Model Question Paper -1 with effect from 2020-21(CBCS Scheme)

USN

Fifth Semester B.E. Degree Examination
FLUID POWER ENGINEERING

TIME: 03 Hours   Max. Marks: 100

Note:
01. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
02. Draw neat sketches wherever necessary.

		Module – 1	
Q.1	(a)	With the neat sketch explain the components of hydraulic system.	10M
	(b)	What are the advantages and limitations of hydraulic system?	5M
	(c)	Define Pascal's law and explain with neat sketch.	5M
		OR	
Q.2	(a)	Differentiate between strainers and filters. Discuss the basic methods of filtering used in hydraulic circuits.	10M
	(b)	List and explain the desirable properties of fluid used in the hydraulic system.	5M
	(c)	List and explain different types of sealing materials commonly used.	5M
		Module – 2	
Q.3	(a)	With neat sketch explain the working of variable displacement vane pump.	10M
	(b)	List and explain various pump performance parameters.	5M
	(c)	A pump having 96% of volumetric efficiency drives of 0.030 m^3/min of oil at 1000rpm. Calculate the volumetric displacement of pump.	5M
		OR	
Q.4	(a)	With neat sketch explain the construction and working of gear motor.	10M
	(b)	Sketch and explain pressure switch	5M
	(c)	A hydraulic motor has a displacement of 164 cm^3 and operates with a pressure of 70 bars and a speed of 20000 rpm. If the actual flow a rate consumed by the motor is 0.0006m^3/sec and the actual torque delivered by the motor is 170NM, find i. Volumetric efficiency ii. Mechanical efficiency iii. Overall efficiency iv. The actual kW delivered by the motor	5M
		Module – 3	
Q.5	(a)	With the neat sketch explain the working of needle type flow control valve and sketch the symbols for i. Four ports, three position spring centered solenoid operated DCV ii. Four ports, two position mechanically operated DCV	10M

	(b)	With the neat sketch explain the function of check valve	5M
	(c)	With the neat sketch explain the working of sequence valve	5M
		OR	
Q.6	(a)	With neat hydraulic circuit explain the working of meter in and meter out hydraulic circuits.	10M
	(b)	With neat hydraulic circuit explain the working of regenerative hydraulic circuit	5M
	(c)	With neat hydraulic circuit explain the working of hydraulic cylinder sequencing circuit.	5M
		Module – 4	
Q.7	(a)	What are the different types of pneumatic cylinders and with neat sketch explain any 3 of them.	10M
	(b)	List and explain advantages and limitations of pneumatic system	5M
	(c)	Write a neat sketch explain FRL unit used in pneumatic system	5M
		OR	
Q.8	(a)	With neat sketches explain poppet and suspended seat type slide valve	10M
	(b)	With a neat sketch explain any one pressure control used in a pneumatic system	5M
	(c)	With neat sketch explain time delay valve	5M
		Module – 5	
Q.9	(a)	With neat sketches explain direct and indirect actuation pneumatic cylinders	10M
	(b)	Explain with a pneumatic circuit, the control of extension of double acting cylinder using OR and AND logic gates	10M
		OR	
Q.10	(a)	With a neat sketch and a practical application explain cascading method of principle used in the pneumatic applications	10M
	(b)	Write a note on i. Principles of signal input and output ii. Pilot assisted solenoid control of directional control valve	10M

Table showing the Bloom's Taxonomy Level, Course Outcome and Programme Outcome			
Question	Bloom's Taxonomy Level attached	Course Outcome	Programme Outcome
Q.1 (a)	L2	CO1	PO1, PO2, PO3, P12
(b)	L2	CO1	PO1, PO2, PO3, P12
(c)	L2	CO1	PO1, PO2, PO3, P12
Q.2 (a)	L2	CO1	PO1, PO2, PO3, P12
(b)	L2	CO1	PO1, PO2, PO3, P12
(c)	L2	CO1	PO1, PO2, PO3, P12
Q.3 (a)	L2	CO2	PO1, PO2, PO3, P12
(b)	L2	CO2	PO1, PO2, PO3, P12
(c)	L3	CO2	PO1, PO2, PO3, P12
Q.4 (a)	L2	CO2	PO1, PO2, PO3, P12
(b)	L2	CO2	PO1, PO2, PO3, P12
(c)	L3	CO2	PO1, PO2, PO3, P12
Q.5 (a)	L2	CO3	PO1, PO2, PO3, P12
(b)	L2	CO3	PO1, PO2, PO3, P12
(c)	L2	CO3	PO1, PO2, PO3, P12
Q.6 (a)	L4	CO3	PO1, PO2, PO3, P12
(b)	L4	CO3	PO1, PO2, PO3, P12
(c)	L4	CO3	PO1, PO2, PO3, P12
Q.7 (a)	L2	CO4	PO1, PO2, PO3, P12
(b)	L2	CO4	PO1, PO2, PO3, P12
(c)	L2	CO4	PO1, PO2, PO3, P12,
Q.8 (a)	L2	CO4	PO1, PO2, PO3, P12
(b)	L2	CO4	PO1, PO2, PO3, P12
(c)	L2	CO4	PO1, PO2, PO3, P12,
Q.9 (a)	L2	CO5	PO1, PO2, PO3, P12
(b)	L3	CO5	PO1, PO2, PO3, P12

