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**B. Tech. (Civil) 4th Semester/F-Scheme
Examination, May-2019
FLUID MECHANICS-II
Paper-CE-204-F**

Time allowed : 3 hours [Maximum marks : 100]

Note : Question No. 1 is compulsory. Attempt any five questions by selecting at least any one question from each section.

1. Explain the following : 10×2=20
- (a) Laminar & Turbulent flow
 - (b) Net positive suction head
 - (c) Aging of pipes
 - (d) Cavitation
 - (e) Water Hammer
 - (f) Airlift Pump
 - (g) Total Energy Line
 - (h) Draft Tube
 - (i) Priming of Pump
 - (j) Surges in open Channels

Section-A

2. A smooth pipe of diameter 400mm & length 800m carries water at the rate of 0.04m³/sec. Determine the head lost due to friction, wall shear stress, center line velocity and thickness of laminar sub-layer. Take kinematic viscosity of water 0.18 stokes. 20

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3. (a) Explain various energy losses through pipe. 10
 (b) At a sudden enlargement of a water main from 240mm to 480mm dia, the hydraulic gradient rise by 10mm. Estimate the rate of flow. 10

Section-B

4. (a) Explain various types of flow in channel. 8
 (b) Derive the formula for most economical trapezoidal channel. 12
5. (a) The discharge of water through a rectangular channel of width 8m is 18m³/sec when depth of flow of water is 1.5m. Calculate specific energy of flowing water, critical velocity and value of minimum specific energy. 15
 (b) Explain classification of surface profile. 5

Section-C

6. (a) Two jets strike the buckets of a pelton wheel, which is having shaft power 15400 KW. The diameter of each jet is 250mm. If the net head on the turbine is 400m, find the overall efficiency of the turbine. Take $C_v = 1.2$. 15
 (b) Describe the components of radial flow reaction turbine with neat diagram. 5
7. (a) Explain various characteristics curves of hydraulic turbines. 12
 (b) Explain various type of turbines and various parts of turbines. 8

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Section-D

8. (a) Derive the expression for specific speed of a centrifugal pump. 10
(b) Explain the working of a single stage centrifugal pump with a neat sketch. 10
9. (a) A single acting reciprocating pump running at 40rpm, discharges $1.5\text{m}^3/\text{sec}$ of water. The diameter of the piston is 250mm and stroke length 500mm. Determine the theoretical discharge of the pump, co-efficient of discharge and percentage of slip of the pump. 15
(b) Describe the working of air-vessels. 5

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