

Day: Monday
Date: 21-5-2018

Time: 2:30 P.M. To 5:30 P.M.
Max. Marks: 80

S-2018-2319

N.B.:

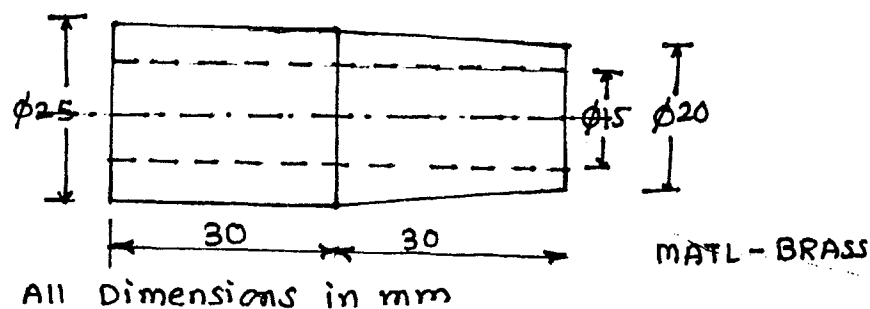
- 1) Q.No.1 and Q.No.5 are **COMPULSORY**. Out of remaining Attempt **ANY TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks
- 3) Use of non programmable electronic calculator is **ALLOWED**
- 4) Assume suitable data if necessary.

SECTION - I

- Q.1** Design a speed gear box for machine tool to have spindle speeds ranging from 30 to 1000 rpm in 9 steps. Draw the structural diagram, best ray diagram, layout of gear box and deviation diagram. (14)
- Q.2** a) Discuss the engineering design process applied to machine tools. (07)
b) Explain the modular concept of machine tool design. (06)
- Q.3** a) What are the various laws of stepped regulation? Compare them. (07)
b) Explain in detail the VVFD drives. (06)
- Q.4** a) Compare welded structures with cast structures and explain how box type structures are strengthened. (07)
b) What are the factors taken into consideration for selection of materials in machine tool structures? (06)

SECTION - II

- Q.5** Design a cam set for single spindle automat for machining of component shown in figure (14)



- Q.6** a) Discuss in detail the design criteria for sideways. (07)
b) Explain with neat sketch the design of rolling friction power screw. (06)

- Q.7** a) Sketch typical spindle units used in various machine tools and discuss the significance of its geometry. **(07)**
- b) What is preloading of antifriction bearing? With suitable sketch explain the methods used for preloading of roller bearings. **(06)**
- Q.8** a) Discuss the principles of Automation. Also give the advantages and disadvantages of automation. **(07)**
- b) Explain with neat sketch the bar feed mechanism for automatic screw cutting machine. **(06)**

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