



R18 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY  
(Autonomous, Accredited by NAAC with 'A' Grade)

Subject code: 2P5CC

**B.Tech V Semester Regular/Supplementary Examinations, December 2021**  
**MACHINE TOOLS**  
**(Mechanical Engineering)**

**Maximum Marks: 70**

**Date:05.01.2022** Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit which carries 10M.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

**Part-A**

All the following questions carry equal marks

(10x2M=20 Marks)

- 1 Give the effects of a built up edge.
- 2 Mention the variables affecting tool life.
- 3 What are the various accessories used in a lathe?
- 4 List the main parts of capstan and turret lathes.
- 5 Compare a shaper and planer.
- 6 Write the specifications of a drilling machine.
- 7 List the various operations performed in milling machines.
- 8 Compare up milling and down milling process.
- 9 What is truing of grinding wheels?
- 10 Why is a coolant used in grinding work?

**Part-B**

Answer All the following questions.

(5X10M=50Marks)

- 11 Draw a Merchant's circle diagram and derive expressions to show relationships among the different forces acting on the cutting tool and different parameters involved in metal cutting. (10M)  
OR
- 12 (a) What are the desirable characteristics of a cutting tool material? (5M)  
(b) In orthogonal cutting of mild steel component, if the rake angle of the cutting tool is  $12^\circ$  and the shear angle is  $42^\circ$ . Find the chip thickness ratio. (5M)
- 13 Discuss the machining operations that can be performed on a centre lathe. (10M)  
OR
- 14 Describe the principal features and working of an automatic lathe. (10M)
- 15 Explain the working of a quick return mechanism in a shaper with a sketch. (10M)  
OR
- 16 Sketch and label the parts of a radial drilling machine. Also draw and explain the reaming and counter boring operations performed in a drilling machine. (10M)

- 17 With the help of a line diagram, explain the constructional features of a universal milling machine. (10M)
- OR
- 18 Discuss the common methods of indexing used in milling machine. (10M)
- 19 Sketch and explain the three methods of external cylindrical centre less grinding. (10M)
- OR
- 20 (a) List the advantages and disadvantages of different bonds used in grinding wheel. (5M)  
(b) Discuss the different types of abrasives used in grinding wheel. (5M)