



C14-A-401/C14-AA-401/C14-AEI-401/C14-CH-401/
C14-CHST-401/C14-IT-401/C14-MET-401/C14-MNG-401/
C14-PKG-401/C14-TT-401/C14-C-401/C14-CM-401/
C14-EC-401/C14-EE-401/C14-M-401

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BOARD DIPLOMA EXAMINATION, (C-14)

MARCH / APRIL - 2019

COMMON - IV SEMESTER 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) Answer should be brief and straight to the point and shall not exceed five simple sentences.

1 Solve $(D^2 + 2D - 3)y = 0$

2 Solve $(D^2 + 4D + 4)y = 0$

3 Find the PI of $(D^2 - 25)y = \sin 5x$

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

5 Find $L(t^3 e^{2t})$

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

4401]

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[Contd...

- 7 Find $L^{-1}\left(\frac{3s+7}{s^2-9}\right)$
- 8 Write the Fourier series for the function $f(x)$ in the interval $(C, C+2\pi)$.
- 9 Calculate the coefficient a_0 in Fourier series of expansion of x in $(0, 2)$.
- 10 If A, B are two disjoint events in a sample space S , $P(A) = \frac{3}{5}$, $P(B) = \frac{3}{4}$, then find $P(A \cup B)$.

PART - B

10×5=50

Instructions :

- (1) Answer any **FIVE** questions.
- (2) Each question carries **TEN** marks.
- (3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 11 (a) Solve $(D^2 - 6D + 9)y = e^{3x} + \cos 2x$
- (b) Solve $(D^2 - 4D + 3)y = \sin 3x$
- 12 (a) Solve $(D^2 + 1)y = x^2 + 7x + 9$
- (b) Solve $(D^2 + D - 6)y = e^{-2x} + 5$
- 13 (a) Find $L(e^{3t} \sin 3t \cos t)$
- (b) Find $L^{-1}\left(\frac{1}{s^2 - 3s}\right)$

- 14 Using convolution theorem find $L^{-1}\left(\frac{1}{s(s^2+4)}\right)$
- 15 Develop $f(x)=x^2$ in a Fourier series in the interval $(-\pi, \pi)$ and deduce that $\frac{1}{1^2}-\frac{1}{2^2}+\frac{1}{3^2}-\frac{1}{4^2}+\dots\infty=\frac{\pi^2}{12}$
- 16 Obtain the Fourier series for $f(x)=x^2-2$ in the interval $(-2, 2)$.
- 17 (a) If two cards are drawn at random from a pack of 52 cards, then find the probability for the cards to be one spade and one heart.
- (b) If A and B are two independent events with $P(A)=\frac{1}{3}$, $P(B)=\frac{1}{2}$, then find $P(A\cup B)$ and $P(A\cap B)$.
- 18 Three urns have the following composition of balls
Urn I : 1 white, 2 black,
Urn II : 2 white, 1 black,
Urn III : 2 white, 2 black
One of the urns is selected at random and a ball is drawn. It turns out to be white find the probability that it come from urn III.