



C14-A-401/C14-AA-401/C14-AEI-401/C14-  
CH-401/C14-CHST-401/C14-  
MET-401/C14-MNG-401/  
C14-TT-401/C14-BM-401

**4401**

**BOARD DIPLOMA EXAMINATION, (C-14)  
OCT / NOV-2017  
FOURTH SEMESTER (COMMON) EXAMINATION  
ENGINEERING MATHEMATICS - III**

Time : 3 Hours ]

[ Total Marks : 80

**PART - A**

3 × 10 = 30

- 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. Solve  $(D^2 + D + 4)y = 0$
2. Solve  $(D^3 - 3D^2 + 3D - 1)y = 0$
3. Find the particular integral of  $(D^2 + 1)y = \text{Cos}2x$
4. Find  $L\{e^{-t} + 1 + 2\text{Sinh}3t\}$
5. Find  $L(t^3e^{3t})$
6. If  $L\{f(t)\} = \frac{1}{s}e^{-\frac{1}{s}}$ , find  $L\{f(3t)\}$ .
7. Find  $L^{-1}\left\{\frac{s}{(s-3)^2}\right\}$
8. Find the Fourier coefficient  $\alpha_0$  for the function  $f(x) = x\text{Sin}x$  in the interval  $(-\pi, \pi)$ .
9. Find the half range Fourier Sine series of unity in the interval  $(0, \pi)$ .

10. What is the probability that a non leap year has 53 Mondays?

**PART - B**

$10 \times 5 = 50$

**Instructions :** (1) Answer any **five** questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and the criteria for valuation is the content but not the length of the answer.

11. a) Solve  $\frac{d^2y}{dx^2} - 3\frac{dy}{dx} + 2y = e^{2x} + \sin 2x$

b) Solve  $(D^3 + 9D)y = \cos 3x + 3$

12. Solve  $(D^3 - D^2 - 6D)y = x^2 + 3x + 1$

13. a) Find  $L(t^2 \cos 4t)$

b) Find  $L\left(\frac{\sin 2t}{t}\right)$

14. Using Laplace transform method, solve  $\frac{d^2y}{dt^2} + 2\frac{dy}{dt} + 5y = e^t \cos t$  with conditions  $y(0) = 0, y'(0) = 1$

15. Obtain the Fourier series of  $f(x) = e^{2x}$  in  $0 < x < 2\pi$

16. Find the Fourier series to represent  $f(x) = 2x + x^2$  in the interval  $(-\pi, \pi)$

17. a) A committee of two persons is selected from 2 men and 3 women. Find the chance that the committee will have (i) one man (ii) no men.

b) Evaluate  $P(A \cup B)$ , if  $2P(A) = P(B) = 5/11$  and  $P(A/B) = 2/5$ .

18. There are two identical boxes containing respectively 2 blue balls, 3 red balls; and 5 blue ball, 3 red balls. A ball is drawn at random from one of the boxes turns out to be red. What is the probability that it came from the second box?

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