

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST 1 EXAMINATION, September-2016
B. Tech. III Semester

COURSE CODE: 10B11CE312
COURSE NAME: Fluid Mechanics
COURSE CREDIT: 4

MAX. MARKS: 15
MAX. TIME: 1 hrs

Note: All questions are compulsory. Carrying of mobile phone during examination will be treated as case of unfair means. Assume suitable data if required.

- Q1.** Explain the terms meta-centre and meat-centric height. Explain the condition of equilibrium for floating body. [3]
- Q2.** A hydraulic lift consists of a 60 cm diameter ram and slides in a cylinder of diameter 60.02 cm. Annular spacing between cylinder and ram is filled with oil. If rate of travel of the ram is 9.15m/min, find the frictional resistance when 4.15 m of ram is engaged in the cylinder. Kinematic viscosity and specific gravity of oil is $0.03 \text{ cm}^2/\text{sec}$ and 0.85 respectively. (See: Fig. 1) [3]
- Q3.** A cubical box, 2 m each edge, has its base horizontal and is half filled with a liquid of specific gravity 1.5. The rest upper half is filled with an oil of specific gravity 0.9. Calculate:
- The resultant force on the wall of the box due to the fluids
 - Position of centre of pressure.
- [4]
- Q4.** If a mercury manometer is attached to a tank of oil or relative density 0.85 and the readings were as shown in Figure, what would be the level of oil (h) above the point where the manometer was attached? (See: Fig. 2) [3]
- Q5.** Describe with the aid of diagrams the following [2]
- No-slip condition
 - Differentiate between U tube manometer and U tube differential manometer.

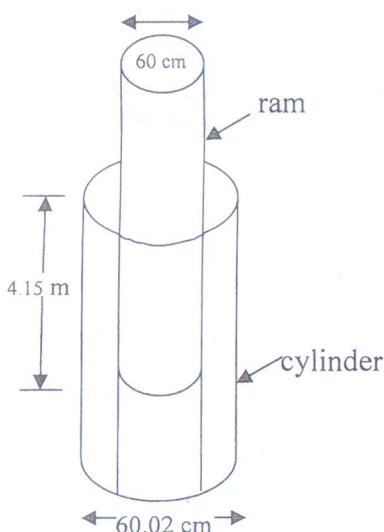


Fig. 1

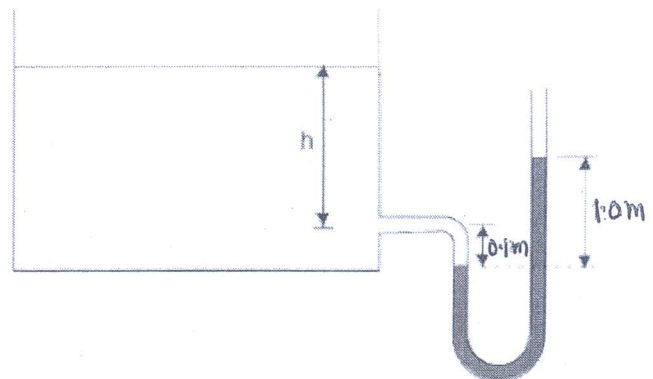


Fig. 2