

Total No. of Questions : 10]

SEAT No. :

P1855

[4859]-1020

[Total No. of Pages : 2

B.E. (Mechanical)

d-MACHINE TOOL DESIGN

(2012 Course End Sem) (Elective-I)(Semester-I)

Time : 2 1/2 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer in one answer book.*
- 2) *Answer Q1 or Q2 , Q3 or Q4 ,Q5 or Q6, Q7 or Q8,Q9 or Q10.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right side indicate full marks.*
- 5) *Use of Calculator is allowed.*
- 6) *Assume Suitable data if necessary.*

- Q1)** a) Explain Geometric Progression with suitable example. [4]
b) In Machine tool gear box, if number of speed steps are 12 and is to be realized in 3 steps, write down six various possible structural formula.[6]

OR

- Q2)** a) What are consideration in design of machine tools drives. [4]
b) Define static and dynamic stiffness. [6]

- Q3)** a) Explain various types of beds used in machine tool and their construction and design features (only three). [6]
b) Classify machine tools guide-ways. [4]

OR

- Q4)** a) Explain stick-slip motion in guide-ways. [4]
b) Write design procedure for Aerostatic slide-ways. [6]

- Q5)** a) Explain calculation for spindle design. [12]
b) What are function and design requirement of spindle. [6]

OR

- Q6)** a) Explain design of power screw with respect to wear resistance, strength and stiffness. [12]
b) Why re-circulating ball screws are used in precision machines. [6]

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Q7) a) Explain dynamic characteristics of cutting process. [8]

b) Explain vibration in machine tools. [8]

OR

Q8) a) Explain ergonomics consideration applied to design of control members push button, toggle , knobs and crank. [12]

b) Explain Adaptive Control system. [4]

Q9) a) What are design consideration in CNC machines. [8]

b) Explain recent trends in machine tools. [8]

OR

Q10) a) Explain various mechanical variators stepless speed regulations. [12]

b) Explain Hydraulic stepless regulations. [4]

