Exam Date & Time: 07-Dec-2023 (02:30 PM - 05:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SEVEN SEMESTER B.TECH END SEMESTER EXAMINATIONS, 7th December 2023

Machine Tools and Metrology [MME 4073]

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

A

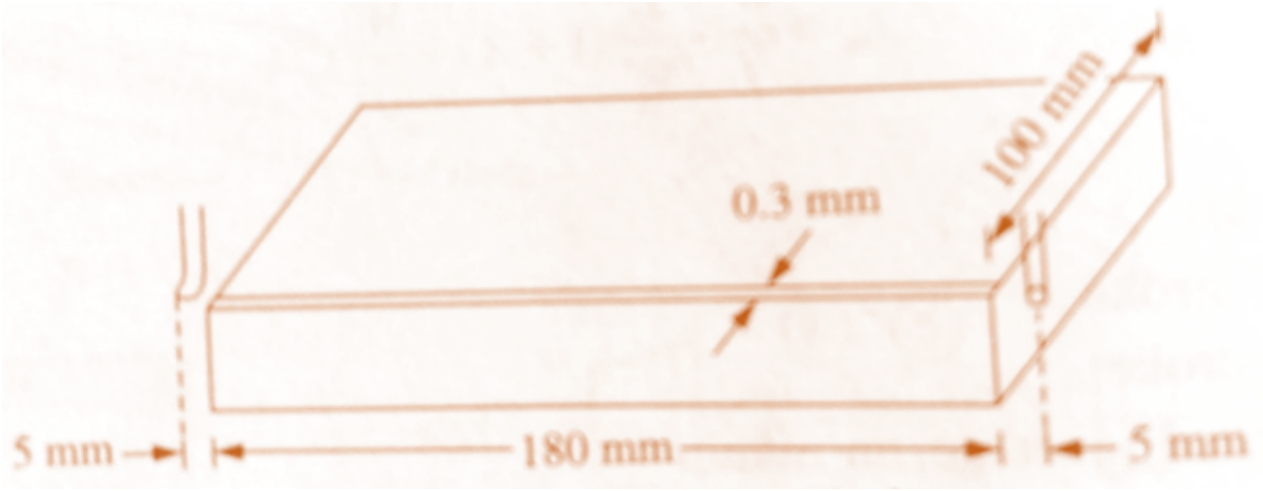
Answer all the questions.

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

1) Briefly explain the operations performed by lathe by holding the work between the centres or by a chuck. (4)

A)

B) A C.I block 180 mm×100 mm as shown in figure 1 is required to be faced on a shaper. The ratio of forward to reverse speed is 0.75. The mean cutting speed is 22 m/min, depth of cut is 2.5 mm and table feed is 0.3 mm/stroke. Determine machining time and material removal rate. (3)



C) With a neat sketch explain Whitworth quick return 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) Briefly explain the work holding devices used in drilling machine. (3)

C) Briefly explain the principal parts of a plain milling cutter. (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)

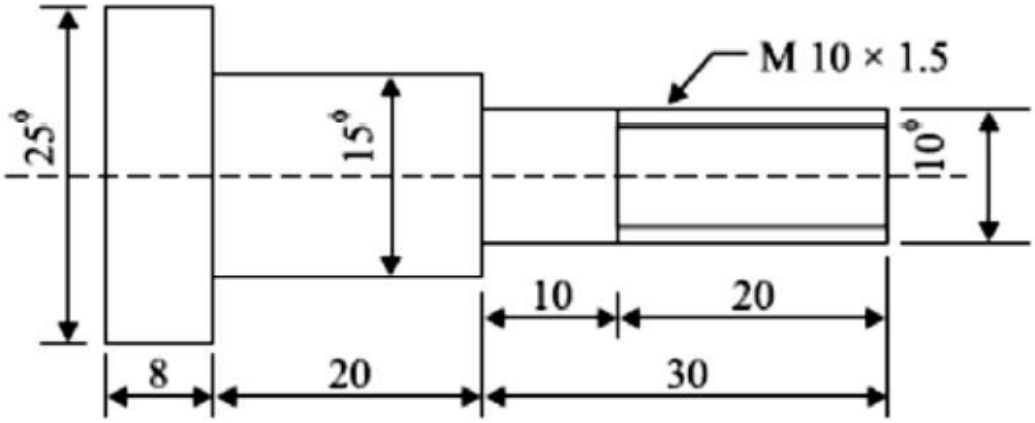
A)

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) What is meant by machining time and tool life? Calculate the machining time required to produce one piece of the component shown in Figure given below starting from f 25 mm bar. The following data is available.

A)



(4)

For turning:

Cutting speed = 40 m/min.

Feed = 0.4 mm/rev.

Depth of cut = 2.5 mm/per pass

For thread cutting:

Cutting speed = 8 m/min.

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

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

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