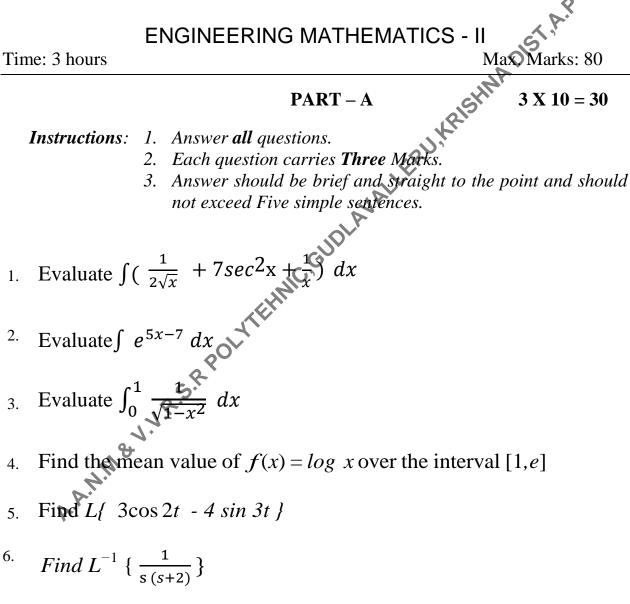
## 6222

## **BOARD DIPLOMA EXAMINATIONS**

## **COMMON-THIRD SEMISTER**

## **OCT/NOV-2019**



[Cont..,

- <sup>7.</sup> Find the value of  $a_0$  in the Fourier series expansion of the function  $f(x) = e^{-x}$  in the interval  $[0, 2\pi]$
- <sup>8.</sup> Find the order and degree of the Differential Equation

$$\frac{d^{3}y}{dx^{3}} = \log_{e} \left( x \frac{d^{2}y}{dx^{2}} + y \right)$$
9. Solve  $\frac{dy}{dx} = \sqrt{\frac{1-y^{2}}{1-x^{2}}}$ 
10. Solve  $\frac{d^{2}y}{dx^{2}} - 2 \frac{dy}{dx} + 5y = 0$ 
11. Solve  $\frac{d^{2}y}{dx^{2}} - 2 \frac{dy}{dx} + 5y = 0$ 
12. Instructions: 1. Answer any Five questions
2. Each difference questions
2. Each difference and a criterion for valuation is the content but not the length of the answer.
3. Answer should be comprehensive and a criterion for valuation is the content but not the length of the answer.
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3. Answer  $\int (\frac{1}{3+4\cos x}) dx$ 
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4. Content for the content but not the length of the answer.
3. Answer  $\int \frac{1}{3+4\cos x} dx$ 
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[Cont..,

(a)Find the area bounded by the curve  $y^2 = 16x$ , y-axis and the line 13. y = 2 and y = 6

(b)Using the method of integration find the volume of Cylinder with radius r units and height h units.

- a) Calculate the approximate value of  $\int_{-3}^{3} x^4 dx$  using Simpson's rule 14. by dividing [-3,3] into 6 equal parts. Verify the result with its exact value by integration techniques. b) Find L{t<sup>2</sup> cos t} 15. a) Find L<sup>-1</sup> {  $\frac{s}{(s+2)^2+4}$ } b) using Convolution theorem Find L<sup>-1</sup>{ $\frac{1}{s(s^2+25)}$ } 16. Expand  $f(x) = e^{\frac{1}{x}x}$ ,  $-\pi < x < \pi$  in Fourier Series.

17. (a)Solve 
$$\frac{dy}{dx} = \sin(x + y) + \cos(x + y)$$
  
(b) solve  $\frac{d}{dx} + \frac{y}{1 + x^2} = \frac{e^{\tan^{-1}x}}{1 + x^2}$ 

\*

a) Solve  $(D^2 + D - 6)y = e^{3x}$ , where  $D = \frac{dy}{dx}$ 18. b) Solve  $(D^3 + D)y = sin 2x$