College of Engineering, Pune

Department of mechanical Engineering

End Semester Examination (autumn seme-2012)

Fluid Machinery and Fluid Power (ME302)

Time 3 hrs   Max marks-50

Date 2/12/2012

1. *Solve five questions*

Que1 (a)	What is the difference between Gerotor and Gerolar . Why Gerolar is prefer over Gerotor	3
Que1 (b)	Justify that use of rotary positive displacement pump in automation is more advantageous	3
Que1 (c)	Explain the principle of working of Air lift pump with neat sketch	4
Que 2 (a)	Draw the three sketches of cylinder mounting	3
Que 2 (b)	Explain the design consideration in hydraulic circuit	3
Que 2 (c)	Explain meter in and meter out circuit	4
Que3 (a)	Explain the following terminology with reference to filter(1)silt index(ii)Beta rating(iii)Mesh Number(iv) surface filter	4
Que 3 (b)	Explain the FRL unit used in the pneumatic system	4
Que 3 (c)	Explain the concept of hydraulic coupling	2
Que 4 (a)	Explain the design consideration and features of hydraulic circuit tank	3
Que 4 (b)	What are the selection criteria for fluid conductors	2
Que 4 (c)	Explain the hydraulic circuit for milling machine with neat sketch	5
Que 5(a)	A hydraulic crane is operated by ram fitted with a jigger. The crane is required to lift 598 N at 1.25 meter per second through 80 meter once every 5 minutes. The diameter of ram is 750 mm and the pressure of water is 4 N /mm^2 and mechanical efficiency is 80 %. A pump supply water continuously to the cylinder via accumulator which can store water at the required ram pressure. Find (i) The required minimum pump output (ii)The minimum volumetric capacity of accumulator(iii)The stroke of jigger arm.	5
Que 5 (b)	Explain the construction and principle of operation of hydraulic intensifier	5
Que 6 (a)	Show that in a turbine with radial vane at the receiving circumference the hydraulic efficiency is given by $(2/2+\tan^2 \alpha)$ Where α is the angle made by the guide blade with the wheel tangent at the point where it cuts the receiving circumference, the velocity of flow through the runner being constant. Assume that the turbine is a reaction turbine discharging radially at outlet to atmosphere.	5
Que 6 (b)	Derive the fundamental equation of centrifugal pump	5