



C09-CHPP-302/C09-EE-302

3240

BOARD DIPLOMA EXAMINATION, (C-09)  
OCT/NOV—2013  
DEEE—THIRD SEMESTER EXAMINATION  
ENGINEERING MATHEMATICS—II

Time : 3 hours ]

[ Total Marks : 80

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PART—A

- Instructions** : (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. Evaluate :  
 $(\cos x - \sin x) dx$

2. Evaluate :  
 $\frac{e^{\sin^{-1} x}}{\sqrt{1-x^2}} dx$

3. Evaluate :  
 $\sqrt{1 - \cos 2x} dx$

4. Evaluate :  
 $\sqrt{9 - x^2} dx$

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5. Evaluate :

$$\int \frac{1}{5x-7} dx$$

6. Evaluate :

$$\int_1^{\sqrt{3}} \frac{1}{1-x^2} dx$$

7. Find the area enclosed by the parabola  $y = x^2$ , the  $x$ -axis and the lines  $x = 3$  and  $x = 5$ .

8. Form the differential equation of the family of curves,  $y = Ae^x + Be^{-x}$ , where  $A, B$  are arbitrary constants.

9. Solve :

$$\frac{d^2y}{dx^2} + 16\frac{dy}{dx} + 64y = 0$$

10. Solve :

$$x dy - y dx = 0$$

**PART—B**

**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 :

$$\int \cos 3x \cos 2x dx$$

(b) Evaluate :

$$\int \cos^3 \theta \sin^6 \theta d\theta$$

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12. (a) Evaluate :

$$\frac{x^2}{(x-1)(x-3)} dx$$

(b) Evaluate :

$$x^2 e^{3x} dx$$

13. Find the area bounded by the curve  $16x^2 + 25y^2 = 400$ , using the method of integration.

14. (a) Find the RMS value of  $\sqrt{\log x}$  over the range  $x = 1$  to  $x = e$ .

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

15. Solve :

$$\frac{dy}{dx} = \frac{2x-y}{x+y}$$

16. (a) Solve :

$$(D^2 - 4)y = \sin 2x$$

(b) Solve :

$$(D^2 - 4)y = x^2$$

17. (a) Solve :

$$\frac{dy}{dx} = \frac{y}{x} + 5$$

(b) Solve :

$$(D^2 - 2D - 1)y = 4e^{3x}$$

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18. Use Simpson's rule to evaluate

$$\int_5^5 x^4 dx$$

by taking eleven equidistant ordinates.

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