

**INDIAN MARITIME UNIVERSITY**  
(A Central University, Government of India)  
**End Semester Examination Dec 2019/Jan 2020**  
**B.Tech (Marine Engineering)**  
**Semester- VIII/VII**

**UG11E1801/E2701- Advanced Hydraulics and Hydraulic Machinery**

---

**Date: 20.12.2019**

**Max Marks: 70**

**Time: 3 Hours**

**Pass Marks: 35**

---

**Part – A (compulsory)**

**Answer the following (10x2=20 Marks)**

1. Brief about 'Proportional valves.' Mention most common proportional control valves used.
2. Give any two examples each for (i) hydrostatic machine and (ii) hydrokinetic machine. Mention which pump creates more suction at inlet, hydrostatic or hydrokinetic.
3. What are referred to as flow ripple in axial piston pumps? What are the effects of 'flow ripple'?
4. What is meant by precharging in case of accumulators? Mention the importance of ensuring correct precharge pressure?
5. What is the function of return-line filters? Why do they have integral bypass check valves?
6. (a) What are the functions of reservoir tank fitted in a hydraulic system?  
(b) What provision is made inside the tank to prevent solid contaminants coming from return line getting into the suction line immediately?
7. What is the result of using a higher viscous hydraulic oil than recommended one in a system?
8. How is the temperature control maintained in a hydraulic system?
9. Mention any 6 applications of hydraulic systems on board a ship.
10. What are the safety devices fitted in a crane?

## Part – B

**Answer any 5 out of 7 questions (5 x 10= 50 marks)**

11. Describe about an Inline linear axial piston swash plate type hydrostatic pump with a diagram. (10 marks)
12. Describe the working principle of Fluid coupling with a sketch. Mention few applications of this coupling. (10 marks)
13. What are the functions of accumulators in hydraulic system? (10 marks)
14. (a). Explain the function of counterbalance valve using a simple diagram. (6 marks)  
  
(b). Draw symbolic representation of following:  
(i) Variable flow double outlet hydraulic motor, (ii) Palm button operated, spring return, 3/2, normally closed valve. (4 marks)
15. (a) Describe the working principle of a balanced type vane pump with a sketch. (6 marks)  
(b) Mention any two advantages and two disadvantages of vane pumps. (2 marks)  
(c) Mention any two advantages and two disadvantages of balanced vane pump over unbalanced vane pump. (2 marks)
16. Describe the operation of hydraulic deck crane with a hydraulic circuit diagram. (10 marks)
17. Describe the working principle of a hydraulic jack with a diagram. (10 marks)