

## 6201

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** the questions. Each question carries **three** marks.  
2) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1) Evaluate  $\int (2e^x + \sec^2 x + 5) dx$

2) Evaluate  $\int \frac{x^3}{\sqrt{1-x^8}} dx$

3) Evaluate  $\int_0^1 (2x+3)^2 dx$

4) Find the area of the region bounded by the curve  $2y=x^2$ , the X-axis and the ordinates at  $x=1$  and  $X=3$ .

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

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

7) Write the Euler's formulae for Fourier series of a functions  $f(x)$  in the interval  $(c, c+2\pi)$ .

8) Form the differential equation by eliminating the arbitrary constants A and B from the equation  $y=Ae^x + Be^{-x}$ .

- \* 9) Solve  $\frac{dy}{dx} = \frac{y}{x}$
- 10) Solve  $(D^2-16)y=0$

### PART-B

5X10=50M

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

11) (a) Evaluate  $\int \frac{1}{\sqrt{x^2+2x+3}} dx$ .

(b) Evaluate  $\int \frac{3x+1}{(x-1)(x-2)} dx$ .

12) (a) Evaluate  $\int x^4 e^{2x} dx$

(b) Evaluate  $\int_0^{n/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx$

- 13) (a) Find the volume generated by revolving about X-axis the part of the circle  $x^2+y^2=25$  from  $x=2$  to  $x=3$ .

(b) Find the RMS value of  $\sqrt{\log x}$  over the range  $x=1$  to  $x=e$ .

14) (a) Evaluate  $\int_1^5 \frac{dx}{1+x}$  using Trapezoidal rule by taking  $n=4$ .

(b) Find  $L(e^{2t}(\cos 4t + 3\sin 4t))$ .

15) (a) Find  $L^{-1}\left(\frac{3s-2}{s^2-2s+5}\right)$

(b) Find  $L^{-1}\left(\frac{1}{(s^2+4)(s^2+9)}\right)$  using convolution theorem.

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16) Obtain a Fourier series to represent  $f(x) = x^2$  in the interval  $(-1,1)$ .

17) (a) Solve  $(x^3+y) dx + (y^4+x)dy=0$

(b) Solve  $\frac{dy}{dx} + y \tan x = \sec x$

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

(b) Solve  $(D^2 + 1)y = x^2 + 3x$

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