SATHYABAMA UNIVERSITY

(Established under section 3 of UGC Act, 1956)

Course & Branch: B.E /B.Tech- Common to ALL Branches
Title of the paper: Engineering Mathematics – I/ Engineering Mathematics - III
Semester: III Max. Marks: 80
Sub.Code: 20301 (2004/2005)/6C0049/ 6C0032/301 Time: 3 Hours
Date: 21-04-2008 Session: AN

PART – A (10 x 2 = 20)

Answer All the Questions

1. Prove that $L[\cosh at] = \frac{s}{s^2 - a^2}, s > |a|$

2. State initial value theorem.

3. If y satisfies the equation $y'' + 3y' 2y = e^{-1}$ and $y(0) = 0$ and $y'(0) = 0$. find L[y]

4. Solve $y(t) = a \sin t = 2 \int_0^t y(u) \cos(t - u)\, du$.

5. Determine whether function $2xy + i(x^2 - y^2)$ is analytic or not.

6. What do you mean by conformal mapping?

7. State Cauchy's integral theorem.

8. Find the Residue of $\frac{e^z}{z - 2} atz = 2$.

9. What is meant by type I and type II errors?

10. Give the statistic for testing the significance of mean in small samples.

PART – B (5 x 12 = 60)

Answer All the Questions

11. Find $L[te^{-1} \cosh t]$

(or)

12. Find using $L^{-1}\left[\frac{1}{(s^2+4)^2}\right]$ convolution theorem.

13. Solve: $y + \int_0^t y\,dt = t^2 + 2t.$

(or)

14. Solve: $y'' - 3y' + 2y = e^t$.

15. Find an analytic function whose imaginary part is $3x^2 y - y^3$.

(or)

16. Find the bilinear transformation that maps the points $z_1 = -i, z_2 = 0, z_3 = i$ in to the points $w_1 = -1, w_2 = i, w_3 = 1$.

17. Evaluate using Cauchy integral formula $\int_c \frac{\cos \pi z^2}{(z-1)(z-2)}\,dz$ where C is the circle $|z| = 3$.

(or)

18. Find the radius pf $f(z) = \frac{z^2}{(z-1)^2(z+2)}$ at each of the poles.

19. A random sample of size 16 values from a normal population showed a mean of 53 and a sum of squares of deviation from the mean equals to 150. Can this sample be regarded as taken from the population having 56 as mean. Obtain 95% confidence limits of the mean of the population.

(or)

20. Given the following contingency table for hair colour and eye colour. Find the value of ψ^2.Is there good association between the two?

	Hair colour				
		Fair	Brown	Black	Total
Eye Colour	Blue	15	5	20	40
	Grey	20	10	20	50
	Brown	25	15	20	60
	Total	60	30	60	150