FALSE **(CO1)**

   d. $\int_0^1 x dx =$ _____. **(CO2)**

2. Evaluate $\int \left(\sec^2 x + 2e^x\right) dx.$ **(CO1)**

3. Evaluate $\int \frac{\sin(\log x)}{x} dx.$ **(CO1)**

4. Evaluate $\int_0^{\frac{\pi}{2}} \cos x \, dx$ **(CO2)**

5. Evaluate $\int_0^{1/2} \frac{1}{\sqrt{1-x^2}} dx$ **(CO2)**

Part-B **3×8=24 Marks**

Instructions: (1) Answer **all** questions.

(2) Each question carries **eight** marks

(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. A) Evaluate $\int \sin^4 x \cos x dx.$ **(OR)** **(CO1)**

   B) Evaluate $\int \frac{1}{(x+1)(x+2)} dx.$ **(CO1)**

7. A) Evaluate $\int \sqrt{1-\sin 2x}dx.$ **(OR)** **(CO1)**

   B) Evaluate $\int x^2 e^{3x}dx.$ **(CO1)**

8. A) Evaluate $\int_0^1 \frac{tan^{-1}x}{1+x^2}dx$ **(OR)** **(CO2)**

   B) $\int_0^{\frac{\pi}{2}} \frac{\sin x}{\sin x+\cos x}dx$ **(CO2)**

Unit Test II

Subject name: **Engineering Mathematics-II**

Sub Code: **A/AA/C/EE/M/MET/MNG/TT-301**

Time : 90 minutes Max. Marks: 40

Part-A **16 Marks**

Instructions: (1) Answer **all** questions.
(2) First question carries **four** marks and the remaining questions carry **three** marks each

1. Answer the following:
   a. Formula to find area bounded by $y = f(x)$ and X-axis from x=a to x=b is____ (**CO3**)
   b. Integrating factor of $\frac{dy}{dx} + P(x)y = Q(x)$ is $e^{\int Pdx}$: State TRUE/FALSE **(CO4)**
   c. The order of the differential equation $\frac{d^3y}{dx^3} + \frac{d^2y}{dx^2} + y = 0$ is _____. **(CO4)**
   d. The auxiliary equation of the differential equation $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + y = 0$ is ____**(CO4)**
2. Find the area bounded by the curve $y = 2x + 3,\ x-$ axis, between the lines $x = 1, x = 2.$ **(CO3)**
3. Find the mean value of $f(x) = 2x$ in the interval $[2,6].$ **(CO3)**
4. Form the differential equation by eliminating the arbitrary constant m from $y = mx + 1.$ **(CO4)**
5. Solve the differential equation $(D^2 - 9)y = 0.$ **(CO4)**

Part-B **3×8=24 Marks**

Instructions: (1) Answer **all** questions.
(2) Each question carries **eight** marks
(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

6. A) Find the R.M.S value of $\sqrt{x}$ over the range $x = 1$ and $x = 3.$ **(OR)** **(CO3)**

   B) Calculate the approximate value of $\int_1^6 x^2 dx$ by using Trapezoidal rule by dividing the range into 5 equal intervals. **(CO3)**

7. A) Solve $\frac{dy}{dx} = e^{2x+y}$ **(OR)** **(CO4)**

   B) Solve $\frac{dy}{dx} + \frac{y}{x} = x^2.$ **(CO4)**

8. A) Solve $(D^2 - 2D + 1)y = e^{-x}$ **(OR)** **(CO4)**
   B) Solve $(D^2 + 6D + 9)y = sin3x$ **(CO4)**

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END EXAM MODEL PAPERS
ENGINEERING MATHEMATICS – II
A/AA/C/EE/M/MET/MNG/TT-301
MODEL PAPER-I

TIME : 3 HOURS **MAX.MARKS : 80M**

PART-A

Answer All questions. Each question carries THREE marks. **10x3=30M**

11. Evaluate $\int (5^x + 5x)dx.$ **(CO 1)**
12. Evaluate $\int (\sin 3x + \cos 2x)dx.$ **(CO 1)**
13. Evaluate $\int \frac{\sin^{-1} x}{\sqrt{1-x^2}}\, dx$ **(CO 1)**
14. Evaluate $\int_0^1 (x^3 + 1)dx$ **(CO 2)**
15. Evaluate $\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} \sin x\, dx$ **(CO 2)**
16. Find the area bounded by the curve $y = x^2$, the X-axis between the lines $x = 1$ and $x = 2.$ **(CO3)**
17. Find the mean value of the function $f(x) = \frac{1}{1+x^2}$ in the interval $[0,1]$. **(CO 3)**
18. Find the order and degree of the differential equation $\frac{d^3y}{dx^3} + 3\frac{d^2y}{dx^2} + 5y = 0$. **(CO 4)**
19. Form the differential equation for the family of curves $y = mx$ by eliminating the arbitrary constant m. **(CO 4)**
20. Solve $x\,dy = y\,dx$ **(CO 4)**

PART-B

Answer any five questions. Each question carries TEN marks. **5x10=50M**

11. (a) Evaluate $\int \left(\cos 5x + 4\sec^2 x + 8e^{4x} + \frac{2}{x} \right) dx.$ **(CO 1)**

    (b) Evaluate $\int \sqrt{1 + \sin 2\theta}\, d\theta$ **(CO 1)**

12. (a) Evaluate $\int \frac{1}{\sqrt{25x^2+9}}\, dx$ **(CO 1)**

(b) Evaluate $\int \frac{3x+1}{(x-1)(x+3)}dx.$ **(CO 1)**

13. (a) Evaluate $\int x^3 e^{2x} dx.$ **(CO 1)**

(b) Evaluate $\int_0^{\pi/2} x\cos x\, dx$ **(CO 2)**

14. (a) Evaluate $\int_0^{\frac{\pi}{2}} \frac{\cos x}{\sin x+\cos x}dx$ **(CO 2)**

(b) Find the RMS value of $\sqrt{x}$ over the range x=1 and x=2. **(CO 3)**

15. Calculate the approximate value of $\int_2^{10} \frac{1}{1+x}dx$ by using Simpson's 1/3rd rule by dividing the range into 8 equal parts. **(CO 3)**

16. Solve $\frac{dy}{dx}+\frac{y}{x}=\frac{1}{x^2}$ **(CO 4)**

17. (a) Solve $(D^2+4D+4)y=0$ **(CO 4)**

(b) Solve $\left(D^2+3D+2\right)y=0.$ **(CO 4)**

18. Solve $(D^2+5D+6)y=e^{3x}+sin2x$ **(CO 4)**

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END EXAM MODEL PAPERS
ENGINEERING MATHEMATICS – II
A/AA/C/EE/M/MET/MNG/TT-301
MODEL PAPER- 2

TIME : 3 HOURS **MAX.MARKS : 80M**

PART-A

Answer All questions. Each question carries THREE marks. **10x3=30M**

1. Evaluate $\int (3^x+3x)dx.$ **(CO 1)**
2. Evaluate $\int (\sin 2x+\cos 3x)dx.$ **(CO 1)**
3. Evaluate $\int \frac{logx}{x}dx$ **(CO 1)**
4. Evaluate $\int_0^{\frac{\pi}{4}} \sec^2 x\, dx$ **(CO 2)**
5. Evaluate $\int_{-1}^{1} x^3\, dx$ **(CO 2)**
6. Find the area bounded by $f(x)=2x+3$, X-axis and the lines x=0, x=1. **(CO 3)**
7. Find the mean value of the function $f(x)=x^2$ in the interval [1,2] **(CO 3)**
8. Find the order and degree of the differential equation $\frac{d^3y}{dx^3}+3\frac{d^2y}{dx^2}+3\frac{dy}{dx}+y=0$

(CO 4)

9. Form the differential equation for the family of curves $y = ae^x + be^x$ by eliminating the arbitrary constants *a* and *b*. **(CO4)**
10. Solve $(1+x)\,dy = (1+y)\,dx$ **(CO 4)**

PART-B

Answer All questions. Each question carries TEN marks. 5x 10=50M

11. (a) Evaluate $\int\left(1-2x+\sec x\tan x+\frac{3}{x}\right)dx.$ **(CO 1)**

    (b) Evaluate $\int\sqrt{1-\cos 2x}\,dx$ **(CO 1)**

12. (a) Evaluate $\int\frac{9}{\sqrt{25-x^2}}\,dx$ **(CO 1)**

    (b) Evaluate $\int\frac{1}{(x-1)(x+2)}\,dx.$ **(CO 1)**

13. (a) Evaluate $\int x^2e^{3x}dx.$ (CO 1)

    (b) Evaluate $\int_0^1(x+2)(2x-1)dx$ (CO 2)

14. (a) Evaluate $\int_0^{\frac{\pi}{2}}\frac{\sin^3 x}{\sin^3 x+\cos^3 x}\,dx$ (CO 2)

    (b) Find the R.M.S. value of the function $f(x) = \sqrt{sinx}$ over the range $x = 0$ and $x = \pi$ (CO3)

15. Find the approximate value of $\int_1^{11}(x+1)dx$ using Trapezoidal rule by dividing the interval into 10 equal parts. (CO 3)
16. Solve $\frac{dy}{dx} + y\,cotx = cosecx$ (CO 4)
17. (a) Solve $(D^2+4)y = 0$ (CO 4)

    (b) Solve $\left(D^2+4D+3\right)y=0.$ (CO 4)

18. Solve $(D^2 - 5D + 4)y = x + sin2x$ (CO 4)

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