

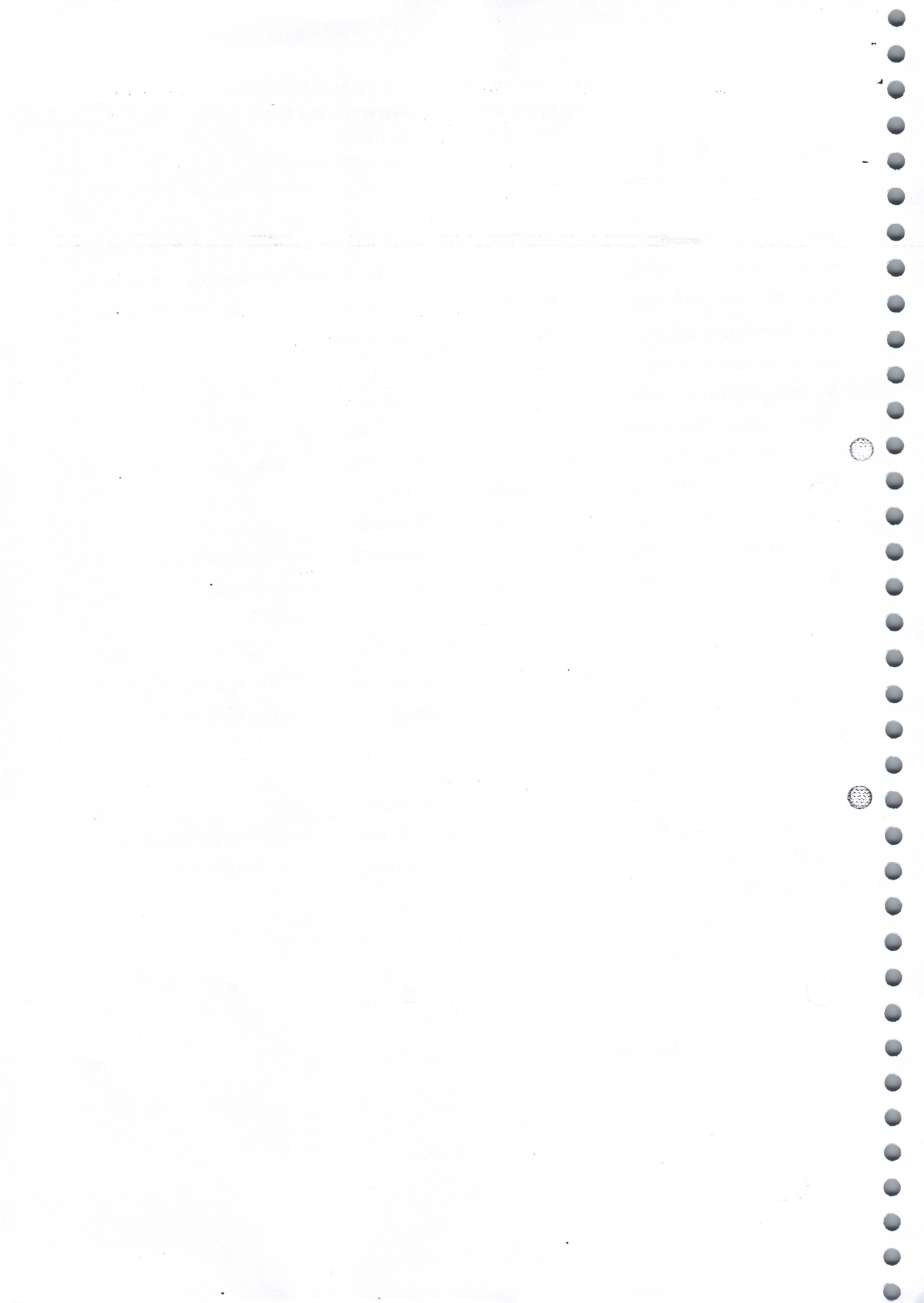
RISE KRISHNA SAI GANDHI GROUP OF INSTITUTIONS :: ONGOLE
DEPARTMENT OF MECHANICAL ENGINEERING
IMPORTANT QUESTIONS

