INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)
Dundigal, Hyderabad -500 043

MECHANICAL ENGINEERING

ASSIGNMENT

Course Name	:	MECHANICS OF SOLIDS
Course Code	:	A30104
Class	:	II B. Tech I Semester
Branch	:	MECH
Year	:	2016 – 2017
Course Coordinator	:	Mrs. J. Swetha, Assistant Professor.
Course Faculty	:	USP Rao, Professor.

OBJECTIVES

Mechanics of Solids is the physical science that deals with the reaction of a body to movement and deformation due to mechanical, thermal, or other loads. The basis of virtually all mechanical design lies in how the material reacts to outside forces. Mechanics is the core of engineering analysis and is one of the oldest of the physical sciences. An in-depth understanding of material properties as well as how certain materials react to outside stimulus is paramount to an engineering education.

S No	QUESTION	Blooms taxonomy level	Course Outcomes
	ASSIGNMENT – I		
1	A straight bar of steel rectangular in section is 4m long and is18mm thick. The width of the rod varies uniformly from 130mm at one end 250mm at the other. If the rod is subjected to an axial tensile load of 50KN, determine the extension of the rod. Take E=2.0×10^5 N/mm	Applying	1
2	Define composite bar how will you find the stress and load carried by each member of composite bar.	Remembering	1
3	A Beam of length 6.0m is simply supported at the ends and carries a u.d.l of intensity 1.5KN/m run and three concentrated loads of 1KN, 2KN and 3KN acting at a distance of 1.5m, 3.0m and 4.5m respectively from left end. Draw the S.F.D and B.M.D and also determine the maximum bending moment.	Analyzing	2
4	A cantilever beam AB, 1.8 m long carries a point load of 2.5 KN at its free end and a uniformly distributed load of 1KN/m from A to B. Draw shear force and bending moment diagrams for the beam.	Analyzing	2
5	A rectangular beam 300mm deep is simply supported over a span of 4.0m. Determine the uniformly distributed load per meter which the beam may carry, if bending stress should not exceed 120N/mm2. Take I=8.0x106mm4	Analyzing	3
	ASSIGNMENT – II		
1	Determine out the maximum shear stress in a shaft of dia 40 mm subjected to a shear force of 30 KN.	Analyzing	3
2	A circular bar of diameter 80mm is subjected to an axial load of 20KN.Dtermine the shear stress on a section which is inclined at an angle of 30° with normal cross section of the bar?	Knowledge	1,4
3	A rectangular bar of coss sectional area 100mm*80mm is subjected to an axial load of 20KN.Dtermine the shear stress on a section which is inclined at an angle of 30° with normal cross section of the	Knowledge	1,4

S No	QUESTION	Blooms taxonomy level	Course Outcomes
	bar?		
4	A solid shaft of 80mm diameter is transmitting 100 KW power at 200 rpm. Calculate the maximum shear stress induced in the shaft and the angle of twist in degrees for a length of 6m. Take N=8×104 N/ mm2.	Applying	5
5	A solid circular shaft of length 3m has diameters of 60 mm, 70 mm and 40 mm of each 1m length. Determine the angle of twist if shaft is transmitting 20KW at 200 rpm. Take N=8×104 N/ mm2.	Applying	5

Prepared By:

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