

HYDRAULIC MACHINES & INDUSTRIAL FLUID POWER

TH-03



BRANCH-MECHANICAL ENGINEERING

SEMESTER-5th

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CHAPTER-01

HYDRAULIC TURBINES

QUESTIONS FOR 2 MARKS

1. Classify the turbine according to inlet energy and head.
2. State the function of nozzle in pelton wheel turbine.
3. Explain the function of breaking jet in Pelton wheel turbine.
4. State any two function of draft tube .
5. Define cavitation in turbine.

QUESTIONS FOR 10 MARKS

1. Differentiate between Francis and Kaplan turbine.
2. Draw and explain hydroelectric power plant.
3. Draw and explain Francis turbine.
4. Draw inlet and outlet velocity triangle for bucket in Pelton wheel with meaning of each term.
5. A Pelton wheel develops 200kw under a head of 100 meter and with an overall efficiency of 85%. Find diameter of nozzle if $CV=0.98$.of nozzle.
6. A Francis turbine produces 3160 kW under a head of 144 m at a overall efficiency of 86%.it rotates at 1000 rpm. Taking speed ratio as 0.9 and flow ratio as 0.3, find the guide blade angle at inlet, diameter of runner and width of runner at inlet. Assume radial discharge and hydraulic efficiency as 90% .

CHAPTER- 2&3

CENTRIFUGAL PUMP AND RECIPROCATING PUMP

QUESTIONS FOR 2 MARKS

1. Define Slip and Negative slip.
2. Define NPSH.
3. Define priming. State its methods.
4. State function of air vessel in reciprocating pump.
5. What is multistaging of centrifugal pump?
6. Draw neat sketch of vortex casing.

QUESTIONS FOR 10 MARKS

1. Explain construction and working of Centrifugal pump.
2. Explain construction and working of single acting reciprocating pump.
3. Explain pump in parallel and pump in series.
4. Differentiate between centrifugal pump and reciprocating pump.
5. State various type of casing in centrifugal pump. Explain any one.
6. A centrifugal pump delivers 30 liters of water per second to a height of 18 meters through a pipe 90 m long and 100 mm diameter. If the overall efficiency of the pump is 75%, find the power required to drive the pump. Take $f=0.012$.

CHAPTER-4&5
PNEUMATIC CONTROL SYSTEM

QUESTIONS FOR 2 MARKS

1. What is a two way valve?
2. List any four types of pressure control valves
3. Differentiate between pressure reducing valve and pressure relief valve giving graphical symbol.
4. What are the different between pilot operated and direct operated pressure relief Valve?
5. What is the function of accumulator?
6. What is a combined flow control valve and check valve?
7. What are the function of reservoir?
8. What is the purpose of regenerative circuit?
9. Define 'pressure override' in pressure controls valves.
10. Highlight the need of using an accumulator in hydraulic circuits.
11. What is twin pressure valve?
12. What are the control functions of different valves in hydraulic systems?
13. What is a control valve?
14. What are a positive displacement pump and a non-positive displacement pump?
15. Mention different types of pumps used in fluid power system?
16. List the factors to be considered in the pump selection?
17. What are pump characteristic curves? Draw the same for the positive displacement Pump.
18. Why end cushions are used in cylinders?
19. How do you select hydraulic pipes for a hydraulic system?

QUESTIONS FOR 10 MARKS

1. (i) With neat sketch describe the construction and operation of pressure regulated low control valve.
(ii) Explain the working of four way two position direction control valve .
2. (i) Briefly explain any two type of accumulators.
(ii) Explain the working of four-way three position control valve
3. (i) Explain the operational features of check valve with neat diagram.
(ii) Write short notes on shuttle valve
(iii) Which kind of accumulator operates at constant pressure? How can the pressure Changed?
4. (i) Explain air over oil intensifier with suitable example.
(ii) With neat sketch Explain the weight loaded accumulator
5. (i) Explain with a circuit how in shaping operation a fast approach, slow feed, and rapid return can be achieved.
(ii) Explain with a circuit how punching operation can be achieved
6. (i) How does the pilot operated direction control valve function? Explain with neat diagram.
(ii) Discuss with neat diagram the working of non-return valve.
7. Design a suitable circuit.
(i) Two hydraulic cylinders two work in sequence.
(ii) An hydraulic cylinder is used for industrial application. It has been decided to use an accumulator as a leakage compensator. Design a circuit to fulfill these requirements.