

Q.P. Code :50332

[Time: Three Hours]

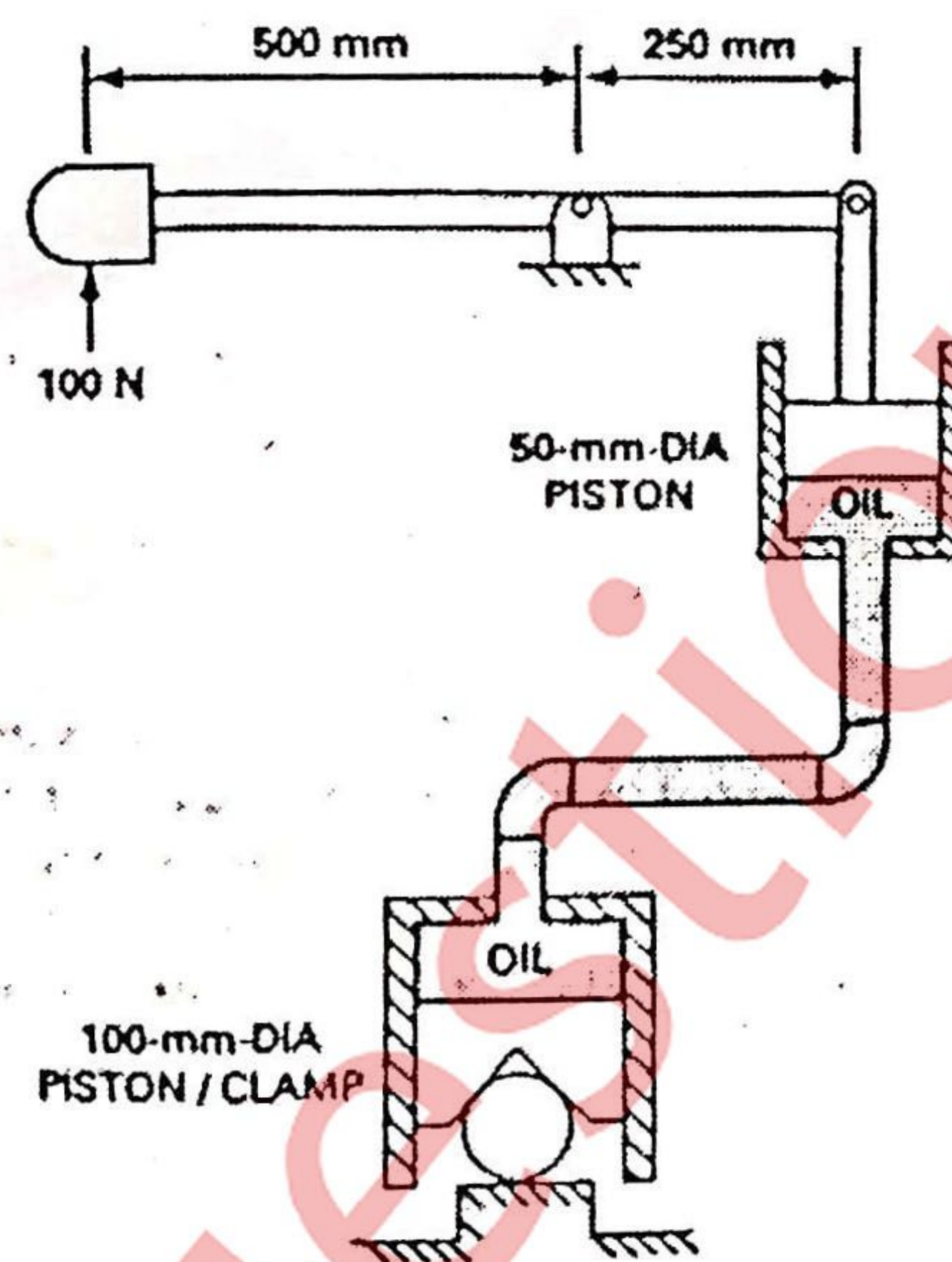
[Marks:80]

Please check whether you have got the right question paper.

- N.B:
1. Question.No.1 is compulsory.
 2. Attempt any **three** questions out of the remaining **five** questions.
 3. Figures to the **right** indicate **full marks**.
 4. Assume suitable data wherever required but justify the same.

1. Write short note on any 4 20
 - (a) Advantages of fluid power
 - (b) Cylinder cushions
 - (c) 4/2 way spool valve
 - (d) Pneumatic time delay valve
 - (e) Ladder Logic diagram

2. (a) Figure 1 shows a hydraulic system used for clamping a cylindrical workpiece during machining operation. If the machine operator applies a 100N force to the lever as shown, what clamping force is applied to the workpiece? 9



- (b) Derive the equation for volumetric discharge of bent axis piston pump based on offset angle. 11
3. (a) Explain types of hydraulic linear actuators with symbol. 5
- (b) What are hydraulic pressure intensifiers? Explain their construction. Draw and explain the pressure intensifier circuit for punch press application. 15
4. (a) Explain meter-in and meter-out speed control of a hydraulic cylinder with diagram. 6
- (b) Write short note on construction and working of FRL unit. 14

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5. (a) In a stamping station cylinder 'A' extends and brings the work-piece under stamping cylinder 'B'. Cylinder 'B' then extends and stamps the job. Cylinder A can return back only after cylinder B has retracted fully. Draw a displacement step diagram and develop a pneumatic circuit using cascade method. 12
- (b) Explain construction and working of electrical relays. What are advantages of PLC based control over relay logic? 8
6. (a) Write short note on 'shift register method'. 6
- (b) Double acting cylinder is used to perform to and fro operation. Cylinder has to move forward when PB1 button is pressed and continue to and fro motion till 10 cycles of operations is performed. Draw the pneumatic circuit, PLC wiring diagram and ladder diagram to implement this task. 14
