

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FIFTH SEMESTER B.TECH DEGREE EXAMINATION(S), MAY 2019**

**Course Code: ME303**

**Course Name: MACHINE TOOLS AND DIGITAL MANUFACTURING**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any three full questions, each carries 10marks.*

Marks

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|---|--|-----|
| 1 | a) Draw the tool-chip interface of a metal cutting process and explain the regions of heat generation.   | (5) |
|   | b) Compare orthogonal cutting & oblique cutting.   | (5) |
| 2 | a) Describe different types of tool wear.  | (3) |
|   | b) During an orthogonal cutting of steel, the following data were obtained. Chip thickness = 0.35mm, width of cut = 3mm, feed = 0.25 mm/rev, tangential cutting force = 1100N, feed thrust force = 325N, cutting speed = 2m/s, $\alpha = +10^\circ$ . Calculate the Shear force & Kinetic coefficient of friction. | (7) |
| 3 | a) Why Cast Iron is preferred for Lathe bed.   | (4) |
|   | b) With a neat diagram explain how a lathe is specified.   | (6) |
| 4 | a) Differentiate between Counter boring & Counter sinking with help of neat diagrams.  | (5) |
|   | b) With a neat diagram explain different parts of a radial drilling machine.   | (5) |

**PART B**

*Answer any three full questions, each carries 10marks.*

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|---|---|-----|
| 5 | a) List the advantages of V-guide ways provided on the planing machine bed.   | (4) |
|   | b) Compare planning & shaping machines.   | (6) |
| 6 | a) Calculate the cutting speed if the shaper has stroke length of 240 mm, number of double strokes per minute 40 and ratio of return to cutting time 2:3. | (5) |
|   | b) Explain various operations performed on slotting machines.   | (5) |
| 7 | a) Discuss the advantages & disadvantages of Up milling & Down milling with the help of diagrams.   | (7) |
|   | b) List any three milling attachments used.   | (3) |
| 8 | a) With a neat sketch explain the principal parts of a milling machine.   | (5) |
|   | b) Illustrate the milling cutter nomenclature with a neat diagram.  | (5) |

**PART C**

*Answer any four full questions, each carries 10marks.*

- 9 a) Explain the working of a swiss type automatic lathe. (5)  
b) With help of neat diagram differentiate between internal grinding and planetary internal grinding. (5)
- 10 a) Compare Glazing & Loading of grinding wheels. (4)  
b) Explain the importance of super finishing operations & comment on the surface roughness achievable by various super finishing operations (6)
- 11 a) Explain honing process by citing an application. (5)  
b) Explain with neat sketch a plain cylindrical grinding process. (5)
- 12 a) 'With rapid developments in the field of information Technology, DM is gaining momentum'. Discuss. (7)  
b) How concepts like JIT, TQM, FMS etc., can be related to DM. (3)
- 13 a) Differentiate between traditional manufacturing (mass production) & Digital manufacturing. (4)  
b) Explain the operation reference mode of DM with the help of a flow diagram. (6)
- 14 a) List the benefits of DM system. (6)  
b) Explain IDEF modelling method (4)

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