

Code No: 07A50303

R07**Set No. 2**

III B.Tech I Semester Examinations, May 2011

MACHINE TOOLS

Common to Mechanical Engineering, Mechatronics

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

1. (a) List out honing parameters and explain them.
(b) Give the complete classifications of broaching machines . [8+8]
2. What are the common methods of construction used for jigs and fixtures? [16]
3. Give classification of planer machine and explain about Double column planning machine and edge-planning machine. [16]
4. Write short notes on the following:
 - (a) Tool and cutter grinder.
 - (b) Grinding speed feed and depth of cut.
 - (c) Glazing, loading and gumming of grinding wheel. [5+5+6]
5. (a) Explain about compound indexing.
(b) Calculate the Compound indexing for 87 divisions. [8+8]
6. (a) Specify the safety guidelines for working on lathe.
(b) Specify precautions of lathe operation and care of lathes.
(c) Specify the check-out procedures for operation on lathe. [6+5+5]
7. In an orthogonal cutting set up, the depth of the cut was 10mm, $t=1\text{mm/rev}$. cutting speed 60m.p.m, back rake angle= 10° chip thickness ratio =0.33, shear stress of material at zero compressive stress= 1000kg/sq.cm. Assume that the value of constant k, in equation

$$2\phi+\beta-\alpha=\cot^{-1}k,$$
 is 0.2. Calculate the resultant force, rate of metal removal, shear strain, h.p at the tool per cubic cm. of metal removal per minute. [16]
8. Explain the kinematic mechanism of Drilling machine with neat sketches. [16]

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R07**Set No. 4**

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1. (a) With the help of sketches, describe:
 - i. External centre less grinding.
 - ii. Internal centre less grinding.(b) Discuss about wheel wear and grinding ratio. [4+4+8]
2. What are the methods for changing speed in Gear Boxes? Explain about sliding Gears arrangement in detail with neat sketch. [16]
3. What is a planer? Explain the principal parts of planer with neat sketches. [16]
4. (a) Explain the operation of a vertical turret lathe with suitable sketches?
(b) Explain about multi-spindle Automatics? [8+8]
5. Explain the following with neat sketches:
 - (a) Planer type milling machine.
 - (b) Rotary table or continuous milling machine. [8+8]
6. (a) For what purposes are indexing jigs and fixtures used?
(b) List the operations suitable for use with indexing fixtures. [8+8]
7. (a) Explain kinematic scheme of broaching machine.
(b) Explain how machining time is calculated in broaching? [8+8]
8. Describe with the help of a neat diagram the construction and working of a precision vertical boring machine? And also mention some salient design features? [16]

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R07**Set No. 1**

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1. What are the various milling operations? Explain with the help of suitable sketches. [16]
2. Differentiate among shaping, planing and slotting machines with respect to constructed features, applications and working. [16]
3. Write a short note on the following:
 - (a) Floor type boring machine
 - (b) Planer type boring machine.
 - (c) Multiple head type boring machine. [6+5+5]
4. (a) Name and explain the various materials used for cutting tools.
 (b) During turning a mild steel component with an orthogonal tool a feed of 0.75mm/rev is used at 50 rpm if the chip thickness is 1.5mm, determine the chip thickness ratio. Also find the length of chip removed in one minute, if the work diameter is 50mm before the cut is taken. Assume a continuous chip. [10+6]
5. (a) What are truing and dressing? Distinguish them.
 (b) What are the different types of abrasives used in the manufacturing of grinding wheel? What are the selection criteria? [8+8]
6. Draw the tool lay out for the component as shown in the figure1 and mention the sequence of operations performed on it [16]
7. (a) Sketch a broaching tool and explain various elements.
 (b) Why robust fixtures are required to support jobs to be broached? [8+8]
8. (a) Briefly discuss the following related to jigs and fixtures .
 - i. Choosing a location surface
 - ii. Profile location.
 - iii. Equalizing jacks.
 - iv. Setting blocks.
 (b) Distinguish between hydraulic, magnetic and vacuum clamping devices . [8+8]

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Set No. 1

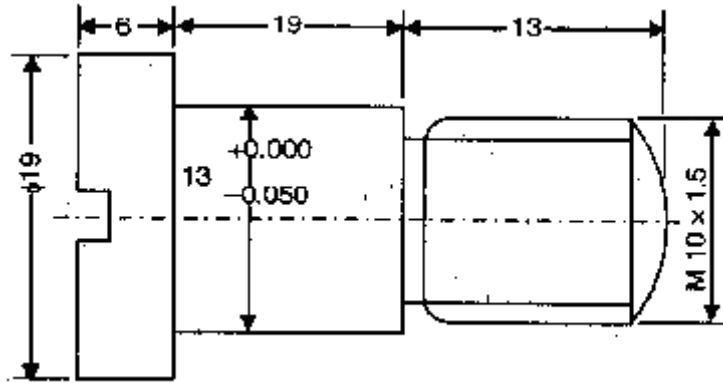


Figure 1

FIRSTRANKER

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MACHINE TOOLS

Common to Mechanical Engineering, Mechatronics

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
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1. Explain in detail the role played by individual elements of Jig and fixture. [16]
2. Write short notes on the following:
 - (a) Chip breakers.
 - (b) Advantage of negative rake angle.
 - (c) Curling of chip.
 - (d) Cutting speed. [4+4+4+4]
3. Explain constructional features and applications of chuck, lathe centers, collets, carriers and catch plates, and faceplate of lathe machine. [16]
4.
 - (a) Calculate the differential indexing to give 73 divisions.
 - (b) A gear is to have 14 teeth. What is the indexing movement required?
 - (c) Explain Differential indexing. [5+5+6]
5. Write short notes on the following:
 - (a) Plain Cylindrical grinders.
 - (b) Universal Cylindrical grinders.
 - (c) Roll grinders. [6+5+5]
6. What is a slotter? Classify and explain the slotted disc mechanism with a neat sketch. [16]

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7. (a) Why robust fixtures are required to support jobs to be broached?
(b) How much stock is removed by tooth on a broach?
(c) How the length of a broach is determined? Explain. [6+5+5]
8. (a) Specify the precautions in drilling operation?
(b) What is a twist drill? Explain the parts and function of a twist drill. What are the advantages of using it? [6+10]

FIRSTRANKER