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**E Reg. No. :**

**Question Paper Code: 55P11**

M.E. DEGREE EXAMINATION, NOV 2017

Elective

CAD / CAM

15PCD503 - DESIGN OF HYDRAULIC AND PNEUMATIC SYSTEMS

 (Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

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| 1. | (a) | Explain the working principle of the swash plate piston pump with neat sketch. | CO1- U | (20) |
|  |  | Or |  |  |
|  | (b) | Explain rotary actuator and analyze the torque capacity for the actuator containing single rotating vane.  | CO1- U | (20) |
|  |  |  |  |  |
| 2. | (a) | Explain the working principle of unloading valve with its application  | CO2- U | (20) |
|  |  | Or |  |  |
|  | (b) | State the specification of D/C valve. What is 4/3 D/C valve. State the art of actuation in D/C valve. | CO2- U | (20) |
|  |  |  |  |  |
| 3. | (a) | Sketch the circuit for a hydraulic press incorporating two-hand safety system and explain the same | CO3- Ana | (20) |
|  |  | Or |  |  |
|  | (b) | Describe the hydraulic circuit used to control the motion of a hydraulic surface grinding machine | CO3- Ana | (20) |
|  |  |  |  |  |
| 4. | (a) | Consider an automatic drilling machine with three cylinders. The complete cycle is as follows; Cylinder A extends to clamp the work piece, then cylinder B extends to drill the hole and then retracts. Cylinder A then retracts to unclamp the work piece. Design a control circuit applying step- counter method  | CO4- App | (20) |
|  |  | Or |  |  |
|  | (b) | What are the different types of pneumatic switching elements are there .Explain them in detail  | CO4- App | (20) |
|  |  |  |  |  |
| 5. | (a) | Explain the maintenance and troubleshooting of pneumatic systems in detail. | CO5- U | (20) |
|  |  | Or |  |  |
|  | (b) | Develop a circuit to control a double acting cylinder which uses a single solenoid valve and a single limit switch . Clearly sketch the pneumatic circuit and PLC ladder logic diagram and explain.  | CO5- Ana | (20) |
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