Sanjay Ghodawat University, Kolhapur 2018-19

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017 EXM/P/09/01

Year and Program: 2018-19 **School of Technology** **Department of FY M. Tech**

Course Code: MMD 506 **Course Title: Advanced Machine Tool Design** **Semester – II**

Day and Date: Friday 24-05-2019 **End Semester Examination (ESE)** **Time:** 2.30 to 5.30 pm. **Max Marks: 100**

Instructions:
1) All questions are compulsory.
2) Assume suitable data wherever necessary.
3) Figures to the right indicate full marks.

		Marks	Bloom's Level	CO
Q.1	**Solve following**			
a)	How suitable layout can best be carried out using Boolean algebra technique. Show one example by drawing layout	06	L_3	CO1
b)	Explain in brief the steps involved in engineering design process applied to machine tools presenting block diagram.	06	L_3	CO1
	OR			
b)	Consider two beams of mild steel and cast iron, with mechanical properties: for M.S, $E = 2 \times 105$ N/mm^2, $[\sigma] = 140$ N/mm2, for Cast Iron, $E = 1.2 \times 105$ N/ mm^2, $[\sigma] = 30$N/mm^2, deflection = 0.002 mm for both materials. Compare volumes of the two beams with optimum l/b values will be in the ratio	06	L_3	CO2
Q.2	**Solve any Two**			
a)	Explain briefly the various forces must be taken into account while designing machine tool structure	06	L_3	CO2
b)	Derive the expression for reduced torsional rigidity diagonal stiffeners in the design of machine tool bed	06	L_4	CO2
	OR			
b)	Explain various design considerations for sliding friction power screw with design conditions.	06	L_3	CO3
Q.3	**Solve any Two**			
a)	Derive the expressions for average pressure acting on the mating surfaces of guideways.	08	L_3	CO3
b)	Derive the expression for the deflection of axis due to compliance of spindle support	06	L_4	CO4
	OR			

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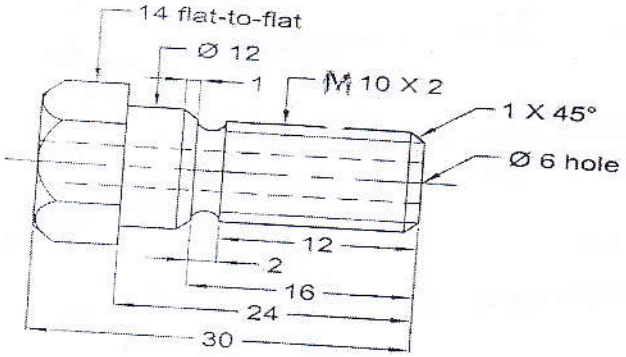
	b)	State design calculations in the design of antifriction bearings	06	L_4	CO4
Q.4		**Solve any Two**			
	a)	Discuss procedure for assessing dynamic stability of equivalent elastic system cutting process closed loop system	10	L_3	CO5
	b)	Explain instrumentation necessary for dynamic characteristics of the machine tool elastic system	10	L_3	CO5
	c)	Draw block diagram for regenerative chatter and explain	10	L_3	CO5
Q.5		**Solve any Two**			
	a)	State the purpose of dynamic analysis of machine tools. Explain equivalent elastic system and closed loop machining system	10	L_3	CO5
	b)	Discuss constructional features of multiple spindle vertical turret lathe	10	L_2	CO6
	c)	Basic principle of Swiss type automatic lathe with neat sketch	10	L_2	CO6
Q.6		**Solve any Two**			
	a)	Explain kinematic system and working principle hydraulic copying lathe	10	L_3	CO6
	b)	Draw a schematic of typical tool layout for a hollow hexagonal headed M.S. bolt to be machined in a single spindle automatic lathe Also mention scheduling and operation chart indicating tool positions and machining conditions	10	L_5	CO6



	c)	Explain bar feeding mechanism of capstan lathe with neat sketch	10	L_2	CO6

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