Subject: MC & MT

Faculty: K.S.J.PRAKASH

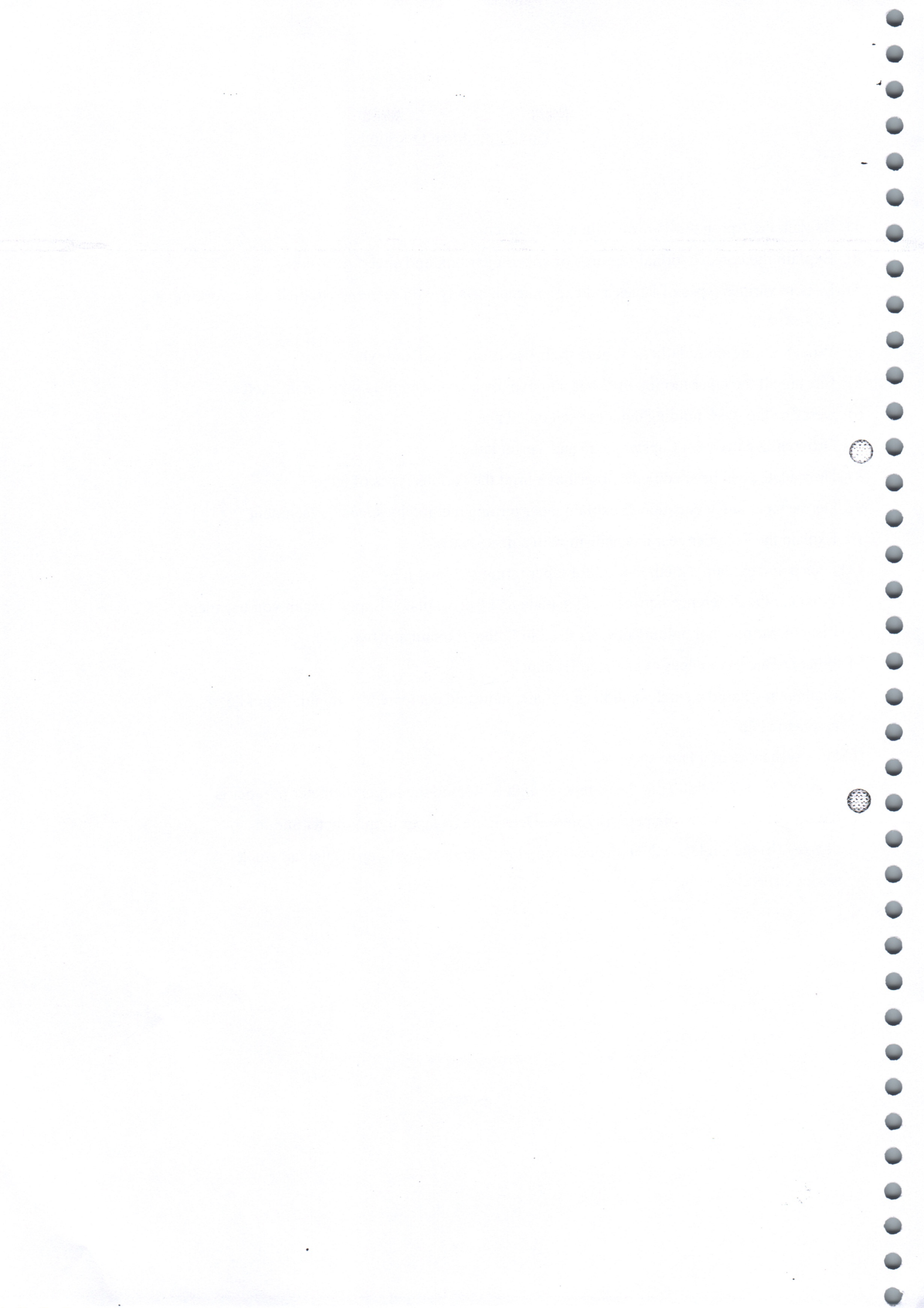
Unit 1

- 1) During a metal cutting test under orthogonal conditions it was found that cutting force is 125 kg and feed force is 110 kg when cutting at 170mpm. The rake angle of tool is 10° and shear plane angle was found to be at 19°. Determine i) Shear velocity ii) Chip flow velocity. iii) Work done per minute in shearing the metal & work done against friction. iv) Show that the work input is equal to the sum of work done in shearing & against friction.
- 2) A) Define the Tool life and explain the factors affecting tool life. ✓
B) Write a short notes on different types of Tool materials and cutting fluids
- 3) A) Describe the significance of Single Point Cutting Tool angles with a neat sketch. ✓
B) What are the possible reasons of tool failure? Explain in brief.
- 4) Explain the geometry of a single point cutting tool with neat sketches..
- 5) During an orthogonal cutting a chip length of 160mm was obtained from an uncut chip length of 350 mm. The cutting tool has 22° rake angles and a depth of cut is 0.8mm. Determine the shear plane angle and chip thickness.
- 6) The orthogonal cutting of steel is done with 10° rake tool with a depth of cut 2mm and feed rate of 0.20 mm/rev. The cutting speed is 200 m/min. The chip thickness ratio is 0.31. The vertical cutting force is 1200 N and the horizontal cutting force is 650 N. Calculate from the merchant's theory, the various works done in metal cutting and shear stress.
- 7) A) Write short notes on crater wear and flank wear. ✓
B) How is metal removed in metal cutting? Explain the process with neat sketch?
- 8) A cutting tool at 35m/min gave a life of one hour twenty minutes, when operating on roughening cuts. What will be the probable life when engaged on light finishing cuts? Take $n=0.125$ for rough cut $n=0.1$ for finishing cut.
- 9) A) Explain the factors influencing tool wear and tool life.
B) What are essential characteristics of cutting fluid?
- 10) A) Explain various types of tool materials and their applications.
B) Derive an expression for optimum value of cutting speed.
- 11) What is built up edge? Discuss its effects.



