FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA

COURSE- PHY 113

COMPILED BY CLEVER-B EDUCONSULT.

1. A car travels 20.0 km due North and then 35.0 km in a direction of 60^o West of North. Find the magnitude of the resultant displacement of the car. A. 48.2 km B. 30.0 km C. 82.5 km
2. A car is driven Northeast for 40 km, then Northwest for 50 km and then South for 30 km. Determine the resultant displacement of the car. A. 38.34 km B. 34.38 km C. 58.2 km
3. An aircraft is flying Northwards at 300 km/h when a steady wind is blowing Westwards at 80 km/h. What is the actual velocity with which the aircraft travels over the ground? A. 380.0 km/h B. 220.0 km/h C. 310.48 km/h
4. A car travels 3.0 km due South and then 4.0 km due West. What is its displacement from the starting point? A. 5 km Northwest B. 7 km Southwest C. 5 km Southwest
5. A body of mass 2 kg undergoes a constant horizontal acceleration of 5 m/s² . Calculate the resultant horizontal force acting on the body. A: 10 N B: 2.5 N
6. What will be the resultant force on a body of mass 50 kg when it moves with a uniform velocity of 10 m/s? A: 500 N B: 0 N C: 5 N
7. A car of mass 600 kg moving with a forward acceleration of 5 m/s² is acted upon by a constant resistive force of 1000 N. Calculate the force exerted from the engine to maintain this forward acceleration. A: 2 Kn B: 4 kN C: 3 kN
8. A force of 100 N acts for 20 s. What is the change in momentum of the body? A: 200 Ns B: 2500 Ns C: 2000 Ns
9. A body of mass 5 kg moving with a speed of 30 m/s is suddenly hit by another body moving in the same direction thereby changing the speed of the former body to 60 m/s. What is the impulse received by the first body? A: 300 Ns B: 250 Ns C: 150 Ns
10. A body of mass 5 kg is to be given an acceleration of 20 m/s² . Calculate the force required when the acceleration is vertically upwards (Take g = 10 m/s²). A: 150 N B: 100 N C: 250 N
11. Calculate the force required to impart an acceleration of 5 m/s² to a mass 10 kg. A: 2.0 N B: 50.0 N C: 0.2 N
12. What force would be required to accelerate an electron (mass = 9 x 10⁻³¹ kg) from rest to a velocity of 104 m/s in 10 seconds? A: 9.63 x 10⁻³¹ N B: 9.63x ¹⁰⁻³⁰ N C: 9.36 x 10⁻³⁰ N
13. A block of weight 7.0 N rests on a level floor. The frictional force between the block and the floor is 1.0 N. A horizontal force of 1.4 N is used to pull the block for 4 seconds. What is the velocity of the block after this time? A: 3.2 m/s B: 2.5 m/s C: 2.3 m/s
14. A player hits a ball of mass 0.3 kg which was moving eastwards with a velocity of 10 m/s, causing it now to move with velocity 15 m/s westwards. The force of the blow acts on the ball

for 0.01 s. Calculate the average force exerted on the ball by the player A: 650 N B: 450 N C: 750 N

