



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**

4401

BOARD DIPLOMA EXAMINATION, (C-14)

MARCH/APRIL—2018

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.

1. Solve $(D^2 - 5D - 6)y = 0$.

2. Solve $(D^2 - 6D - 9)y = 0$.

3. Find the particular integral of $(D^2 - 5D - 6)y = 3e^{5x}$.

4. Find $L\{9e^{-2t} - 5\cos 2t - 5\sin 3t\}$.

5. Find $L\{(t - 2)^2 e^t\}$.

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[Contd...

6. Evaluate*

$$L\left\{\int_0^t \sin 2t dt\right\}$$

7. Evaluate

$$L^{-1} \frac{s}{(s-2)^2}$$

8. Write down the Fourier series expansion of a function $f(x)$ in the interval $(c, c+2\pi)$ and give the formula for finding the Fourier coefficient.

9. Find a_0 , if $f(x) = e^x$ in the interval $(-\pi, \pi)$.

10. If A and B are independent events with $p(A) = 0.2$, $p(B) = x$ and $p(A \cap B) = 0.08$, then find x .

PART—B

10×5=50

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

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

* 11. (a) Solve $(D^2 - D - 6)y = e^{3x}$.

(b) Solve $(D^2 - 16)y = 8 \cos 4x$.

12. (a) Solve $(D^2 - 9)y = \sin 3x$.

(b) Solve $(D^2 - 1)y = x$.

13. (a) Find

$$L\left\{\int_0^t te^{-t} \sin 4t dt\right\}$$

(b) Evaluate

$$L^{-1} \frac{1}{s(s^2 - 9)}$$

- 14.** Using Laplace transform method, solve $Y'' + 2Y' + 8Y = 0$ with respect to $Y(0) = 3$ $Y'(0) = 6$.
- 15.** Obtain the Fourier series for the function $f(x) = x - x^2$ for the interval $(-\pi, \pi)$.
- 16.** Obtain the Fourier cosine series for $f(x) = x \sin x$ for the interval $(0, \pi)$.
- 17.** (a) A bag contains 4 red, 5 black and 6 blue balls. What is the probability that two balls drawn simultaneously are one red and one black?
- (b) If three cards are drawn at a random from a pack of 52 cards, then find the probability for the cards to be a King, a Queen and a Jack.
- 18.** (a) Let A and B be two events with
- $$p(A) = \frac{3}{8}, p(B) = \frac{5}{8} \text{ and } p(A \cap B) = \frac{3}{4}.$$
- Find $p(A \cup B)$ and $p(B \setminus A)$.
- (b) If A and B be two events with $p(A) = \frac{1}{6}$, $p(B) = \frac{5}{8}$ and $p(A \cap B) = \frac{4}{15}$, then find the value of $p(A \cup B)$.