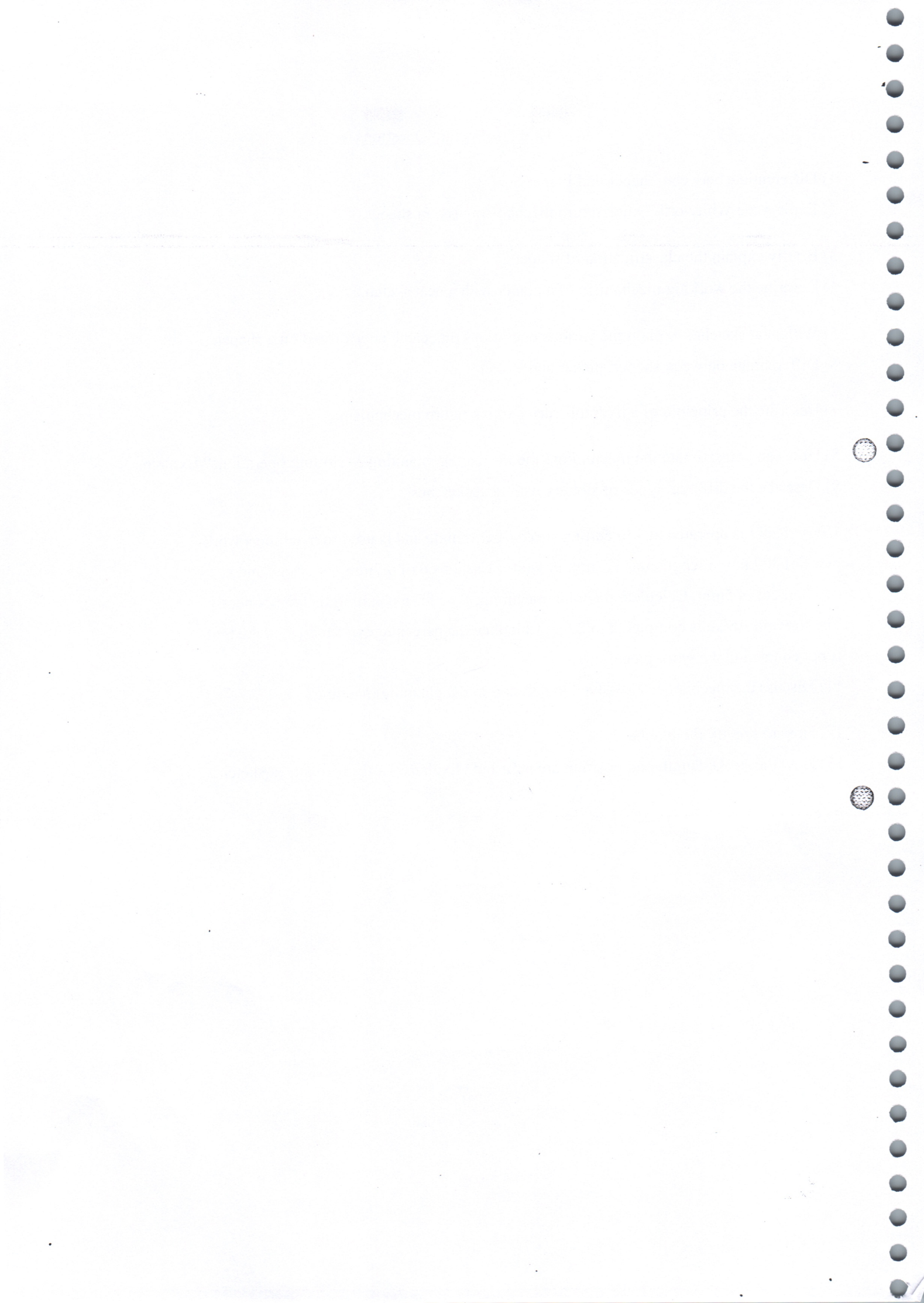
Unit 2 Important Questions

- 1) Explain the Apron mechanism with a neat sketch
- 2) Explain the constructional features of speed gear box and speed gear box.
- 3) List out various types of lathes and explain each briefly with reference to their size, working and applications.
- 4) What are automatic lathes? Where their use is preferred and why?
- 5) List out all the taper turning methods and explain any one method with a neat sketch.
- 6) Describe the work holding devices used on a lathe.
- 7) Differentiate between Capstan lathe and Turret lathe.
- 8) How a lathe can be specified? Describe in brief the various types of lathes.
- 9) Derive taper angle equation & explain taper turning method by special attachment.
- 10) Explain the Tumbler gear mechanism with a neat sketch.
- 11) Sketch and explain a method used for taper turning of long jobs.
- 12) What are the difference between a face plate and a drive plate? Explain when you use them.
- 13) List out various tool holding devices used in Lathe. Explain any two.
- 14) What are the advantages of using collet chuck?
- 15) Explain in detail the single-spindle automatic lathe and compare it with multi-spindle automatic lathe.
- 16) How is the size of a lathe specified?
