B.Tech / Integrated (MBA/M.Tech) 3rd Sem(ME) Examination
June 2014
Strength of Material
Subject Code: MEL-207

Time Allowed: 03 hours. Maximum Marks: 100

Before answering the question paper the candidate should ensure that they have been supplied the correct question paper. Complaints in this regard, if any, shall not be entertained after the examination.

Note: Question No. 1 is Compulsory and attempt two questions from each section. All questions carry equal marks.

1. (a) Define the terms: Torsion, Torsional Rigidity, Polar Moment of Inertia & Polar Modulus
(b) Define the terms: Bending stress, Shear stress, Neutral axis.
(c) Define stress, strain and poison ratio
(d) Define principle stress, principal strain, and mohr circle

SECTION-A

2. (a) what will be SF & BM diagram of a simply supported beam carrying UDL of intensity 12N/m on its entire span. L=2m

(b) What will be SF & BM diagram of a cantilever beam carrying point load of 6N on its free end? L=4m

3. (a) Explain thermal stress & strain in detail
(b) Explain stress-strain curve for ductile and brittle material in detail

4. (a) Drive an expression for the torque transmitted by a hollow shaft when subjected to torsion.

(b) A solid circular shaft 200mm in diameter has the same cross sectional area as that of a hollow shaft of the same material with inside diameter of 150mm. Find the ratio of power transmitted by the two shafts at the same speed.

SECTION-B

5. (a) Prove that the max. Shear stress in a rectangular section of a beam is 1.5 times the average shear stress.

(b) A rectangular beam 200mm deep & 300mm wide is simply supported over a span of 8m. What UDL per meter the beam can carry if the bending stress is not to exceed 120N/mm².

6. Drive an expression for Eulers formulae for elastic buckling in column.

7. What are different methods of determining slope of a beam, explain various steps involved in these methods?