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LDRP INSTITUTE OF TECHNOLOGY & RESEARCH, GANDHINAGAR.
B.E. Fourth Semester (Branch: MECH,EE,CIVIL,AO,EC)

MID EXAMINATION

Date/Day : 27/02/2015, Friday

Time : 12:00 pm to 01:30pm

Subject Name : Complex Analysis and Numerical Analysis(CC401A)

Max. Marks: 30

Instructions:1) All questions are compulsory.
2) Figures to the right indicate full marks.

Q-1

Do as directed

[10]

- (1) (i) Find z if $\arg(z + 2i) = \frac{\pi}{4}$, $\arg(z - 2i) = \frac{3\pi}{4}$
(ii) Find the modulus and principal argument of $z = \frac{1-7i}{(2+i)^2}$
- (2) Apply Lagrange's formula (inversely) to find the root of the equation $f(x)=0$, when $f(30) = -30$, $f(34) = -13$, $f(38) = 3$, $f(42) = 18$

Q-2

Do as directed

[10]

- (1) Use the composite Simpson's 1/3 - rule with step length $h = 0.5$ to estimate $\int_0^1 \frac{1}{1+x} dx$
- (2) Using the following table determine $f(0.23)$ by Newton's divided difference

x:	0.20	0.22	0.24	0.26	0.28	0.30
y:	1.6596	1.6698	1.6804	1.6912	1.7024	1.7139

OR

- (1) Evaluate the following integrals by Gaussian Quadrature formula:
 $\int_0^1 x e^{-x} dx$ with 2- points and 3-points
- (2) The population of a town is decennial census was as given below:

Year:	1891	1901	1911	1921	1931
Population	46	66	81	93	101

Estimate the population for the year 1925, Using Newton's backward difference.

Q-3

Do as directed

[10]

- (1) Evaluate $\int_C \operatorname{Re}(z^2) dz$, Where C is a boundary of the square with vertices $0, i, 1 + i, 1$ in the clockwise direction
- (2) Show that the function $u(x, y) = 4xy - 3x + 2$ is harmonic. Construct the Corresponding analytic function $u + iv$.

OR

- (1) Find and plot the fourth root of unity on the unit circle , Using De' Moivre's Theorem
- (2) Evaluate $\oint_c \frac{e^{2z}}{(z+1)^4} dz$, where c is the circle $|z| = 2$

****BEST OF LUCK ****