CONCORDIA UNIVERSITY
FACULTY OF ENGINEERING AND COMPUTER SCIENCE

Department of Mechanical and Industrial Engineering

MIDTERM 2

MECH 313: Machine Drawing and Design: Winter 2016

Maximum Marks = 50

Instructors: Drs. F. Tardy, H. Gomaa and S. Joshi

Date: 20 March 2016 Time: 90 minutes

NAME: _____
(Please Print) SURNAME FIRST NAME

STUDENT ID: _____ SECTION: _____

SIGNATURE: _____

INSTRUCTOR: _____

Name and student I/D must be written in INK.

All work must be illustrated in order to gain full marks assigned to the question.

INDIVIDUAL WORK - Closed Book Test

Material allowed: Approved calculator, Drawing equipment.

Answer the questions in the space provided.

Return the paper and data booklet at the end of the schedule time.

Q1 (10)	Q2 (5)	Q3 (20)	Q4 (15)	Total (50)

Q1. Encircle the correct answer for the following multiple choice questions (only one). **(1X10)**

1. A weld made *in situ* in the field is indicated by

A. ○

B. ⚑ (correct)

C. <

D. ⊳

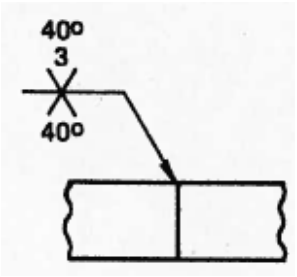
2. What defines the distance a screw will travel when rotated an angle of 360°?

A. Crest
B. Root
C. Lead (correct)
D. Pitch

3. Which headstyle in fastener provides good grip and high torque to be applied during assembly of aerospace components?

A. Hexagonal
B. Fillister
C. Truss
D. 12-Point (correct)

4. For the given weld notation, the width of the root fillet is



A. 40 mm
B. 3 mm (correct)
C. 40/3 mm
D. 3/40 mm

5. What is the single major advantage of adhesive fasteners compared with other fastening methods like rivets or bolts?

A. Adhesive fastening is faster than other fastening methods
B. Adhesive fastening provides uniform stress distribution over the bonded area (correct)
C. Adhesive fastening is sensitive to condition of surface
D. Adhesive fastening is sensitive to environmental conditions

6. All of the following are part of the English thread specification, except:

A. thread form
B. major diameter
C. tap drill
D. class of fit

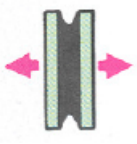
7.Which of the following is true; if thread is designated as M10 X 1.5 X 15?

A. Nominal diameter of the thread is φ10 inch
B. Pitch of the thread is 1.5mm (correct)
C. Pitch of the thread is 15mm
D. Nominal diameter of the thread is φ1.5inch

8. A pin fastener is an inexpensive and effective method of assembly when the loading is predominantly _____.

A. tensile
B. compressive
C. shear (correct)
D. torsional

9. Which one of the following shows the peel mode of stress in adhesive fastening?

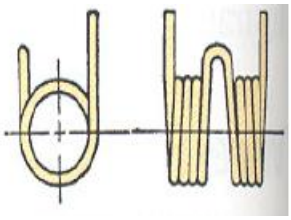
A. 

B. 

C. 

