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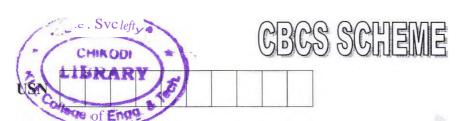
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17MAT21

# econd Semester B.E. Degree Examination, June/July 2019 **Engineering Mathematics -**

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing one full question from each module.

### **Module-1**

a. Solve  $(D^2 + 1)y = 3x^2 + 6x + 12$ .

(06 Marks)

b. Solve  $(D^3 + 2D^2 + D)y = e$ .

(07 Marks)

c. By the method of undetermined coefficients, solve (D  $^2$  +  $\mathbf{D}$  - 2) $y = x + \sin x$ .

(07 Marks)

### OR

a. Solve  $(D^2 - 6D + 9)y = 6e^{3t} + 7e^{2t}$ .

(06 Marks)

h. Solve  $(D^3 - D)y = (2x + 1) + 4\cos x$ .

(07 Marks)

C. By the method of variation of parameters, solve  $(D^2 + 1)y = \csc x$ .

(07 Marks)

a. Solve  $x^2y''-3xy^3+4y=1+x^2$ .

(06 Marks)

b. Solve  $xyp^2 - (x^2 + y^2)p + xy = 0$ .

(07 **Marks**)

c. Solve  $(px - y)(py + x) = a^2p$  by taking x = x and  $y^2 = y$ .

(07 **Marks**)

a. Solve  $(2+X)^2 y'' + (2+x)y' + y = \sin(2\log(2+x))$ .

(06 Marks)

b. Solve  $yp^2 + (x - y)p - x = 0$ .

(07 Marks)

C. Obtain the general and singular solution of the equation  $\sin px \cos y = \cos px \sin y + p$ .

(07 Marks)

### Module-3

a. Form a partial differential equation by eliminating arbitrary function

 $1x + my + nz = 4(x^2 + y^2 + z^2)$ 

b. Solve  $\frac{1}{ax^2} = x_y$  subject to the conditions  $\frac{1}{ax^2} = x_y$  subject to  $\frac{1}{ax^2}$ 

(07 Marks)

(06 Marks)

c. Derive an expression for the one dimensional wave equation.

(07 Marks)

a. Form a partial differential equation z = f(y + 2x) + g(y-3x)

(06 Marks)

(07 Marks)

b. Solve  $-\frac{a2z}{} = z$ , given that when y = 0, z = ex and -a, -a(07 Marks)

c. Find all possible solutions of heat equation  $u_1 = c^2 u$ , by the method of separation of variables.



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## **17MAT2**

### Module-4

7 a. Evaluate if r sin 0 dr dO over the cardioids  $r = a(1 - \cos^{\circ} above the initial line.$ (06 Marks)

Evaluate 1 x dz dx dy

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(07 Marks)

F(m)F(n)c. Derive the relation between Beta and Gamma function as B(m, n) =(07 Marks)

### OR

Evaluate by changing the order of integration if \_\_\_dydx . (06 Marks)

Find by double integration, the area lying between the parabola  $y = 4x - x^2$  and the line y = x. (07 Marks)

Show that  $V \cot 0 de = 2 (i4) (34)$ (07 Marks

Find the Laplace transform of  $t \cos 2t \frac{\left| 1 - e^{31} \right|}{t}$ 9 (06 Marks)

having the period It Find the Laplace transform of  $f(t) = E\sin \cot \theta < t < 0$ (07 Marks)

C. Solve y'' - 3y' + 2y = 2e'',  $y(0) = y^{1}(0) = 0$  by using Laplace transforms. (07 Marks)

Find the inverse Laplace transforms of

By using convolution theorem, find 1.  $\frac{s+}{2s+2}$   $\frac{s+a}{s+b}$ , 10 a. (06 Marks)

(07 Marks)

 $c_{-}$  Express  $f(t) = |\cos t, \, {}^{7}Y_{2} < t$  TC in terms of unit step functions and hence find its Laplace < t

transform\_ (07 Marks)

