1. Force is an agent which try to bring body in
(a) Motion
(b) Rest
(c) Either a or b
(d) None

2. Forces whose lines of action pass through common point are.
(a) Coplanar
(b) Concurrent
(c) Non-concurrent
(d) None

3. Forces whose lines of action are parallel are.
(a) Coplanar
(b) Concurrent
(c) Non concurrent
(d) None

4. Forces whose line of action lie in different plains and pass through common point are.
(a) Coplanar
(b) Concurrent
(c) Non-concurrent
(d) Non coplanar – concurrent.

5. Forces whose line of action lie in different plains and do not pass through common point are.
(a) Coplanar
(b) Concurrent
(c) Non-concurrent
(d) Non coplanar –non-concurrent

6. S.I. units of force
(a) Newton
(b) Dyne
(c) kgf
(d) None

7. M.K.S. units of force
(a) Newton
(b) Dyne
(c) kgf
(d) None

8. C.G.S. units of force
(a) Newton
(b) Dyne
(c) kgf
(d) None

9. 1 dyne is equal to------Newton.
(a) 10^{-5}
(b) 10^{5}
(c) 1000
(d) 100

10. 50N is equal to------dyne.
(a) 5×10^{6}
(b) 5×10^{5}
(c) 5×10^{-5}
(d) 5×10^{-6}

11. 1 kgf is equal to------Newton.
(a) 1
(b) 10
(c) 9.8
(d) 100

12. Value of acceleration due to gravity is.
(a) 9.81 m/sec^2
(b) 981 m/sec^2
(c) Both
(d) None

13. Value of acceleration due to gravity is----- for all bodies.
(a) Same
(b) Different
(c) High
(d) None

14. Value of acceleration due to gravity depends upon
(a) Mass
(b) Velocity
(c) Ace
(d) None

15. Force of gravity depends upon
(a) Mass
(b) Velocity
(c) Ace
(d) None

16. Force of gravity increases with increase of-----.
(a) Mass
(b) Velocity
(c) Ace
(d) None

17. Effect of tensile force on body is to
(a) Increase its length.
(b) Decrease its length.
(c) Deform the body.
(d) All the above.

18. Effect of compressive force on body is to
(a) Increase its length.
(b) Decrease its length.
(c) Deform the body.
(d) All the above.

19. Effect of shear force on a body is to
(a) Increase its length.
(b) Decrease its length.
(c) Deform the body.
(d) All the above.

20. Law of can calculate resultant of two forces
(a) Parallelogram
(b) Triangle
(c) Both
(d) None

21. Magnitude of resultant of two forces depends upon
(a) Magnitude of two forces.
(b) Angle between two forces.
(c) Both
(d) None

22. Law of parallelogram of forces is applicable for-----forces
(a) Coplanar
(b) Concurrent
(c) Both
(d) None

23. Two forces P and Q act at a point, the resultant is
(a) P+Q
(b) P-Q
(c) Between P+Q and P-Q
(d) All the above

24. Resultant of two equal forces of magnitude P is equal may be
(a) P
(b) 2P
(c) Either a or b
(d) None

25. Resultant of two equal forces of magnitude P is equal P then angle between two forces is
(a) 30°
(b) 60°
(c) 90°
(d) 120°

26. As the angle between two forces increases, the magnitude of resultant
(a) Increases
(b) Decreases
(c) Remain constant
(e) First increases and then decreases.

27. Law of parallelogram of forces is applicable for
(a) 2 forces
(b) 3 forces
(c) 4 forces
(d) 5 forces

28. In law of triangle total number of forces acting at a point
(a) 2 forces
(b) 3 forces
(c) 4 forces
(d) 5 forces

29. Two forces of magnitude 5N each and angle between
Them is 120°,resultant can be calculated by law of,
(a) Parallelogram
(b) Triangle
(c) Both
(d) None

30. In the above problem the resultant is,
(a) 5N
(b) 10N
(c) 7N
(d) 15N

31. If the resultant of two equal forces is 10N and angle between them is 90°,then magnitude of forces,
(a) $2\sqrt{2}$
(b) $3\sqrt{2}$
(c) $4\sqrt{2}$
(d) $5\sqrt{2}$

32. If the resultant of two forces P and Q is R, if P is doubled resultant will be
(a) R
(b) 2R
(c) R/2
(d) None

33. In the above problem if Q is halved
(a) R
(b) 2R
(c) R/2
(d) None

34. If more than two forces are acting at a point, then for finding the resultant law of----- can be used
(a) Parallelogram
(b) Triangle
(c) Both
(d) None

35. Law of polygon can be used for -----.
(a) 2 forces
(b) 3 forces
(c) 4 forces
(d) All

36. If n numbers of forces are acting at a point, in a polygon-by-polygon law no. Of sides of polygon are

(a) n
(b) 2n
(c) n-1
(d) n+1

37. For the resultant of three forces by law of polygon the polygon will be
(a) Parallelogram
(b) Triangle
(c) Pentagon
(d) Quadrilateral.

38. Magnitude of resultant of two forces does not depends upon
(a) Magnitude of two forces
(b) Angle between two forces
(c) Both
(d) None

39. In the figure 1 the resultant force is------Newton.
(A) 3
(b) 4
(c) 5
(d) 6

40. In the above problem the resultant makes an angle of --- with horizontal.
(a) 30°
(b) 60°
(c) 90°
(d) 45°

41. If three equal forces of magnitude P are acting at a point, angle between first and second, second and third are 90°, the resultant will be
(a) P
(b) 2P
(c) 3P
(d) None

42. If five forces are acting at a point and fifth force closes the polygon then, polygon will be
(a) Parallelogram
(b) Triangle
(c) Pentagon
(d) Hexagon

43. In the above problem the resultant is
(a) 0
(b) 1
(c) ∞
(d) None

44. In the figure 2 the resultant force is------Newton.
(A) 5
(b) 10
(c) 15
(d) 20

45. Six forces of magnitude 2N each acting along sides of regular hexagon, the resultant will be
(a) 12N
(b) 6N
(c) 0N
(d) None

46. Forces of 50N and 100N act at a point, resultant is perpendicular to 50N force. Angle between them is
(a) 30°
(b) 60°
(c) 90°
(d) 45°

47 In figure 3, if P=2Q then
(a) $\theta_1=\theta_2$
(b) $\theta_1=2\theta_2$
(c) $\theta_1> \theta_2$
(d) $\theta_1<\theta_2$

48. If the angle between two forces P and Q is 90º and resultant makes an angle of 45º with force P then
(a) P=Q
(b) P=2Q
(c) Q=2P
(d) None

49. A book is placed on the table. Total no of forces acting on book
(a) 0
(b) 1
(c) 2
(d) 3

50. If the body is in equilibrium minimum no of forces acting on it are.
(a) 0
(b) 1
(c) 2
(d) 3

51. At a point 30 forces are acting on a body, resultant can be found by law of----------forces
(a) Parallelogram
(b) Triangle
(c) Both
(d) None

52. If three forces acting at a point are in equilibrium, the value of resultant is
(a) 0
(b) 1
(c) ∞
(d) None

53. For lami's theorem resultant between two forces should be ------ to third force.
(a) Equal
(b) Less
(c) Greater
(d) None

54. Lami's theorem can applied if number of forces acting at a point is
(a) 2
(b) 3
(c) 4
(d) 5

55. For Lami's theorem forces should be
(a) Coplanar
(b) Concurrent
(c) Non-concurrent
(d) Both a and b

56. For lami's theorem resultant of three forces should be ------in magnitude.
(a) Equal
(b) Unequal
(c) Greater
(d) None

57. In the figure if point O is in equilibrium value of R is---N.
(a) 2
(b) 3
(c) 4
(d) 5

58. In the figure if ά >β then
(a) P>Q
(b) P>R
(c) Q>P
(d) Q=R

59. IF $\alpha=90^\circ$ and $\beta=\gamma$ then
(a) P=Q
(b) P=R
(c) Q=R
(d) None

60. IF mass of the body is 1 kg, its weight is
(a) 1N
(b) 1kgf
(c) 9.81N
(d) 9.81kgf.

61. In 1 ton, mass of body is
(a) 1000kg
(b) 1000kgf
(c) 981kg
(d) 981kgf.

62. If the resultant of four forces are zero.
(a) All forces are equal in magnitude.
(b) Directions of forces are east, west, north and south.
(c) Both the above.
(d) None of the above.

63. In the figure, the resultant is
(a) 108.1kgf
(b) 108.1N
(c) 88.1N
(d) None.

64. Two forces of 10N at 30° north of west and of 5N at 60° south of east act at a point. Resultant is
(a) 10N
(b) 5N
(c) 0N
(d) 15N

65. In the above problem direction of resultant is
(a) 30° north of west
(b) 60° south of east
(c) 60° north of west
(d) None of the above.

