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Pages: 2

Reg No.:_____ Name:_____

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

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

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