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Paper ID [PE204]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 4th)

FLUID MECHANICS AND FLUID MACHINERY (PE - 204)

Time : 03 Hours **Maximum Marks : 60**

Instruction to Candidates:

1) Section - A is **Compulsory.**
2) Attempt any **Four** questions from Section - B.
3) Attempt any **Two** questions from Section - C.

Section - A

Q1) *(10 × 2 = 20)*

a) What is a real fluid?

b) Define compressibility.

c) What is meant by buoyancy?

d) What is dimensional homogeneity?

e) What is the use of a rotameter?

f) What is a reaction turbine?

g) What is the use of a centrifugal pump?

h) What is a draft tube?

i) What do you understand by priming?

j) What is a reciprocating pump?

Section - B

(4 × 5 = 20)

Q2) Find the density of a metallic body which floats at the interface of mercury of sp. gravity 13.6 and water such that 40% of its volume is submerged in mercury and 60% in water.

Q3) Derive an expression for discharge through venturimeter.

Q4) How are the repeating variables selected for dimensional analysis? Discuss.

Q5) With the help of neat sketches, explain the conditions of equillibrium for floating and submerged bodies.

Q6) Explain the working of a centrifugal pump with sketch.

Section - C

(2 × 10 = 20)

Q7) Derive the continuity equation for a three dimensional flow in Cartesian co-ordinates.

Q8) Describe briefly the function of main components of Pelton turbine with a neat sketch.

Q9) A jet of water of diameter 150 mm strikes a flat plate normally with a velocity of 12 m/s. The plate is moving with a velocity of 6 m/s in the direction of jet and away from the jet. Find :

(a) The force exerted by the jet on the plate.

(b) Work done by the jet on the plate per second.

(c) Power and

(d) Efficiency of the jet.