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Question Paper Code : 91834

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019
Seventh Semester
Mechanical Engineering
ME 6021 - HYDRAULICS AND PNEUMATICS
(Regulations 2013)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART - A

(10×2=20 Marks)

1. Why is hydraulic power especially useful when performing heavy work ?
2. List five fields of application where fluid power can be used more effectively than other power sources.
3. Why gear pumps cannot be used as a variable displacement pump ?
4. List the important considerations in the selection of a pump for any given application.
5. State the functions of accumulators.
6. What is fail-Safe circuit ?
7. What is a Muffler ?
8. Distinguish between check valve and directional control valve.
9. Define PLC and list the components present in PLC.
10. What is an electro-mechanical relay ?

PART - B

(5×13=65 Marks)

11. a) Explain with neat sketch of the basic hydraulic system and its components.

(OR)

- b) Discuss the petroleum base hydraulic oils and non-petroleum base hydraulic oils.

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12. a) Distinguish between non-positive displacement pumps. State the advantages of positive displacement pumps over non-positive displacement pumps.

(OR)

- b) With neat sketch explain the construction and working of telescopic cylinder and state its advantages.

13. a) Draw and explain the working of a sequencing circuit.

(OR)

- b) Explain the construction and working of a mechanical hydraulic servo system with a neat sketch.

14. a) Explain the components of pneumatic system. State the reasons for considering the use of pneumatic systems instead of hydraulic systems.

(OR)

- b) Discuss with neat sketches the construction and working of air filter and air pressure regulator.

15. a) Draw and explain a hydraulic circuit to actuate a shaping machine ram.

(OR)

- b) Discuss the advantages and disadvantages of automation control in industry.

PART – C

(1×15=15 Marks)

16. a) Consider two types of variable speed drives. In the first one an electric motor with a power electronic servo drive is directly coupled to the load through a mechanism. In the second one an electric motor with a constant speed drive drives the pump in a hydraulic system which provides the variable speed drive to the load. Which one of these two is more energy efficient? Discuss in detail.

(OR)

- b) With suitable sketches explain (i) A Practical use of a pneumatic back pressure sensor, (ii) construction of a hybrid sensor amplifier for pneumatic logic circuits, (iii) use of fluidic mono stable OR-NOR devices in circuit. (5+5+5)