15. A bullet of mass 0.045 kg is fired from a gun of mass 9 kg the bullet moving with an initial velocity of 200 m/s. Find the initial backward velocity of the gun. A: 1.0 m/s B: 1.2 m/s C: 0.9 m/s
16. A jet engine develops a thrust of 270 N when the velocity of the exhaust gases relative to the engine is 300 m/s. Find the mass of the gas ejected per second. A: 0.9 kg/s B: 0.7 kg/s C: 0.8 kg/s
17. A gun fires a shell of mass 5 kg in horizontal direction. The gun recoils at 0.4 m/s and its mass is 3000 kg, calculate the velocity of the shell. A: 220 m/s B: 350 m/s C: 240 m/s
18. A riffle bullet weighing 7 g leaves the barrel of riffle with a velocity of 300 m/s. If the riffle recoils with a velocity of 1 m/s, find the mass of the riffle. A: 2.1 kg B: 1.2 kg C: 3.4 kg
19. A constant force acts on a body of mass 50 kg and reduces its speed from 90 m/s to 20 m/s in 20 s. Calculate the magnitude of the force. A: 175 N B 165 N C: 162 N
20. A 2000 kg truck moving at 24 m/s is stopped in 16 s by the action of brakes. What is the average force applied by the brakes? A: 2.43 x 10³ N B: 1.24 x 10³ N C: 3.0 x 10³ N
21. Object A of mass 20 kg moving with a velocity of 3 m/s makes a head-on collision with object B, mass 10 kg, moving with a velocity of 2 m/s in the opposite direction. If A and B stick together after collision, calculate their common velocity V in the direction of A. A: 2.36 m/s B: 1.23 m/s C 1.33 m/s
22. A bullet of mass 0.045 kg is fired from a gun of mass 9 kg the bullet moving with an initial velocity of 200 m/s. Find the initial backward velocity of the gun. A: 1.0 m/s B: 1.2 m/s C: 0.9 m/s
23. A body of mass 2 kg moving with velocity of 6 m/s collides with a stationary object of mass 0.5 kg. If the two bodies move together after the impact, calculate their common velocity. A: 24.0 m/s B: 2.6 m/s C: 4.8 m/s
24. A player hits a ball of mass 0.3 kg which was moving eastwards with a velocity of 10 m/s, causing it now to move with velocity 15 m/s westwards. The force of the blow acts on the ball for 0.01 s. Calculate the average force exerted on the ball by the player. A: 750 N B: 650 N C: 450 N
25. A railway engine of mass 5 ton travels along a level track at 75 km/h and collides with a wagon of mass 15 ton travelling in the opposite direction at 20 km/h. After impact the engine is seen to travel in the same direction as before with a speed of 3 km/h. Find the speed of the wagon. A 2 km/h B: 3 km/h C: 4 km/h
26. A 1000 kg elevator is descending vertically with an acceleration of 1.0 m/s² . If the acceleration due to gravity is 10.0 m/s² , the tension in the suspending cable is A: 1.0 N B: 10.0 N C: 9000.0 N
27. Fuel was consumed at a steady rate 5.0 x 10⁻² kg per second in a rocket engine and ejected as a gas with a speed of 4 x 10³ m/s. Determine the thrust on the rocket A: 200 N B: 150 N C: 250 N
28. A sub machine gun of mass 20 kg fires a bullet of mass 100 g due south with a velocity of 250 m/s. What is the recoil velocity of the gun? A: 1.25 m/s due North B: 1.25 m/s due South C: 2.25 m/s due South

29. An arrow of mass 0.3 kg is fired with a velocity of 100 m/s into a wooden block of mass 0.7 kg. Calculate the final kinetics energy after impact, given that the wooden block can freely move A 550 J B: 250 J C: 450 J
30. When taking a penalty kick, a footballer applies a force of 30.0 N for a period of 0.05 s. If the mass of the ball is 0.075 kg, calculate the speed with which the ball moves off. A: 4.5 m/s B: 11.25 m/s C: 20.0 m/s
31. A 0.05 kg bullet travelling at 500 m/s horizontally strike a thick vertical wall. It stops after penetrating through the wall a horizontal distance of 0.25 m. What is the magnitude of the average force the wall exerts on the bullet? A: 11000 N B: 5000 N C: 25000 N
32. A rope is being used to pull a mass of 10 kg vertically upward, Determine the tension in the rope if, starting from rest, the mass acquires a velocity of 4 m/s in 8 s (g = 10m/s²) A: 105 N B: 95 N C: 50 N
33. A body of mass 2 kg moving vertically upwards has its velocity increased uniformly from 10 m/s to 40 m/s in 4 s. Neglecting air resistance, calculate the upward vertical force acting on the body (g = 10m/s²) A: 15 N B: 20 N C: 35 N
34. A ball of mass 100 g travelling with a velocity of 100 m/s collides with another ball of mass 400 g moving at 50 m/s in the same direction. If they stick together, what will be their common velocity? A: 65 m/s B: 60 m/s C: 68 m/s
35. A gun of 3 kg fires a bullet of mass 20 g with a velocity of 500 m/s. Calculate the recoil velocity of the gun. A: 6.67 m/s B: 3.33 m/s C: 6.12 m/s
36. A car moves from rest with an acceleration of 0.2 m/s² . Find its velocity when it has moved a distance of 50 m. A: 4.47 m/s B: 10.0 m/s C: 250.0 m/s
37. A car has a uniform velocity of 108 km/h. How far does it travel in ½ minute? A: 15 km B: 0.9 km C: 3240 km
38. A train slows from 108 km/h with a uniform retardation of 5 m/s² . How long will it take to reach 18 km/h? A: 18 s B: 25. 2 s C: 5 s
39. A train slows from 108 km/h with a uniform retardation of 5 m/s² . What is the distance covered when the velocity is 18 km/h? A: 630.0 m B: 95.6 m C: 87.5 m
40. A car starts from rest and accelerates uniformly until it reaches a velocity of 30 m/s after 5 s. It travels with uniform velocity of 30 m/s for 15 s and is then brought to rest in 10 s with a uniform retardation. Determine the acceleration of the car. A: 6 m/s² B: 8 m/s² C: 7.5 m/s²
41. A car starts from rest and accelerates uniformly until it reaches a velocity of 30 m/s after 5 s. It travels with uniform velocity of 30 m/s for 15 s and is then brought to rest in 10 s with a uniform retardation. Determine the retardation of the car. A: 5 m/s² B: 4 m/s² C: 3 m/s²
42. A car starts from rest and accelerates uniformly until it reaches a velocity of 30 m/s after 5 s. It travels with uniform velocity of 30 m/s for 15 s and is then brought to rest in 10 s with a uniform retardation. Determine the distance covered after 5 s. A: 66.8 m B: 82.3 m C: 75 m
43. A car starts from rest and accelerates uniformly until it reaches a velocity of 30 m/s after 5 s. It travels with uniform velocity of 30 m/s for 15 s and is then brought to rest in 10 s with a uniform retardation. Determine the total distance covered. A: 675 m B: 560 m C: 660 m
44. A ball is released from a height of 20 m. Calculate the time it takes to hit the ground. A: 2.0 s B: 2.5 s C: 2.8 s