66. If four forces of magnitude P,2P,3P and4P act along four direction east, west, north and south respectively,the resultant is
(a) 2.4P
(b) 3.4P
(c) 4P
(d) 3P

67. In the above problem the resultant makes an angle of ----- degrees with the force P.
(a) 315
(b) 225
(c) 135
(d) 45

68. In the figure if point O is in equilibrium then force P is of
(a) 5N
(b) 10N
(c) $5\sqrt{3}$N
(d) None.

69. In the above problem force Q is of
(a) 5N
(b) 10N
(c) $5\sqrt{3}$N
(d) None.

70. Under the action of two forces, if both forces balance each other then body is at
(a) Rest
(b) Motion
(c) May be at rest or motion.
(d) None.

71. Forces are called concurrent when their lines of action meet in
(a) One point
(b) Two point
(c) Different planes
(d) Perpendicular planes

72. Forces are called coplanar when all of them acting on a body lie in.
(a) One point
(b) Two plane
(c) Different planes
(d) Perpendicular planes

73. A force acting on a body may
(a) Balance the other force
(b) Retard its motion
(c) Change its motion
(d) All of the above

74. Effect of the force on the body depends upon.
(a) Magnitude
(b) Direction
(c) Position or line of action
(d) All of the above

75. A force is completely defined by
(a) Magnitude
(b) Direction
(c) Point of application
(d) All of the above

76. The weight of the body is due to
(a) Centripetal force of earth
(b) Gravitational pull exerted by earth
(c) Force experienced by body in atmosphere
(d) Gravitational force of attraction towards the center of the earth.

78. The force, which meet at one point, but their lines of action do not lie in a plane, are called
(a) Coplanar non-concurrent forces
(b) Non-coplanar concurrent forces
(c) Non-coplanar non-concurrent forces
(d) Intersecting forces.

79.The magnitude of two forces, which when acting at right angle produce resultant force of $\sqrt{10}$ kg and acting at 60° produce resultant of $\sqrt{13}$ kg.these forces are
(a) 2 and $\sqrt{6}$
(b) 3 and 1
(c) $\sqrt{5}$ and $\sqrt{5}$
(d) None

80. A number of forces acting at a point will be in equilibrium if
(a) Their total sum is zero
(b) All of them inclined equally
(c) Sum of resolved parts in any two perpendicular directions are both zero.
(d) None of the above.

81. The resultant of two forces acting along the same straight line, but in opposite direction is

(a) P+Q

(b) P-Q

(c) P/Q

(d) Q/P

82. The resultant of two equal forces p making an angle X is
(a) 2P sin X/2
(b) 2P cos X/2
(c) 2P tan X/2

83. The resultant of two equal forces p acting at right angle is
(a) 2P
(b) P /2
(c) P /√ 2
(d) √2 P

84. Forces of 50N and 100N act at a point, resultant is perpendicular to 50N force. Angle between them is 90˚.
(a) True
(b) False

85. In figure 3,if P=2Q then $\theta_1=\theta_2$.
(a) True
(b) False

86. If the angle between two forces P and Q is 90º and resultant makes an angle of 45º with force P then P=Q.
(a) True
(b) False

87. A book is placed on the table. Total no of forces acting on book is three.
(a) True
(b) False

88. If the body is in equilibrium minimum no of forces acting on it are three.
(a) True
(b) False

89. At a point 30 forces are acting on a body, resultant can be found by law of Parallelogram forces
(a) True
(b) False

90. If three forces acting at a point are in equilibrium, the value of resultant is one.
(a) True
(b) False

91. For lami's theorem resultant between two forces should be less than third force.
(a) True
(b) False

92. Lami's theorem can applied if number of forces acting at a point is three
(a) True
(b) False

93. For lami's theorem forces should be Coplanar non-concurrent
(a) True
(b) False

94. For lami's theorem resultant of three forces should be less than one.
(a) True
(b) False

95. Under the action of two forces, if both forces balance each other then body is at rest.
(a) True
(b) False

96. Forces are called concurrent when their lines of action meet in one point
(a) True
(b) False

97. Forces are called coplanar when all of them acting on a body lie in two planes.
(a) True
(b) False

98. Two forces are collinear coplanar and concurrent, it is not possible.
(a) True
(b) False

99. Resultant of forces 4N and 5N cannot be greater than 6N.
(a) True
(b) False

100. Resultant of three forces 4N, 3N and 5N cannot be less than 2N.
(a) True
(b) False

101. Effect of force is to bring the body in-------motion.
(a) Linear
(b) Rotational
(c) Both
(d) None

102. The moment of a force is
(a) Turning effect produced by force
(b) Equal to the product of force and perpendicular distance of a point and a line of action of the force.
(c) Equal to twice the area of a triangle, whose base is the line representing the force and vertex is the point about which the moment is taken?
(d) All the above

103 The moment of force about point O is,
(a) PxOA
(b) PxOB
(c) PxOC
(d) PxAC

104. 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 60mm from any given force, the two forces are
(a) 15N and 5N
(b) 20N and 5N
(c) 15N and 15N
(d) None

105. IF a body is acted upon by a number of coplanar forces, it may
(a) Rotate about itself with moving
(b) Move in any one direction rotating about itself
(c) Be completely at rest
(d) All of above

106. Moment of force depends upon
(a) Magnitude of force
(b) Distance of point of application from fixed point.
(c) Both the above
(d) None of the above

107. In the figure 1 moment about O is-----N.m
(a) 2
(b) 3
(c) 4
(5) 5

108. In the above problem the effect of the moment is
(a) To rotate the rod in clockwise direction.
(b) To rotate the rod in anti clockwise direction.
(c) To rotate the rod in any direction.
(d) None.

109. In figure2 the total moment about point o is
(a) 5
(b) 10
(c) 15
(d) 20

110. In figure3 the total moment about point o is
(a) 12
(b) 14
(c) 16
(d) 18

111. In the figure 3, the resultant force lies---cm from point A.
(a) .5
(b) .75
(c) 1.5
(d) 2.0

112. In the figure 4, the resultant force lies---cm from point A.
(a) .5
(b) .75
(c) 1.5
(d) 2.0

113. A couple produces
(a) Translatory motion
(b) Rotational motion
(c) Combined translatory and rotational motion
(d) None

114. The force induced in the string AB in the figure is
(a) W sin θ
(b) W cos θ
(c) W sec θ
(d) W cosec θ

115. In the above problem the force induced in BC is
(a) W sin θ
(b) W cos θ
(c) W tan θ
(d) W cot θ

116. The point through which the weight of whole body acts is known as
(a) Moment of inertia
(b) Centre of gravity
(c) Centre of percussion
(d) (d) centre of mass

117. The C.G. of an equilateral triangle of sides a is
(a) 3 a/2
(b) 2 3a
(c) a/2 3
(d) 3 2 a

118. The C.G. of the semi circle lies at ------ from the base
(a) 3r/8
(b) 4r/3Π
(c) 8r/ 3
(d) 3r/4Π

119. The C.G. of right circular cone is -------from base.
(a) h/2
(b) h/3
(c) h/4
(d) h/6

120. The C.G. of the quadrant of circle of radius r,lies along its central radius at a distance of
(a) 0.5r
(b) 0.6r
(c) 0.7r
(d) 0.8r

121. The C.G. of a T section 100mmX150mmX50mm from its bottom is
(a) 50mm
(b) 75mm
(c) 87.5mm
(d) 125mm

122. Moment of inertia is the
(a) Second moment of force
(b) Second moment of area
(c) Second moment of mass
(d) All

123. The units of moment of inertia of an area is
(a) kg-m^2
(b) kg-m-s^2
(c) kg/ m^2
(d) m^4

124. Mass moment of inertia of a uniform thin rod of mass M and length (L) about its mid-point and perpendicular to its length
(a) $2ML^2/3$
(b) $ML^2/3$
(c) $3ML^2/4$
(d) $4ML^2/3$

125. Mass moment of inertia of thin rod about its one end is ----the mass moment of inertia of the same rod about its mid point
(a) Same as
(b) Twice

(c) Thrice
(d) Four times

126. Moment of inertia of rectangular section having width (b) and depth (d) about an axis passing through its C.G. and parallel to the width (b), is
(a) $db^3/12$
(b) $bd^3/12$
(c) $db^3/36$
(d) $bd^3/36$

127. Moment of inertia of rectangular section having width (b) and depth (d) about an axis passing through its C.G. and parallel to the depth (d), is
(a) $db^3/12$
(b) $bd^3/12$
(c) $db^3/36$
(d) $bd^3/36$

