Total No. of Questions : 12]

SEAT No. :

**P2982**

[Total No. of Pages : 2

# [5154]-537
# B.E. (Mechanical)
# MACHINE TOOL DESIGN
## (2012 Course) (Semester - I) (402044D) (Elective - I)

*Time : 2 ½ Hours]* *[Max. Marks : 70*

***Instructions to the candidates:***

1) ***Neat duagrams must be drawn wherever necessary.***
2) ***Assume suitable data, if necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Use of non-programmable electronic calculators is allowed.***

## SECTION - I

***Q1)*** What are the general requirements of Machine Tool Design? Explain each in brief. **[10]**

OR

***Q2)*** Explain the design procedure of Feed box by considering all safety factors.**[10]**

***Q3)*** Explain the factors affecting the Machine tool structures. Suggest methods to improve it. **[10]**

OR

***Q4)*** With the schematic, explain the stress analysis of Column. **[10]**

***Q5)*** a) Discuss the methods of adjusting clearances in slide-ways. **[5]**

b) What is stick-slip motion in slide-ways. Explain. **[5]**

OR

***Q6)*** Explain the design criteria and calculations of any Hydrostatic slide-ways.**[10]**

***P.T.O.***

## SECTION - II

***Q7)*** a) Discuss the different factors for the design of sliding friction power screws. **[6]**

b) Describe with neat sketch aerostatic bearings. **[6]**

OR

***Q8)*** a) Explain the methods of preloading of antifriction bearings. **[6]**

b) Explain the design procedure of Spindles with sketches. **[6]**

***Q9)*** Explain the dynamic characteristics of the equivalent elastic system with the sketches. **[12]**

OR

***Q10)*** What is Forced Vibration? Explain its effect on the cutting process on machine tools. **[12]**

***Q11)*** a) Explain retrofitting with reference to Lathe machine. **[8]**

b) Discuss the principle of self locking. **[8]**

OR

***Q12)*** a) Discuss recent trends in machine tools in industries. **[8]**

b) What are the aesthetic and ergonomics considerations applied to the design of control members. **[8]**

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