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C14–M–301/C14–CHOT–301/C14–RAC–**301**

4249

BOARD DIPLOMA EXAMINATION, (C–14)

OCT/NOV—2015

DME—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 :

$$e^{x} \quad 2\cos x \quad \frac{6}{\sqrt{1 \quad x^{2}}} \quad dx$$

2. Evaluate :

$$\frac{\sin(\log x)}{x}\,dx$$

3. Evaluate :

$$e^{x}(\sin x \quad \cos x)\,dx$$

4. Evaluate :

$$\int_{0}^{/2} \sqrt{1 \quad \sin 2x}\,dx$$

5. Find the area of the region bounded by the curve y $\sin x$ and x-axis between x 0 and x .

6. Find the differential equation of family of curves x^2 y^2 a^2.

7. Solve :

$$\frac{dy}{dx} \quad e^{y} \quad x^2.e^{y}$$

8. Solve :

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

9. Find the mean and mode of the followings numbers :

4, 3, 2, 5, 3, 4, 5, 1, 7, 3, 2, 1

10. Write the merits and de merits of mean deviation.

PART—B 10×5=50

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

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

11. *(a)* Evaluate :

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

(b) Evaluate :

$$x^4.e^{4x}\,dx$$

12. *(a)* Evaluate :

$$\frac{1}{\sqrt{x \quad 1} \quad \sqrt{x \quad 2}}\,dx$$

(b) Evaluate :

$$\frac{x}{(x \quad 1)(x \quad 2)}\,dx$$

13. *(a)* Evaluate :

$$\cos 4x . \cos 2x \, dx$$

(b) Evaluate :

$$\int_0^{/4} \frac{\sec^2 x}{(1 \quad \tan x)^2} dx$$

14. *(a)* Find the volume of the right circular cone of height h and radius of the base r.

(b) Find the RMS value of $\sqrt{8 \quad 4x^2}$ between $x \quad 0$, $x \quad 2$.

15. *(a)* Evaluate :

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

(b) A river is 80 feet wide and the depth d in feet at a distance x feet. from one bank is given by the following table :

x	0	10	20	30	40	50	60	70	80
d	0	4	7	9	12	15	14	8	3

Find the cross-section of the river using Simpson's rule.

16. *(a)* Solve :

$$(1 \quad x^2)\frac{dy}{dx} \quad y \quad e^{\tan \ ^1 x}$$

(b) Solve :

$$e^y \ dx \quad (x \ e^y \quad 2y)\, dy \quad 0$$

17. Solve the homogeneous differential equation

$$(x^3 \quad 3xy^2)\, dx \quad (y^3 \quad 3x^2 y)\, dy \quad 0$$

18. *(a)* Find the mean, variance and standard deviation of the following frequency distribution :

x_i	:	6	10	14	18	24	28	30
f_i	:	2	4	7	12	8	4	3

(b) Calculate the coefficient of correlation between the following data and interpret the result :

x	:	1	2	3	4	5	8	9
y	:	3	2	5	4	6	7	11

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