128. The moment of inertia of a square of side (a) about an axis through its C.G. is
(a) $a^4/4$
(b) $a^4/8$
(c) $a^4/12$
(d) $a^4/36$

129. The M.I. of rectangular section 3cm wide and 4cm deep about axis X-X is
(a) 9 cm^4
(b) 16 cm^4
(c) 12 cm^4
(d) 20 cm^4

130. The M.I. of a square of side a about its diagonal is
(a) a^2 /8
(b) a^3 /12
(c) a^4 /12
(d) a^4 /16

131. M.I. of a circular section about its diameter (d) is
(a) $\Pi\ d^3$ /16
(b) $\Pi\ d^3$ /32
(c) $\Pi\ d^4$ /32
(d) $\Pi\ d^4$ /64

132. M.I. of a circular section about an axis perpendicular to the section is
(a) $\Pi\ d^3$ /16
(b) $\Pi\ d^3$ /32
(c) $\Pi\ d^4$ /32
(d) $\Pi\ d^4$ /64

133. M.I. of a circular section about an axis X-X is, (refer figure)
(a) $\Pi\ (D^2-d^2)$ /16
(b) $\Pi\ (D^3-d^3)$ /16
(c) $\Pi\ (D^4-d^4)$ /32
(d) $\Pi\ (D^4-d^4)$ /64

134. M.I. of a hollow circular section about an axis perpendicular to the section is -------than that about X- X axis.
(a) Two times
(b) Same
(c) Half
(d) None

135. M.I. of inertia of a triangular section of base (b) and height (h) about an axis passing through its C.g. and parallel to the base is
(A)bh^3 /4
(b)bh^3 /8
(c)bh^3 /12
(d)bh^3 /36

136.M.I. of inertia of a triangular section of base (b) and height (h) about an axis passing through its base is
(a)bh^3 /4
(b)bh^3 /8
(c)bh^3 /12
(d)bh^3 /36

137.M.I. of inertia of a triangular section of base (b) and height (h) about an axis passing through its vertex and parallel to the base is----than its C.g. and parallel to the base is
(a) Nine times
(b) Six times
(c) Four times

138. M.I. of inertia of a thin disc of mass m and radius r, about an axis passing through its c.g. and perpendicular to the plane of the disc is
(a) mr^2 / 2
(b) mr^2 / 4
(c) mr^2 / 6
(d) mr^2 / 8

139. M.I. of inertia of a thin rod of mass m and radius r, about an axis passing through its c.g. and perpendicular to its length is
(a) $ml^2/12$
(b) $ml^2/4$
(c) $ml^2/6$
(d) $ml^2/8$

140. M.I. of inertia of a solid cylinder of mass m and radius r and length L about longitudinal axis or polar axis is
(a) $mr^2/2$
(b) $mr^2/4$
(c) $mr^2/6$
(d) $mr^2/8$

141. M.I. of inertia of a thin spherical shell of mass m and radius r, about its diameter is
(a) $mr^2/3$
(b) $2mr^2/3$
(c) $2mr^2/5$
(d) $3mr^2/5$

142. M.I. of inertia of a sphere of mass m and radius r, about an axis tangential to it is is
(a)$7mr^2/3$
(b) $2mr^2/3$
(c) $2mr^2/5$
(d) $7mr^2/5$

143. M.I. of inertia of a solid sphere of mass m and radius r is
(a) $mr^2 / 2$
(b) $2mr^2 / 3$
(c) $2mr^2 / 5$
(d) mr^2

144. M.I. of inertia of a solid cone of mass m and radius r about its vertical axis is
(a) $3mr^2 / 5$
(b) $3mr^2 / 10$
(c) $2mr^2 / 5$
(d) $4mr^2 / 5$

145. M.I. of inertia of a triangular section of base (b) and height (h) about an axis passing through its C.g. and parallel to the base depends upon
(a) Base
(b) Height
(c) Both
(d) None

146. 136.M.I. of inertia of a triangular section of base (b) and height (h) about an axis passing through its base c
(a) Base
(b) Height
(c) Both
(d) None

147.M.I. of inertia of a triangular section of base (b) and height (h) about an axis passing through its vertex and parallel to the base 137.M.I. of inertia of a triangular section of base (b) and height (h) about an axis passing through its vertex and parallel to the base
(a) Base
(b) Height
(c) Both
(d) None

148. M.I. of inertia of a thin disc of mass m and radius r, about an axis passing through its c.g. and perpendicular to the plane of the disc depends upon
(a) Mass
(b) Radius
(c) Both
(d) None

149. M.I. of inertia of a thin rod of mass m and radius r, about an axis passing through its c.g. and perpendicular to its length depends upon
(a) Mass
(b) Radius
(c) Both
(d) None

150. M.I. of inertia of a solid cylinder of mass m and radius r and length L about longitudinal axis or polar axis depends upon
(a) Mass
(b) Radius
(c) Both
(d) None

151. M.I. of inertia of a thin spherical shell of mass m and radius r, about its diameter depends upon
(a) Mass
(b) Radius
(c) Both
(d) None

152. M.I. of inertia of a sphere of mass m and radius r , about an axis tangential to it depends upon
(a) Mass
(b) Radius
(c) Both
(d) None

153. M.I. of inertia of a solid sphere of mass m and radius r depends upon
(a) Mass
(b) Radius
(c) Both
(d) None

154. M.I. of inertia of a solid cone of mass m and radius r about its vertical axis depends upon
(a) Mass
(b) Radius
(c) Both
(d) None

156. Units of C.G. is
(a) kg
(b) Meter
(c) Newton
(d) None

157. Which of the following is not the Units of C.G.
(a) cm
(b) Meter
(c) mm
(d) None

158. Units of M.I. is
(a) kg
(b) Meter
(c) Newton
(d) None

159. A force acting in the opposite direction to the motion of the body is called force of
(a) Friction
(b) Couple
(c) Moment
(d) None

160. Maximum friction force, which comes into play, when a body just begins to slide over the surface of the other body, is known as
(a) Static friction
(b) Dynamic friction
(c) Static friction
(d) None

161. The friction experienced by a body when at rest is
(a) Static friction
(b) Dynamic friction
(c) Static friction
(d) None

162. The ratio of static friction to dynamic friction is always
(a) Equal to one
(b) Greater than one
(c) Less than one
(d) None

163. The friction experienced by a body when it is in motion is
(a) Static friction
(b) Dynamic friction
(c) Static friction
(d) None

164. The angle of inclination of a plane at which the body begins to move down the plane, is called the angle of ------
(a) Friction
(b) Repose
(c) Projection
(d) None

165. A force acting on a body may
(a) Balance the other force
(b) Retard its motion
(c) Change its motion
(d) All of the above

166. Effect of the force on the body depends upon.
(a) Magnitude
(b) Direction
(c) Position or line of action
(d) All of the above

167. A force is completely defined by
(a) Magnitude
(b) Direction
(c) Point of application
(d) All of the above

168. The weight of the body is due to
(a) Centripetal force of earth
(b) Gravitational pull exerted by earth
(c) Force experienced by body in atmosphere
(d) Gravitational force of attraction towards the center of the earth

169. The force, which meet at one point, but their lines of action do not lie in a plane, are called
(a) Coplanar non-concurrent forces
(b) Non-coplanar concurrent forces
(c) Non-coplanar non-concurrent forces
(d) Intersecting forces.

170. The magnitude of two forces, which when acting at right angle produce resultant force of $\sqrt{10}$ kg and acting at 60° produce resultant of $\sqrt{13}$ kg.these forces are
(a) 2 and $\sqrt{6}$
(b) 3 and 1
(c) $\sqrt{5}$ and $\sqrt{5}$
(d) none

171. The angle of inclination of the plane at which a body begins to move down the plane, is called angle of friction.
(a) True
(b) False

172. The weight of the body is due to Centripetal force of earth
(a) True
(b) False

173. Moment of inertia of rectangular section having width (b) and depth (d) about an axis passing through its C.G. and parallel to the depth (d), is $bd^3/12$
(a) $db^3/12$
(b) $bd^3/12$
(c) $db^3/36$
(d) $bd^3/36$

174. The moment of inertia of a square of side (a) about an axis through its C.G. is $a^4/12$
(a) True
(b) False

175. The M.I. of rectangular section 3cm wide and 4cm deep about axis X-X is 16 cm^4
(a) True
(b) False

176. The M.I. of a square of side a about its diagonal is $a^2/8$
(a) True
(b) False

177. M.I. of a circular section about its diameter (d) is $\Pi d^3 /32$
(a) True
(b) False

178. M.I. of a circular section about an axis perpendicular to the section is $\Pi d^4 /32$
(a) True
(b) False

179. The angle which the normal reaction makes with the resultant reaction is called angle of friction.
(a) Agree
(b) Disagree

180. A body will begin to move down an inclined plane if the angle of inclination of the plane is ---------the angle of the friction.
(a) Equal to one
(b) Greater than one
(c) Less than one
(b) None

181. Coefficient of friction is the ratio of the limiting friction to the normal reaction between the two bodies.
(a) Agree (b) disagree.

