

**B.Tech. 4th Semester (AUE) F-Scheme Examination,
May-2018**

DESIGN OF MACHINE ELEMENTS

Paper-AUE-210 F

Time allowed : 3 hours] [Maximum marks : 100

Note: Attempt five questions. Question No. 1 is compulsory. Attempt at least one question from each section.

1. (i) What is design process ?
- (ii) What are casting materials ?
- (iii) What are steels ?
- (iv) What is fastening ?
- (v) What are the steps taken in value analysis ?
- (vi) What are tolerances
- (vii) What are Joints ? Mention its types.
- (viii) What are strings ? Mention its types. 8×2.5

Section-A

2. What are general considerations taken in machine design ? Explain the procedure taken in design of machines. 20
3. (a) Explain factors influencing selection of materials. 10
- (b) Explain mechanical properties of materials. 10

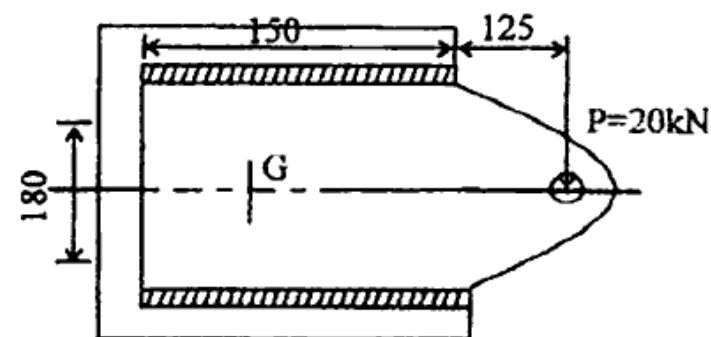
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Section-B

4. (a) Explain the classification of Engineering materials. 12
- (b) What are the application of engineering materials ? 8
5. What are fits ? Explain types of fits with neat and clean diagram. 20

Section-C

6. (a) What are fasteners ? Explain its types with suitable examples. <http://haryanapapers.com> 12
- (b) Explain the application of fasteners. 8
7. A bracket is welded to a column. Determine the size of the weld, if permissible shear stress in the weld is 80 N/mm^2 . All units are in mm. 20



Section-D

8. (a) What are belt drives ? Classify them with neat and clean diagram. 10
- (b) Derive maximum power transmitting capacity of belt drive. 10
9. A spring loaded safety valve for a boiler is required to blow off at a pressure of 1.25 N/mm^2 . Design a suitable compression spring for safety valve using following data
- diameter of valve = 60 mm
- max. lift of valve = 20 mm
- Initial compression of spring = 40 mm
- Spring index = 6
- Limiting shear stress for spring material = 600 MPa
- Modules of rigidity = $.85 \times 10^5 \text{ MPa}$ 20

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