



## College of Engineering & Technology

Department: Mechanical Engineering

Marks: 20

Lecturer: Dr. Rola Afify

Time: 4:00 – 5:00

Course Code: ME356

Date: 17/12/2013

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### Answer the following questions:

#### Question one (5 marks)

A) Define:

i) Machinability:

ii) Resilience:

B) What are the main considerations should be taken while choosing the factor of safety?

#### Question two (5 marks)

A shaft is required to transmit 600 kW at 110 r.p.m. The shear stress is not to exceed 60 MPa and twist in a length of 1.5 meters not to exceed 2 degrees. Find the diameter of the shaft. Take modulus of rigidity as 84 GPa.

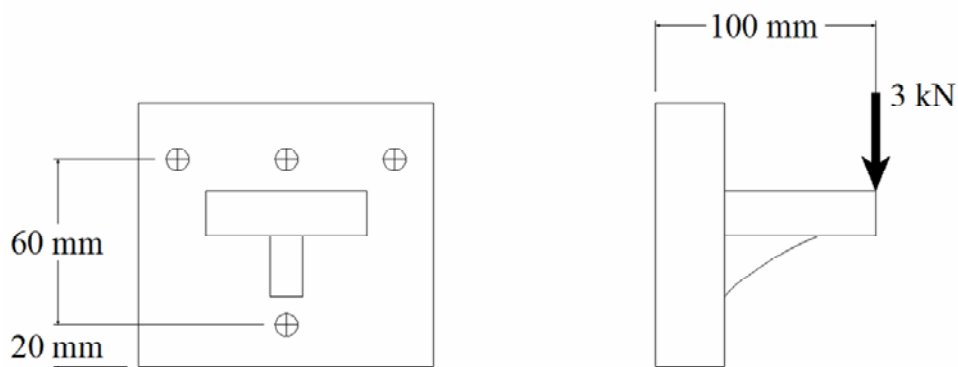
### **Question three (5 marks)**

An electric motor driven power screw moves a nut in a vertical plane against a car weight of 30 kN at 50 r.p.m. The screw has a single square thread of 6 mm pitch on a major diameter of 40 mm. The coefficient of friction at screw threads is 0.1. Estimate:

- i) The power of the motor.
- ii) The power screw efficiency.

### **Question Four (5 marks)**

For the bolted Joint shown in following figure find the maximum shear stress if the outer diameter of the bolts is 14 mm.



**Good Luck**  
*Dr. Rola Afify*