182. Coefficient of friction depends upon
(a) Area of contact only
(b) Nature of surface only
(a) Both a and b
(d) None

183. The force required to move the body up the plane will be minimum when it makes the angle with the inclined plane----- the angle of friction.
(a) Equal to
(b) Greater than
(c) Less than

185. The ladder is resting on a rough ground and leaning against a smooth vertical wall .the force of friction will act
(a) downwards at its upper end
(b) away from the wall at its upper end
(c) zero at its upper
(d) upwards at its upper end

186The ladder is resting on a smooth ground and leaning against a rough vertical wall .the force of friction will act
(a) downwards at its upper end
(b) away from the wall at its upper end
(c) zero at its upper
(d) upwards at its upper end

187. In a screw jack, the effort required to lift the load is ----- the effort required to lower the same load
(a) Less than
(b) Equal to
(c) More than

188. The angle of inclination of a plane at which the body begins to move down the plane, is called the angle of repose
(a) True
(b) False

189. A force acting on a body may Balance the other force.
(a) True
(b) False

190. Effect of the force on the body depends upon Magnitude only
(a) True
(b) False

191. A force is completely defined by its Direction.
(a) True
(b) False

Effect of force is to bring the body in-------motion.
(a) Linear
(b) Rotational
(c) Both
(d) None

192. The moment of a force is turning effect produced by force
(a) True
(b) False

192. Two like parallel forces are acting at a distance of 20 mm apart and their resultant is 20N. if the line of action of the resultant is 60mm from any given force, the two forces are 20N and 5N
(a) True
(b) False

193. IF a body is acted upon by a number of coplanar forces, it may rotate about itself with moving
(a) True
(b) False

194. Moment of force depends upon distance of point of application from fixed point only.
(a) True
(b) False

195. Effect of force is to bring the body in linear motion always.
(a) True
(b) False

196. The process of finding out the resultant force is called
(a) Composition
(b) Resolution

197. Vectors method for finding resultant force is also called polygon law of forces.
(a) True
(b) False

198. Concurrent forces will always be coplanar.
(a) True
(b) False

199. IF two forces are collinear and coplanar, then they may be concurrent.
(a) True
(b) False

200. Resultant of forces 4N and 5N cannot be less than 1N.
(a) True
(b) False

201. The velocity ratio in case of an inclined plane inclined at angle e to the horizontal and weight being pulled up the inclined plane by vertical effort is

(A) sin e

(b) cos e

(c) tan e

(d) cosec e

202. An ideal machine is one whose efficiency is

(a) Between 60 and 70%

(b) Between 70 and 80%

(c) Between 80 and 90%

(d) 100 %

203. The mechanical advantage of a lifting machine is the ratio of

(a) Distance moved by effort to the distance moved by load

(b) Load lifted to the effort applied

(c) Output to the input

(d) All of the above

204. The efficiency of a lifting machine is the ratio of

(a) Output to the input

(b) Work done by the machine to the work done on the machine

(c) Mechanical advantage to the velocity ratio

(d) All of the above

205. If the efficiency of a lifting machine is kept constant, its velocity ratio is propotional to its mechanical advantage.

(a) Directly

(b) Inversely

206. In ideal machines, mechanical advantage is velocity ratio.

(a) Equal to

(b) Less than

(c) Greater than

207. In actual machines, mechanical advantage is velocity ratio.

(a) Equal to

(b) Less than

(c) Greater than

208. A lifting machine lifts a load of l000N through a distance of 0.2 m by means of an effort of 200N through a distance of 1m. This machine is an ideal one.

(a) Right

(b) Wrong

209. A machine having an efficiency less than 50%, is known as

(A) Reversible machine

(b) Non-reversible machine

(c) Neither reversible nor non-reversible machine (d) ideal machine

210. A machine having an efficiency greater than 50%, is known as

(a) Reversible machine

(b) Non-reversible machine

(c) Neither reversible nor non-reversible machine

(d) Ideal machine

211. A machine which is capable of doing work in the reversed direction, after the effort is re- moved, is called a non-reversible machine.

(a) Yes

(b) No

212. A machine which is not capable of doing any work in the reversed direction, after the effort is removed, is called a reversible machine.

(a)True

(b) False

213. A non-reversible machine is also called a self-locking machine.

(a) Agree

(b) Disagree

214. A screw jack used for lifting the loads is

(a) A reversible machine

(b) A non-reversible machine

(c) An ideal machine

(d) None of these

215. A weight of 1000 N can be lifted by an effort of 80 N. If the velocity ratio is 20, the machine is

(a)Reversible (b) Non-reversible (c) Ideal

216. For a self-locking machine, the efficiency must be

(a) Equal to 50%

(b) Less than 50%

(c) Greater than 50%

(d) 100%

217. The law of the machine is

(a)P=mW-C

(b) P=m/W+C

(c) P=mW+C

(d) *P=C-mW*

Where *P* = Effort applied to lift the load,

m = A constant which is equal to the slope of the line,

W = Load lifted, and

C = Another constant which represents the machine friction.

218. The maximum mechanical advantage of a lifting machine is

(a) l+m

(b) 1-m

(c) 1/m

(d) m

219. *The maximum efficiency of a lifting machine is*

(a)1/m

(b)V.R./m

(c) m/VR.

(d) *1/mxVR.*

220. The velocity ratio for the first system of pulleys is

(A) n

(b) n2

(c) 2n

(d) 2n - 1

where *n* is the number of pulleys.

221. The velocity ratio for the second system of pulleys is *n.*
(a) True

(b) False

222. The velocity ratio for the third system of pulleys is

(a) n

(b) n2

(c) 2n

(d) 2n- 1

223. The velocity ratio of a differential pulley block with *D* and *d* as the diameters of larger and

smaller pulley, is

(a) D/ (D-d)

(b) D/ (D+d)

(c) 2D/ (D-d)

(d) 2D/ (D-d)

224. Which of the following statement is wrong?

(a) A force acting in the opposite direction to the motion of the body is called force of friction,

(b)The ratio of the limiting friction to the normal reaction is called coefficient of friction.

(c) A machine whose efficiency is 100% is known as an ideal machine.

(d)The velocity ratio of a machine is the ratio of load lifted to the effort applied.

225. The velocity ratio of a first system of pulleys with 4 pulleys is

(A) 4

(b) 8

(c) 16

(d) 20

226. Which of the following is a scalar quantity?

(a) Force

(b) Speed

(c) Velocity

(d) Acceleration

227. The rate of change of displacement of a body is called

(A) Velocity

(b) Acceleration

(c) Momentum

(d) None of these

228. Which of the following are vector quantities?

(a)Linear displacement

(b) Linear velocity

(c) Linear acceleration

(d) All of these

229. The negative acceleration is called retardation.

(a) True

(b) False

230. If the body falls freely under gravity, then the gravitational acceleration is taken as

(a)+ 8.9 m/s2

(b) -8.9 m/s2

(c) + 9.8 m/s2

(d) -9.8 m/s2

231. If a body is thrown upwards, then the gravitational acceleration is taken as zero.

(a) Right

(b) Wrong

232. If the gravitational acceleration at any place is doubled, then the weight of a body will be

(a) g/2

(b) g

(c)$\sqrt{}$ 2 g

(d) 2g

233. The velocity of a body on reaching the ground from a height h, is

(a)2 $\sqrt{}$gh

(b) $\sqrt{}$gh

(c) $\sqrt{}$2gh (d) 2g$\sqrt{}$ h

234. The acceleration of a body sliding down an inclined surface is

(A) g sin θ

(b) g cos θ

(c) g tan θ

(d) None of these

235. Which of the following is an equation of linear motion?

(a) v=u+aJ

(b) s=u.t + 2aP

(c) v2 =u2+2a.s

(d) all of these

where u and v = Initial and final velocity of the body,

a = Acceleration of the body, and

s = Displacement of the body in time t seconds.

