	OR			
5	a) Expand f(z)= $\frac{7z-2}{(z+1)z(z-2)}$ about the point z = -1 in the region $1 < \lvert z+1 \rvert < 3$ as Laurent's series. b) Expand $f(z) = \frac{1}{z^2-3z+2}$ in the region (i) $0 < \lvert z-1 \rvert < 1$ (ii) $1 < \lvert z \rvert < 2$	5M 5M	2	L2
6	a)Evaluate $\oint \frac{4-3z}{z(z-1)(z-2)}\, dz$ where c is the circle $\lvert z \rvert = \frac{3}{2}$ using Residue theorem b) Find the poles of f (z) and the residues of the poles which lie on imaginary axis if $f(z) = \frac{z^2+2z}{(z+1)^2(z^2+4)}$	5M 5M	3	L2 L1
	OR			
7	a) Evaluate $\int \frac{2e^z}{z(z-3)}$ along a curve c: $\lvert z \rvert=2$ by residue theorem. b) Evaluate $\int \frac{z^2+2z-2}{z(z-4)(z-1)}dz$, along the curve c is $\lvert z \rvert=1.5$.	5M 5M	3	L3 L3
8	a) A vector field is given by $\bar{F}= (x^2-y^2-x)\hat{i} + (2xy+y)\hat{j}$ Show that the field is irrational and find its Scalar potential b) Prove that div curl $\bar{f} = 0$	5M 5M	4	L1 L2
	OR			
9	a) Show that $\nabla^2[f(r)] = f''(r) + \frac{2}{r} f'(r)$ b) Find constants a,b,c so that the vector A = (x+2y+az) i + (bx-3y-z) j + (4x+cy+2z) k is irrotational .Also find Ø such that A= ∇Ø .	5M 5M	4	L2 L1
10	a) Evaluate the line integral $\int_c (x^2 + xy)\, dx + (x^2+y^2)\, dy$, where C is the square formed by the lines x = 1,-1 and y= 1,-1 b) Find $\int_C \vec{F} . \vec{dr}$, If $\vec{F} = xy\vec{i} - z\vec{j} + x^2\vec{k}$ and C is the curve $x= t^2, y = 2t, z = t^3$ where t=0 to 1	5M 5M	5	L3 L1
	OR			
11	Verify Stokes theorem for f= (x^2+y^2)i-2xyj taken around the rectangle bounded by the lines x= -a, ,x=a, y=0, y=b.	10M	5	L2