

22570

11920

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions* – (1) All Questions are *Compulsory*.
- (2) Answer each next main Question on a new page.
- (3) Illustrate your answers with neat sketches wherever necessary.
- (4) Figures to the right indicate full marks.
- (5) Assume suitable data, if necessary.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

- 1. Attempt any FIVE of the following: **10****
- a) Differential between machine tool and cutting tool.
- b) state the causes of vibration in machine tool.
- c) Explain the preloading of antifriction bearing.
- d) List material used for guide ways.
- e) State any two factors affecting the stiffness of machine tool structure.
- f) Define Ray diagram.
- g) Define importance of Asthetics in machine tool.

P.T.O.

- 2. Attempt any THREE of the following:** **12**
- a) Explain speed chart? State the importance with suitable example.
 - b) State the factors to be consider for selection of factor of safety.
 - c) Describe any four requirements of machine tool structure.
 - d) Discuss the ergonomic considerations applied to types and location of display.
- 3. Attempt any THREE of the following:** **12**
- a) List out the protecting devices used for slideways, sketch any one device.
 - b) State different material used for machine tool structures, write their properties?
 - c) A machine tool spindle is to have 6 speeds and to run at maximum speed of 12.80 rpm. and Geometric Ratio of 2.00 Calculate the spindle speed in G.P. and draw Ray diagram.
 - d) Explain stick-slip vibration in machine tool?
- 4. Attempt any THREE of the following:** **12**
- a) Discuss basic design procedure of machine tool structure.
 - b) State the functions of the spindle unit with their application in machine tool.
 - c) State the general requirements of the machine tool design.
 - d) Draw any structural diagram for 1x2x3 and 3x1x2
 - e) State any four design recommendations for display.

5. Attempt any TWO of the following:**12**

- a) Draw the structural diagram of machine tool speed box for $n_{\min}=16$ rpm $n_{\max}=770$ rpm, and $\phi=1.26$, Which layout is best and why?
- b) Explain the properties of material required for machine tool spindles.
- c) With neat sketch explain the different methods of adjusting clearances in slideways.

6. Attempt any TWO of the following:**12**

- a) Explain the role of vibration dampers and isolators.
 - b) Explain importance of speed chart with suitable example for 6 speeds.
 - c) Explain the different profiles of machine tool structures? Compare these sections for stiffness and having same cross sectioned area.
-