45. question : A ball is released from a height of 20 m. Calculate the velocity with which it hits the ground. A: 12 m/s B: 22.6 m/s C: 20.0 m/s
46. A ball is thrown up vertically with a velocity of 40 m/s. Calculate the maximum height reached. A: 78.0 m B: 76.5 m C: 80 m
47. A ball is thrown up vertically with a velocity of 40 m/s. Calculate the time to reach the maximum height. A: 4.0 s B: 3.5 s C: 3.3 s
48. A ball is thrown up vertically with a velocity of 40 m/s. Calculate the time to return to the ground. A: 15.0 s B: 7.8 s C: 8.0 s
49. A body is projected horizontally from the top of a vertical cliff 40 m high, with a velocity of 20 m/s. Calculate the time taken for the body to fall to the ground. A: 2.83 s B: 1.22 s C: 5.52 s
50. A body is projected horizontally from the top of a vertical cliff 40 m high, with a velocity of 20 m/s. Calculate the vertical component of the velocity when the body hits the ground. A: 18.55 m/s B: 35.52 m/s C: 28.28 m/s
51. A body is projected horizontally from the top of a vertical cliff 40 m high, with a velocity of 20 m/s. Calculate the distance from the cliff when it strikes the ground. A: 56.57 m B: 57.56 m C: 65.75 m
52. A body moving with a constant velocity along a straight line PQR takes 30 s to go from P to Q and 10 s to go from Q to R. If PR = 4 m, Find PQ. A: 3 m B: 1 m C: 2 m
53. An object moves in a straight line, starting from rest. There are two stages in the journey: (a) it gains speed uniformly for 2.0 s and attains a speed of 8.0 m/s. (b) it continues at the speed for a further 1.5 s. Find the acceleration in stage (a). A: 2 m/s² B: 3 m/s² C: 4 m/s²
54. An object moves in a straight line, starting from rest. There are two stages in the journey: (a) it gains speed uniformly for 2.0 s and attains a speed of 8.0 m/s. (b) it continues at the speed for a further 1.5 s. Find the acceleration in stage (b). A: 0 m/s² B: 1 m/s² C: 2 m/s²
55. An object moves in a straight line, starting from rest. There are two stages in the journey: (a) it gains speed uniformly for 2.0 s and attains a speed of 8.0 m/s. (b) it continues at the speed for a further 1.5 s. Find the total distance moved during stages (a) and (b). A: 20 m B: 25 m C: 27 m
56. A train starts from rest from a station and travels with uniform acceleration 0.5 m/s² for 20 s. It travels with uniform velocity for another 30 s, the brakes are then applied so that a uniform retardation is obtained and the train comes to rest in a further 10 s. Calculate the total distance travelled by the train. A: 400 m B: 420 m C: 450 m
57. A ball thrown vertically upwards from ground level hits the ground after 4 s. Calculate the maximum height it reached during its journey (g = 10 m/s²). A: 20.0 m B: 18.0 m C: 17.5 m
58. A body is dropped from rest at a height of 80 m. How long does it take to reach the ground? (g = 10 m/s²). A: 5 s B: 6 s C: 4 s
59. A stone is thrown vertically upwards with an initial speed U. If g is the acceleration due to gravity, at what time will the stone return to the starting point. A: 2U/g B: g/2U C: U/2g
60. A motor car is uniformly retarded and brought to rest from a velocity 36 km/h in 5 s. Find its retardation. A: 3 m/s² B: 1 m/s² C: 2 m/s²

