

6237

BOARD DIPLOMA EXAMINATION, (C-16)
 MARCH /APRIL-2019
 THIRD SEMESTER(COMMON) EXAMINATION
 ENGINEERING MATHEMATICS-II

Time: 3 Hours

Max.Marks:80

PART-A

10x3=30M

- Instructions:** 1) Answer all questions.
 2) Each question carries three marks.
 3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1) Evaluate $\int (e^x - 2\sin x + \frac{6}{\sqrt{1-x^2}}) dx$

2) Evaluate $\int \frac{\sin(\log x)}{x} dx$

3) Evaluate $\int_{-1}^1 (x^2 - 3x + 2) dx$

- 4) Find the area bounded by the parabola $y=x^2$, x-axis between the lines $x=1$ and $x=2$.

5) Find $L\{e^{2t} - 4t^3 + 2\sin 3t\}$

6) Find $L^{-1}\left\{\frac{2}{s-4} + \frac{3}{s^2-9}\right\}$

- *7) Write the fourier series for the function $f(x)$ defined in the interval $(c, c+2\pi)$

* 8) Find the differential equation of family of curves $y=Ae^x+Be^{-x}$ where A,B are arbitrary constants.

9) Solve $\frac{dy}{dx} + \sqrt{\frac{1-y^2}{1-x^2}} = 0$.

10) Solve $\frac{d^2y}{dx^2} + 5\frac{dy}{dx} - 12y = 0$

PART-B

10x5=50M

Instructions : 1) Answer any **five** questions
2) Each question carries **ten** marks
3) Answer should be comprehensive and the criteria for valuation is the content but not the length of the answer.

11) a) Evaluate $\int \sin^3 x \cos^6 x dx$

b) Evaluate $\int \frac{x}{(x+1)(x+2)} dx$

12) a) Evaluate $\int \tan^{-1} x dx$

b) Evaluate $\int_0^{\pi/2} \log \tan x dx$

13) a) Find the R.M.S value of $\sqrt{8-4x^2}$ between $x=0$ and $x=2$

b) Find the volume of the solid of revolution the area between the curve $y=x^2-4$ and x-axis about x-axis.

* 14) a) Obtain the value of $\int_0^1 \frac{1}{1+x^2} dx$ using Simpson's rule by dividing the interval $[0,1]$ into four equal parts.

b) Find $L\left\{\frac{1-\cos t}{t}\right\}$

* 15) a) Find $L^{-1} \left\{ \frac{s^2}{(s-2)^3} \right\}$

b) Using convolution theorem, find $L^{-1} \left(\frac{s}{(s^2+1)(s^2+2)} \right)$

16) Find the Fourier Series for $f(x) = x-x^2$ in the interval $(-\pi, \pi)$. Hence show

that $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - \frac{1}{4^2} + \dots = \frac{\pi^2}{12}$

17) a) Solve $\frac{dy}{dx} + y = e^{-3x}$

b) Solve $(x^{12} + y)dx + (y^8 + x)dy = 0$

18) a) Solve $(D^2 + 4)y = \sin 2x$

b) Solve $(D^2 + 3D + 2)y = x^2$

* * *

A.A.N.M & V.V.R.S.R POLYTECHNIC, GUDLAVALLERU, KRISHNA...AP