D.  (correct)

10. The part shown in the adjacent drawing is a _____.

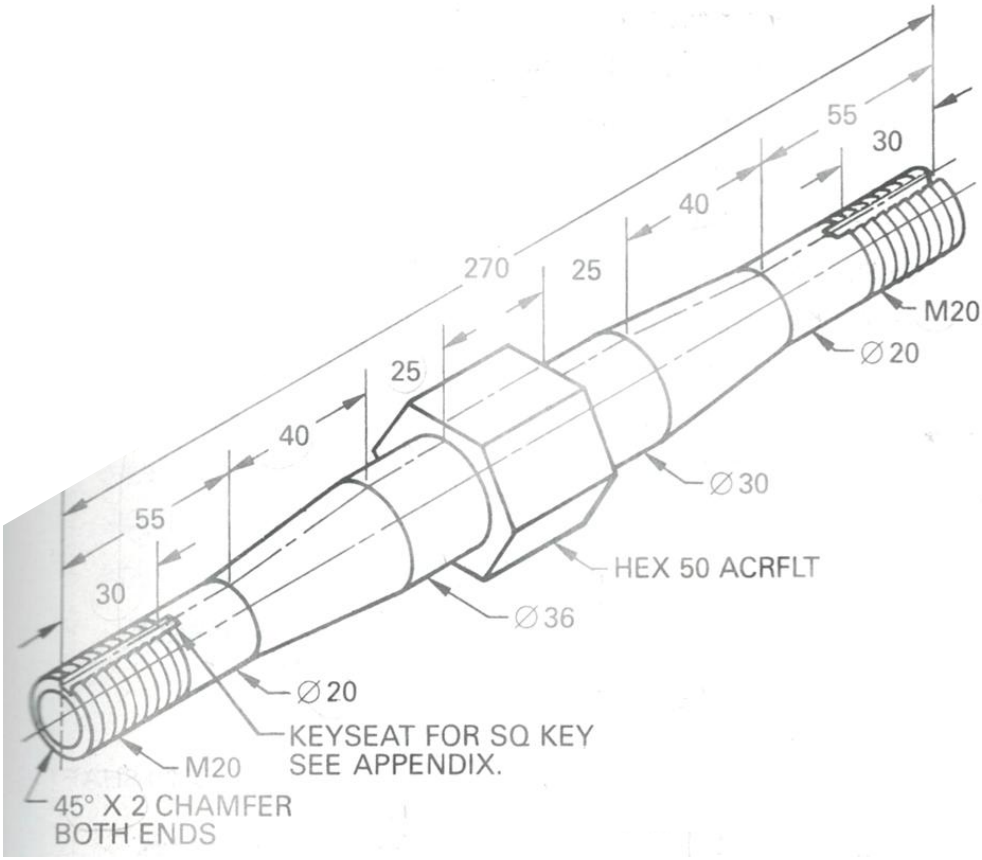


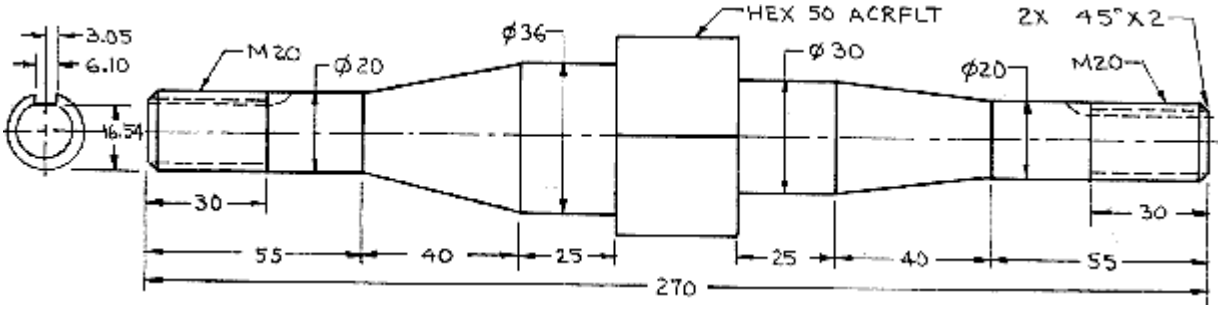
A. compression spring
B. extension spring
C. torsion spring (correct)
D. lea spring

Q2. (a) A metric fastener has 830 MPa as Minimum Tensile strength and 660 as Minimum Yield strength. What is the property class of this fastener? Show calculations. [5 Marks]

