Q.34 A uniform beam weighing 60N is 6 m long. If weights of 40N and 50N are suspended from its ends, at what point must the beam be supported so that it may be remain horizontal?

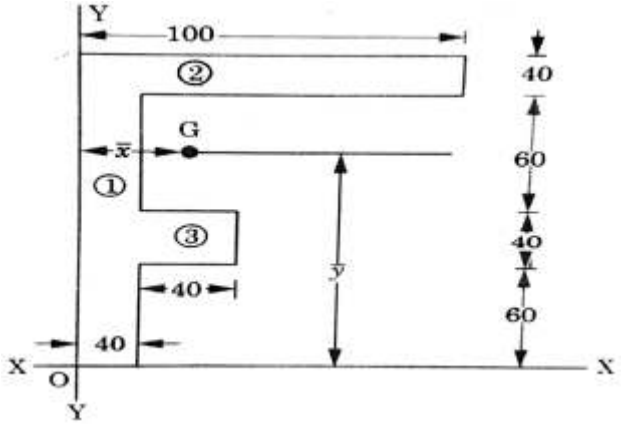
Q.35 Find the maximum torque transmitted by a hollow circular shaft of external diameter 250mm and internal diameter 200 mm, if the maximum shear stress is not exceed 50 n /mm^2

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

Q.36 Drive the bending Equation, $M/I=\sigma/y=E/R$ (CO2)

Q.37 Find the position of centroid of F-section as shown in fig- (CO5)



Q.38 A simply supported beam of 16m span, carries concentrated load 400 N, 500 N and 300 N at a distance of 3m, 8 m and 11m from left support. Draw the shear force And bending moment diagram.

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Advance diploma in Tool & Die making
Subject:- Applied Mechanics & Strength of Materials

Time : 3Hrs. M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

Q.1 Which of the following is scalar quantity-
a) Weight b) mass
c) Volume d) none of the above

Q.2 The rotational tendency of a force is called
a) Shear force b) moment
c) couple d) centriod

Q.3 The coefficient of friction depends upon
a) Strength of surfaces b) area of contact
c) shape of surfaces d) nature of surfaces

Q.4 Equilibrium conditions for coplanar concurrent forces are
a) $\Sigma H=0$ b) $\Sigma V=0$
c) both a & b d) none of the above

Q.5 _____is the property of material of a body by virtue of which it opposes any change being produced in its shape or size by external force and it tends to regain its original shape and size after removal of the external force.
a) Plasticity b) Elasticity

c) Both a and b d) None of the above

Q.6 The total extension S_1 when springs are connected in series is

a) $S_1=1/\delta_1+1/\delta_2$ b) $S_1=1/2\delta_1+1/2\delta_2$

c) $S_1=\delta_1+\delta_2$ d) $S_1=\delta_1+2\delta_2$

Q.7 Young modulus of rigidity is the ratio of

a) Tensile stress / tensile strain

b) Shear stress / Shear strain

c) Tensile stress / Volumetric strain

d) Compressive stress / Compressive strain

Q.8 M.O.I of circle is

a) $I=pd^4/64$ b) $I=pd^4/32$

c) $I=pd^3/32$ d) $I=pd^3/36$

Q.9 The equivalent length of a column when both ends are fixed is

a) Equivalent length = Actual length

b) Equivalent length= Actual length /$\sqrt{2}$

c) Equivalent length = Actual length/2

d) Equivalent length = 2 x Actual length

Q.10 Newton's _____ of motion is also known as the law of inertia

a) First law b) Second law

c) third law d) None of the above

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Define unit

Q.12 Define force system.

Q.13 Define couple.

Q.14 What do you by second moment of area?

Q.15 What is cantilever beam?

Q.16 On what factors does strength of column depend.

Q.17 Which section will be best in torsion?

Q.18 What is Torque

Q.19 What is torsion equation.

Q.20 Define proof stress.

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. (12x5=60)

Q.21 Differentiate between scalar and vector quantities.

Q.22 Write the characteristics of a force.

Q.23 Define non-coplanar force system and classify it.

Q.24 State the condition of equilibrium for bodies under co-planner concurrent force system.

Q.25 Differentiate between like and unlike parallel forces.

Q.26 Where does the centroid of following lies

i) Parallelogram ii) Equilateral triangle

iii) Semi-circle

Q.27 Derive the condition for a machine to be reversible.

Q.28 What are the need of unit ?

Q.29 What is physical significance of moment of inertia?

Q.30 Differentiate between Uniformly distributed and uniformly varying load.

Q.31 How the column are classified?

Q.32 What are assumptions made while deriving the torsion equation?

Q.33 Explain laminated spring advantages over helical spring.