

TEST-1 MEACHNICAL (MEACHNICS)

Objective Type Questions:-

- Q.1 The term 'force' may be defined as an agent which produces or tends to produce, destroys or tends to destroy motion.
a) Agree b) disagree
- Q.2 A force while acting on a body may
a) change its motion
b) balance the forces, already acting on it
c) Give rise to the internal stresses in it
d) all of these
- Q.3 In order to determine the effects of a force, acting on a body, we must know
a) Magnitude of the force
b) line of action of the force
c) Nature of the force i.e. whether the force is push or pull
d) all of the above
- Q.4 The unit of force in S.I. system of units is
a) Dyne b) kilogram
c) Newton d) watt
- Q.5 One kg force is equal to
a) 7.8 N b) 8.9 N
c) 9.8N d) 12N
- Q.6 A resultant force is a single force which produces the same effect as produced by all the given forces acting on a body.
a) True b) False
- Q.7 The process of finding out the resultant force is called..... of forces.
a) composition b) resolution
- Q.8 The algebraic sum of the resolved parts of a number of forces in a given direction is equal to the resolved part of their resultant in the same direction. This is known as
a) principle of independence of forces
b) principle of resolution of forces
c) principle of transmissibility of forces
d) none of these
- Q.9 Vectors method for the resultant force is also called polygon law of forces.
a) Correct b) Incorrect
- Q.10 The resultant of two forces P and Q acting at an angle θ is.
a) $(P^2 + Q^2 + 2PQ \sin\theta)$
b) $(P^2 + Q^2 + 2PQ \cos\theta)$
c) $(P^2 + Q^2 - 2PQ \cos\theta)$
d) $(P^2 + Q^2 - 2PQ \tan\theta)$
- Q.11 If the resultant of two forces P and Q acting at an angle θ , makes an angle α with the force P, then.
a) $\tan \alpha = \frac{P \sin \theta}{P + Q \cos \theta}$ b) $\tan \alpha = \frac{P \cos \theta}{P + Q \cos \theta}$
c) $\tan \alpha = \frac{Q \sin \theta}{P + Q \cos \theta}$ d) $\tan \alpha = \frac{Q \cos \theta}{P + Q \sin \theta}$
- Q.12 The resultant of two forces P and Q (such that $P > Q$) acting along the same straight line, but opposite direction, is given by
a) $P + Q$ b) $P - Q$
c) P / Q d) Q / P

- Q.13 The resultant of two equal forces P making an angle θ , is given by
 a) $2P \sin \theta/2$ b) $2P \cos \theta/2$
 d) $2P \tan \theta/2$ d) $2P \cot \theta/2$
- Q.14 The resultant of two forces each equal to P and acting at right angles is
 a) $P / \sqrt{2}$ b) $P/2$
 c) $p/2 \sqrt{2}$ d) $\sqrt{2}P$
- Q.15 The angles between two forces when the resultant is maximum and minimum respectively are
 a) 0° and 180° b) 180° and 0°
 c) 90° and 180° d) 90° and 0°
- Q.16 If the resultant of two equal has the same magnitude as either of the forces, then the angle between the two forces is:
 a) 30° b) 60° c) 90° d) 120°
- Q.17 The resultant of the two forces P and Q is R . If Q is doubled, the new resultant is perpendicular to P . Then
 a) $P = Q$ b) $Q = R$
 c) $Q = 2R$ d) None of these
- Q.18 Two force at acting at an angle of 120° . The bigger force is 40N and the resultant is perpendicular to the smaller one. The smaller force is:
 a) 20N b) 40N
 c) 80N d) None of these
- Q.19 The terms 'leverage' and 'mechanical advantage' of a compound lever have got the same meaning.
 a) Right b) Wrong
- Q.20 A number of forces acting at a point will be in equilibrium, if
 a) all the forces are equally inclined
 b) sum of the forces is zero
 c) sum of resolved parts in the vertical direction is zero.
 d) sum of resolved parts in the horizontal direction is zero
- Q.21 If a number of forces are acting at a point, their resultant is given by
 a) $(\Sigma V)^2 + (\Sigma H)^2$
 b) $\sqrt{(\Sigma V)^2 + (\Sigma H)^2}$
 c) $(\Sigma V)^2 + (\Sigma H)^2 + 2(\Sigma V)(\Sigma H)$
 d) $\sqrt{(\Sigma V)^2 + (\Sigma H)^2 + 2(\Sigma V)(\Sigma H)}$
- Q.22 If a number of forces are acting at a point, their resultant will be inclined at an angle with the horizontal, such that
 a) $\tan \theta = \Sigma H / \Sigma V$
 b) $\tan \theta = \Sigma V / \Sigma H$
 c) $\tan \theta = \Sigma V \times \Sigma H$
 d) $\tan \theta = \frac{\Sigma V}{\Sigma V + \Sigma H}$
- Q.23 The triangle law of forces states that if two forces acting simultaneously on a particle, be represented in magnitude and direction by the two sides of a triangle taken in order, then their resultant may be represented in magnitude and direction by the third side of a triangle, taken in opposite order.
 a) True b) False
- Q.24 The polygon law of forces states that if a number of forces, acting simultaneously on a particle, be represented in magnitude and direction by the sides a polygon taken in order, then their resultant is represented in magnitude and direction by the closing side of the polygon, taken in opposite direction.
 a) Correct b) Incorrect
- Q.25 Concurrent forces are those forces whose lines of action.
 a) lie on the same line
 b) meet at one point

