GOVT. POLYTECHNIC MAYURBHANJ, TIKARPADA
DISCIPLINE: MECHANICAL ENGG.

SUBJECT- HM & IFP

Question bank- 5TH Semester

CHAPTER – 01

HYDRAULIC TURBINE :

1. State the working principle of water turbine ?
2. State the advantages & disadvantages of hydro electric plant ?
3. Draw a layout of hydro-electric power station & name the parts ?
4. State the types of turbine based on water flow,supply head,specific speed, energy available,discharge of water ?
5. Explain the working of Pelton wheel with diagram & also draw the velocity triangle ?
6. Explain the working principle of Francis turbine with diagram & also draw the velocity triangle ?
7. Write the difference between Impulse turbine &Reaction turbine ?
8. Explain the working principle of Kaplan turbine with diagram & also draw the velocity triangle?
9. Distinguish between Kaplan turbine &Francis turbine?
10. Write down the efficiency of Pelton turbine, Francis turbine, Kaplan turbine ?
11. A Francis turbine is working under a head of 150 m. The discharge through the turbine is 100 m^3/sec. The inlet & outlet diameters of the runner are 3.6 m and 2.4 m respectively. Its inlet vane angle is 120°. The discharge is radial at outlet with 15 m/sec as velocity of flow. Hydraulic efficiency is 90% and width of wheel is constant. Find the power produced & speed of the turbine ?
12. A Kaplan turbine is required to develop 7000 KW under a head of 4 m, speed ratio is 2, flow ratio is 0.7 and the ratio of boss diameter to runner diameter is 0.35 . Find the speed of runner assuming 90% overall efficiency ?
13. Write down the efficiency of Pelton turbine, Francis turbine, Kaplan turbine ?

CHAPTER –02

CENTRIFUGAL PUMPS

1. Define pump ?
2. List the classification of pumps ?
3. Explain the working principle of a centrifugal pump with a neat sketch & also draw the velocity triangle ?
4. State the difference between the pump &Turbine ?
5. What is cavitation ? What are the effects of cavitation ?
6. How can cavitation be eliminated in centrifugal pump ?
7. What is priming in Centrifugal pump & Explain its types ?
8. What is casing &Explain its types ?
9. The impeller of a centrifugal pump has external & internal diameters of 500 mm & 250 mm respectively. Blade angle at outlet is 30°. Speed of the impeller is 1250 rpm. Velocity of flow at inlet & outlet is same at 2.5 m/sec. If manometric efficiency is 78% find - (i) Head developed (ii) Absolute velocity at outlet and (iii) Blade angle at inlet.
10. A centrifugal pump has external & internal impeller diameters of 600 mm & 300 mm respectively. The vane angle at outlet & inlet are 30°& 45° respectively, if water enters the impeller at 2.5 m/sec. Find speed of the impeller in rpm &work done/Kg of water.

CHAPTER – 03

RECIPROCATING PUMPS

1. Explain the principle of working of a double acting Reciprocating pump with a neat sketch ?
2. Explain the principle of working of a single acting Reciprocating pump with a neat sketch ?
3. Write the difference between Centrifugal pump & Reciprocating pump ?
4. A single acting Reciprocating pump having a bore of 150 mm and stroke of 300 mm length discharges 0.02 $m^3$of water per minute running at 40 rpm. The delivery and suction heads 24 m & 6 m respectively. Find theoretical discharge in Liters/min, co-efficient of discharge, slip of pump, power required to drive the pump if its efficiency is 80% ?
5. A single acting single cylinder reciprocating pump has a plunger diameter 600 mm, stroke 360 mm, speed 75 rpm. Static lift 12 m & discharge 6870 Liters/min. Determine co-efficient of discharge, slip & power required to run the pump if efficiencyis 80% ?
6. What is slip of reciprocating pump ?

CHAPTER - 04

PNEUMATIC CONTROL SYSTEM

1. Define pneumatic circuit?
2. State the application of pneumatic system ?
3. Why air used in pneumatic system ?
4. What is FRL units & Explain each briefly ?
5. Explain direction control valve (DCV) ?
6. Explain flow control valve (FCV) ?
7. Write the working principle of pressure relief valve ?
8. What is the purpose of pressure regulator ?
9. Explain the principles & working of pneumatic circuits for control of single acting cylinders & double acting cylinder ?
10. What is actuator ?

CHAPTER – 05

HYDRAULIC CONTROL SYSTEM

1. Define hydraulic machine ?
2. Define fluid power system ?
3. Write the difference between hydraulic system & pneumatic system ?
4. Merits, Limitations & Application of hydraulic system ?
5. Draw a line diagram of a hydraulic circuit & name the elements ?
6. What is hydraulic accumulators ?
7. What is fluid power pump ?
8. Write the difference between Positive displacement pump &Rotodynamic pump ?
9. What is gear pump & Explain its types ?
10. Write the difference between Hydraulic system &Mechanical system ?
11. What is throttle valve ?
12. Explain the working principle of different vane pump with neat sketch ?
13. Draw the symbol of single acting cylinder, double acting cylinder & pressure relief valve ?
14. Why & where filters are fitted in a hydraulic system ?