I. A liquid is flowing in a tube under a streamlined flow. If the radius of the tube is doubled, the rate of flow becomes:
   a. $16\ times$ b. $4\ times$ c. $2\ times$ d. $¼\ times$

J. Two hailstones with radii in the ratio $1:2$ fall from a great height through the atmosphere. Then, their momentum are in the ratio after they attain terminal velocity is:
   a. $1:2$ b. $1:4$ c. $1:16$ d. $1:32$

K. One poise is equal to: [BP 2005, KU 2014]
   a. $0.01Nsm^{-2}$ b. $0.1Nsm^{-2}$ c. $1Nsm^{-2}$ d. $10Nsm^{-2}$

L. If the density of air is neglected, then the radius of the liquid drop with density $900kg/m^3$ moving in the air with a coefficient of viscous medium $1.85\times10^{-5}Ns/m$ with terminal velocity $2.76\times10^{-4}m/s$: [MOE 2014]
   a. $1.6cm$ b. $1.6mm$ c. $1.6\mu m$ d. $1.6nm$

M. Two drops of water having the same radius moving in air downwards with constant velocity (v). If the drops coalesced, what would be the new velocity: [IOM 2010]
   a. $2^{\frac{1}{3}}v$ b. $2^{\frac{2}{3}}v$ c. $(2^{\frac{2}{3}}-1)v$ d. $(2^{\frac{1}{3}}-1)v$

N. Bernoulli's equation is applicable in the case of:
   a. Streamlined flow of compressible fluid
   b. Streamlined flow of incompressible fluid
   c. Turbulent flow of compressible fluid
   d. Turbulent flow of incompressible fluid

Subjective questions:

Fluid Statics

1. a. What is specific gravity? Relate specific gravity with density. 2
   b. The blood pressure in humans is greater at the feet than at the head. Why?
   c. Why an air bubble in water rises from bottom to top and grow in size? 2
   d. How much pressure will man of weight 80kg exert on the ground when he is lying and he is standing on his feet? Given that the area of the body of the man is $0.6m^2$ and that of the foot is $80cm^2$. 3
   [$1.307\times10^3Nm^{-2}$, $4.9\times10^4Nm^{-2}$]

2. a. Smaller air bubbles rise slowly while big bubbles rise rapidly through the liquid. Why? 2
   b. Why it is difficult to stop bleeding from a cut in human body at high altitudes? 2
   c. An ice cube floats in a glass of water. When the ice melts, will the water level in the glass rise, fall, or remain unchanged? Explain. 2
   d. A slab of ice floats on fresh water lake. What minimum volume must the slab have for a 45kg woman to be able to stand on it without getting her feet wet? [**V = $0.5625m^3$**] 2

3. a. State Pascal's law.
   b. Explain a case, with suitable diagram, showing that the pascal's law is used to change the magnitude and direction of force in hydraulic system. 2
   c. Obtain an expression for the gauge pressure exerted by a liquid at certain depth. 2
   d. A storage tank 12m deep is filled with water. The top of the tank is open to the air. What is the absolute pressure and gauge pressure at the bottom of the tank? [Ans: $2.19\times10^5Pa,\ 1.18\times10^5Pa$] 2

4. a. State Archimedes principle. Show how the law of floatation follows Archimedes principle. 2
   b. A 25cm thick block of ice floating on freshwater can support a man 80Kgstanding on it. What is the smallest area of the ice block? (Specific gravity of ice= 0.197) 2
   c. A solid weigh 237.5g in air and 12.5g when totally immersed in a liquid of density $0.9gcm^{-3}$. Calculate
      i. the density of the solid. 1
      ii. the density of a liquid in which the solid would float with one-fifth of its volume exposed above the liquid surface. 1
   d. A string supports a solid iron object of mass 180g totally immersed in a liquid of density $800kgm^{-3}$. Calculate the tension in the string if the density of iron is $8000kgm^{-3}$. [***1.26N***] 2
   e. What is metacenter of a floating body? Describe the different equilibrium conditions of a floating body.