Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S5 (S,FE) (FT/WP/S3PT) Examinations June 2026 (2019 Scheme)

Course Code: MET307
Course Name: MACHINE TOOLS AND METROLOGY

Max. Marks: 100 Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks)

		Marks
1	Define taper turning, Chamfering and knurling operations in lathe machine.	3
2	List the operations that can be carried out using shaper machines.	3
3	Formulate machining time of milling process.	3
4	Describe tool and cutter grinding machine.	3
5	Differentiate between pull type and push type broaching process.	3
6	What is gear shaving process?	3
7	What is limit gauging?	3
8	Discuss the difference between hole basis and shaft basis tolerance system.	3
9	Explain the purpose of optical flats. Draw the fringe pattern when the surface viewed under an optical flat is perfectly flat.	3
10	Define the terms face, flank and circular pitch of a gear.	3

PART B

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

Module -1

11	a)	Sketch and explain any three work holding devices used in lathe.	7
	b)	Explain the nomenclature of drill bit with neat sketch.	7
12	a)	Construct the basic structure of shaper with related explanation.	7
	b)	Explain any three tool holding devices used in drilling machine.	7

Module -2

13	a)	Summarize any four types of milling cutters with suitable sketches.	8
	b)	Illustrate gear lapping and honing process with neat sketches.	6
14	a)	How do you specify a grinding wheel? Explain with a suitable example.	6
	b)	Discuss the internal and external centreless grinding operations with neat sketches and list their advantages and disadvantages.	8

Module -3

15	a)	Explain horizontal, vertical and continuous broaching machines.	7
	b)	Explain gear hobbing process with suitable diagram.	7
16	a)	Discuss gear teeth grinding and gear burnishing process with neat sketches.	10
	b)	Compare internal and external broaching processes.	4

Module -4

17	a)	State Taylor's principle used in limit gauges with neat sketches.	6
	b)	Describe the operation of plug and snap gauges with neat sketches.	8
18	a)	Explain the process of wringing in slip gauges.	4
	b)	Provide short notes on various measurement errors.	10

Module -5

19	a)	Apply and discuss the interferometry principle to measure the linear dimensions with suitable sketches.	7
	b)	Explain the application of Tool maker's microscope with neat sketch.	7
20	a)	Show the terminologies used in screw thread with neat sketch and explanation.	8
	b)	Explain the various elements of surface roughness with neat figure.	6

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