C16–EE–**401**

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BOARD DIPLOMA EXAMINATION, (C–16)
MARCH/APRIL—2018
DEEE—FOURTH SEMESTER 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 $(D^2 \ 5D \ 6)y \ 0$.

2. Solve $(D^2 \ 4D \ 4)y \ 0$.

3. Solve $(D^3 \ D^2 \ D \ 1)y \ 0$.

4. Find the particular integral of $(D^2 \ 2D \ 1)y \ 4e^{3x}$.

5. Find the particular integral of $(D^2 \ 4)y \ \cos 2x$.

6. Find Laplace transform of $e^{\ 2t} \sin 4t$.

7. Find Laplace transform of $3\sin 4t \ 4\cos 3t$.

8. Find $L^{\ 1} \ \dfrac{2s \ 3}{s^2 \ 16}$.

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9. Define Fourier series of the function $f(x)$ in the interval $(c, c+2\pi)$.

10. Find the value of a_0 for $f(x)=e^{ax}$ in $(0, 2\pi)$ by Fourier series.

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PART—B $\qquad$ 10×5=50

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

$\qquad\qquad\qquad$ (2) Each question carries **ten** marks.

11. *(a)* Solve $(D^2+D-6)y=5e^{2x}+e^{-3x}$.

$\quad$ *(b)* Solve $(D^2+D-1)y=2\sin 3x$.

12. *(a)* Solve $(D^2-4D+4)y=5+\cos 2x$.

$\quad$ *(b)* Solve $(D^2-3D+2)y=2x^2$.

13. *(a)* Find Laplace transform of $\cos t\, 4t \sin 2t$.

$\quad$ *(b)* Find $L\{te^{-t}\sin 3t\}$.

14. *(a)* Find $L\left\{\dfrac{1-\cos t}{t}\right\}$.

$\quad$ *(b)* Find $L\{\int_0^t \sin t\, dt\}$.

15. *(a)* Evaluate $\int_0^\infty te^{-4t}\sin 3t\, dt$.

$\quad$ *(b)* Find $L^{-1}\left\{\dfrac{1}{(s-1)(s-2)}\right\}$ using convolution theorem.

16. Solve $y''-3y'+2y=e^{-t}$ with $y(0)=0, y'(0)=1$.

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

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

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