

This paper has four questions

Answer question one and any other two

1. Describe the following terms stating under what conditions each exist
  - a. Uniform flow - When there is no variation in the magnitude and direction of velocity vector from one point to another along paths of flow.
  - b. Laminar flow  
Particles of the fluid move in an orderly manner retaining the same relative positions during the flow.
  - c. Steady flow  
When conditions of flow that include velocity & cross-sectional area are constant with respect to time.
2. (a) A cylindrical tank 650 Cm in diameter with vertical axis is filled to depth of 1.2m with water vertical. Compute the total pressure on the curved surface?
 

(b) What is meant by continuity of flow and under what conditions does it occur?  
Total amount of fluid that enters the system must be equal to the amt leaving the system.
3. (a) Losses in pipe flow cannot be ignored. Discuss  
Mainly due to check disturbances
- (b) With help of a diagram describe the Bernoulli's equation of liquid flow
4. (a) State the Manning's equation of open channel flow
- (b) Explain how Manning's equation if applied in land use planning

$$V = \frac{R^{2/3} \cdot S^{1/2}}{n}$$

we  $v$  = average flow velocity

$n$  = roughness coefficient of the channel.

$R$  =  $a/p$  cross-sectional area/wetted perimeter

$S$  = hydraulic gradient of channel.