Model Question Paper
(2018 Scheme)

USN | | | | | | | | | | |

Fifth Semester B.E. Degree Examination
18IP54: Hydraulics and Pneumatics

TIME: 03 Hours **Max. Marks: 100**

Note: Answer any one full question from each module

		Module - 1	Marks
Q.01	a)	Name any five basic components required in a hydraulic circuit and mention their functions.	**10**
	b)	Define Pascal's law. Explain the working of hydraulic jack using this law.	**10**
		OR	
Q.02	a)	Explain with a neat sketch the working of a single acting cylinder	**10**
	b)	A hydraulic motor has a 82 cm^3 (0.082L) volumetric displacement. It has a pressure rating of 70 bars and receives oil from a 0.0006m^3/sec (0.60LPs) theoretical flow rate pump. Find the motor speed and theoretical torque.	**10**
		Module – 2	
Q. 03	a)	With a neat sketch explain the working of a pilot operated check valve.	**10**
	b)	With graphical symbol, explain the different Centre flow path configuration of 4/3 direction control valve.	**10**
		OR	
Q.04	a)	Explain the working principles of sequence and counter balance valves along with their symbols	**10**
	b)	Write a note on flow control valves	**10**
		Module – 3	
Q. 05	a)	Draw and explain hydraulic circuit to show synchronization of 2 double acting cylinders	**10**
	b)	Explain with suitable circuits, how the cylinder speed can be controlled by using flow control valves	**10**
		OR	
Q. 06	a)	Discuss a regenerative circuit and explain how it helps to get equal extension and retraction forces	**10**
	b)	Explain the working of solenoid operated 4/3 spring centered directional control valve for automatic cylinder reciprocating system	**10**
		Module – 4	
Q. 07	a)	List and briefly explain the important characteristics of compressed air	**10**
	b)	Explain with a schematic diagram the production of compressed air for pneumatic systems	**10**
		OR	
Q. 08	a)	Explain the construction and working of a rotary (vane) air compressor with a neat diagram	**10**
	b)	With a neat sketch explain how following functions are generated in pneumatic system i) AND function ii) OR function	**10**

Module – 5			
Q. 09	a)	Sketch and explain the working of a double acting cylinder	**10**
	b)	Explain with a neat diagram working principle of quick exhaust valve	**10**
OR			
Q. 10	a)	Explain the functioning of time dependent control pneumatic circuit	**10**
	b)	With sketches, explain the logic of AND and OR gates, used in operation of pneumatic circuits	**10**

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Note: Answer any one full question from each module

Module - 1			**Marks**
Q.01	a)	What are the advantages and limitations of a hydraulic system? Explain briefly.	**10**
	b)	Explain the working of axial piston pump with a neat sketch	**10**
		OR	
Q.02	a)	Explain with a neat sketch the working of a single acting cylinder	**10**
	b)	A gear pump has 75mm outside diameter, 50mm inside diameter and 25mm width. If the volumetric efficiencies is 90%. The pump speed is 1000rpm. What is the corresponding actual flow rate?	**10**
Module – 2			
Q. 03	a)	Explain the working of a direct acting pressure relief valve	**10**
	b)	Explain the actuation of single and double acting cylinder using appropriate direction control valves (DCV).	**10**
		OR	
Q.04	a)	What is the function of pressure reducing valve? Explain its working with a neat diagram	**10**
	b)	Explain the speed control of hydraulic cylinder using 'meter in' and 'meter out' circuits	**10**
Module – 3			
Q. 05	a)	Develop an industrial application circuit of a counter balance valve application	**10**
	b)	What is a filter and how they are classified?	**10**
		OR	
Q. 06	a)	Design and explain the hydraulic power circuit for sequencing of clamping and drilling operations on a work piece in a drilling operation	**10**

	b)	Explain the working of solenoid operated 4/3 spring centered direction control valve for automatic cylinder reciprocating system	**10**
Module – 4			
Q. 07	a)	Develop and explain a hydraulic circuit to show sequencing of 2 cylinders	**10**
	b)	With a neat sketch explain the structure of a pneumatic control system	**10**
		OR	
Q. 08	a)	What is the function of a time delay valve? Explain the constructional features of a typical time delay valve with a neat sketch.	**10**
	b)	With a neat sketch explain how following functions are generated in a pneumatic system i) AND function ii) OR function	**10**
Module – 5			
Q. 09	a)	Explain the working of a memory valve with a neat sketch	**10**
	b)	Explain with a neat diagram working principle of a quick exhaust valve	**10**
		OR	
Q. 10	a)	With a neat diagram explain the procedure for supply air and exhaust air throttling process	**10**
	b)	With neat sketches explain NAND and NOT functions in pneumatic applications	**10**