

**DIPLOMA EXAMINATION IN ENGINEERING/TECHNOLOGY/MANAGEMENT/  
COMMERCIAL PRACTICE – APRIL - 2023**

**FLUID MECHANICS AND HYDRAULIC MACHINES**

(Maximum Marks : 75)

[Time : 3 hours]

**PART-A**

**I. Answer all the following questions in one word or sentence. Each question carries 1 mark.**

**(9x1=9 marks)**

		Module Outcome	Cognitive level
1	Ratio of weight per unit volume is.....	M1.01	R
2	Density of water at 4°C is.....	M1.01	R
3	Unit of viscosity in CGS system.	M1.01	R
4	Venturimeter is used for the measurement of .....of liquid through pipes.	M2.04	U
5	If the energy available at inlet is kinetic energy and pressure energy, that turbine is known as.....turbine.	M3.05	U
6	Name an inward radial flow reaction turbine.	M3.05	R
7	For high head and low discharge, the suitable turbine is.....	M3.04	U
8	The ratio of power available at the impeller to the power at the shaft in a centrifugal pump is known as.....efficiency.	M4.03	U
9	To discharge a large quantity of liquid by multistage centrifugal pump, the impeller is connected in.....	M4.03	U

**PART B**

**II. Answer any Eight questions from the following. Each question carries 3 marks.**

**(8x3=24)**

		Module Outcome	Cognitive level
1	Define Specific gravity of fluid.	M1.01	R
2	State Pascal's law.	M1.03	R
3	Explain laminar and turbulent flow.	M2.01	R
4	State limitations of Bernoulli's equation.	M2.07	R
5	Explain the working of pitot tube.	M2.04	U
6	Draw the layout of hydroelectric power plant.	M3.03	U
7	Name the parts of a centrifugal pump.	M4.01	U
8	Define slip and percentage of slip in a reciprocating pump.	M4.07	U
9	Define Cavitation.	M4.02	R
10	A single-acting reciprocating pump operating at 120 r.p.m has a piston diameter of 200 mm and stroke of 300 mm. The suction and delivery heads are 4 m and 20 m, respectively. Determine the power required by the pump.	M4.06	A

**PART C**

Answer **all** questions from the following. Each question carries 7 marks.

**(6x7=42marks)**

		Module Outcome	Cognitive level
III	Calculate the density and specific weight of 1 litre of petrol of specific gravity 0.7	M1.02	U
	<b>OR</b>		
IV	Convert 800000 N/m <sup>2</sup> into pressure head a) Equivalent water height b) Equivalent height of oil having specific gravity 0.8 c) Equivalent mercury height.	M1.04	U
V	Explain head loss in pipes.	M2.07	U
	<b>OR</b>		
VI	Explain hydraulic co efficient of orifice.	M2.06	U
VII	In a pipe of diameter 350 mm and length 75 m water is flowing at a velocity of 2.8 m/s. Find the head lost due to friction using: (i) Darcy-Weisbach formula; (ii) Chezy's formula for which C=55. Assume kinematic viscosity of water as 0.012 stoke, co-efficient of friction, f = 0.00263	M2.08	A
	<b>OR</b>		
VIII	A horizontal venturimeter with inlet diameter 30 cm and throat diameter 15 cm is employed to measure the flow of water. The reading of the differential manometer connected to the inlet is 20cm of mercury. If the co-efficient of discharge is 0.98, determine the rate of flow.	M2.05	A
IX	A nozzle of 10 cm diameter delivers a stream of water at 15 m/s perpendicular to a plate that moves away from the jet at 6 m/s. Find: (i) The force on the plate (ii) The work done (iii) The efficiency of the jet.	M3.02	A
	<b>OR</b>		
X	Explain the working principle of Kaplan turbine with neat sketch.	M3.05	U
XI	Explain Unit quantities of a turbine.	M3.05	U
	<b>OR</b>		
XII	Explain different types of draft tube.	M3.06	A
XIII	Explain the differences between centrifugal pump and reciprocating pump.	M4.01	U
	<b>OR</b>		
XIV	Explain the working of an air lift pump with neat sketch.	M4.08	U

\*\*\*\*\*