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 arte 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 of1.4 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.
