No. of Printed Pages : 4
Roll No. .....

221821

2nd Sem. /Branch: Mechanical Eng (Tool & Die Design)

Subject : Mechanics of solids

Time : 3 Hrs. M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory (6x1=6)

Q.1 A pair of scissor is an example of lever of (CO2)

a) First order b) Second order
c) Third Order d) None of the above

Q.2 The lever in which both the effort and the load are applied on one side of the fulcrum and the load is nearer to the fulcrum is known as (CO2)

a) First type lever b) Second type lever
c) Third type lever d) Compound lever

Q.3 Friction in lubricated surface is (CO3)

a) Sliding and rolling
b) Sliding and boundary
c) Rolling and Viscous
d) Boundary and Viscous

Q.4 Units of stress is (CO5)

a) MM^2/N b) N/MM^2
c) KG d) None of the above

2) Limiting force of friction
3) Coefficient of friction
4) Angle of friction

Q.24 Derive the bending Equation, $\frac{M}{I} = \frac{\sigma}{Y} = \frac{E}{R}$ (CO6)

Q.25 The following observations were made during a Tensile test conducted on a Mild steel bar:- (CO5)

(1) Diameter of Steel bar=40mm
(2) Guage Length of bar=300mm
(3) Load at elastic limit=300 KN
(4) Extension at 200 KN load =045mm
(5) Maximum load=420KN
(6) Total Extension=75mm
(7) Diameter of Road at failure=34mm

Calculate:
(a) Young's modulus
(b) Stress at Elastic Limit
c) Percentage Elongation
(d) Percentage reduction in Area

Q.5 Angle of Twist is measured in:- (CO6)

a) Degrees b) MM

c) Radians d) Inches

Q.6 Screw jack is used to (CO7)

a) Lift heavy load

b) In engines for power transmission

c) Move the car

d) None of the above

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 Strain is_____quantity (CO5)

Q.8 Coplanar forces lie in_____plane (CO1)

Q.9 Moment of a force=_____xMoment Arm (CO2)

Q.10 Efficiency_____as the load increases (CO7)

Q.11 S.I unit of Torque is_____ (CO6)

Q.12 Section Modulus=_____ (CO6)

SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 State the various effects of a force on a body. (CO1)

Q.14 Classify simple lever. Explain each type (CO2)

Q.15 Explain the various methods of reducing the

friction. (CO3)

Q.16 Differentiate between Centrold and Centre of Gravity. (CO4)

Q.17 State and explain the Law of Machine (CO7)

Q.18 Write various assumptions made in deriving the Torsion Equation of a Solid Shaft. (CO6)

Q.19 Draw a stress strain curve for a Mild Steel Specimen subjected to a Tensile load. Explain the main points. (CO5)

Q.20 Give differences between Longitudinal Strain and Lateral Strain. (CO5)

Q.21 An axial pull of 30KN is applied to a bar of length 2m and diameter 40mm If modulus of elasticity of the material is 2x10 5 N/ mm^2 find:- (CO5)

a) Stress

b) Strain

c) Elongation produced

Q.22 Where does the centre of Gravity of the following plane figure lies:- (CO4)

a) Semi circle

b) Parallelogram

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x8=16)

Q.23 A body of weight 100 N is placed on a rough horizontal plane. If a horizontal force of 50 N just causes the body to slide on a horizontal plane, then find. (CO3)

1) Normal reaction