Exam Date & Time: 12-Jan-2024 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SEVENTH SEMESTER B.TECH END SEMESTER MAKE-UP EXAMINATIONS, 12th JANUARY 2024

Machine Tools and Metrology [MME 4073]

Marks: 50 **Duration: 180 mins.**

A

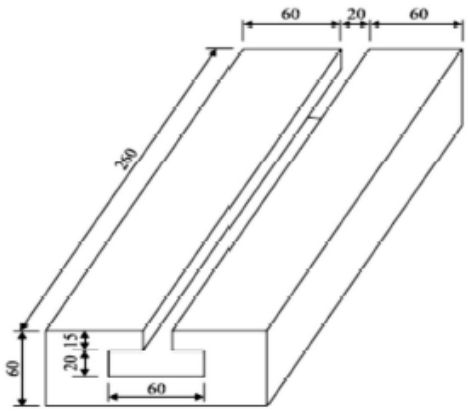
Answer all the questions.

Instructions to Candidates:
Answer ALL questions
Missing data may be suitably assumed

1) With a neat sketch explain the lathe accessories. (4)

A)

B) A T-slot is to be cut in a C.I. slab as shown in figure. Estimate the machining time. Take cutting speed 25 m/min, feed is 0.25 mm/rev. Diameter of cutter for channel milling is 80 mm (3)



C) With a neat sketch explain slider crank mechanism in shaping machine. (3)

2) What is meant by machinability? When operating with roughing cuts on mild steel at 18 m/min, a certain tool shows a life of 3 hours between regrind. Estimate the life of this tool on similar cuts at a speed of 24 m/min. (4)

A)

B) With a neat sketch explain tool holding devices used in milling machine. (3)

C) Briefly explain the tool holding devices used in drilling machine. (3)

3) With a neat sketch explain the process of measuring the angle of a V groove. (4)

A)

B) Explain measuring and gauging. Briefly explain the concepts of interchangeability and selective assembly. (3)

C) What is meant by geometrical tolerancing. Explain common requirements of it. (3)

4) Briefly explain the alignment test carried out on lathe. (4)

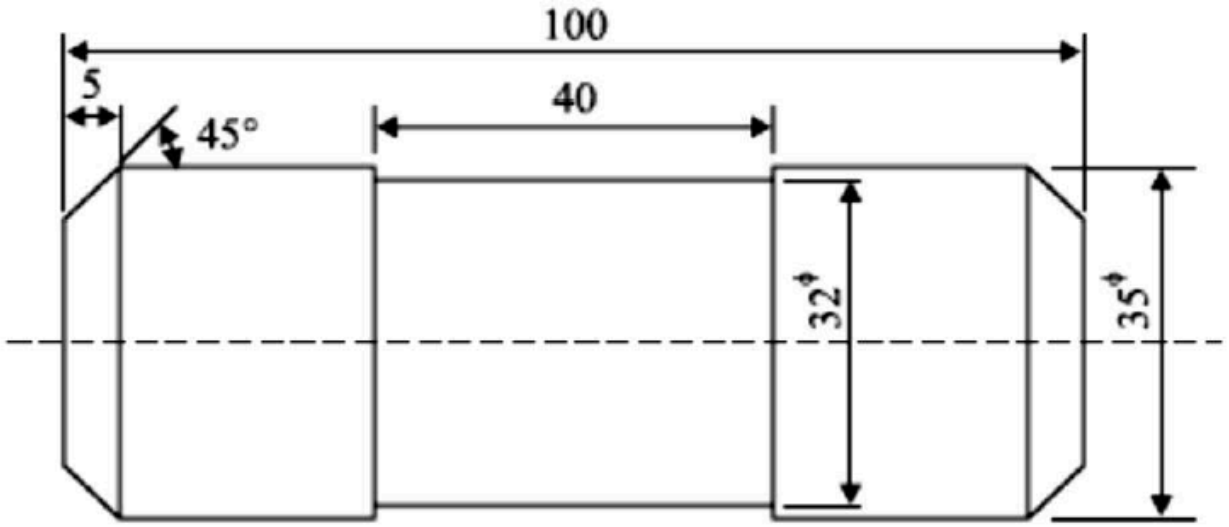
A)

B) Briefly explain the installation and testing of machine tool. (3)

C) With a neat sketch explain various shaping operations on material made of cast iron. (3)

5) A mild steel bar 102 mm long and 38 mm in diameter is turned to 35 mm diameter and was again turned to a diameter of 32 mm over a length of 40 mm as shown in the Figure 1. The bar was machined at both the ends to give a chamfer of 45° × 5 mm after facing. Calculate the machining time. Assume cutting speed of 65 m/min and feed 0.5 mm/rev. The depth of cut is not to exceed 3 mm in any operation

A) (4)



.

B) With a neat sketch explain cylindrical grinding operations on a given workpiece. (3)

C) With a neat sketch explain coordinate measuring machines. (3)

-----End-----