

**School of University Polytechnic****Diploma in Mechanical Engineering  
Semester End Examination - Jul 2024****Duration : 180 Minutes  
Max Marks : 100****Sem V - N1DL501T - Machine Design**General Instructions*Answer to the specific question asked**Draw neat, labelled diagrams wherever necessary**Approved data hand books are allowed subject to verification by the Invigilator*

- 1) Explain the buttress thread . K1(2)
- 2) Demonstrate the methods of rivetting. K2(4)
- 3) Explain the pitch and back pitch in terms of riveted joint. K2(6)
- 4) Develop and Describe the classification of riveted joint on the base of number of strip. K3(9)
- 5) Identify the advantages of screwed joint. K3(9)
- 6) Explain the different types of riveted joints and rivets K5(10)
- 7) Distinguish clearly amongst screw joint and rivet joint. K4(12)
- 8) A double riveted lap joint with zig-zag riveting is to be designed for 13 mm thick plates. Assume  $\sigma_t = 80$  MPa ;  $\sigma_s = 60$  MPa ; and  $\sigma_c = 120$  MPa State how the joint will fail and determine the efficiency of the joint. K5(15)
- 9) Determine the efficiency of the following riveted joints : 1. Single riveted lap joint of 6 mm plates with 20 mm diameter rivets having a pitch of 50 mm. 2. Double riveted lap joint of 6 mm plates with 20 mm diameter rivets having a pitch of 65 mm. Assume a cast iron pipe 250 mm diameter to carry a pressure of 0.7 N/mm<sup>2</sup> Permissible tensile stress in plate = 120 MPa Permissible shearing stress in rivets = 90 MPa Permissible crushing stress in rivets = 180 MPa K5(15)
- 10) Design and draw a cotter joint to support a load varying from 30 kN in compression to 30 kN in tension. The material used is carbon steel for which the following allowable stresses may be used. The load is applied statically. Tensile stress = compressive stress = 50 MPa ; Shear stress = 35 MPa and Crushing stress = 90 MPa. K6(18)