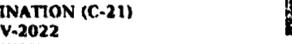
STATE BOARD OF TECHNICAL EDUCATION AND TRAINING TELANGANA

DIPLOMA EXAMINATION (C-21) C21-NOV-2022





AA/AL/AU/BM/CCB/CE/CH/CPS/CS/EC/EE/EI/ES/EV/LF/LG/ME/MN/MT/PK/PT/TT PCODE SC-301

13001

Applied Engineering Mathematics(Open Book System)

Exam Date: 25-11-2022

Session: FN

Duration: 2 Hours 110:00 AM To 12:00

[Total Marks: 40]

NOON

PART-A

Instructions:

1. Answer the following questions.

 $8 = 1 \times 8$

2. Each question carries ONE mark.

Evaluate $\int (x^3 + 4x^2) dx$ ١.

Find the value of the integral $\int_0^1 e^{-x} dx$ 2.

Find the order and degree of $y^l + y = e^x$ 3.

Write the successive derivatives of 'u' while applying Bernoulli's rule to 4. evaluate ∫x² ex dx

Find the mean square value $f(x) = \sqrt{x+1}$ in [0,3] 5.

6. Find the mean value of 3e' over [-1,1]

Check the differential equation (2ax + by + g)dx + (2cy + bx + e)dy = 0 is an 7. exact or not?

Find the order and degree of $\left(\frac{dv}{dx}\right)^4 + 2v\frac{d^2v}{dx^2} = 0$ 8.

PART-B

Instructions:

1. Answer the following questions.

4 X 3 = 12

2. Each question carries THREE marks.

Evaluate $\int \sqrt{1 + \cos x} \, dx$ 9(a).

---- OR ----

9(b). x000.250.50.751.0

V10.250.80.640.50

then find the value of $\int_0^1 v \, dx$ using trapezoidal rule.

10(a).
$$\int_{0}^{4} x \sqrt{x^{2} + 1} dx$$
Evaluate

- 10(b). Find the differential equations of the family of curves $V = Ae^{2x} + Be^{-2x}$ by eleminating the arbitrary constants A and B.
- 11(a). Find the Mean value of $y=x^2-3$ from x=2 to x=3——OR ——

then find the value of $\int_0^{0.4} y \, dx$ using Simpson's rule

12(a). Solve
$$\frac{dy}{dx} = e^{x-2y}$$

12(b). Solve
$$(x+y-2) dx + (x-y+4) dy=0$$

PART-C

Instructions:

- 1. Answer the following questions.
- $4 \times 5 = 20$
- 2. Each question carries FIVE marks.

13(a). Evaluate
$$\int \frac{1}{(x^2 + a^2)(x^2 + b^2)} dx$$
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Find the R.M.S value of the current I=s Sax, over a half wave

13(b). Find the R.M.S value of 14(a).
$$\int_{0}^{\infty} |S = x| dx$$
Evaluate

14(b). Solve
$$(x^2 + y^2) \frac{dy}{dx} = xy$$

15(a).
$$\int_{-3}^{3} x^{4} dx$$
 using trapezoidal rule by taking n=6

15(b). Find the RMS Value of xe' in the range between x = 0 and x = 1

16(a). Solve
$$\frac{dy}{dx} + xy = xy^3$$

16(b). Solve
$$(1+x^2)\frac{dy}{dx} + y = e^{\tan^{-1}(x)}$$

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