

II B.Tech II Semester Regular Examinations, Apr/May 2008

**MACHINE TOOLS
(Production Engineering)**

Time: 3 hours

Max Marks: 80

**Answer any FIVE Questions
All Questions carry equal marks**

1. (a) What are the different types of chips? Explain.
(b) Explain the following types of cutting fluids: [8+8]
 - i. Water based cutting fluids
 - ii. Straight or neat oil based cutting fluids.
2. (a) Explain briefly the working principle of a lathe.
(b) Name any three work-holding devices and explain briefly. [8+8]
3. (a) Describe with a schematic sketch the operation of a hydraulic shaper.
(b) Write the applications of planning machines. [8+8]
4. (a) Discuss problems faced in a drilling operation with their causes and possible remedies.
(b) What are vertical boring machines? Where are they preferred and why? [8+8]
5. (a) Describe the process of generating a helical groove on a milling machine.
(b) Make a neat sketch of a universal milling machine indicating the various controls and constructional features. [8+8]
6. (a) What is a bond? Explain the different types of bonds used in grinding wheel manufacture.
(b) Why is grinding so important in modern production? [8+8]
7. (a) Explain how to determine the length of broach.
(b) Describe the continuous broaching machine. [6+10]
8. (a) Write short notes on the following types of jigs
 - i. Rack and pinion operated jig
 - ii. Air operated jigs.
(b) How can the relation of the jig plate and vise-jaw be accurately controlled? [12+4]

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1. (a) Discuss the various forces encountered in metal cutting.
(b) What are the types of tool materials used in metal cutting? Discuss their importance. [8+8]
2. (a) Explain the following operations:
 - i. Rough turning
 - ii. Finish turning
 - iii. Facing.(b) What are the chief distinguishing features of a turret lathe as compared to an engine lathe?
(c) What is meant by 'tool layout' of a turret lathe? [6+6+4]
3. (a) Sketch and explain the hydraulic drive of a horizontal shaper.
(b) Name the common work-holding devices used on planers. With the help of a neat sketch, describe a planer vice. [8+8]
4. (a) Describe in brief the working principle of a boring machine.
(b) Explain the different types of holes and processes used for manufacturing them. [8+8]
5. (a) Describe the differences between a lathe and milling machine in terms of the types of surfaces generated, the types of tools used and applicability for general and production applications.
(b) Discuss the various motions of the arbor mounted milling cutter with respect to the work piece. [8+8]
6. (a) Explain the following:
 - i. Grinding wheel wear
 - ii. Grinding temperature
 - iii. Power required for grinding.(b) How is grinding different from other machining operations? Explain its applications in view of its capabilities. [6+10]
7. (a) Sketch a typical tooth shape of a broach and label all the parts of it.
(b) Explain the following operations: [8+8]

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Set No. 2

- i. Honing
 - ii. Lapping.
8. (a) Explain vise-jaw jigs.
- (b) What are different methods used for construction of fixtures? [8+8]

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1. (a) With the help of neat sketch, explain the tool geometry.
(b) Describe the effect of cutting fluid on cutting speed and tool life. [10+6]
2. (a) Explain any three methods of taper turning on a lathe.
(b) Explain the advantages and disadvantages of a turret lathe. [8+8]
3. (a) Illustrate and describe the 'friction disc mechanism' of a planer.
(b) It is required to machine on a shaper a mild steel plate measuring $480 \times 280 \times 40$ mm along its wider face. Calculate the machining time considering approach equal to 20 mm. [8+8]
4. (a) What are the different types of drills used? Explain the function of each type of drill.
(b) Describe the various kinds of operations that can be performed on a boring machine. [8+8]
5. (a) What are the differences between a fixed head and swiveling head vertical milling machine?
(b) Describe the following milling operations with suitable sketches:
 - i. Face milling
 - ii. Angle milling
(c) How is a milling machine specified? [6+8+2]
6. (a) Describe vitrified, shellac and resinoid bonds.
(b) What is the marking system followed in case of grinding wheels? Explain the individual elements of the marking system from the standpoint of the functioning of the wheel. [6+10]
7. (a) What factors contribute to increased production rates for broaching?
(b) Explain the process of lapping with neat sketch. [8+8]
8. Explain the following types of fixtures:
 - (a) Grinding fixtures
 - (b) Indexing fixtures. [8+8]

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1. (a) Explain the effect of cutting fluids on chip contraction.
(b) Explain the factors used for judging the machinability. [8+8]
2. (a) Explain any three methods of taper turning on a lathe.
(b) Explain the advantages and disadvantages of a turret lathe. [8+8]
3. (a) Describe the 'Belt Drive' mechanism used for driving the table of a planer.
(b) Sketch the tool head of a shaper and explain how it functions. [8+8]
4. (a) Describe in brief the working principle of a boring machine.
(b) Explain the different types of holes and processes used for manufacturing them. [8+8]
5. (a) Explain the various methods of indexing.
(b) Sketch and explain the principal parts of a horizontal milling machine. [8+8]
6. Sketch and explain the following grinding processes:
(a) Form grinding
(b) Gear tooth grinding
(c) Thread grinding and
(d) Cam grinding. [4+4+4+4]
7. (a) Write briefly about the materials of broaching tools.
(b) Describe the continuous type broaching machine. [8+8]
8. (a) What are the construction methods of jigs?
(b) What are the advantages and disadvantages of four locating points in a plane?
(c) Discuss the uses liner bushes. [6+6+4]
