M-402 HYDRAULICS & FLUID POWER SYTEMS

MODEL BLUE PRINT OF THE QUESTION PAPER

Sl. No	Chapter Name	Periods Allocated	Weightage Allocated	Question Wise Distribution of Weightage			Marks Wise Distribution of Weightage		
				R	U	Ap	R	U	Ap
1	Fluid Statics	10	16	1	1	1	3	3	10
2	Fluid Dynamics	14	26	1	1	2	3	3	20
3	Flow through pipes	14	26	1	1	2	3	3	20
4	Hydraulic Machines	14	26	1	1	2	3	3	20
5	Fluid Power Systems	08	16	1	1	1	3	3	10
TOTAL		**60**	**110**	**5**	**5**	**08**	**15**	**15**	**80**

Unit Test - 1

Q.No	Question from the Chapter	Bloom's category	Marks allocated	CO addressed
Part - A (16 marks)				
1	Fluid Statics, Fluid Dynamics and Flow through pipes	R,U	4	CO1,CO2, CO3
2,3	Fluid Statics	U	6	CO1
4	Fluid Dynamics	U	3	CO2
5	Flow through pipes	U	3	CO3
Part - B (24 marks)				
6	Fluid Statics	Ap	8	CO1
7	Fluid Dynamics	Ap	8	CO2
8	Flow through pipes	Ap	8	CO3

Unit Test - 2

Q.No	Question from the Chapter	Bloom's category	Marks allocated	CO addressed
Part - A (16 marks)				
1	Hydraulic Machines and Fluid Power systems	R,U	4	CO4,CO5
2,3,4	Hydraulic Machines	U	3	CO4
5	Fluid Power systems	U	3	CO5
Part - B (24 marks)				
6,7	Hydraulic Machines	Ap	16	CO4
8	Fluid Power systems	Ap	8	CO5

R-Remembering; U-Understanding; Ap-Applying; An- Analylising

MODEL PAPER

Unit Test - 1

HYDRAULICS & FLUID POWER SYTEMS (M-402)

Time : 90 Minutes Total Marks: **40**

PART – A

Instructions: *1st Question having 4 one mark questions, and remaining 4Questions carry 3 marks each*

1. (a) One liter of a certain fluid weighs 8N. specific volume of the same fluid is----------

   (b) ----------is the formula for determining the size of equivalent pipe for two pipes of lengths L1, L2 and diameters d1, d2 respectively? Where, L = L1 + L2
   (c) In a steady, ideal flow of an incompressible fluid, total energy at any point of the fluid is always constant. This theorem is known as----------
   (d) The imaginary line drawn in the fluid in such a way that the tangent to any point gives the direction of motion at the point, is called as----------

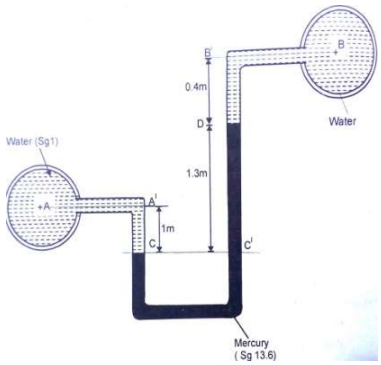
2. Define Specific gravity, Surface Tension and Bulk Modulus.
3. State the condition for maximum power transmitted through a pipe. What is the corresponding maximum efficiency?
4. State any three assumptions made in Bernoulli's theorem.

5. Define Absolute pressure and Vaccum Pressure and give the formulae.

PART – B

Instructions: *Part B consists of **3** Units. Answer any one full question from each unit. Each question carries 8 marks and may have sub questions.*

6. A U-tube differential manometer, containing mercury is connected to two pipes as shown in figure. The pipes are carrying water. Find the pressure difference between two pipes.



(OR)

Explain the Bourdan Pressure Gauge with neat Sketch.

7. A vertical pipe of 15 m high and 6 m in diameter is filled with water. The distance between datum to the pipe bottom is 3 m. How much potential energy is stored in the water? Also express potential energy in terms of energy head.

(OR)

A 50 cm diameter pipe, carrying water, branches into two pipes of diameters 30 cm and 15 cm respectively. The mean velocity in the 50 cm diameter pipe is 3 m/sec and in the 30 cm diameter pipe is 2 m/sec. Determine.

(a) Discharge in 50 cm pipe.
(b) Velocity in 15 cm pipe.

8. Water is supplied from a reservoir through a 300 mm diameter pipe and 600 m long to a turbine which is situated 108m below the free surface. Discharge through the pipe is 81 lit/sec. Find the head lost and the power transmitted by the pipe? Darcy's friction factor, f =0.01.

(OR)

Find the maximum power that can be transmitted to a power station through a hydraulic pipe 3 km long and 20 cm diameters, when the pressure at the power station is 600 kN/m^2. Take f = 0.0075.

MODEL PAPER

Unit Test - 2

HYDRAULICS & FLUID POWER SYTEMS (M-402)

Time : 90 Minutes Total Marks: **40**

PART – A

Instructions: *1st Question having 4 one mark questions, and remaining 4Questions carry 3 marks each*

1. (a) Pelton turbine the energy available at inlet of runner that is at outlet of nozzle is known as----------
   (b) Francis Turbine is a Reaction turbine. (True/False)

   (c) Centrifugal pumps transport fluids by converting _____ energy to_____ energy
   (d) The speed of the reciprocating pump is generally measured in _____

2. What is priming and why it is necessary
3. State any three differences between peloton wheel and Francis turbine.
4. Classify water turbines according to the direction of flow?
5. Define static and manometric heads of a centrifugal pump?

PART – B

Instructions: *Part B consists of **3** Units. Answer any one full question from each unit. Each question carries 8 marks and may have sub questions.*

6. Explain the Constructional details and working of Kaplan turbine

(OR)

Explain the Constructional details and working of Francis turbine

7. Explain the working of reciprocating pump.

(OR)

Explain the working of centrifugal pump

8.Explain the Pneumatic system with a schematic diagram

(OR)

Explain the hydraulic system with a schematic diagram.

MODEL PAPER
DME - FOURTH SEMESTER END EXAMINATION
HYDRAULICS & FLUID POWER SYTEMS

Time: **3** hours] [Total Marks: **80**

PART – A **3 x 10 = 30**

Instructions: (1) Answer **all** questions.
(2) Each question carries **Three** marks.

1. Define the following fluid properties *(a)* Viscosity *(b)* Surface tension

2. Calculate the specific gravity of a liquid whose specific weight is 7·5 k N/m^3?

3. State any three limitations of Bernoulli's theorem

4. State continuity equation and mention units of each term.

5. Water flows through a pipe 250 mm in diameter and 60 m long with a velocity of 3 m/s. Find the loss of head due to friction by using Darcy's formula when f = 0·005.

6. State major energy losses and minor energy losses in pipes

7. Write the applications of centrifugal pump?

8. Write any three differences between Impulse turbine and Reaction turbine.

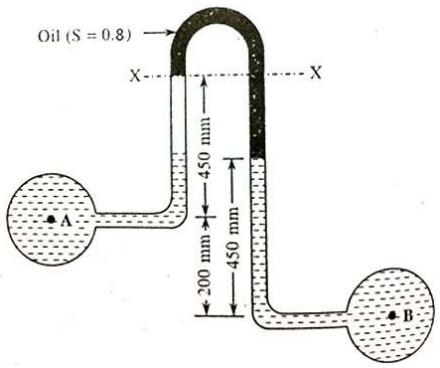
9. Write advantages and applications of fluid power systems.

10. List out any six applications of fluid power systems.

PART – B **5 x 10 = 50**

Instructions: (1) Answer all **Five** questions either A or B from each question.
(2) Each question carries **Ten** marks.

11. (A) An inverted differential manometer is connected to two pipes A and B carrying water as shown in the figure. The fluid in the manometer is oil of specific gravity 0.8. Determine the pressure difference between A and B.



12. A pipe 300m long has a slope of 1 in 100 taper from 1.5 m diameter at the higher end to 0.75 m diameter at the lower end. The discharge of water through the pipe is 5500 litre/min. If the pressure at the higher end is 100 kPa, then find the pressure at the other end

13. A horizontal venturi meter, 30 cm × 15 cm, discharges 80 litre/sec. If the difference of the pressure head between inlet and throat is 1·5 m of water, find the coefficient of discharge of venturi meter

14. Find the maximum power transmitted through a pipe of 100 mm diameter and 2 km long. The supply head is 4·9 kPa. [Take f = 0.01]

15. Two reservoirs are connected by a straight pipe 1·6 km long for the first half of its length it has 160 mm diameter and then suddenly reduced to 80 mm. The water level in the two reservoirs differ by 30 m. Determine the rate of flow in litre/min. [Take f = 0.01] Neglect minor losses.

16. Explain the working of Kaplan turbine with a neat sketch.

17.Explain the working of centrifugal pump with a neat sketch.

18.Explain Pneumatic system with a schematic diagram

M-403 THERMAL ENGINEERING- II
Blue Print of Model Question Paper

Sl. No.	Chapter Name	Periods Allocated	Weightage Allocated	Question Wise Distribution of Weightage			Marks Wise Distribution of Weightage		
				R	U	Ap	R	U	Ap
1	Internal Combustion Engines.	19	26	1	1	2	3	3	20
2	Performance of IC Engines.	12	16	1	1	1	3	3	10
3	Air Compressors.	16	26	1	1	2	3	3	20
4	Gas Turbines & Jet Propulsion.	14	21	1	1	1 ½	3	3	15
5	Automobile Technology	14	21	1	1	1 ½	3	3	15
TOTAL		**75**	**110**	**5**	**5**	**08**	**15**	**15**	**80**

R-Remember; U-Understanding; Ap-Application ; An- Analylising

Unit Test – 1