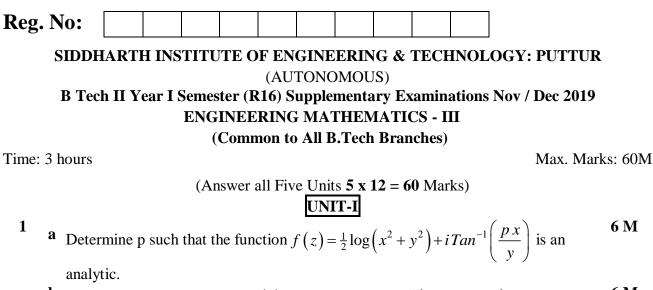
2



**b** Obtain the analytic function f(z) = u + iv, if  $u - v = e^x (\sin x - \cos y)$ . **6** M **0**R

**a** Evaluate 
$$\int_{0}^{1+3i} (x^2 - iy) dz$$
 along the parabola  $y = x^2$ . **6** M

**b** Evaluate  $\int_{c} \frac{\cos z}{z(z^2+8)} dz$ , where *c* denotes the boundary of the square whose sides **6** M

lie along the lines  $x = \pm 2$ ,  $y = \pm 2$ .

## UNIT-II

3 Show that 
$$\int_{0}^{2\pi} \frac{\cos 2\theta}{1 + 2a\cos\theta + a^2} d\theta = \frac{2\pi a^2}{1 - a^2}, (a^2 < 1)$$
 by using residue theorem. 12 M

**OR 4** a Find the bilinear transformation which maps the points  $(\infty, i, 0)$  in to the **6** M points  $(0, i, \infty)$ .

**b** Obtain the image of the infinite strip x = 0 and  $x = \frac{\pi}{4}$  under the **6** M transformation  $w = \cos z$ .

## UNIT-III

5 Find an iterative formula for  $\sqrt{N}$  (where *N* is a positive number) by Newton- 12 M Raphson method and hence compute the real root of  $\sqrt{18}$ .

#### OR

6 From the following table values of x and  $y = \tan x$  interpolate values of y when 12 M x = 0.12 and x = 0.28.

X	0.1	0.15	0.2	0.25	3
f(x)	0.1003	0.1511	0.2027	0.2553	0.3093

#### Q.P. Code: 16HS612

# UNIT-IV

7 **a** Fit the equation of the curve  $y = a e^{bx}$  to the following data.

Х	1	2	3	4
у	7	11	17	27

**b** Using Simpson's  $\frac{3}{8}$  rule to evaluate the value of  $\int_{0}^{6} \frac{1}{1+x} dx$  take h = 0.5. 5 M

OR

- 8 a Fit a second-degree polynomial to the following data by the method of least 5 M squares
  - $\mathbf{b} = \begin{bmatrix} \mathbf{x} & \mathbf{0} & \mathbf{1} & \mathbf{2} & \mathbf{3} & \mathbf{4} \\ \mathbf{y} & \mathbf{1} & \mathbf{5} & \mathbf{10} & \mathbf{22} & \mathbf{38} \end{bmatrix}$   $\mathbf{b} = \begin{bmatrix} \mathbf{x} \\ \mathbf{y} \\ \mathbf{y} \\ \mathbf{x} \end{bmatrix} \begin{bmatrix} \mathbf{x} \\ \mathbf{y} \\ \mathbf{y} \\ \mathbf{x} \end{bmatrix} \mathbf{x} = \begin{bmatrix} \mathbf{x} \\ \mathbf{y} \\ \mathbf{y} \\ \mathbf{x} \end{bmatrix} \mathbf{x} = \begin{bmatrix} \mathbf{x} \\ \mathbf{y} \\ \mathbf{y} \\ \mathbf{x} \end{bmatrix} \mathbf{x}$   $\mathbf{7} \mathbf{M} = \begin{bmatrix} \mathbf{x} \\ \mathbf{y} \\ \mathbf{y} \\ \mathbf{y} \\ \mathbf{x} \end{bmatrix} \mathbf{x} = \begin{bmatrix} \mathbf{x} \\ \mathbf{y} \\ \mathbf{y} \\ \mathbf{x} \end{bmatrix} \mathbf{x}$   $\mathbf{7} \mathbf{M} = \begin{bmatrix} \mathbf{x} \\ \mathbf{y} \\ \mathbf{y} \\ \mathbf{y} \\ \mathbf{x} \end{bmatrix} \mathbf{x}$

# UNIT-V

9 Using Taylor's series method find an approximate value of y at x = 0.2 for the 12 M differential equation  $y' = 2y + 3e^x$ , y (0) = 0. Compare the numerical solution obtained with exact solution.

OR

- 10 a Solve y' = x + y, with y(1) = 0 by using Taylor's series method and calculate the 6 M values of y(1.1) and y(1.2).
  - **b** b) Apply the fourth order R-K method to find y(0.1) and y(0.2), given **6** M  $\frac{dy}{dx} = x y + y^2 \text{ with } y(0) = 1.$

\*\*\* END \*\*\*

7 M