

Question Bank (G scheme)

Name of subject: ENGINEERING MECHANICS
Subject code: 17204
Semester: II

Unit Test :I
Course : CH/ME

Q. No. 1 Attempt any Three (3 x 3 = 9)

Chapter 1

- 1) Define Mechanical Advantage, Velocity Ratio, and Efficiency of the Machine?
- 2) Differentiate between ideal machine and actual machine.
- 3) State the formula for efforts lost in friction.
- 4) State the formula for load lost in friction.
- 5) What do you mean by Self-locking machine?

Chapter 2

- 1) State the principle of transmissibility of a force
- 2) State the use of Varignon's Theorem of Moments.
- 3) Define the force and its unit.
- 4) What is the different type of coplanar forces?
- 5) Find the components of force of 50 N acting from (2, 2) towards (2, -4).

Chapter 3

- 1) What are the limitations of Law of Parallelogram of forces?
- 2) Define Resultant Force.
- 3) What is resolution and composition of force?

Que. No. 2 Questions for 4 marks.

Attempt any Two (4 x 2 = 8)

Chapter 1

- 1) A screw jack lifts a load of 30 KN with an effort of 400 N at the end of the handle of 60 cm. If the pitch of the screw is 15 mm. Calculate the velocity ratio, M. A. and efficiency of the machine.
- 2) In a worm and worm-wheel, number of teeth on worm wheel is 80. If effort wheel and load drum having diameters 100 mm and 200mm respectively. Find velocity ratio of worm and worm-wheel.

Chapter 2

- 1) A loaded wagon is at rest on railway track. It is pulled by force of 1.5 KN applied at an angle of 45° to the railway line. Find the force tending to move the wagon forward.
- 2) Resolve a force of 300 N acting N-W in to two components such that one acts along N-E and other acts along 30° S-W.

- 3) A man pulls a hand roller on a cricket pitch and in doing so exerts pull of 150 N inclined at an angle of 30^0 to the horizontal. Find the force tending to move the roller forward.

Que. No. 3 Questions For 4 marks.

Attempt any Two (4 x 2 = 8)

Chapter 3

- 1) Four forces 10 N , 20 N , 30 N , 40 N acting in upward direction, horizontal distance between 10 N and 20 N is 2m, 10N and 30 N is 4m and 10 N and 40 N is 6m. Calculate resultant and its location by graphical method.
- 2) Three parallel forces of magnitude 100 N, 200 N and 400N are acting vertically upwards at A, B, and C such that AB= 2 m, and BC= 3m Determine the resultant force graphically.

Chapter 2

- 1) Find the magnitude of forces P and Q such that if they acts at right angles their resultant is $\sqrt{34}$ N. If they acts at an angle of 60^0 , their resultant is 7N.

Chapter 1

- 3) A machine has a V.R. of 250 and has its Law, $P= 0.01W+5$ express in Newtons. Find
 - i) M.A.
 - ii) Efficiency
 - iii) Effort lost in friction at load of 1000 N. State whether the machine is reversible or not.