Dr. Aashish

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATION- October 2018
B.Tech III Semester

COURSE CODE: **10B11 CE312** MAX. MARKS: 25
COURSE NAME: **Fluid Mechanics**
COURSE CREDITS: 04 MAX. TIME: 1Hr 30 Min

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.* ***Assume suitable data if required. Notation has their usual meanings.***

1. **Answer the following in brief:** **[6]**
   (a) Define stream line & equation of stream line.
   (b) Show that if any function Ψ (stream function) which is continuous, is a possible case of flow.
   (c) Principle of Venturimeter with neat sketch of venturimeter

2. Define the term circulation. Find the circulation around the elementary rectangle, in the plane of 2-dimensional steady flow field. Show that circulation is proportional to angular velocity. **[4]**

3. If for a two dimensional flow, the velocity potential function is given by Φ=4x(3y-4), Determine the velocity at the point x (2,3). Determine also the value of stream function at the point x. **[3]**

4. An orifice meter with orifice diameter 15 cm is inserted in a pipe of 30 cm diameter. The pressure difference measured by a mercury manometer fitted on the two sides of the orifice meter gives a reading of 50 cm of mercury. Find the rate of flow of oil of specific gravity 0.9 when the co-efficient of discharge of the meter = 0.64 **[3]**

5. A pipe line carrying oil of specific gravity 0.85, changes in diameter from 300 mm at a position A to 500 mm diameter to a position *B* which is 5 m at a higher level. If the pressures at A and *B are* 19.62 N/cm^2 and 14.91 N/cm^2 respectively, and the discharge is 150 litres/s, determine the loss of head and direction of flow. **[4]**

6. Find the horizontal and vertical component of water pressure on the face of a tainter gate of 90° sector of radius 4 m as shown in figure 1. Width of tainter gate is 3 m. **[5]**

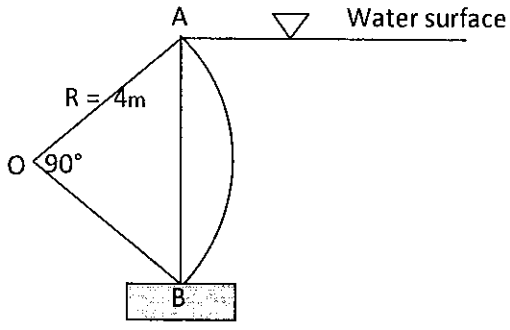

Figure 1