Code No. 6301

FACULTY OF ENGINEERING

B.E. 3/4 (M/P) I-Semester (Main) Examination, November/December, 2009

Subject : DESIGN OF MACHINE ELEMENTS

Time : 3 Hours] **[Max. Marks : 75**

Note : *Answer **all** questions from **Part - A**. Answer **any five** questions from **Part - B**. Any missing data may be assumed suitably :*

PART - A **(25 Marks)**

1. Distinguish Yield Point Stress and Ultimate Stress.

2. What is Factor of safety ?

3. What is Endurance Limit ?

4. What is Stress Concentration ?

5. What is Notch Sensitivity ?

6. Distinguish between feather key and Gib head key.

7. What is Bolt of Uniform Strength ?

8. Why is sleeve split, in Split muff coupling ?

9. Where do you find lead screw ? What is its necessity? What are design considerations ?

10. Sketch a triple riveted lap joint.

Contd...2

PART - B **(50 Marks)**

11. Consider the state of stress at a point of a bi-axially loaded member as shown in the Figure 1. Determine the principal stresses and calculate the factor of safety using. **10**

(a) Maximum principal stress theory

(b) Maximum shear stress theory

(c) Maximum distortion energy theory

Take the value of critical stress of the material as 300 N/mm^2.

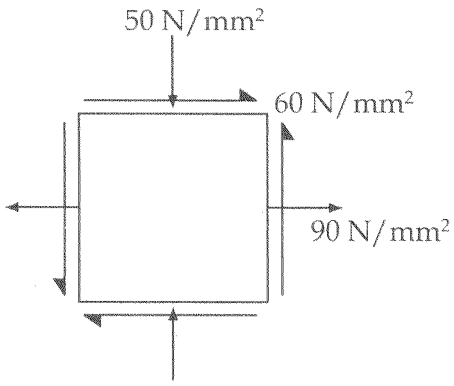

Figure 1

12. A rod of diameter 40 mm is subjected to a variable axial load which varies from 200 to 1000 N. If the endurance limit and the yield point of the material are 200 and 350 N/mm^2, respectively, determine the factor of safety. **10**

13. Design a flange coupling to transmit 60 kw at 350 rpm. Allowable shear stress may be taken as 30 N/mm^2. **10**

14. Design a knuckle joint to transmit a load of 3 kN. Take allowable stress values in tension and shear as 60 N/mm^2, and 25 N/mm^2, respectively. **10**

15. Determine the size of the rivet required for the arrangement shown in the Figure 2. Take the allowable shear stress for the rivet material as 50 N/mm^2. **10**

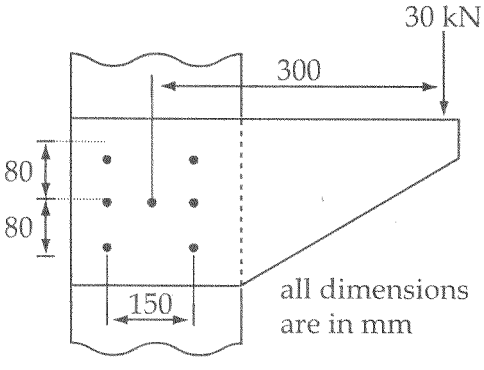

Figure 2

Contd...3

16. Determine the size of the weld required for the joint shown in the Figure 3. Allowable stress for the weld material is 80 N/mm^2. **10**

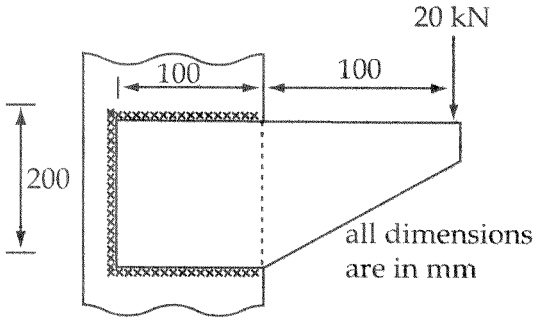

Figure 3

17. Sketch : **10**

(a) Lozenze Joint

(b) Turn Buckle

(c) Castle nut

(d) Screw jack

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