ANJUMAN-I-ISLAM'S

KALSEKAR TECHNICAL CAMPUS, NEW PANVEL

School of Engineering & Technology

Symbol of Secularism & National Integration

DEPARTMENT OF MECHANICAL ENGINEERING

CLASS:- S.E M.E-1 and S.E.M.E - 2	SEM:- III
SUBJECT:- SOM	DATE:- **16/ 09 / 2016**
DURATION:- **60 min.**	MARKS:- **20**

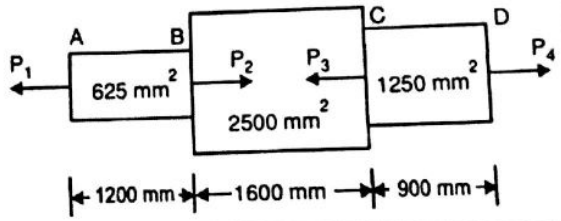
CLASS TEST 01

Note : 1 : Q1 is Compulsory

2 : Attempt **any two** questions of the remaining

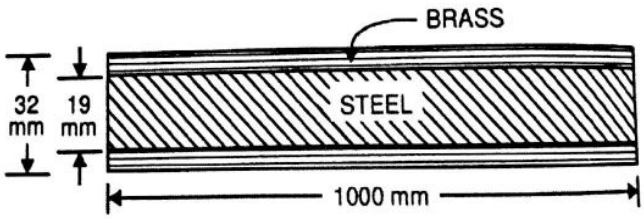
3. Assume suitable data wherever necessary

Q1. Fig shows a steel bar of varying C/s subjected to axial external loads P1,P2,P3 and P4. Determine P3 which will produce equilibrium and hence the total elongation of AD. P1= 45kN, P2 = 450kN and P4 = 130kN. Take E= 2.1 x 10^5 Mpa



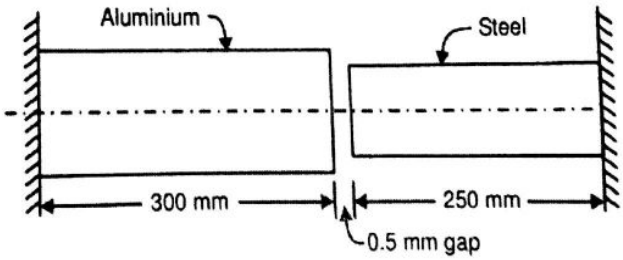
04

Q2. A compound bar is made of steel rod 19mm in diameter surrounded by closely fitting brass tube of 32mm outside diameter and the two are securely fixed together at the ends. Calculate the value of G for brass if the angle of twist over a length of 1m is 7.2° when compound bar is subjected to twisting couple of 520Nm. Also calculate maximum shear stress in two materials. Gs = 80Gpa.



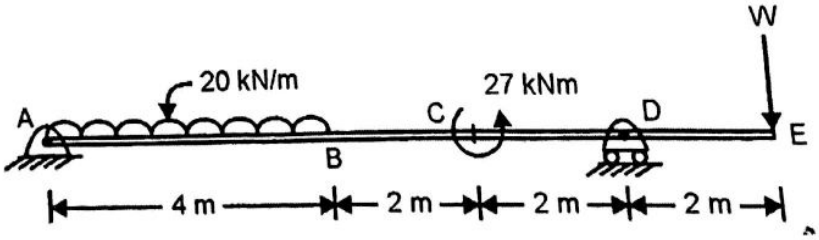
08

Q3. At 20°C a 0.5 mm gap exists between the ends of rods as shown. Taking for aluminium E_{al} = 70Gpa, α_{al} = 23 x 10^{-6}/°C, A_{al} = 2000 mm^2 and for steel Es = 190Gpa, αs= 18 x 10^6/°C, As = 800mm^2. When the temperature reaches 140 °C, Determine
a) Normal Stresses in Aluminium
b) Exact length of Aluminium rod



08

Q4. Find load W such that the support reactions are the same. Hence draw S.F.D and B.M.D



08