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C16–M–301/C16–CHOT–301/C16–RAC–**301**

6242

BOARD DIPLOMA EXAMINATION, (C–16)

OCT/NOV—2017

DMET—THIRD SEMESTER EXAMINATION

ENGINEERING MATHEMATICS—II

Time : 3 hours] [*Total Marks* : 80

PART—A 3×10=30

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

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

1. Evaluate :

$$\frac{e^{\sin^{-1}x}x}{\sqrt{1-x^2}}\,dx$$

2. Evaluate :

$$\frac{1}{\sqrt{9-x^2}}\,dx$$

3. Evaluate :

$$\int_0^{\sqrt{3}} \frac{1}{1+x^2}\,dx$$

4. Find the mean value of $y^2 = 4x$ from $x = 0$ to $x = 4$.

5. Find $L\{t^4 \quad e^{2t} \quad 2\sin 2t\}$

6. Find $L^{1}\ \dfrac{3S \quad 2}{S^2 \quad 9}$

7. Find the Fourier coefficient a_0 in $f(x) \quad x$ in the interval $(0, 2\ )$.

8. Find the differential equation of the family of curves $y \quad A\cos 5x \quad B\sin 5x$, where A, B are arbitrary constants.

9. Solve :

$$\frac{dy}{dx} \quad e^{x \ y}$$

10. Solve :

$$\frac{d^2y}{dx^2} \quad 4y \quad 0$$

PART—B

10×5=50

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

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

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

11. *(a)* Evaluate :

$$\frac{1}{x^2 \quad 6x \quad 13}\,dx$$

(b) Evaluate :

$$\cos^3 \sin^6 x\,dx$$

12. *(a)* Evaluate :

$$x^3 \sin 5x\,dx$$

(b) Evaluate :

$$\int_0^{/2} \log \cot x \, dx$$

13. (a) Find the volume of the solid generated by revolving the area bounded by the circle $x^2 \quad y^2 \quad 16$ about x-axis.

(b) Find the RMS value of $f(x) \quad xe^x$ from $x \quad 1$ to $x \quad 3$.

14. (a) Evaluate

$$\int_0^6 \frac{1}{1 \quad x^2} \, dx$$

using Simpson's rule by taking $n \quad 6$.

(b) Find

$$L\{e^{\ 2t}(3\sin 4t \quad 4\cos 4t)\}$$

15. (a) Find

$$L^{\ 1}\frac{5S \quad 1}{(S \quad 2)(S \quad 1)}$$

(b) Using convolution theorem, find

$$L^{\ 1}\frac{1}{S(S^2 \quad 4)}$$

16. Find the Fourier series for $f(x) \quad x \quad x^2$ in the interval [,].

17. (a) Solve :

$$\frac{dy}{dx} \quad \frac{y}{x} \quad \tan\frac{y}{x}$$

(b) Solve :

$$\frac{dy}{dx} \quad y\cot x \quad \text{cosec}x$$

18. *(a)* Solve :

$$(D^2 \quad 4)\,y \quad \sin 2x$$

(b) Solve :

$$(D^2 \quad 3D \quad 2)\,y \quad x$$

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