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RM-7857

B. E. IV (Sem. VIII) (Mech.) Examination

May / June – 2010

Fluid Power Engineering

(Elective - II)

Time : 3 Hours] [Total Marks : 100

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ B. E. 4 (Sem. 8) (Mech.)

Name of the Subject :

☛ Fluid Power Engineering (Elective - 2)

☛ Subject Code No. : 7 8 5 7 ☛ Section No. (1, 2,.....) : 1&2

Seat No. :

Student's Signature

(2) Attempt all questions.

(3) Answers to the **two** sections must be written in **separate** answer books.

(4) Use of calculator is permitted.

(5) Figures to the **right** indicates full marks.

(6) Assume suitable data if required.

	SECTION - I	
Q-1 (A)	Answer the following questions.	**(10)**
	1. Give the pasca'l law	
	2. Define viscosity index	
	3. Define steady flow process.	
	4. What do you mean by kinetic energy?	
	5. What do you mean by fluid power?	
(B)	Draw the following symbols: 1.Check Valve , 2.On-off Valve, 3.Solenoid operated tandem center valve 4. Flexible line, 5. Line crossing	**(10)**
Q-2 (A)	Explain reciprocation pump with neat sketch.	**(8)**
	(OR)	
(A)	Classify the fluid power pump and write selection criteria of pump.	**(8)**
(B)	Discus on simple hydraulic accumulator with neat sketch.	**(7)**
	(OR)	
(B)	Draw and explain hydraulic regeneration circuit.	**(7)**

Q-3	Answer any two. (15)
	1. Explain fluid reservoir of setting tank. 2. Explain with sketch of internal gear pump. 3. Discus on operation and maintenance of filter and strainer. 4.A cylinder with a bore diameter 75 mm. and a rod diameter 20 mm. is to be used in a system with a 55 Lpm pump. what are the extension and retraction speed ?

Section 2

Q 4

A	Draw the symbols of the following.	10
	1. Check valve – free open if inlet pressure is higher	
	2. Pilot check valve with variable orifice	
	3. Four way direction control valve – normal position	
	4. Solenoid with two winding operating in opposite direction	
	5. Heat exchanger – cooler with liquid cooling	
B	Immersed steam coil for fluid heating	5
C	Automatic fluid temperature control	5

Q 5

A	1. Spring loaded relief valve	5
	2 Total priority circuit for flow control	5
B	A hydraulic pump delivers pressurized fluid at 50 L/min and 9,000 kPa. How much hydraulic power can this pump deliver? If the overall efficiency of this pump is 90%, how much mechanical power is needed to drive the pump? If all the pressurized fluid is delivered to a motor to drive a load, what is the maximum useful power the motor can deliver if the motor has the same overall efficiency as the pump?	5

OR

Q 5

A	A hydraulic cylinder has a diameter of 2.5 inches. Compute the area of the piston. What pressure is developed for lifting 8836 lbf load? What is the pressure in Pascal?	5
B	1. What is the purpose of flow control valve? When is a gate valve used for flow control?	3
	2. What feature is common to relief, safety and counterbalance valve?	2
C	Explain shuttle valve with sketch	5

Q 6 Attempt any three 15

1. Two way direction control valve
2. Pitot valve
3. Counterbalance type holding valve
4. Fluid sealing material