

Code No: R31036

R10

Set No: 1

III B.Tech. I Semester Supplementary Examinations, June/July - 2014

METAL CUTTING & MACHINE TOOLS

(Mechanical Engineering)

Time: 3 Hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain the factors influencing tool wear and tool life.
(b) What are essential characteristics of cutting fluid?
2. (a) Describe briefly about taper turning methods?
(b) What are the different types of Lathe attachments? Discuss them briefly.
3. (a) What is planer? Illustrate and describe its working principle.
(b) Distinguish between shaper and planer.
4. (a) Distinguish between drilling operation by a drilling machine and that by a lathe machine with reference to the tool/job holding and difficulty of operational technique.
(b) With the help of a sketch explain the construction and working of
(i) Pillar drilling machine (ii) Fine boring machine
5. Explain with a neat sketch the terms “helix angle” and “direction of cut” in the case of milling. What is their importance with respect to machining performance? Explain the basis on which these are selected.
6. (a) Explain the importance of using cutting fluids during grinding.
(b) Explain the various precautions to be taken before mounting a grinding wheel.
7. (a) Explain clearly how work pieces are located.
(b) Write a short note on Clamps and clamping devices.
8. Discuss the following
(a) Working Principles of CNC Machines.
(b) Merits and Demerits of CNC Machines.

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Set No: 2

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METAL CUTTING & MACHINE TOOLS

(Mechanical Engineering)

Time: 3 Hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Discuss various types of cutting fluids.
(b) Explain the constructional features of speed gear box and speed gear box.
2. (a) List out various types of lathes and explain each briefly with reference to their size, working and applications.
(b) What are automatic lathes? Where their use is preferred and why?
3. (a) What are various operations performed on shaper? Explain in detail
(b) Describe constructional features of speed gearbox of slotter?
4. (a) How a drilling machine is specified? How is a drill specified?
(b) Distinguish between drilling, reaming and boring machines and their operations
5. (a) What are the various methods by which a cam can be cut?
(b) Discuss the effect of the helical tooth on the clearance
6. (a) Explain what is meant by internal centreless grinding?
(b) Explain with neat sketches various types of internal grinders.
7. (a) Define tools, Jigs and Fixtures in brief. What are their advantages?
(b) What are the important principles of Jig design? Explain.
8. Discuss the following
 - (a) Constructional Features of CNC Machines.
 - (b) Distinction between CNC and DNC.

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Set No: 3

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METAL CUTTING & MACHINE TOOLS

(Mechanical Engineering)

Time: 3 Hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Explain various types of tool materials and their applications.
(b) Explain about Machine ability and Machine ability index.
2. With the help of sketches explain the following
(a) Lathe carriage (b) Cross slide (c) Tool post (d) Compound rest
3. (a) How do you classify the different types of shapers?
(b) Explain with the help of a neat sketch, the working principle of a shaper.
4. (a) Write a brief note on the various work holding devices of a drilling machine
(b) Explain the construction, working and applications of radial drilling machine?
5. (a) What are the differences between bed type and planar type milling machine? Discuss with neat sketches
(b) List the various precautions in use of milling cutters.
6. Write a short note on the following
(a) Brazed carbide tools (b) Grade of grinding wheel
(c) Geometry of a single point turning tool (d) Surface grinding machines
7. (a) What are the advantages and disadvantages of four locating points in a plane?
(b) Explain clearly how can be determined that the Jigs and fixtures for a particular application will be economical.
8. Discuss the following
(a) Applications of CNC Machines.
(b) CNC Controllers.

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Set No: 4

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METAL CUTTING & MACHINE TOOLS

(Mechanical Engineering)

Time: 3 Hours

Max Marks: 75

Answer any FIVE Questions
All Questions carry equal marks

1. (a) Derive an expression for optimum value of cutting speed.
(b) What is built up edge? Discuss its effects.
2. Give neat diagram of engine lathe, and describe its main parts and controls.
3. (a) What is planer? Illustrate and describe its working principle.
(b) Give detailed classification of planer machines.
4. (a) Explain with neat sketches the constructional features of a twist drill and label the important features
(b) Discuss the construction and working of Jig Boring Machine? How is it superior to ordinary boring machine?
5. Show with sketches and explain the following milling cutter angles
(i) Radial rake angle (ii) Axial rake angle
(iii) Approach angle (iv) Side clearance angle
6. (a) Explain with a neat sketch the chip formation during surface grinding. Describe the expression for the various forces generated.
(b) State the differences between Honing and Lapping.
7. (a) Describe principle of six-point location.
(b) Write a short note on Locating Pins.
8. Discuss the following
(a) Classification of CNC Machines.
(b) Motion Controllers in CNC Machines.
