

Unit Test I

State Board of Technical Education and Training, A. P

III SEM

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. $\int x^6 dx = \underline{\hspace{2cm}}.$

(CO1)

b. $\int \frac{1}{16+x^2} dx = \underline{\hspace{2cm}}.$

(CO1)

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

(CO1)

d. $\int_0^1 x dx = \underline{\hspace{2cm}}.$

(CO2)

2. Evaluate $\int (\sec^2 x + 2e^x) dx.$

(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)

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Unit Test II

C –23, XX -301

State Board of Technical Education and Training, A. P

III Sem

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 $e^{\int P dx}$: State TRUE/FALSE (CO4)
 - c. The order of the differential equation $\frac{d^3 y}{d x^3} + \frac{d^2 y}{d x^2} + y = 0$ is _____. (CO4)
 - d. The auxiliary equation of the differential equation $\frac{d^2 y}{d x^2} + 2 \frac{dy}{dx} + y = 0$ 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 $(D^2 + 6D + 9)y = \sin 3x$ (CO4)

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END EXAM MODEL PAPERS
STATE BOARD OF TECHNICAL EDUCATION, A.P
ENGINEERING MATHEMATICS – II
A/AA/C/EE/M/MET/MNG/TT-301
MODEL PAPER-1

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 $\frac{d^3 y}{dx^3} + 3 \frac{d^2 y}{dx^2} + 5y = 0$.

(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 $(D^2 + 3D + 2)y = 0$. (CO 4)
18. Solve $(D^2 + 5D + 6)y = e^{3x} + \sin 2x$ (CO 4)

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END EXAM MODEL PAPERS
STATE BOARD OF TECHNICAL EDUCATION, A.P
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 $\int \frac{\log x}{x} dx$ (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 $\frac{d^3 y}{dx^3} + 3 \frac{d^2 y}{dx^2} + 3 \frac{dy}{dx} + y = 0$ (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 $\int x^2 e^{3x} \, dx$. (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 $f(x) = \sqrt{\sin x}$ 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 $\frac{dy}{dx} + y \cot x = \operatorname{cosec} x$ (CO 4)
17. (a) Solve $(D^2 + 4)y = 0$ (CO 4)
- (b) Solve $(D^2 + 4D + 3)y = 0$. (CO 4)
18. Solve $(D^2 - 5D + 4)y = x + \sin 2x$ (CO 4)