

JK Lakshmi Pat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, December, 2023

Theory of Machines

B. Tech. in Mechanical Engineering

Roll No.

Course Code : ME1108

Time: 3 hours

Max. Marks: 40

Instructions to students:

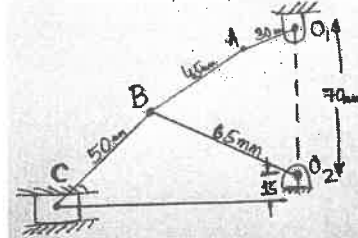
Do not write anything other than your roll number on question paper.

Answer any four.

Assume suitable data wherever required and mention it clearly.

Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.

- Q.1 a) What is inversion of mechanism? Explain inversions of four bar chain mechanism with proper labelled diagram. **05**
b) The distance between two parallel shafts connected by Oldham's coupling is 25mm. The driving shaft revolves at 240 rpm. Determine the maximum speed of sliding of tongue of intermediate piece along its groove. **05**
- Q.2 In a mechanism, the crank O_1A rotates at a uniform speed of 650 rpm. Determine the linear velocity of the slider C and the angular speed of the link BC. **10**



- Q.3 A disc cam is to give SHM to a knife edge follower during out stroke of 50 mm. The angle of ascent is 120° , dwell 60° and angle of descent is 90° . The minimum radius of cam is 50 mm. Draw the profile of cam when the axis of the follower passes through the axis of camshaft. **10**
- Q.4 A belt drive is used to transmit power between two pulleys. The smaller pulley has a diameter of 8 inches, and the larger pulley has a diameter of 16 inches. The smaller pulley rotates at 1200 revolutions per minute (RPM). Calculate the belt speed, and if the belt material can handle a maximum safe speed of 2500 feet per minute, determine if the system is within the safe speed limit. **10**
- Q.5 A machine of 20 kg mass is mounted on springs and dampers as shown in Figure. Total stiffness of the springs is 8 kN/m and the total damping is 130 Ns/m. If the system is initially at rest and a velocity of 100 mm/s is imparted to the mass, determine (a) the displacement and velocity of the mass as a time function, and (b) the displacement at $t = 1.0$ s. **10**

