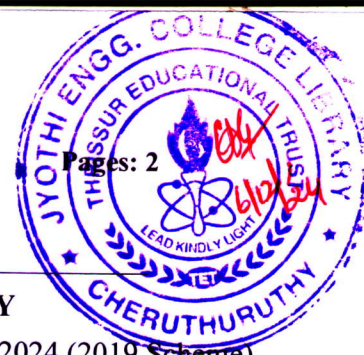


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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S5 (R, S) / S5 (WP) (R) / S3 (PT) (S,FE) Examination November 2024 (2019 Scheme)

Course Code: MET 307

Course Name: MACHINE TOOLS AND METROLOGY

Max. Marks: 100

Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

		Marks
1	How do you specify a Lathe?	3
2	Define Boring, Reaming and Tapping operations.	3
3	Define and classify indexing.	3
4	Describe the terms used in grinding wheel - grain size, grade and structure.	3
5	What are the advantages and disadvantages of broaching process?	3
6	State the significant of gear finishing process.	3
7	Define the terms sensitivity and precision.	3
8	Explain the terms basic size, fit and fundamental deviation.	3
9	Discuss about comparators.	3
10	List out any four errors in spur gear.	3

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

- | | | |
|----|--|---|
| 11 | a) Illustrate Radial and Sensitive drilling machine with neat sketch. | 8 |
| | b) Explain the essential parts of a slotting machine with a neat sketch. | 6 |
| 12 | a) Discuss the crank and slotted link mechanism applied in shaper machine. | 7 |
| | b) Explain any six operations that can be performed in a lathe machine. | 7 |

Module -2

- | | | |
|----|--|---|
| 13 | a) Sketch and discuss the nomenclature of milling tool. | 8 |
| | b) Explain the different types of bonds used in the manufacturing of grinding wheel. | 6 |
| 14 | a) Explain Surface grinding and Cylindrical grinding process with neat sketch. | 9 |
| | b) Differentiate up milling and down milling process with neat sketches. | 5 |

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Module -3

- 15 a) Illustrate gear shaving and gear burnishing operations with neat sketches. 10
b) Describe form cutting operation in manufacture of gears. 4
- 16 a) Employ the suitable broaching process for gear manufacturing. 7
b) Sketch and cite the geometric parameters of a broach tool. 7

Module -4

- 17 a) Provide short notes on ring gauge, feeler gauge, snap gauge and plug gauge with neat diagrams. 10
b) Summarize the types of fits used in limit system. 4
- 18 a) Discuss the principle of interchangeability and selective assembly. 7
b) Calculate the limit dimensions for a clearance fit between mating parts of diameter 50 mm, providing a minimum clearance of 0.15 mm with a tolerance on hole equal to 0.025 mm and on shaft 0.05 mm using hole basis system. 7

Module -5

- 19 a) Demonstrate the flatness measurement using optical flats. 7
b) What is Coordinate Measuring Machine? Explain the different types of CMM. 7
- 20 a) How do you measure the effective diameter of Screw thread? Explain three wire method. 7
b) Examine the straightness using the principle of an autocollimator with neat sketch. 7
