



C16-A/CH/EI/MET/MNG/IT/TT/PKG/401

5601

BOARD DIPLOMA EXAMINATION, (C-16)

MARCH/APRIL—2018

FOURTH SEMESTER (COMMON) EXAMINATION

ENGINEERING MATHEMATICS—IV

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

Instructions : (1) Answer **all** questions.

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

* 1. Solve :

$$(D^2 - 4D - 3)y = 0$$

2. Solve :

$$(D^2 - 9)y = 0$$

3. Solve :

$$(D^3 - 5D^2 - 8D - 4)y = 0$$

4. Find the particular integral of

$$(D^2 - 3D - 2)y = 4e^{4x}$$

/5601

*

1

[Contd...

5. Find the particular integral of
 $(D^2 - 16)y = \sin 3x$
6. Find the Laplace transform of
 $\{4t^3 - 2\sin 3t + 3\cos 3t\}$
7. Find the Laplace transform of $e^{2t} \cos 4t$.
8. Find the inverse Laplace transform of
 $\frac{6}{s^2 - 4} - \frac{1}{s - 6} + \frac{1}{s^2}$
9. Define Fourier series of the function $f(x)$ in the interval $(c, c + 2\pi)$.
10. Find the value of a_0 in $f(x) = x - x^2$ in $(-\pi, \pi)$ by Fourier series.

PART—B

10×5=50

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

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

11. (a) Solve :

$$(D^2 - 2D - 8)y = e^{3x} - e^{4x}$$

(b) Solve :

$$(D^2 - D - 9)y = \sin 3x + 25$$

12. (a) Solve :

$$(D^2 - 16)y = x^3$$

(b) Solve :

$$(D^2 - 5D - 6)y = \cos 4x$$

13. (a) Find the Laplace transform of $e^{2t} (\cos 4t - 3 \sin 4t)$.

(b) Find the Laplace transform of $\{te^{-3t} \cos 5t\}$.

14. (a) Solve :

*

$$L^{-1} \frac{3S + 14}{S^2 + 4S + 8}$$

(b) Solve :

$$L^{-1} \frac{1}{(S + 1)(S + 3)}$$

15. (a) Using convolution theorem, find

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

(b) Find

$$L^{-1} \frac{e^{-3s}}{S^3}$$

16. Solve :

$$y'' + 2y' + 8y = 0 \text{ if } y(0) = 3, y'(0) = 6$$

17. Obtain the Fourier series of $f(x) = x^2$ in the interval $(0, 2\pi)$.

18. Expand the function $f(x) = (\cos x)(|\cos x|)$ as a Fourier series in the interval $(-\pi, \pi)$.

*