

- Q.29 Differentiate between first and third system of pulleys.
 Q.30 Explain any five methods to increase force of friction.
 Q.31 What are the factors on which the force of friction depends?
 Q.32 Discuss briefly about worm and worm wheel.
 Q.33 Differentiate between Centroid and gravity.
 Q.34 Locate the Centroid of T-Section 10cm x 10cm x 2cm.
 Q.35 Explain the general conditions of equilibrium of bodies under coplanar forces.

SECTION-D

- Note:** Long answer type questions. Attempt any two out of three questions. (2x10=20)
- Q.36 Three forces keep a particle in equilibrium, one act towards East, another towards North-West and the third towards South. If the first force be 50N, find the other two forces.
 Q.37 Drive the condition for the reversibility of a machine.
 Q.38 Two bodies of mass 80kg and 20kg are connected by a thread. A force of 400N is applied to the first body of mass 80kg, coefficient of friction between sliding surface between body and the plane is 0.3. Determine
 i) the acceleration of the body
 ii) Tension in the thread.

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Time : 3 Hrs. M.M. : 100

SECTION-A

- Note:** Multiple choice Questions. All questions are compulsory (10x1=10)
- Q.1 The need of applied mechanics is in field of.
 a) Civil Engineering
 b) Mechanical Engineering
 c) Automobile Engineering
 d) All of the above
- Q.2 The unit of power in S.I. unit is
 a) Newton metre b) Watt
 c) Joule d) Kilogram metre/Sec
- Q.3 Which of the following is a vector quantity?
 a) Mass b) Volume
 c) Density d) None of the above
- Q.4 According to principle of transmissibility of forces, the effect of a force upon a body is
 a) Maximum when it acts at the centre of gravity of a body
 b) Different at different point in its line of action
 c) The same at every point in its line of action.
 d) Minimum when it acts at C.G. of the body

Q.5 For a machine to be self-locking, its efficiency should be

- a) 100%
- b) Less than 67%
- c) Less than 50%
- d) More than 50%

Q.6 The S.I. unit of force is.

- a) Kilogram
- b) Newton
- c) Dyne
- d) Watt

Q.7 The principle of lever was developed by.

- a) Archimeds
- b) Kelvin
- c) Watt
- d) Newton

Q.8 Moment of inertia of a body does not depend upon.

- a) Angular velocity of body
- b) Mass of the body
- c) Distribution of mass in the body
- d) Axis of rotation of the body

Q.9 Forces are called coplanar when all of them acting on body lie in

- a) One point
- b) One plane
- c) Different planes
- d) Perpendicular planes

Q.10 Which of the following is not a vector quantity?

- a) Work
- b) Velocity
- c) Acceleration
- d) Force

SECTION-B

Note: Objective type questions. All questions are compulsory. (10x1=10)

Q.11 Density is a _____ quantity.

Q.12 A force can have more than two components.
(True/False)

Q.13 What is a point force?

Q.14 Define coefficient of friction.

Q.15 What is SI unit of pressure?

Q.16 Write the law of moments.

Q.17 Name any two methods of finding center of gravity of regular bodies.

Q.18 What is free body diagram?

Q.19 Define a self locking machine.

Q.20 The moment of couple is known as _____.

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions.

(12x5=60)

Q.21 Write any five difference between simple and compound machines.

Q.22 Derive the expression for load lost due to friction.

Q.23 Explain addition of vector quantities.

Q.24 Draw free body diagram of a rectangular block resting on a rough inclined plane subjected to Pull "P" parallel to the plane.

Q.25 Explain five advantages of friction.

Q.26 Explain principle of transmissibility of forces in brief.

Q.27 What is a couple? Give any five characteristics of a couple.

Q.28 Describe the concept of moment of force.