22240

11920

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) Define Kinetic energy, Potential energy.

b) State the Newton's Law of Motion.

c) State the law of machine for reversible and irreversible machine.

d) Define Hook's Law with neat sketch.

e) List the application of bearings in textile industry.

f) Enlist the factors affecting the friction.

g) Give any four advantages of 'V' belt drive.

Marks

2. Attempt any THREE of the following: **12**

a) Explain the concept of force and moment of force with suitable example.

b) Determine the magnitude of the forces P and Q for the force system which is in equilibrium as shown in Figure - 2.1.

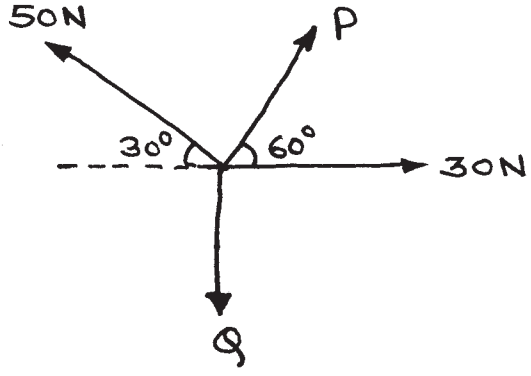

Fig. - 2.1.

c) Certain machine has a Law P = 0.025 W + 20 N; with V, R = 60. Calculate it's efficiency at a load of 1 kN.

d) Give classification of lubricants with suitable applications of each.

3. Attempt any THREE of the following: **12**

a) Draw a neat sketch of single purchase crab winch. Name the parts of machine and write it's V.R.

b) Sketch and explain stress strain curve for ductile material.

c) Explain factor of safety with suitable example, discuss only two criteria for selection of factor of safety.

d) A bar 200 mm long and 20 mm in diameter is streched by 0.7 mm by an axial pull of 22 kN. calculate the stress, strain and modulus of elasticity of the bar.

Marks

4. Attempt any THREE of the following: **12**

a) Explain inversion mechanism of a single slider crank chain.

b) Find the required diameter of steel rod that has to carry on axial pull of 40 kN if the permissible tensile stress is 150 MPa.

c) Enlist the various criteria for the selection of bearings.

d) Explain roller bearing with neat sketch, give its suitable application in textile industry.

e) Describe the coding system of Bearing.

5. Attempt any TWO of the following: **12**

a) i) Differentiate between centrifugal and centripetal force.

ii) Give any three uses of centrifugal and centripetal forces in dryer machine.

b) In a differential axle and wheel the diameter of the wheel is 40 cm and that of axle are 10 cm and 8 cm. If an effect of 50 N can lift a load of 1500 N. Find the efficiency of machine.

c) Explain with neat sketch geometry of 'V' belt.

6. Attempt any TWO of the following. **12**

a) Explain Kinematics for linear and angular motion with suitable example.

b) Define the following with suitable example

i) Modulus of Elasticity

ii) Modulus of Rigidity

iii) Working stress.

c) Derive the equation of velocity ratio for belt drive.

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