UNIT–II

UNIT NAME: Fluid Kinematics

S.No		Questions	BT	CO	PO
Part – A (Short Answer Questions)					
1		Define path line and stream line	1	2	1
2		Define and state the applications of momentum equation	1	2	1
3		State the assumptions and Bernoulli's equation for flow along a stream line	2	2	1
4		Classify the types of fluid flows	2	2	1
5		State the continuity equation with assumptions		2	1
6		Define stream function and streak line	1	2	1
7		Define velocity potential	1	2	1
8		Define steady flow, compressible flow and rotational flow	1	2	1
9		Define one ,two and three dimensional flows	1	2	1
10		Define laminar flow, turbulent and transition flows	1	2	1
Part – B (Long Answer Questions)					
11	a)	Derive an expression for an Euler's equation	3	2	2
12	a)	Derive an expression for a Bernoulli's equation and what are assumptions for the application.	3	2	2
13	a)	The water is flowing through a pipe having a diameter 20cm and 10cm at the section 1 and 2 respectively. The weight of flow through the pipe is 35m/sec the section 1 is above the datum and 4m above the datum above at section 2. if the pressure at section 1 is 39.24N/m^2 find the intensity o f pressure at section 2.	5	2	3
	b)	Demonstrate different types of correction factor.	2	2	2
14	a)	A stream function is given by $\psi = 3x^2y+(2+t)y^2$. Find the velocity and determine its value at a point defined by position vector r =1i+2j-3k when t=2	5	2	3
	b)	The velocity potential function for a 2D flow Ø= x(2y-1) at a fine point P(4,5) determine the velocity u= - dØ/dx	5	2	3
15	a)	For the following stream functions. Calculate velocity at a point(1,2) if i) $\psi = 3xy$ ii) $\psi = 3x^2y-y^3$	5	2	3
	b)	What is the irrotational velocity field associated with the potential $Ø=3x^2-3x+3y^2+16t^2+12zt$	2	2	3
16	a)	A pipe of dia 400mm at a velocity of 25m/sec. The pressure at A and B are 29.43N/cm^2 and 22.563 N/cm^2 respectively. While datum head at A and B are 28m and 30m. find the loss of head between A and B	5	2	3
	b)	Define velocity potential and stream function	1	2	1