236. According to Newton's first law of motion,

(a) Every body continues in its state of rest or of uniform motion, in a straight line, unless it is acted upon by some external force

(b) The rate of change of momentum is directly proportional to the impressed force, and take r place in the same direction, in which the force acts

(c) To every action, there is always an equal and opposite reaction

(d) None of the above

237. Newton's second law motion_____ a relation between force and mass of a moving body

(a) Gives

(b) Does not give

238. A science teacher claimed that Newton's third law of motion is involved while studying the motion of rockets. Is his statement:

(a) Justified

(b) Not justified

239. D' Alembert's principle basically depends upon Newton's second law of motion.

(a) Correct

(b) Incorrect

240. The rate of change of momentum is directly proportional to the impressed force, and place in the same direction in which the force acts. This statement is known as

(a) Newton's first law of motion

(b) Newton's second law of motion

(c) Newton's third law of motion

(d) None of these

241. The law of motion involved in the recoil of gun is

(a)Newton's first law of motion

(b) Newton's second law of motion

(c) Newton's third law of motion

(d) None of these

242. If *P* is the force acting on the body, *m* is the mass of the body and *a* is the acceleration then according to Newton's second law of motion,

(a)P+m.a=0

(b) P-m.a=0

(c) PXm.a=0

(d) P/m.a=0

243. The matter contained in a body, is called

(a)Impulsive force

(b) Mass

(c) Weight

(d) Momentum

244. The force, by which the body is attracted, towards the centre of the earth, is called

(a)Impulsive force

(b) Mass

(c) Weight

(d) Momentum

245. When a body falls freely under gravitational force, it possesses weight.

(A) No

(b) Minimum

(c) Maximum

246. The total motion possessed by a body, is called

(a) Impulsive force

(b) Mass

(c) Weight

(d) Momentum

247. A Newton is defined as the force while acting upon a mass of one kg, produces an acceleration

of 1 m/S2 in the direction of which it acts.

(a) Yes

(b) No

248. The force applied on a body of mass 100 kg to produce an acceleration of 5 mls2, is

(A) 20N

(b) 100 N

(c) 500 N

(d) None of these

249. A lift moves downwards with an acceleration of9.8 mls2. The pressure exerted by a man o

floor of the lift is zero.

(a) True

(b) False

250. When the lift is moving upwards with some acceleration, the pressure exerted by a

is proportional to its acceleration.

(a) Directly

(b) Inversely

251. Tension in the cable supporting a lift is more when the lift is moving with acceleration.

(a) Upwards

(b) Downwards

252. If tension in the cable supporting a lift moving downwards is half the tension when moving upwards, the acceleration of the lift is

(a) g/2

(b) g/3

(c) g/4

(d) None of these

253. Two balls of equal mass and of perfectly elastic material are lying on the floor. One of the ball with velocity v is made to struck the second ball. Both the bal1s after impact wi1l move with a velocity

(a) v

(b) v/2

(c) v/4

(d) v/8

254. A lead bal1 with a certain velocity is made to strike a wal1, it fal1s down, but rubber bal1 of same mass and with same velocity strikes the samewal1, it rebounds. Select the correct reason from the following:

(a) Both the bal1s undergo an equal change in momentum.

(b) The change in momentum suffered by rubber bal1 is more than the lead ball.

(c) The change in momentum suffered by rubber bal1 is less than the lead ball.

(d) None of the above.

255. If u_1 and u_2 are the velocities of two moving bodies in the same direction before impact and VI and V2 are their velocities after impact, then coefficient of restitution is given by

(a) $(v_1 - v2)/(u_1-u_2)$

(b) $(v_2 - v_1)/(u_1-u_2)$

(c) $(u_1-u_2)/ (v_1 - v2)$

(d) $(u_1 + u_2)/ / (v_1 + v2)$

256. A body of mass *m* moving with a constant velocity v strikes another body of same mass m moving with same velocity but in opposite direction. The common velocity of both the bodies after col1ision is -'--'-'

(a) v

(b) 2 v

(c) 4 v

(d) 8 v

257. A rubber ball is dropped from a height of 2 m. If there is no loss of velocity after rebounding, the bal1 wi1l rise to a height of

(a)I m

(b) 2m

(c) 3m

(d) 4m

258. Whenever a force acts on a body and the body undergoes a displacement, then

(a) Work is said to be done

(b) Power is being transmitted

(c) Body has kinetic energy of translation

(d) None of these

259. The unit of work in S.I. units is

(a)Newton

(b) erg

(c) kg-m

(d) joule

260. One joule is equal to

(a)O.l N-m

(b) 1 N-m

(c) l0 N-m

(d) l00 N-m

261. Work done is said to be zero, when

(a) some force acts on a body, but displacement is zero

(b) No force acts on a body but some displacement takes place

(c) Either (a) or (b)

(d) None of the above

262. One joule means that

(a) Work is done by a force of 1 N when it displaces a body through lm

(b) Work is done by a force of 1 kg when it displaces a body through 1 m

(c) Work is done by a force of 1 dyne when it displaces a body through 1 cm

(d) Work is done by a force of 1 g when it displaces a body through 1 cm

263. Joule is the unit of

(a) Force

(b) Work

(c) Power

(d) Energy

264. The rate of doing work is known as

(A) Potential energy

(b) Kinetic energy

(c) Power

(d) None of these

265. The unit of power in S.I. units is

(A) Horsepower

(b) Joule

(c) Watt

(d) kg-m

266. One watt is equal to

(a) 0. l joule/s

(b) l joule/s

(c) 10 joules/s

(d) 100 joules/*s*

267. The power developed by a body acted upon by a torque T Newton meter (N -m) and revolving at ω radian/s is given by

(a) $T\omega$ (in watts)

(b)$T\omega$ /60 (in watts)

(c)$T\omega$/75 (in kilowatts)

(d) $T\omega$/ 4500 (in kilowatts)

268. Energy may be defined as the capacity of doing work.

(a)Correct

(b) Incorrect

269. The unit of energy in S.I. units is

(a) Dyne

(b) Watt

(c) kg- m

(d) Joule

270. The energy possessed by a body, for doing work by virtue of its position, is called

(a) Potential energy

(b) Kinetic energy

(c) Electrical energy

(d) Chemical energy

271. The kinetic energy of a body upon its mass and velocity.

(a) Does not depend

(b) Depends

272. The potential energy stored by a spring in compression, is called strain energy.

(a) Yes

(b) No

273. When a body of mass *m* attains a velocity *v* from rest in time *t,* then the kinetic energy of translation is

(a) mv^2

(b) mgv^2

(c) 0.5^{mv2}

(d) $0.5\ mgv^2$

274. When a body of mass moment of inertia I (about a given axis) is rotated about that axis with an angular velocity *w,* then the kinetic energy of rotation is

(a)$I\omega$

(b) $I\omega^2$

(c) $0.51\ I\ \omega$

(d) $0.5\ 1\omega^{\ 2}$

275. The wheels of a moving car possess

(A) Potential energy only

(b) Kinetic energy of translation only

(c) Kinetic energy of rotation only

(d) Kinetic energy of translation and rotation both

276. According to principle of conservation of energy, the total momentum of a system of masses in any direction remains constant unless acted upon by an external force in that direction.

(a) True

(b) False

277. The total energy possessed by a system of moving bodies

(a) Is constant at every instant

(b) Varies from point to point.

(c) Is maximum in the start and minimum at the end

(d) Is minimum in the start and maximum at the end

278. C.G.S. units of momentum is
(a) Kg m/ sec
(b) kg m/ sec^2
(c) g cm/ sec^2
(d) None

279. Rate of change of momentum is
(a) Force
(b) Acceleration
(c) Velocity
(d) None

280. Second law of Newton describes
(a) Force
(b) Acceleration
(c) Velocity
(d) Inertia

281. First law of Newton describes
(a) Force
(b) Acceleration
(c) Velocity
(d) Inertia

282. Third law of Newton describes
(a) Force
(b) Acceleration
(c) Velocity
(d) None

283. In the swimming-----law of Newton is applicable
(a) First
(b) Second
(c) Third
(d) All

284. Which of the following is not vector

(a) Mass

(b) Momentum

(c) Velocity

(d) None

285. Concurrent forces always lie in same plane

(a) True

(b) False

286. Collinear forces always act same direction

(a) True

(b) False

287. Tension acts opposite to external force

(a) True

(b) False

288. Equilibriant of force system is equal and opposite to the resultant of force system.

(a) True

(b) False

289. Maximum resultant of two concurrent forces P and Q is P+ Q

(a) True

(b) False

290. Minimum resultant of two concurrent forces P and Q is P/Q

(a) True

(b) False

291. Resolved part of force in a direction right angle to its line of action is the force itself.

(a) True

(b) False

292. Lami's theorem is applicable to only three concurrent coplanar forces.

(a) True

(b) False

293. Polygon law of forces is applicable to only four concurrent coplanar forces

(a) True

(b) False

294. If a system of coplanar concurrent forces are in equilibrium, $\sum X=0$ and $\sum Y=0$.

(a) True

(b) False

295. Bow's notation is used to represent a moment in magnitude and direction.

(a) True

(b) false

296. The unit of work in S.I. units is

(a)Newton

(b) erg

(c) kg-m

(d) Joule

297. One joule is equal to

(a)O.l N-m

(b) 1 N-m

(c) l0 N-m

(d) l00 N-m

298. A body of mass 5 kg is moving with an acceleration of 10 $m/sec^{2.}$ Inertia force acting on a body is

(a) 50 dyne
(b) 50 kgf
(c) 50N
(d) 500dynes

299. A body has a mass of 100kg. Weight of the body is
(a) 100 kgf
(b) 981 Newton
(c) 981X 10^{-6} mega Newton
(d) All the above

