Total No. of Questions – [4]

Total No. of Printed Pages 2

G.R. No.	

U218-154 (T1)

OCTOBER 2018/ IN-SEM (T1)

S. Y. B. TECH. (MECHANICAL ENGINEERING) (SEMESTER - I)

COURSE NAME: STRENGTH OF MATERIALS

COURSE CODE: MEUA21174

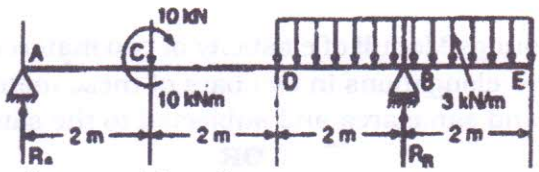
(PATTERN 2017)

Time: [**1Hour**] [Max. Marks: **30**]

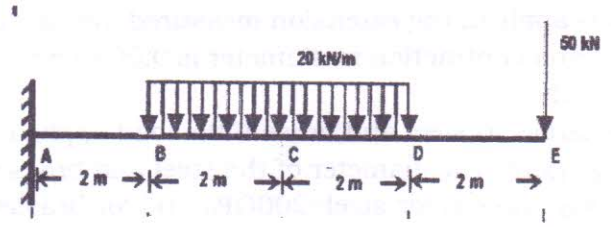
(*) Instructions to candidates:

1) **Answer Q.1 OR Q.2 and Q.3 OR Q.4.**
2) **Figures to the right indicate full marks.**
3) **Use of scientific calculator is allowed**
4) **Use suitable data wherever required**

Q.1) a) Draw shear force and bending moment diagram of the following beam. [6 marks]



b) Draw the shear force and bending moment diagram for the cantilever beam carrying load whose intensity is varying uniformly distributed load and a point load

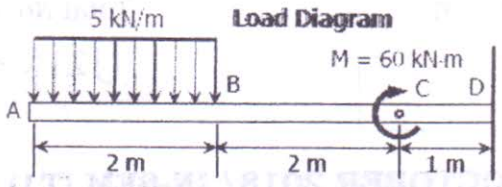


[6 marks]

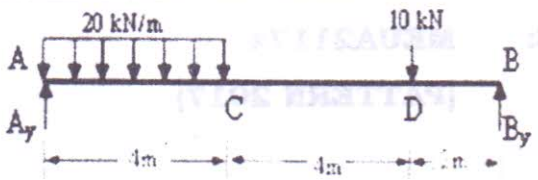
c) What is the application of shear force diagram? Explain its variation with respect to type of loads. [4 marks]

OR

Q.2) a) Explain the behavior of the beam from its shear force and bending moment diagram. [6 marks]



b) Write the conclusion of the following load diagram from its SFD and BMD [6 marks]



c) Explain Point of contraflexure with suitable example. [4 marks]

Q.3) a) Draw and explain typical stress – strain diagram for ductile material indicating all salient features. [6 marks]

b) A rod is 2 meters long at 10 degree celsius. Find the free expansion of the rod when temperature is raised to 80 degree celsius. If this expansion is prevented find the stress in the material. Take E= 1×10^5 GN/mm^2, $\alpha=12\times10^{-6}$ per degree celsius. [4 marks]

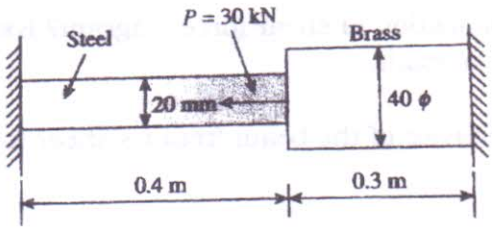
c) The ratio of Youngs Moduli of elasticity of two materials is 2.30. Find the ratio of stresses and elongations in two bars of these materials if they are of the same length and same area and subjected to the same load P. [4 marks]

OR

Q.4) a) Define and explain the following terms [6 marks]
i) Youngs modulus ii) Factor of safety iii) Thermal stress

b) A bar of 25 mm diameter is tested in tension. It is observed that when a load of 60kN is applied, the extension measured over a gauge length of 200 mm is 0.12 mm and contraction in diameter is 0.0045 mm. Find Poisson's ratio and Bulk modulus. [4 marks]

c) Find the stress in steel and brass if the load applied is 30kN as shown in following figure. The diameter of the steel and brass rod is 20mm and 30mm respectively. Take E for steel=200GPa and for brass=105GPa. [4 marks]



*****Best Luck***