22240

12425

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

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

(2) Answer each next main Question on a new page.

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

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

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

(7) 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 Inversion of mechanism.

b) Differentiate between mass and weight.

c) Define Hooke's law.

d) State the lami's theorem of forces.

e) Classify cam and followers.

f) State law of machine and its equation.

g) Define stress and strain.

Marks

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

a) The velocity ratio of machine is 15 and its efficiency is 65% Determine the load which can be raised on application of an effort of 50 N.

b) Explain method of resolution of forces.

c) State types of lubricants with their properties and application.

d) Define - Mass, Weight, Inertia and momentum.

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

a) Differentiate between linear and angular momentum.

b) Define elasticity, plasticity, ductile and brittle material.

c) Explain Inversion of slidercrank mechanism.

d) Two forces of magnitude 20 N and 10 N are acting at point, the angle of inclination between two forces is 60° determine the resultant force when both are in tension.

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

a) Discuss the factors affecting friction.

b) Explain with neat sketch geometry of V belt.

c) Explain bearing specification with example.

d) Explain modulus of elasticity and modulus of rigidity.

e) State advantages and disadvantages of chain drive over belt drive.

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

a) A simple wheel and axle has wheel and axle of diameter 300 mm and 30 mm respectively. What is the efficiency of machine if it can lift load of 900 N by an effort of 100 N.

b) State three Newton's law of motion.

c) Explain with neat sketch stress-strain diagram for ductile material.

Marks

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

a) Explain the term undercutting and backlash with neat sketch.

b) Discuss laws of static friction and kinetic friction.

c) A string has a diameter of 1 cm and original length 2 m, the string is pulled by 200 N. Determine change in length ($E = 5 \times 10^9$ N/m^2)