- 17) A taper pin of length 80 mm has a taper length of 48mm. the larger diameter of taper is 83mm and the smaller diameter is 73mm. Determine (i) taper in mm/meter and in degrees (ii) the angle to which the compound rest should be set up (iii) the tail stock setting over.



Unit 3 Important Questions

- 1) Differentiate between Shaper and Planer.
- 2) Explain the Whitworth Quick return mechanism used in shaper
- 3) Briefly explain the classification of shapers.
- 4) Describe the working mechanism of a planer with a neat sketch.
- 5) With neat sketches explain the various operations that can be performed on a shaper.
- 6) Differentiate between shaper, planer and slotter.
- 7) Describe the principle of a hydraulic drive quick return mechanism.
- 8) How can you estimate the machining time in shaping, planning & slotting operations? Explain.
- 9) Describe the different types of slotters with neat sketches.
- 10) A shaper is operated at 130 cutting strokes per minute and is used to machine a work piece of 300mm in length and 122mm in width. Use a feed of 0.7mm per stroke and a depth of cut of 5mm. Calculate the total machining time for machining the component. The forward stroke is completed in 2200. Calculate the percentage of time when the tool is not contacting the work piece.
- 11) Discuss the mechanisms involved in a shaper and a planning machine?
- 12) How to specify the planner?
- 13) How the stroke length and position are adjusted? Explain briefly with a neat sketch.