- Q.37 If three forces acting at a point are represented in magnitude and direction by the three sides of a triangle, taken in order, then the forces are in equilibrium.
a) Yes b) No
- Q.38 If a number of forces acting at a point be represented in magnitude and direction by the three sides of triangle, taken in order, then the forces are not in equilibrium.
a) Agree b) Disagree
- Q.39 The moment of a force.
a) is the turning effect produced by a force, on the body, on which it acts
b) is equal to the product of force acting on the body and the perpendicular distance of a point and the line of action of the force
c) is equal to twice the area of the triangle, whose base in the line representing the force and whose vertex is the point, about which the moment is taken
d) all of the above
- Q.40 If a number of coplanar forces acting at a point be in equilibrium, the sum of clockwise moments must be.....
the sum of anticlockwise moments, about any point
a) equal to
b) less than
c) greater than
- Q.41 Varignon's theorem of moments states that if a number of coplanar forces acting on a particle are in equilibrium, then
a) their algebraic sum is zero
b) their lines of acting are at equal distances
c) the algebraic sum of their moments about any point in their plane is zero.
d) the algebraic sum of their moments about any point is equal to the moment of their resultant force about the same point.
- Q.42 According to the law of moments, if a number of coplanar forces acting on a particle are in equilibrium , then
a) their algebraic sum is zero
b) their lines of action are at equal distance
c) the algebraic sum of their moments about any point in their plane is zero.
d) the algebraic sum of their moments about any point is equal to the moment of their resultant force about the same point.
- Q.43 For any system of coplanar forces, the condition of equilibrium is that the
a) algebraic sum of the horizontal components of all the force should be zero
b) algebraic sum of the vertical components of all the forces should be zero
c) algebraic sum of moments of all the forces about any point should be zero.
- Q.44 The forces, whose lines of action are parallel to each other and act in the same directions, are known as.
a) coplanar concurrent forces
b) coplanar non-concurrent forces
c) like parallel forces
d) unlike parallel forces
- Q.45 The three forces of 100N, 200N and 300N have their lines of action parallel to each other but act in the opposite directions. These forces are known as.
a) coplanar concurrent forces
b) coplanar non-concurrent forces
c) like parallel forces
d) unlike parallel forces
- Q.46 Two like parallel forces are acting at a distance of 24 mm apart and their resultant is 20N. If the line of action of the resultant is 6 mm from any given force, the two forces are.

- a) 15 N and 5 N b) 20 N and 5 N
c) 15 N and 15N d) none of these

- Q.47 If a body is acted upon by a number of coplanar non-concurrent forces, it may
- Rotate about itself without moving
 - Move in any one direction rotating about itself
 - Be completely at rest
 - All of these
- Q.48 A smooth cylinder lying on its convex surface remains in..... equilibrium.
- stable
 - unstable
 - neutral
- Q.49 Three forces acting on a rigid body are represented in magnitude, direction and line of action by the three sides of a triangle taken order. The forces are equivalent to a couple whose moment is equal to.
- area of the triangle
 - twice the area of the triangle
 - half the area of the triangle
 - none of these
- Q.50 The principal of transmissibility of forces states that, when a force acts upon a body, its effect is.
- same at every point on its line of action
 - different at different points on its line of action
 - minimum, if it acts at the centre of gravity of the body
 - maximum, if it acts at the centre of gravity of the body