KADI SARVA VISHWAVIDHYALAYA
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:
$\int_0^1 xe^{-x}\,dx$ 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 $\int_C Re(z^2)dz$, 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' Moveir's Theorem

(2) Evaluate $\oint_c \frac{e^{2z}}{(z+1)^4}\, dz$, where c is the circle $|z| = 2$

*** *BEST OF LUCK * ***