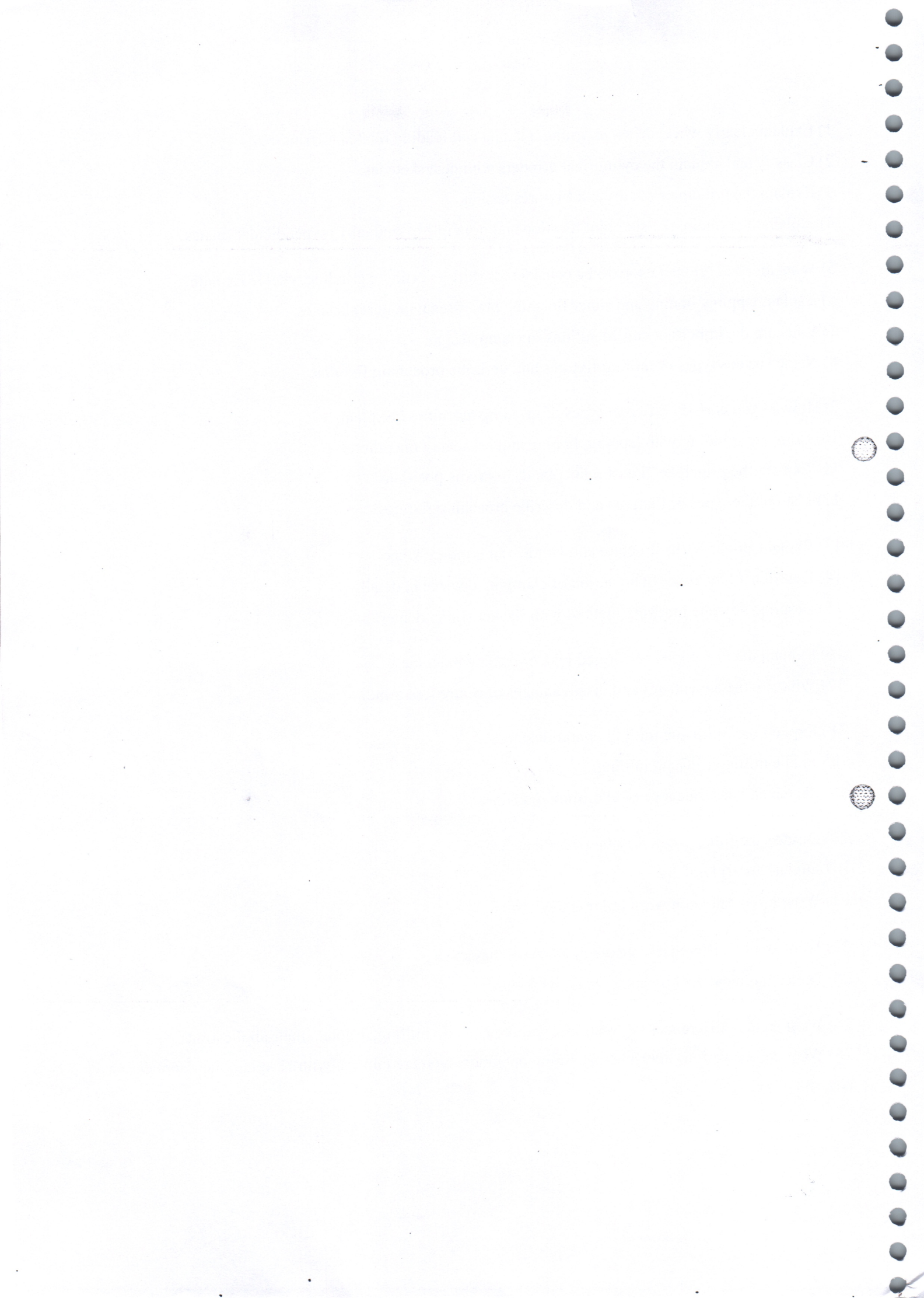
Unit 4 Important Questions

- 1) What are the various work holding devices used on drilling machines? Explain.
- 2) Explain the working principle and constructional details of a deep hole drilling machine.
- 3) What are the different operations that can be performed on a milling machine? Explain.
- 4) Explain how differential indexing of 119 equal divisions can be obtained on a cylindrical job.
- 5) Describe the classification of a drilling machine.
- 6) Explain the principle, working and specifications of boring machines.
- 7) Describe the working and constructional features of column & knee type milling machine.
- 8) Describe the universal dividing head with neat sketch.
- 9) Describe the working principle of a Radial drilling machine.
- 10) With a neat sketch explain the principal elements and angles of a Twist drill.
- 11) Describe the various operations that can be performed on a milling machine with neat sketches.
- 12) Explain how compound indexing of 51 equal divisions can be obtained on a cylindrical job.
- 13) Describe the various operations that can be performed on a drilling machine with neat sketches.
- 14) With a neat sketch explain the working principle & constructional details of Jig boring machine.
- 15) Explain the geometry of a milling cutter with a neat sketch.
- 16) Obtain the compound indexing for 87 divisions.
- 17) With the help of a sketch explain the construction and working of
 - i. Pillar drilling machine
 - (ii) Fine boring machine
- 18) Explain with a neat sketch the feed mechanism used on drilling machines.
- 19) Describe the specifications of horizontal boring machines.
- 20) Explain what is meant by internal centreless grinding?
- 21) Explain with neat sketches various types of internal grinders.



Unit 5 Important Questions

- 1) Explain clearly wheel dressing, truing, glazing and loading related to grinding.
- 2) Classify and explain the cylindrical grinders with neat sketches.
- 3) Explain the principles of Jigs and Fixtures design.
- 4) Explain the principle of six point location and principle of mutually perpendicular planes.
- 5) What are the various factors to be considered while selecting a grinding wheel? Explain.
- 6) Explain lapping, honing and super finishing processes with neat sketches.
- 7) What are the important considerations in clamp design.
- 8) Name various types of milling fixtures and describe broaching fixtures.
