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**Question Paper Code: 92011**

M.E. DEGREE EXAMINATION, OCTOBER 2014.

Elective

CAD / CAM

01PCD503 – DESIGN OF HYDRAULIC AND PNEUMATIC SYSTEMS

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. What is a positive displacement pump and how does it differ from centrifugal pump?
2. Hydraulic system especially useful for heavy work- justify.
3. Name the three ways of applying flow control valves.
4. What is need for temperature compensation in flow control valves?
5. What is the function of a sequence valve?
6. Draw the symbols for a pressure relief valve and pressure reducing valve.
7. Write the importance of lubricator in a pneumatic system.
8. When is pneumatics preferred over hydraulics?
9. What are moving part logic elements?
10. What do you mean by logic control?

PART – B (5 x 14 = 70 Marks)

11. (a) Write in detail about the working principle of cylinder cushioning mechanism with diagram and also derive the expression for speed when the piston rod is extending and retracting. (14)

Or

- (b) (i) Explain the construction and operation of screw pump with a neat sketch. Also list its pros and cons. (14)

12. (a) Narrate the working of compound pressure relief valve with a neat diagram. Also write its limitations (14)

Or

(b) Discuss briefly about the construction and working principle of a 4/2 DC valve with a suitable diagram. (14)

13. (a) With a neat sketch , explain the working of an accumulator as a hydraulic shock absorber. (14)

Or

(b) With a neat sketch, explain about pressure intensifier circuit used in punching press application. (14)

14. (a) Explain in detail on regenerative circuit with a diagram and also explain why extension stroke is faster than retraction stroke in the regenerative circuit. (14)

Or

(b) Develop an electro pneumatic circuit by cascade method for the following sequence:  $A^+ B^+ B^- A^-$  where A and B stands for cylinders,(+) indicates extension and (-) retraction of cylinders. (14)

15. (a) Explain in detail about the control of a hydraulic cylinder using a single limit switch with a neat sketch. (14)

Or

(b) Discuss any one type of robotic circuit of your choice with a neat diagram. (14)

PART – C (1 x 10 = 10 Marks)

16. (a) Explain in detail about automatic cylinder reciprocating system with circuit diagram (10)

Or

(b) Discuss briefly about air-over-oil circuit with a suitable sketch (10)