Q.10	(a)	L2	CO5	PO1, PO2, PO3, P12
	(b)	L2	CO5	PO1, PO2, PO3, P12

Bloom's Taxonomy Levels	Lower order thinking skills		
	Remembering(knowledge):$\square_1$	Understanding Comprehension): $\square_2$	Applying (Application): $\square_3$
	Higher order thinking skills		
	Analyzing (Analysis): $\square_4$	Valuating (Evaluation): $\square_5$	Creating (Synthesis): $\square_6$

Model Question Paper -2 with effect from 2020-21(CBCS Scheme)

USN

Fifth Semester B.E. Degree Examination
FLUID POWER ENGINEERING

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Note:
03. Answer any **FIVE** full questions, choosing at least **ONE** question from each **MODULE**.
04. Draw neat sketches wherever necessary.

Module – 1			
Q.1	(a)	State Pascal's law and explain the working of hydraulic jack using Pascal's law.	10M
	(b)	Explain the concept of transmission of power in static and dynamic states with examples	5M
	(c)	List the types of hydraulic fluids used in a hydraulic systems stating its advantages	5M
OR			
Q.2	(a)	List and explain different types of seals used in hydraulic systems and its compatibility with hydraulic fluids	10M
	(b)	List and explain types of hoses and pipes used in a hydraulic system.	5M
	(c)	With a neat sectional view explain the construction of hydraulic oil reservoir.	5M
Module – 2			
Q.3	(a)	What are the important considerations taken while selecting a pimp for particular applications? Explain procedure	10M
	(b)	A gear pump has an outside diameter of 80mm, inside diameter of 55mm and a width of 25mm. If the pump speed is 1600rpm and actual flow rate is 95 LPM, what is the volumetric displacement and theoretical discharge?	5M
	(c)	List and explain different types of accumulator.	5M
OR			

Q.4	(a)	Give the detailed classification of pumps and motors	10M
	(b)	With neat sectional view of a cylinder explain the cushioning effect cylinders.	5M
	(c)	A hydraulic cylinder used in a hydraulic power system has a bare diameter of 120mm and the rod diameter of 30mm. Determine the velocities of extension and retraction, if pump flow rate is 60 LPM.	5M
Module – 3			
Q.5	(a)	With a neat chart give detailed classification of control valves used in hydraulic system	10M

	(b)	With the neat sketch explain the function of shuttle valve	5M
	(c)	Differentiate the working of direct operated and pilot operated pressure control valves stating with advantages.	5M
OR			
Q.6	(a)	With neat hydraulic sketch explain the working and control of single and double acting cylinders.	10M
	(b)	With neat hydraulic circuit explain the working of hydraulic circuit for force multiplication.	5M
	(c)	With neat hydraulic circuit explain the working of counter balance valve application.	5M
Module – 4			
Q.7	(a)	Explain with a neat schematic diagram, fluid conditioner device to make the air more acceptable medium for a pneumatic system effective performance and draw the graphic symbol for the same.	10M
	(b)	Explain the construction details of a linear double acting pneumatic cylinder.	5M
	(c)	Draw a schematic diagram of a vane type of air motor and explain its construction	5M
OR			
Q.8	(a)	Illustrate the working of a quick exhaust valve with a neat sketch.	10M
	(b)	Discuss the construction and working of a 2 stage piston compressor	10M
Module – 5			
Q.9	(a)	Explain signal overlapping elimination using reversing valves. Draw a neat pneumatic circuit involving two cylinder and a reverse valve.	10M
	(b)	With a help of a neat sketch, explain the working of a time dependent control circuit in a pneumatic system.	10M
OR			
Q.10	(a)	Sketch and explain circuit for air pilot control double acting cylinder.	10M
	(b)	Explain with neat sketch of circuit of sequencing of two pneumatic cylinder that can be done using solenoids, limit switches and valves	10M

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	(c)	L2	CO3	PO1, PO2, PO3, P12
Q.6	(a)	L4	CO3	PO1, PO2, PO3, P12
	(b)	L4	CO3	PO1, PO2, PO3, P12
	(c)	L4	CO3	PO1, PO2, PO3, P12
Q.7	(a)	L2	CO4	PO1, PO2, PO3, P12
	(b)	L2	CO4	PO1, PO2, PO3, P12
	(c)	L2	CO4	PO1, PO2, PO3, P12
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