

INDIAN MARITIME UNIVERSITY
(A Central University, Government of India)

END SEMESTER EXAMINATION December 2017

Programme: B.Tech (Marine Engineering)

Semester: VII

Subject Name: Advanced Hydraulics & Hydraulic Machinery

Subject Code: UG11E2701

Date: 15.12.2017

Maximum Marks: 100

Time: 3 Hrs

Pass Marks: 50

PART – A
(All questions are compulsory)

(10 x 3=30 Marks)

1. a) How does a Gerotor pump work ?
- b) Classify the different types of Gear pumps.
- c) Explain the principle of a pressure relief valve.
- d) What are the different types of filters?
- e) Explain the principle of operation of a poppet valve.
- f) How can you calculate the volumetric displacement by a Gear pump?
- g) How does a hydraulic jack work?
- h) Where can the check valves be applied?
- i) Explain the working principle of a hydraulic crane.
- j) How does a screw pump operate?

PART – B

Answer any 5 of the following

(5 x 14=70 Marks)

- 2 a) Describe the advantages of a Hydraulic System.
- b) What are the major components of a basic hydraulic system?
- c) Why a positive displacement pump is used in a hydraulic system?
- 3 a) Explain the working principle of a Hydraulic Press.
- b) A hydraulic press has a ram of 15 cm diameter plunger of 2 cm diameter. The stroke of the plunger is 20 cm and weight lifted is 800 kgf. If the distance moved by the weight is 1.0 m in 20 minutes, determine:
 - (i) The force applied on the plunger,

- (ii) Number of strokes performed by the plunger.
4.
 - a) Explain the principle of operation of a piston type accumulator.
 - b) How does a diaphragm accumulator work?
 5.
 - a) Explain the working principle of an external Gear Pump.
 - b) What are the different types of Vane Pumps?
 - c) Narrate the construction features and principle of operation of a vane pump.
 6.
 - a) Write about important requirements of filtration in hydraulic system.
 - b) What is by-pass filter? How does it work?
 - c) What are the advantages of a by-pass filter?
 7.
 - a) A cylinder has to operate a vertical load of 600 kgf. If the operating acceleration is 30 m/sec^2 , calculate its running force.
 - b) What is effective cylinder force?
 - c) What are the different types of a cylinder? Discuss about one type.
 8.
 - a) Narrate the working principle of a torque convertor with the help of a neat sketch
 - b) How does a fluid coupling work?
 - c) The water is supplied at a pressure of 1.4 kgf/cm^2 to an accumulator having a ram of diameter 1.5 m. If the total lift of the ram is 8m determine: the capacity of the accumulator and total weight placed on the ram.
