Q.18 Compare solid shaft to hollow shaft with respect to the weight.

Q.19 Why there are two yield points on ductile stress strain diagram?

Q.20 Explain proof resilience and modulus of resilience.

Q.21 Describe the principle and application of double winch crab.

Q.22 Classify forces with respect to the point of application.

SECTION-D

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

Q.23 Explain various system of pulleys with a neat diagram giving their MA and VR.

Q.24 State and derive the bending equation.

Q.25 Find the MOI of lamina of an I-section which has

Top flange =160 mm x 20 mm

Web or centre section = 160 x 20 mm

Bottom flange = 200 mm x 20 mm

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2nd Sem / Mechanical (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 Concurrent forces have their lines of action meet in

a) One point

b) Two point

c) Plane

d) Perpendicular planes

Q.2 In actual machines

a) A Mechanical advantage is greater than velocity ratio

b) Mechanical advantage is equal to velocity ratio
c) Mechanical advantage is less than velocity ratio
d) Mechanical advantage is unity

Q.3 In MKS units 1Kg - f = ___newton

a) 98.1 b) 9.81

c) 1/9.81 d) None of the above

Q.4 Limiting friction has a value _____.

a) Running friction

b) Maximum static frication

c) Minimum static friction

d) Both A and B

Q.5 value of torque if zero at

a) Rmax b) Rmin

c) Centre d) Both B and C

Q.6 In P = mW + C, the C stands for

a) Constant of proportionality

b) Efficiency

c) Velocity ratio

d) Friction load

SECTION-B

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

Q.7 Which is more elastic _____ (rubber /steel) ?

Q.8 Rolling friction is _____than sliding friction.

Q.9 Define centroid.

Q.10 Define varignon theorem.

Q.11 The value of FOS generally varies from ____to ____

Q.12 Safety lever are class _____type of levers.

SECTION-C

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

Q.13 Describe various properties of a couple.

Q.14 Sate and explain triangle law of forces.

Q.15 Two forces 60N and 85 N are acting on a particle with an angle of 135 degree to each other. Find the resultant in magnitude and direction.

Q.16 State and explain parallel axis theorem of Moment of Inertia.

Q.17 Explain angle of repose with a diagram showing a free body diagram.