

**B.Tech. SEM -VII Production 2014 Course (CBCS) : SUMMER - 2019**

**SUBJECT: MACHINE TOOL DESIGN**

Day : Saturday  
Date : 11/05/2019

Time : 02.30 PM TO 05.30 PM

Max Marks : 60

S-2019-2844

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat and labeled diagram **WHEREVER** necessary.
- 4) Assume suitable data, if necessary.

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**Q.1** Explain in detail the general requirements of machine tool control? **(10)**

**OR**

**Q.1 a)** Explain in detail the layout of machine tool. **(05)**

**b)** Define the working motions in machine tools. **(05)**

**Q.2** Design a 12 speed gear box with speed ranging from 30 rpm and  $\phi = 1.41$  **(10)**  
.Draw the layout, deviation diagram and calculate the number of teeth on each gear.

**OR**

**Q.2** Discuss in detail the devices which provide intermittent motions to the machine tools **(10)**

**Q.3** Explain in detail the factors affecting stiffness of machine tool structures and methods of improving it. **(10)**

**OR**

**Q.3** Discuss different profiles of machine tool structures and give reason for the best structure. **(10)**

**Q.4** Explain in detail with neat sketch the protecting devices for slideways. **(10)**

**OR**

**Q.4** Discuss in detail the design procedure for power screws. **(10)**

**Q.5 a)** State the functions of spindle unit and give their requirements. **(05)**

**b)** Discuss the materials used for the spindle unit. **(05)**

**OR**

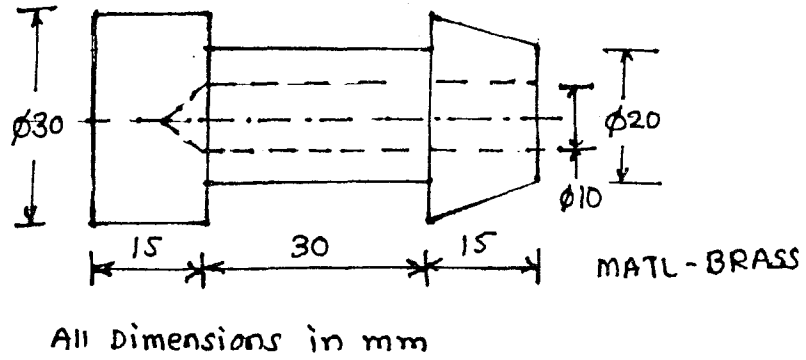
**Q.5** Discuss the effect of machine tool compliance on machining accuracy **(10)**

**P. T. O.**

- Q.6 a) What are the factors affecting choice of transfer devices? (05)
- b) Discuss the automatic loading and feeding of work pieces in machine tools. (05)

OR

- Q.6 Design a cam set for a single spindle automat for the machining of component (10) shown in figure.



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