300. A body of mass 5 kg is moving with an acceleration of 10 m/$sec^{2.}$ Inertia force acting on a body is
(a) 50 dyne
(b) 50 kgf
(c) 50N
(d) 500dynes

301.1dyne is equal to------Newton.
(a) 10^{-5}
(b) 10^{5}
(c) 1000
(d) 100

302. 50N is equal to------dyne.
(a) 5 X 10^{6}
(b) 5 X 10^{5}
(c) 5 X 10^{-5}
(d) 5 X 10^{-6}

303.1 kgf is equal to------Newton.
(a) 1
(b) 10
(c) 9.8
(d) 100

304. Value of acceleration due to gravity is.
(a) 9.81 m/sec^2
(b) 981 m/sec^2
(c) Both
(d) None

305. Value of acceleration due to gravity is----- for all bodies.
(a) Same
(b) Different
(c) High
(d) None

306. Value of acceleration due to gravity depends upon
(a) Mass
(b) Velocity
(c) Acce
(d) None

307. Force of gravity depends upon
(a) Mass
(b) Velocity
(c) Acce
(d) None

308. Force of gravity increases with increase of-----.
(a) Mass
(b) Velocity
(c) Acce
(d) None

309. Magnitude of resultant of two forces depends upon
(a) Magnitude of two forces.
(b) Angle between two forces.
(c) Both
(d) None

310. Law of parallelogram of forces is applicable for-----forces
(a) Coplanar
(b) Concurrent
(c) both (d) none

311.Two forces P and Q act at a point, the resultant is
(a) P+Q (b) P-Q
(c) Between P+Q and P-Q (d) all the above

312.Resultant of two equal forces of magnitude P is equal may be
(a) P (b) 2P (c) either a or b (d) none

313.Resultant of two equal forces of magnitude P is equal P then angle between two forces is
(a) 30° (b) 60° (c) 90° (d) 120°

314.As the angle between two forces increases, the magnitude of resultant
(a) Increases (b) decreases (c) remain constant
(e) First increases and then decreases.

315.Law of parallelogram of forces is applicable for
(a) 2 forces (b) 3 forces (c) 4 forces (d) 5 forces

316.In law of triangle total number of forces acting at a point
(a) 2 forces (b) 3 forces (c) 4 forces (d) 5 forces

317.Two forces of magnitude 5N each and angle between Them is 120°,resultant can be calculated by law of,
(a) Parallelogram (b) triangle (c) both (d) none

318. If the resultant of two forces P and Q is R, if P is doubled resultant will be
(a) R (b) 2R (c) R/2 (d) none

319.In the above problem if Q is halved
(a) R (b) 2R (c) R/2 (d) none

320. If more than two forces are acting at a point, then for finding the resultant law of----- can be used
(a) Parallelogram (b) triangle (c) both (d) none

321. Law of polygon can be used for -----.
(a) 2 forces (b) 3 forces (c) 4 forces (d) all

322.If three equal forces of magnitude P are acting at a point, angle between first and second, second and third are 90°, the resultant will be
(a) P (b) 2P (c) 3P (d) none

323.If five forces are acting at a point and fifth force closes the polygon then, polygon will be
(a) Parallelogram (b) triangle
(c) pentagon (d) Hexagon

324. In the above problem the resultant is
(a) 0 (b) 1 (c) ∞ (d) none

325. The unit of work in S.I. units is

(a)newton *(b)* erg *(c)* kg-m (d) joule

326. One joule is equal to

(a)O.l N-m *(b)* 1 N-m *(c)* l0 N-m *(d)* l00 N-m

327. Work done is said to be zero, when

(b)some force acts on a body, but displacement is zero

(b)no force acts on a body but some displacement takes place

(c) either *(a)* or *(b)*

(d) none of the above

328. One joule means that

(b)work is done by a force of 1 N when it displaces a body through lm

(b)work is done by a force of 1 kg when it displaces a body through 1 m

(c)work is done by a force of 1 dyne when it displaces a body through 1 cm

(d)work is done by a force of 1 g when it displaces a body through 1 cm

329. Joule is the unit of

(a)force *(b)* work *(c)* power (d) energy

330. The rate of doing work is known as

(a)potential energy *(b)* kinetic energy *(c)* power (d) none of these

331.A book is placed on the table. Total no of forces acting on book

(a) 0 (b) 1 (c) 2 (d) 3

332.If the body is in equilibrium minimum no of forces acting on it are.
(a) 0 (b) 1 (c) 2 (d) 3

333. At a point 30 forces are acting on a body, resultant can be found by law of----------forces
(a) Parallelogram (b) triangle (c) both (d) none

334. Energy may be defined as the capacity of doing work.

(a)Correct *(b)* Incorrect

335. The unit of energy in S.I. units is

(a) dyne *(b)* watt *(c)* kg- m (d) joule

336. The energy possessed by a body, for doing work by virtue of its position, is called

(a)potential energy *(b)* kinetic energy

(c) electrical energy (d) chemical energy

337. The kinetic energy of a body upon its mass and velocity.

(a) does not depend *(b)* depends

338. The potential energy stored by a spring in compression, is called strain energy.

(a) Yes *(b)* No

339. When a body of mass *m* attains a velocity *v* from rest in time *t,* then the kinetic energy of

translation is

(a) mv^2 (b) mgv^2 (c) 0.5 ^{mv2} (d) 0.5 mgv^2

340. When a body of mass moment of inertia I (about a given axis) is rotated about that axis with an angular velocity *w,* then the kinetic energy of rotation is

(a)$I\omega$ (b) $I\omega^2$ (c) 0.51 I ω (d) 0.5 1ω **2**

341. The wheels of a moving car possess

(a)potential energy only (b) kinetic energy of translation only

(c) kinetic energy of rotation only *(d)* kinetic energy of translation and rotation both

342. According to principle of conservation of energy, the total momentum of a system of masses in any direction remains constant unless acted upon by an external force in that direction.

(a) True *(b)* False

343. The total energy possessed by a system of moving bodies

(a)is constant at every instant

(b)varies from point to point.

(c) is maximum in the start and minimum at the end

(d) is minimum in the start and maximum at the end

344.C.G.S. units of momentum is
(a) kg m/ sec (b) kg m/ sec^2
(c) g cm/ sec^2 (d) none

345. Rate of change of momentum is
(a) force (b) acceleration (c) velocity (d) none

346.Second law of Newton describes
(a) force (b) acceleration (c) velocity (d) inertia

347.First law of Newton describes
(a) force (b) acceleration (c) velocity (d) inertia

348.Third law of Newton describes
(a) force (b) acceleration (c) velocity (d) none

349. A couple produces
(a) Translatory motion
(b) Rotational motion
(c) Combined translatory and rotational motion
(d) None

350. The force induced in the string AB in the figure is
(a) W sin θ (b) W cos θ (c) W sec θ (d) W cosec θ

351. In the above problem the force induced in BC is
(a) W sin θ (b) W cos θ (c) W tan θ (d) W cot θ

352. The point through which the weight of whole body acts is known as
(e) Moment of inertia (b) Center of gravity
(f) Center of percussion (d) center of mass

353. The C.G. of an equilateral triangle of sides a is
(a) 3 a/2(b) 2 3a (c) a/2 3 (d) 3 2 a

354. The C.G. of the semi circle lies at ------ from the base
(a) 3r/8 (b) 4r/3Π (c) 8r/ 3 (d) 3r/4Π

355. The C.G. of right circular cone is -------from base.
(a) h/2 (b) h/3 (c) h/4 (d) h/6

356. The C.G. of the quadrant of circle of radius r,lies along its central radius at a distance of
(a) 0.5r (b) 0.6r (c) 0.7r (d) 0.8r

357. The C.G. of a T section 100mmX150mmX50mm from its bottom is
(a) 50mm (b) 75mm (c) 87.5mm (d)125mm

358. Moment of inertia is the
(a) second moment of force (b) second moment of area
(c) second moment of mass (d) all

359. The units of moment of inertia of an area is
(a) kg-m^2 (b) kg-m-s^2 (c) kg/ m^2
(d) m^4

360. Mass moment of inertia of a uniform thin rod of mass M and length (L) about its mid-point and perpendicular to its length
(a) $2ML^2/3$ (b) $ML^2/3$ (c) $3ML^2/4$ (d) $4ML^2/3$

361.Mass moment of inertia of thin rod about its one end is ----the mass moment of inertia of the same rod about its mid point
(a) same as (b) twice (c) thrice (d) four times

362. Moment of inertia of rectangular section having width (b) and depth (d) about an axis passing through its C.G. and parallel to the width (b), is
(a) $db^3/12$ (b) $bd^3/12$ (c) $db^3/36$(d) $bd^3/36$

363. An ideal machine is one whose efficiency is

(a) between 60 and 70% *(b)* between 70 and 80% *(c)* between 80 and 90% (d) 100 %

364. The mechanical advantage of a lifting machine is the ratio of *(a)* distance moved by effort to the distance moved by load

(b) load lifted to the effort applied *(c)* output to the input (d) all of the above

365. The efficiency of a lifting machine is the ratio of *(a)* output to the input

(b) work done by the machine to the work done on the machine *(c)* mechanical advantage to the velocity ratio (d) all of the above

366. If the efficiency of a lifting machine is kept constant, its velocity ratio is propotional to its mechanical advantage.

