R17 Regulation *Subject code:* 1P5CC

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

B.Tech III Year I Semester Regular Examinations, NOV/DEC 2019

METROLOGY AND MACHINE TOOLS
(MECHANICAL ENGINEERING)

Maximum Marks: 70 Date: 29.11.2019 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. Mention the various attachments used in a lathe.
2. What is chip thickness ratio?
3. Compare drilling and boring.
4. Give the applications of slotting machine.
5. Mention the advantages of climb milling.
6. What are natural and artificial abrasives?
7. What is the use of sine bar?
8. Define tolerance.
9. Mention applications of CMM.
10. Write the difference between surface roughness and surface waviness.

Part-B

All the following questions carry equal marks **(5 x 10 = 50 marks)**

11. (a) Give the specifications of an engine lathe. (4 marks)
    (b) Mention the various methods of performing taper turning in a lathe and describe any one method in detail. (6 marks)

(OR)

12. (a) Compare orthogonal and oblique cutting with necessary sketches. (5 marks)
    (b) Discuss the formation of various types of chips in machining. (5 marks)

13. (a) Describe the various operations performed in a drilling machine. (7 marks)
    (b) Sketch a twist drill and mark the salient features. (3 marks)

(OR)

14. (a) Mention the important differences between a shaper and a planer. (4 marks)
    (b) Describe the quick return mechanism employed in a shaper. (6 marks)

15. (a) Sketch and describe the purpose of indexing in a milling machine. (5 marks)
    (b) Give a brief account of face milling and end milling. (5 marks)

(OR)

16. (a) Describe the process of surface grinding with a neat diagram. (7 marks)
    (b) What is dressing and truing of a grinding wheel? (3 marks)

17. (a) Explain the different types of fits. (5 marks)
    (b) Explain the interchangeability assembly and selective assembly. (5 marks)

(OR)

18. Draw and explain the measurement of flatness of a surface using optical flats. (10 marks)

19. Give an account of the various machine tool alignment tests on a lathe. (10 marks)

(OR)

20. (a) Define the various terminologies related to surface roughness measurement. (4 marks)
    (b) Explain the construction and working of a CMM. (6 marks)