

- Q.31 What is wheel and axle? Obtain an expression for its mechanical advantages.
- Q.32 Explain 3rd system of pulleys with diagram.
- Q.33 What assumptions are made for torsion equation?
- Q.34 Differentiate between torque and torsion.
- Q.35 Explain the working of common steel yard with diagram.

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions. (2x10=20)

- Q.36 Determine analytical direction and magnitude of the resultant of the following four forces acting at a point
- 46N pulling east
 - 322N pulling N-E
 - 322N pulling N-W
 - 394 N pulling 60 degree west of south
- Q.37 A 10m long beam AB hinged at A carries loads of 50N, 70N & 100N at distance of 2m, 4m & 7m respectively from hinged end A of the beam. Find the magnitude of the force F applied at the end of the beam so that beam remains in equilibrium
- Q.38 Explain Second system of pulley.

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Subject:- Applied Mechanics

Time : 3Hrs.

M.M. : 100

SECTION-A

Note: Multiple choice questions. All questions are compulsory (10x1=10)

- Q.1 When the force are acting at point on a body and lie in the same plane, then the force are
- Coplanar collinear
 - Coplanar concurrent
 - Coplanar parallel
 - None of the above
- Q.2 The resultant of forces 10N and 5N acting at 90 degree
- 11.18N
 - 15N
 - 10.87N
 - None of these
- Q.3 The effect of moment on a body is
- to move it
 - to turn it
 - to bend it
 - None of these
- Q.4 The force of friction between two bodies in contact
- depends upon the area
 - acts always tangential to the surface of contact
 - depend upon nature of surface in contact
 - both a & c

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- Q.5 Angle between the resultant of normal and frictional force and the normal reaction is called
 a) Angle of repose b) Angle of friction
 c) Cone of friction d) Coefficient of friction
- Q.6 Which of the following is the example of lever of first order?
 a) Arm of man b) Pair of scissors
 c) Pair of clinical tongs d) All of the above
- Q.7 Modulus of rigidity is ratio of
 a) Normal stress to normal strain
 b) Normal stress to volumetric strain
 c) Shear stress to shear strain
 d) None of these
- Q.8 A machine is said to be ideal if its efficiency is
 a) 75% b) 50%
 c) 100% d) 25%
- Q.9 Force are called concurrent when their line of action
 a) Meet at a point b) Lie in a plane
 c) Lie in different plane d) None of the above
- Q.10 The C.G of a semicircle of radius 10 cm lies at the following distance above its base
 a) 4.24 cm b) 1.33 cm
 c) 2.39 cm d) 0.23 cm

SECTION-B

Note: Objective type questions. All questions are compulsory. $(10 \times 1 = 10)$

Q.11 Define kinematics.

Q.12 Force is a _____ quantity.

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- Q.13 The moment of couple is known as _____
- Q.14 Angle of Friction is always _____ than 90 degree
- Q.15 Define Angular velocity.
- Q.16 Define mechanical Advantage.
- Q.17 A frictional force when the surfaces in contact are in relative motion is known as dynamic friction (True/False)
- Q.18 Define symmetrical plane.
- Q.19 Define the velocity ratio.
- Q.20 Define the torsion.

SECTION-C

Note: Short answer type questions. Attempt any twelve questions out of fifteen questions. $(12 \times 5 = 60)$

- Q.21 Difference between scalar and vector quantity.
- Q.22 Explain Triangle law of forces.
- Q.23 Explain principle of Transmissibility of force.
- Q.24 What is difference between simple lever and compound lever.
- Q.25 State equilibrium condition for bodies under coplanar forces.
- Q.26 Difference between centroid and center of gravity.
- Q.27 Difference between static and dynamic friction.
- Q.28 Define cone of friction.
- Q.29 State and Explain Newton's second law of motion.
- Q.30 Difference between Reversible machine and Self-locking machine.

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