(a) directly *(b)* inversely

367. In ideal machines, mechanical advantage is velocity ratio.

(a) equal to *(b)* less than *(c)* greater than

368. In actual machines, mechanical advantage is velocity ratio.

(a) equal to *(b)* less than *(c)* greater than

369. A lifting machine lifts a load of l000N through a distance of 0.2 m by means of an effort of 200N through a distance of 1m. This machine is an ideal one.

(a) Right *(b)* Wrong

370.A machine having an efficiency less than 50%, is known as

(a)reversible machine *(b)* non-reversible machine

(c) neither reversible nor non-reversible machine (d) ideal machine

371. A machine having an efficiency greater than 50%, is known as

(a) reversible machine *(b)* non-reversible machine

(c) neither reversible nor non-reversible machine (d) ideal machine

372. A machine which is capable of doing work in the reversed direction, after the effort is re- moved, is called a non-reversible machine.

(a) Yes *(b)* No

373. Law of polygon can be used for 4 forces.
(a) true (b) false

374.If three equal forces of magnitude P are acting at a point, angle between first and second, second and third are 90°, the resultant will be P.
(a) true (b) false

375.If five forces are acting at a point and fifth force closes the polygon then, polygon will be triangle.

(a) true (b) false

376. In the above problem the resultant is one.

(a) true (b) false

377. The unit of work in S.I. units is Newton.

(a) true (b) false

378. One joule is equal to 1 N-m

(a) true (b) false

379. Work done is said to be zero, when some force acts on a body, but displacement is zero

(a) true (b) false

380. One joule means that work is done by a force of 1 kg when it displaces a body through 1 m

(a) true (b) false

381. Joule is the unit of Power

(a) true (b) false

382.Energy cannot be created nor can be destroyed, but it can be transformed from one form to another. This is according to the law of conservation of ---------

(a) mass (b) energy

(c) momentum (d) none of the above

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383.Work done by acting force is equal to change

(a) K.E. (b) P.E.

(c) chemical energy (d) none

384.C.G. of the body remain unaltered in whatever manner the body may be held.
(a) true (b) false

385.A body has one and only one C.G.
(a) true (b) false

386.Centroid of an area is also called C.G.
(a) true (b) false

387.A body may not have C.G., but it always have center of mass.
(a) true (b) false

388.C.G. of a circular lamina is the center of circle.
(a) true (b) false

389.If an area is symmetrical about any axis, its C.G. will lie on that axis.
(a) true (b) false

390.C.G. of a triangle is at a distance of one third of the altitude of the triangle from any base.
(a) true (b) false

391.C.G. of a quadrant of a circle is at a distance of $4r/3\pi$ from a base.
(a) true (b) false

392.In a T section if an axis is drawn at right angles to the flange through its middle point, C.G. of the section will lie on that section.
(a) true (b) false

393.C.G. of a sphere does not necessarily lie at its geometrical axis.
(a) true (b) false

394.C.G. of a right circular cone lies on its central axis drawn at right angles to the circular base.
(a) true (b) false

395.Unit of mass moment of inertia is
(a) $(m\ kg)^2$ (b) $kg\ m^2$ (c) $kg\ m^2$ (d) none

396.A particle moving along the circumference of a circle is describing circular arc at the rate of 0.25 m/s.Then the partical moving with
(a) uniform velocity (b) uniform speed
(c) average velocity (d) average speed

397.A particle describes 10 m,15 m and 25 m in different directions in 2 sec, 3 sec and 5 sec respectively. the average velocity of the particle will be

(a) 10 (b) 50 (c) 2 (d) 5

398. A particle moves 3 m towards the east and 4 m towards the north. Displacement of the particle is----

(a) 7 m (b) 10 m (c) 2 m (d) none

399.Plane motion means motion with uniform acceleration.
(a) true (b) false

400.Speed is a scalar quantity, but velocity is a vector quantity.
(a) true (b) false

401.Momentum is a scalar quantity
(a) true (b) false

402. Momentum is a product of mass and
(a) moment (b) acceleration
(c) velocity (d) none

403.Units of momentum is
(a) cm (b) kg m/ sec^2 (c) kg (d) none

404.S.I. units of momentum is
(a) kg m/ sec (b) kg m/ sec^2
(c) kg m (d) none

405.M.K.S. units of momentum is
(a) kg m/ sec (b) kg m/ sec^2 (c) kg m (d) none

406.C.G.S. units of momentum is
(a) kg m/ sec (b) kg m/ sec^2 (c) g cm/ sec^2 (d) none

407. Rate of change of momentum is
(a) force (b) acceleration (c) velocity (d) none

408.Second law of Newton describes
(a) force (b) acceleration (c) velocity (d) inertia

409.First law of Newton describes
(a) force (b) acceleration (c) velocity (d) inertia

410.Third law of Newton describes
(a) force (b) acceleration (c) velocity (d) none

411.In the swimming-----law of Newton is applicable
(a) first (b) second (c) third (d) all

412.In rocket propulsion-----law of Newton is applicable
(a) first (b) second (c) third (d) all

413.If the body is at rest
(a) no external force acts on it
(b) the resultant of the forces acting on it is zero
(c) both a and b
(d) none of these

414.A body of mass 5 kg is moving with an acceleration of 10 $m/sec^{2.}$ Inertia force acting on a body is
(a) 50 dyne (b) 50 kgf (c) 50N (d) 500dynes

415. A body has a mass of 100kg. Weight of the body is
(a) 100 kgf (b) 981 Newton
(c) $981X\ 10^{-6}$ mega Newton (d) all the above

416. A force of 1 Newton is that force which
(a) acting on a mass of 1 kg produces in it an acceleration of 1 m/sec^2
(b) acting on a mass of 1 kg produces in it an acceleration of 1 cm/sec^2
(c) acting on a mass of 1 g produces in it an acceleration of 1 cm/sec^2

(d) acting on a mass of 1 kg produces in it an acceleration of 981 cm/sec^2

417. A cricket batsman applies a --------on a ball with bat.
(a) force (b) impulse (c) moment (c) none

418. Unit of impulse is.
(a) meter (b) N m (c) kg (c) none

420.S.I. Unit of impulse is.
(a) dyne s (b) N s (c)pound s (c) none

421.M.KS. Unit of impulse is.
(a) dyne s (b) N s (c)pound s (c) none

422.C.G.S. Unit of impulse is.
(a) dyne s (b) N s (c)pound s (c) none

423.F.P.S. Unit of impulse is.
(a) dyne s (b) N s (c)pound s (c) none

424.Principle of rocket launching is based on Newton's -----of motion
(a) first (b) second (c) third (d) all

425. "Kgf" is the ----------unit of force in---------system
(a) gravitational, M.K.S.
(b) gravitational, S.I.
(c) absolute, M.K.S.
(d) absolute, S.I.

426."Newton" is the ----------unit of force in---------system

(a) gravitational, M.K.S.
(b) gravitational, S.I.
(c) absolute, M.K.S.
(d) absolute, S.I.