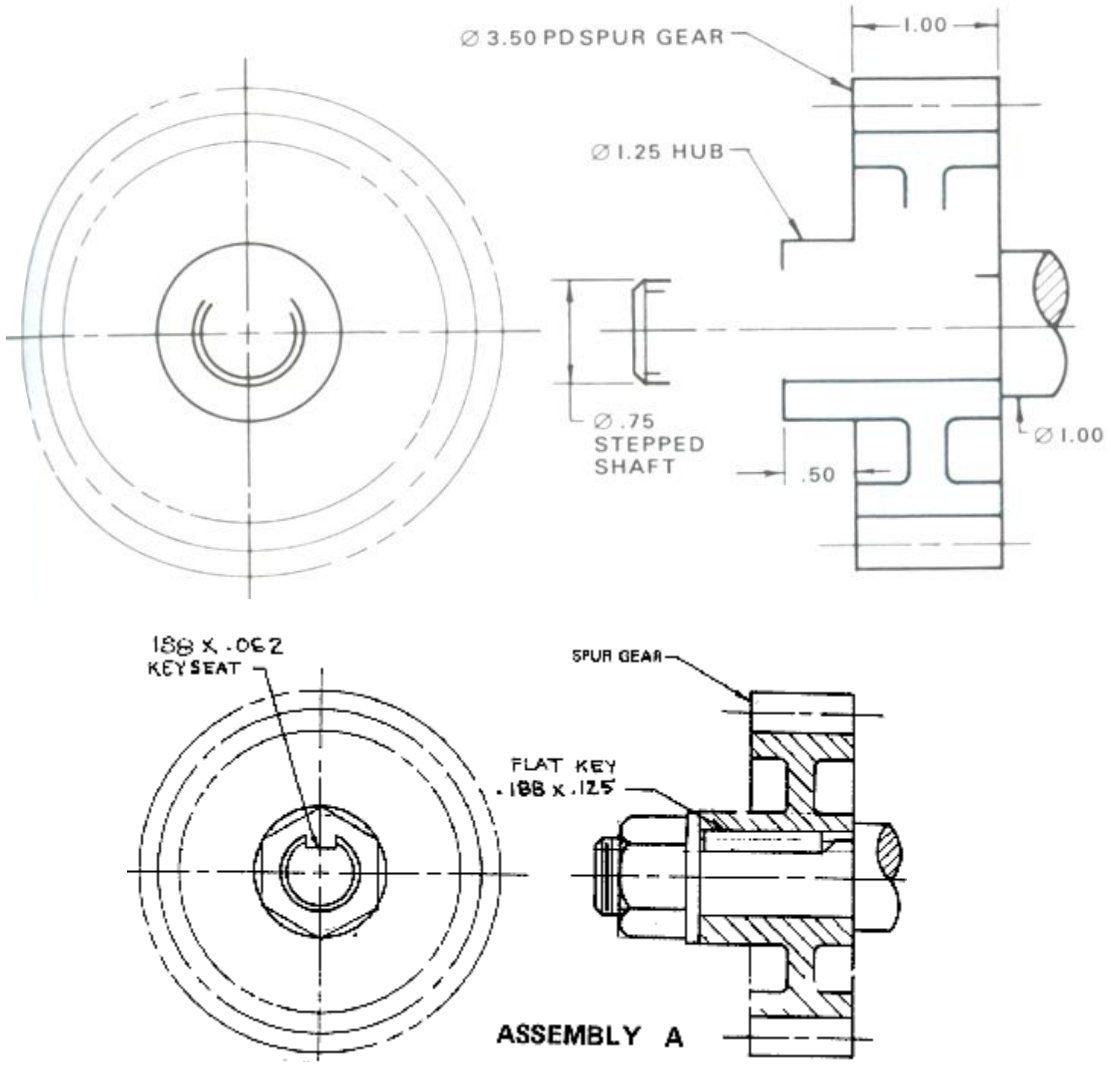
Sol: 1/100th of 830 MPa is 8.3 and the first digit is 8.
Minimum Yield Strength ÷ Minimum Tensile Strength = 660÷ 830 = 0.795 ≅ 80%, so the last digit is 8.
The property class is 8.8.

Q3. Make a working drawing of the axle shown in the figure clearly showing all the dimensions.[20 Marks]
Hint (Draw a front view of the axle containing the key seat and add a side view of the square key).





Q4. a) Add a flat key to the assembly shown. [5 Marks]



Q4. b) Complete the welding symbols shown to the right of the desired welds. [10 Marks]