

Code No: 07A50303

R07**Set No. 2**

III B.Tech I Semester Examinations, November 2010

MACHINE TOOLS

Common to Mechanical Engineering, Mechatronics

Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks

- Is honing a material removing process? What inaccuracies does the honing process eliminate?
 - How a broaching tool is specified?
 - List the applications of broaching. [6+5+5]
- Write a short note on the following:
 - Floor type boring machine
 - Planer type boring machine.
 - Multiple head type boring machine. [6+5+5]
- What are the methods for changing speed in Gear Boxes? Explain about sliding Gears arrangement in detail with neat sketch. [16]
- Draw the tool lay out for the component shown in the figure 1 and mention the sequence of operations performed on it. [16]

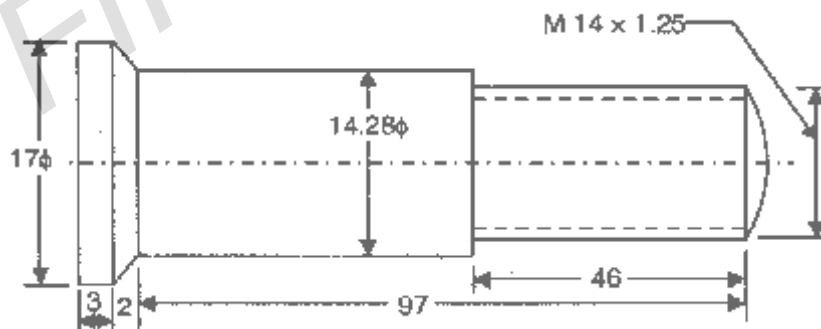


Figure 1:

- Explain the location methods for the design of fixtures for machining components with flat and cylindrical surfaces.
 - What are the functions of jigs and fixtures. [8+8]
- With the help of a neat sketch, explain the working principles of shaper.
 - Derive an expression for estimating machining time of shaper. [6+10]

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7. List out factors which influence the performance of grinding wheel. Explain them in detail. [16]
8. Explain the tool geometry of milling cutters with neat sketches? [16]

FIRSTRANKER

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1. Explain constructional features and applications of chuck, lathe centers, collets, carriers and catch plates, and faceplate of lathe machine. [16]
2. (a) What is lapping? Write in detail any three types of lapping techniques.
(b) Write a brief notes on the following:
 - i. Super finishing
 - ii. Cylindrical super finishing.
 - iii. Flat and spherical super finishing.
 - iv. Polishing. [8+(4x2)]
3. Give classification of planer machine and explain about Double column planning machine and edge-planning machine. [16]
4. (a) Explain different types of bonds used in the manufacturing of grinding wheels.
(b) What is wheel glazing and loading of the grinding wheel? [8+8]
5. (a) Draw sketches of any five types of milling cutters and explain them briefly.
(b) Define and discuss the following milling operations and mention the most commonly used method.
 - i. Up milling
 - ii. Down milling [8+8]
6. Explain the methods for changing Feed in Gear Boxes in detail with suitable sketches. [16]
7. (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]
8. Explain the kinematic mechanism of Drilling machine with neat sketches. [16]

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1. Discuss in detail with neat sketches the locating buttons and profile locators. [16]
2. Explain the operations done on drilling machine in detail, with neat sketches. [16]
3. (a) Derive an expression for finding chip thickness ratio.
(b) Briefly discuss about chip breakers. [12+4]
4. (a) What is an automatic machine? State the factors, which effect the classification of automatic machines?
(b) What are the different type of automatic machines? Explain. [8+8]
5. With the help of a line diagram explain the basic principle, constructional details and working of shapes. [16]
6. Give a comparison of grinding machine with lapping honing and broaching machines. [16]
7. Make a neat sketch of universal milling machine indicating the various controls and constructional features. Give brief description. [16]
8. (a) Grinding wheel characteristics or the performance of a grinding wheel depends on type of abrasive grain size, structure and bonding material. Discuss the effect of each.
(b) Describe a grinding wheel structure with the help of a neat sketch and state different abrasive materials used in it. [8+8]

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All Questions carry equal marks

1. (a) Briefly discuss about tool signature with an example.
(b) What are the requirements of cutting tool?
(c) What are the variables that influence the type of chip produced? And explain about continuous chip with built-up edge? [5+4+7]
2. Give the classification of grinding machines. Explain cylindrical and surface grinding machines with suitable sketches. [16]
3. (a) List out honing parameters and explain them.
(b) Give the complete classifications of broaching machines. [8+8]
4. Write short notes on the following:
(a) Elements of drilling machine.
(b) Elements of vertical boring machine. [8+8]
5. Write short notes on the following:
(a) Gear cutters
(b) Tap and reamer fluting cutters.
(c) T-slot milling cutter
(d) Gear hobs [4+4+4+4]
6. Draw the tool lay out for the component as shown in the figure 2 and mention the sequence of operations performed on it [16]
7. (a) Compare compressed air and hydraulic power as means for operating clamping devices.
(b) What do you understand by principle of least points and principle of extreme points. [8+8]
8. What is a shaper? Explain ram and table feed mechanism in a shaper? [16]

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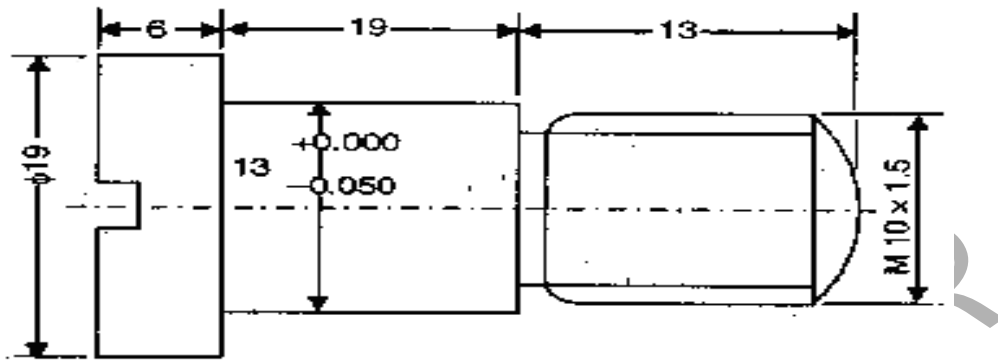


Figure 2:
