CBCS SCHEME

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BME402

Fourth Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Machining Science and Metrology

Time: 3 hrs. Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	With a neat sketch, explain single point cutting tool geometry.	07	L2	CO1
	b.	Explain the merchant circle diagram for the analysis of power requirement for the machine tool.	08	L2	CO1
	c.	Describe the orthogonal and oblique cutting.	05	L2	CO1
		OR			
Q.2	a.	With neat sketches, explain the tool layout for producing a hexagonal bolt on a capstan lathe.	07	L2	CO1
	b.	Briefly discuss the broad classification of lathes.	07	L2	CO1
	c.	Explain any two operations of the lathe.	06	L2	CO1
		Module – 2			
Q.3	a.	With a neat diagram, explain column and knee type milling machine.	07	L2	CO2
	b.	Explain with neat sketches up milling and down milling methods of milling operations. Discuss the significance of both.	08	L2	CO2
	c.	Use compound indexing method for calculating the index crank movement to divide the peripheral of a job into 87 divisions.	05	L3	CO2
		OR			
Q.4	a.	Explain with neat sketch constructional features of radial drilling machine.	08	L2	CO2
	b.	Explain driving mechanisms of shaper.	06	L2	CO2
	c.	Briefly explain the classification of grinding machines.	06	L2	CO2
		Module – 3			
Q.5	a.	Define tool life. Discuss the parameters which influences the tool life.	08	L2	CO3
	b.	With a neat sketch, explain the different heat zones that are present during the metal cutting process.	06	L2	CO3
	c.	Discuss the different wear mechanisms.	06	L2	CO3
		OR			
Q.6	a.	List the different types of cutting tool materials and explain them.	08	L2	CO3
	b.	Explain different properties of cutting fluids.	06	L2	CO3
	c.	Define machinability and discuss the factors affecting machinability.	06	L2	CO3
		Module – 4			
Q.7	a.	Discuss the following standards of measurement: (i) Line standard (ii) Wavelength standard (iii) End standard	07	L2	CO4
	b.	With a neat sketch, explain international prototype meter.	07	L2	CO4
	c.	Explain wringing phenomenon.	06	L2	CO4
		OR			
Q.8	a.	Define fit. Describe the types of fit and their designation.	08	L2	CO4
	b.	What is the purpose of limit system?	06	L2	CO4
	c.	With a neat sketch, explain snap gauges.	06	L2	CO4

		Module – 5			
Q.9	**a.**	With a neat sketch explain Taylor's principle in the design of limit gauges.	**08**	**L2**	**CO5**
	b.	Sketch and explain two types of plug and ring gauges.	**08**	**L2**	**CO5**
	c.	Explain briefly the different gauge tolerances.	**04**	**L2**	**CO5**
		OR			
Q.10	**a.**	Explain the basic characteristics and classification of comparators.	**06**	**L2**	**CO5**
	b.	With a neat sketch, explain sigma comparator.	**08**	**L2**	**CO5**
	c.	Explain the principle and working of a sine bar.	**06**	**L2**	**CO5**

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