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CI6–EC–301/C16–CHPC–301/C16–PCT–301

6232

BOARD DIPLOMA EXAMINATION, (C–16)

OCT/NOV—2017

DECE—THIRD SEMESTER EXAMINATION

ENGINEERING MACHEMATICS-II

Time : 3 hours] [*Total Marks* : 100

PART—A 3×10=40

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

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

(3) Answers should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Evalute, $\frac{1}{1 \quad \sin x}.dx$

2. Evaluate, $\frac{m_e \tan^{\ 1} x}{1 \quad x^2} dx$

3. Evaluate, $\int_0^1 x^2 \quad 1 \ .dx$

4. Find the mean value of y = sin x over 0,

5. Find the Laplace Transform of 3.sin 4t–4cos 3t.

6. Find $L^{-1}\left\{\frac{2s-5}{s^2-4}\right\}$

7. Define the Fourier series of $f(x)$ in the interval $(c, c+2)$

8. Find the differential equation to the family of curves y = A. cos 3x + B.sin 3x where A, B are arbitrary constants.

9. Solve, $\frac{dy}{dx} = \sqrt{\frac{1-y^2}{1-x^2}}$

10. Solve, $\frac{d^2y}{dx^2} - 4\frac{dy}{dx} - 13y = 0$

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, $\int \cos 3x . \sin 2x . dx$

(b) Evaluate, $\int \frac{dx}{5 - 4\cos x}$

12. *(a)* Evaluate, $\int x^3 . \log x . dx$

(b) Evaluate, $\int_0^{\pi/2} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} . dx$

13. *(a)* Find the area enclosed by the ellipse $16x^2 + 25y^2 = 400$

(b) Find the volume of the sphere of radius 'r' using the method of integration.

14. *(a)* Find $L\ e^{2t}.t.\sin 3t$

(b) Obtain the value of $\int_0^6 \frac{1}{1\ x^2}.dx$ using Simpson's rule by taking n = 6.

15. *(a)* Find $L\ \frac{1\ \cos 2t}{t}$

(b) Find $L^{\ 1}\ \log \frac{s\ 3}{s\ 2}$

16. Expland $f\ x\ \ x^2$ as Fourier series in $l\ \ x\ \ l$.

Hence, deduce that $\frac{2}{12}\ \ \frac{1}{1^2}\ \ \frac{1}{2^2}\ \ \frac{1}{3^2}\ \ \ldots$

17. *(a)* Solve, $1\ \ x^2\ \frac{dy}{dx}\ \ 2xy\ \ \ x^3$.

(b) Solve, $D^2\ \ 1\ y\ \ \cosh 2x$.

18. *(a)* Solve, $D^2\ \ 3D\ \ 2\ y\ \ \cos 3x$.

(b) Solve, $D^2\ \ 2D\ \ 1\ y\ \ \ 2x^2$.

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