- 9) How do you classify different types of grinding machines? Explain.
- 10) Compare grinding with lapping, honing and broaching operations.
- 11) Explain the principles 'Least points' and, 'Extreme positions'.
- 12) List out the types of Fixtures and describe broaching fixtures
- 13) Explain Bonds, Grit, structure and Grade of a grinding wheel.
- 14) Describe all the types of actuation of clamping devices in detail.
- 15) Describe any one indexing method with its merits and demerits.
- 16) Explain the operations performed by a broaching machine.
- 17) What are the advantages and disadvantages of centre less grinding?
- 18) Explain the following milling operations:
 - i) Straddle milling ii) Gang milling
- 19) Sketch and describe a vertical milling machine.
- 20) Discuss the following jigs with a neat sketch.
 - i) Template Jig ii) Leaf Jig
- 21) Write a short note on work holding devices.
- 22) What are the differences between jigs and fixtures?
- 23) Sketch a typical drill jig and explain its features.
- 24) What are the differences between face milling and end milling? Explain their applications.
- 25) What are the various abrasive machining operations you are familiar with? Explain their application and imitations.



- 26) Name the various types of abrasive bonds and explain them in detail.
- 27) 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.
- 28) Explain clearly how work pieces are located.
- 29) Write a short note on Clamps and clamping devices.
- 30) 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

Unit 6 Important Questions

- 1) Explain in detail the constructional features of CNC machines with neat sketches.
- 2) List out and explain the applications of CNC machines.
- 3) Discuss the functions of a CNC controller.
- 4) What are the advantages of CNC machines over conventional machines?
- 5) What are the various types of motion controls used in CNC machines? Explain.
- 6) Describe the working principle and classification of CNC machines.
- 7) Discuss various features of CNC meeting.
- 8) Explain the principle of operation of CNC with neat sketch.
- 9) What is meant by CNC? Explain.
- 10) What are the disadvantages of CNC machines over NC machines?
- 11) Explain the coordinate system used for vertical CNC milling machines.
- 12) Discuss the following
 - (a) Applications of CNC Machines.
 - (b) CNC Controllers.
- 13) Discuss the following
 - (a) Classification of CNC Machines.
 - b) Motion Controllers in CNC Machines.