427. "Dyne" is the ----------unit of force in---------system
(a) absolute, C.G.S.
(b) absolute, S.I.
(c) absolute, M.K.S.
(d) none

428.A constant force acts on a mass of 10 kg and produces in it a velocity of 4m/s in a 2 seconds. The force acting on a body is
(a) 20N (b) 10N (c) 30N (a) none

429. A force of 490.5 acts on a mass of 20 kg for 2 minutes. Distance moved by body during this time-----Km.
(a)17.66 (b)176.6 (c)1.766 (a) none

430. A force of 19.62N moves a mass of 20 kg through a distance of 30 m, in time-------seconds starting from rest.
(a)553 (b)55.3 (c)5.53 (a) none

431. A force moves a body through 2 m in 20 seconds starting from rest. Ratio of force to weight of body is--------
(a)1:6 (b)1:98.1 (c)1:981 (a) 1:9.81

432. A force of 98.1N acts on a mass of 81 kg for 3 seconds and then it ceases to act. how far body will move in next 3 seconds?
(a)10.9 (b)109 (c)1.09 (a) none

433. A force of ------KN moves a mass of 100 kg through a distance of 15 m in time 5 seconds starting from rest
(a)120 (b)12 (c)0.12 (a) none

434. A body of mass 15 kg, placed on a smooth horizontal plane and acted upon by a force of 19.62 for 5 seconds. Distance moved by a body in half a minute is-----m.
(a) 19.59 (b) 195.9 (c) 1.959 (a) none

435. A mass of 50 kg moving at 400 m/s strikes a target, which offers a resistance of 117.72 MN.Distance moved in a target is-------cm.
(a) 33.98 (b) 3.398 (c) 339.8 (a) none

436. The velocity of a 2 kg mass that will just penetrate through a wall of 30 cm thickness, the resistance being 400 KN, is------- m/s.
(a) 346.4 (b) 34.64 (c) 3.464 (a) none

437.Momentum is a scalar quantity
(a) true (b) false

438. Momentum is a product of mass and moment.
(a) true (b) false

439.C.G.S. units of momentum is kg m/ sec^2
(a) true (b) false

440. Rate of change of momentum is force
(a) true (b) false

441.Second law of Newton describes inertia.

(a) true (b) false

442.In rocket propulsion first law of Newton is applicable.
(a) true (b) false

443. A body has a mass of 100kg. Weight of the body is 100 kgf.
(a) true (b) false

444. A force of 1 Newton is that force which acting on a mass of 1 kg produces in it an acceleration of m/sec^2
(a) true (b) false

445. A cricket batsman applies a force on a ball with bat.
(a) true (b) false

446.A constant force acts on a mass of 10 kg and produces in it a velocity of 4m/s in a 2 seconds. The force acting on a body is 20N.
(a) true (b) false

447. A force of 19.62N moves a mass of 20 kg through a distance of 30 m, in time 55.3 seconds starting from rest.
(a) true (b) false

448. A force moves a body through 2 m in 20 seconds starting from rest. Ratio of force to weight of body is 1:98.1.
(a) true (b) false

449."Newton" is the absolute unit of force in M.K.S.system
(a) true (b) false

450. A force of 12N moves a mass of 100 kg through a distance of 15 m in time 5 seconds starting from rest.
(a) true (b) false

451. Work=Force X displacement in any direction.
(a) true (b) false

452. A man carries a suitcase in a right hand and walks 1 Km in a horizontal plane. If weight of suitcase is 5 KN, workdone is 5000 KJ.
(a) true (b) false

453. Unit of work is joule or kilojoule.
(a) true (b) false

454. Unit of work is same as that of energy.
(a) true (b) false

455.K.E.=mv^2 / 2g
(a) true (b) false

456. P.E.=mvh.
(a) true (b) false

457.IN S.I. Power is expressed in H.P.
(a) true (b) false

458.When an agent does work at a rate of 1 kj/s, it is said ti have 1 KW power.
(a) true (b) false

459.Energy cannot be created nor can be destroyed, but it can be transformed from one form to another. This is according to the law of conservation of linear momentum.
(a) true (b) false

460.Work done by acting force =change in K.E.
(a) true (b) false

461. In a lifting machine, the following parameters remains constant
(a) velocity ratio (b) mechanical advantage
(c) efficiency (d) all

462.In an equation P=mW+C of a lifting machine, "C" represents:
(a) effort lost in friction
(b) frictional load
(c) efford required to operate a lifting machine under no load condition
(d) none of the above

463. If a machine is to be reversible its efficiency should be
(a) less than 50 % (b) greater than 50 %
(c) equal to 100 % (d) none

464.Efficiency Vs load diagram is
(a) a straight line
(b) a partly straight and partly curved line
(c) curved line not passing through origin
(d) curved line passing through origin

465. The velocity ratio of a single purchase winch crab can be increased by

(a) increasing the length of the handle
(b) increasing the number of teeth of the spur gear
(c) decreasing the diameter of load drum
(d) all the above

466. Limiting friction depends upon
(a) materials of bodies in contact
(b) weight of body to be moved
(c) roughness of the surface in contact of two bodies
(d) all the above

467. Coefficient of the friction depends upon
(a) materials of surface of contact
(b) roughness of the surface of contact
(e) weight of body to be moved
(c) none of the above

468. Total reaction is
(a) the resultant of limiting friction and sliding friction
(b) the resultant of normal reaction and sliding friction
(c) the resultant of limiting friction and normal reaction
(d) none of the above

469. Angle of the friction is the angle between
(a) normal reaction and resultant reaction
(b) limiting friction and resultant reaction
(c) limiting friction and sliding friction
(d) none of the above

470. When a body slides down on an inclined plane under its own weight, the angle of inclination of the inclined plane is
(a) greater than angle of repose
(b) less than angle of repose

(c) equal to angle of repose
(e) none of the above

471.Forces of 50N and 100N act at a point, resultant is perpendicular to 50N force. Angle between them is
(a) 30° (b) 60° (c) 90° (d) 45°

472.If the angle between two forces P and Q is 90º and resultant makes an angle of 45º with force P then
(a) P=Q (b) P=2Q (c) Q=2P (d) none

473.A book is placed on the table. Total no of forces acting on book
(a) 0 (b) 1 (c) 2 (d) 3

474.If the body is in equilibrium minimum no of forces acting on it are.
(a) 0 (b) 1 (c) 2 (d) 3

475. A body of mass 15 kg, placed on a smooth horizontal plane and acted upon by a force of 19.62 for 5 seconds. Distance moved by a body in half a minute is 19.59 m.

476. A mass of 50 kg moving at 400 m/s strikes a target, which offers a resistance of 117.72 MN.Distance moved in a target is 3.398 cm.

477. The velocity of a 2 kg mass that will just penetrate through a wall of 30 cm thickness, the resistance being 400 KN, is 346.4 m/s.

478. Moment is
(a) Vector quantity (b) scalar quantity
(c) both a and b (d) Imaginary quantity

479. Moment of force about an axis indicates
(a) turning tendency of body about that axis
(b) translatory tendency of body about that axis
(c) moving tendency of body away from that axis
(d) none of the above

480. Moment of force about a point is
(a) universally proportional to the distance of the point from the line of action of the force
(b) directly proportional to the distance of the point from the line of action of the force
(c) does not depend upon the distance of the point from the line of action of the force
(d) none of the above

481. Moment of force about a point can be represented by
(a) area of triangle
(b) area of quadrilateral
(c) twice the area of the triangle
(d) none of the above

482. Varignon's theorem is applicable only to
(a) coplanar concurrent forces
(b) coplanar non-concurrent forces
(c) both of the above
(d) forces lying in different planes.

483. A couple is formed by
(a) two equal and like parallel forces
(b) two unequal and unlike parallel forces
(c) two equal and unlike parallel forces

(d)two coplanar concurrent forces

484.Moment of couple is called
(a) torque (b) torsion (c) both a and b (d) none

485.Units of moment of couple is
(a) N m (b) N mm (c) KN mm (d) all

486. Friction is a kind of reactive force
(a) true (b) false

487.Limiting friction is less than sliding friction
(a) true (b) false

488.Rolling friction is less than sliding friction
(a) true (b) false

489. Rolling friction is inversely proportional to the radius of roller
(a) true (b) false

490.Limiting friction is the maximum value of the static friction
(a) true (b) false

491.Dynamic friction is greater than static friction
(a) true (b) false

492.Coefficient of friction is the ratio of the normal reaction to the limiting firction.
(a) true (b) false

493.Angle of repose is equal to angle of friction.

(a) true (b) false

494.Veloocity ratio of lifting machine is constant is constant
(a) true (b) false

495.Mechanical advantage of lifting machine is variable.
(a) true (b) false

496.Load Vs effort graph is curved line.
(a) true (b) false

497.Efficiency Vs load graph does not pass through origin.
(a) true (b) false

498.If the M.A. is 10 and V.R. is 20 then efficiency is 50 %.
(a) true (b) false

499. If efficiency of machine is 40 % the machine is reversible.
(a) true (b) false

500.Maximum efficiency takes place when load lifted is very small.
(a) true (b) false