

**BACHELOR OF TECHNOLOGY (C.B.C.S.) (2014 COURSE)**  
**B.Tech.Sem - VI MECHANICAL : WINTER- 2022**  
**SUBJECT : MACHINE TOOL DESIGN**

Day : Wednesday

Time : 10:00 AM-01:00 PM

Date : 30-11-2022

**W-13454-2022**

Max. Marks : 60

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**N.B.:**

- 1) All questions are **COMPULSORY**.
  - 2) Figures to the right indicate **FULL** marks.
  - 3) Draw neat and labelled diagram **WHEREVER** necessary.
  - 4) Assume suitable data if necessary.
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**Q.1** Explain in detail the general requirements of machine tool design. **[10]**

**OR**

**Q.1** Define working motions and auxiliary motions in machine tools. Show the same for lathe, drilling and milling machines. **[10]**

**Q.2** State the various laws of stepped regulation. Why geometric progression is commonly used for speed gear box design? **[10]**

**OR**

**Q.2** Design a 9 speed gear box with speed ranging from 30 rpm, given that  $\phi = 1.41$ . Draw the structural diagram, best ray diagram and layout sketch of gear box. **[10]**

**Q.3** Explain the different factors which decide the materials used for machine tool structure. Also explain the materials used for same. **[10]**

**OR**

**Q.3** What are the various factors affecting stiffness of machine tool structure? Explain in detail the methods to improve it. **[10]**

**Q.4** What is the basic function of guide ways and explain its types? **[10]**

**OR**

**Q.4** Give the different materials used for sliding friction power screw. Explain in detail the different profiles of power screw. **[10]**

**Q.5** Explain in detail the effect of machine tool compliance on machining accuracy. **[10]**

**OR**

**Q.5** State the common requirement of spindle support. Explain in detail the preloading of antifriction bearings. **[10]**

**Q.6** State and explain the different type of maintenances in detail. **[10]**

**OR**

**Q.6** Define transfer devices. What are the advantages and limitations of transfer devices? **[10]**

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