61. A motor car is uniformly retarded and brought to rest from a velocity 36 km/h in 5 s. Find the distance covered during this period. A: 25 m B: 20 m C: 18 m
62. A body travels from rest with acceleration 8 m/s² . Find its velocity when it has covered a distance of 100 m. A: 42.3 m/s B: 45.5 m/s C: 40.0 m/s
63. An object falls from a height of 20 m. What is its velocity just before hitting the ground? (Take g = 10 m/s²). A: 20.5 m/s B: 20.0 m/s C: 24.5 m/s
64. A particle moving in straight line with uniform deceleration has a velocity of 40 m/s at a point P, 20 m/s at a point Q and comes to rest at a point R, where QR = 50 m. Calculate the distance PQ. A: 144 m B: 158 m C: 150 m
65. A particle moving in straight line with uniform deceleration has a velocity of 40 m/s at a point P, 20 m/s at a point Q and comes to rest at a point R, where QR = 50 m. Calculate the time taken to cover PQ. A: 5 s B: 4 s C: 6 s
66. A particle moving in straight line with uniform deceleration has a velocity of 40 m/s at a point P, 20 m/s at a point Q and comes to rest at a point R, where QR = 50 m. Calculate the time taken to cover PR. A: 13 s B: 12 s C: 10 s
67. A ball is thrown horizontally from the top of a cliff 20 m high. If the initial horizontal velocity is 8.0 m/s, find how long it takes to reach the horizontal plane at the foot of the cliff. (Take g = 10 m/s²). A: 2.02 s B: 2.20 s C: 2.41 s
68. A ball is thrown horizontally from the top of a cliff 20 m high. If the initial horizontal velocity is 8.0 m/s, find how far from the foot of the cliff it strikes the ground. (Take g = 10 m/s²). A: 16.2 m B: 14.45 m C: 10.2 m
69. A ball is thrown horizontally from the top of a cliff 20 m high. If the initial horizontal velocity is 8.0 m/s find the speed with which it strikes the ground (Take g = 10 m/s²). A: 19.8 m/s B: 17.5 m/s C: 15.7 m/s
70. New born hatchling turtles can swim approximately 40 km in 30 hours. How long would it take them to swim 15 m? A: 40.5 s B: 20.0 s C: 11.3 s
71. Determine the dimension of density. A: ML⁻³ B: ML² T⁻² C: ML² T⁻³
72. What is the dimension of energy? A: ML² T⁻² B: MLT⁻² C: ML⁻³
73. Find the dimension of power. A: ML² T⁻² B: ML⁻³ C: ML² T⁻³
74. The dimension of momentum is ------- A: ML⁻¹ T⁻² B: ML² T⁻² C: MLT⁻¹
75. Determine the dimension of pressure. A: ML⁻¹ T⁻² B: ML² T⁻³ C: ML² T⁻²
76. A vector of magnitude 5 units in the North direction is combined with another vector to give a zero resultant. What is the other vector? A: 0 units South B: 5 units South C: 5 units North
77. Which of the following is an example of an object experiencing uniform motion? A: a car accelerating at a green light B: a space shuttle launching into orbit C: a toy car crossing the floor at a constant speed
78. Which of the following quantities represents the rate of change of an object's position? A: velocity B: displacement C: acceleration

79. Which of the following is not a possible unit for velocity? A: centimetres/month B: millimetres/kilowatt C: decimetres/kilosecond
80. What is the average velocity of a bird that flies 6 m (South) in 2 s? A: 0.33 m/s (South) B: 6 m/s (South) C: 3 m/s (South)
81. A ball is thrown straight up in the air. What happens as the ball travels upward? A: Acceleration is negative and velocity is negative. B: Acceleration is zero and velocity is positive. C: Acceleration is negative and velocity is positive.
82. Which of the following examples describe a ball experiencing positive acceleration?
 I. a ball rolling down a ramp
 II. a ball being dropped straight down
 III. a ball rolling up a steep ramp. A: I, II, and III B: II and III C: I and II
83. When a penny is dropped toward the floor, which of the following quantities will change for each successive time interval?
 I. acceleration
 II. displacement
 III. Velocity. A: II and III B: I and III C: I, II, and III
84. Which of the Newton's law state that, "when a body is acted upon by a force, its resulting acceleration is directly proportional to the force and inversely proportional to the mass"? A: first Newton's law B: second Newton's law C: third Newton's law
85. If a bike moves with a uniform velocity of 4 m/s, determine its acceleration after 30 s. A: 7.5 m/s² B: 0.133 m/s² C: 0 m/s²
86. The force acting on a body moving with a uniform velocity is A: uniform B: constant C: zero
87. The sum of kinetic energy and potential energy of a system at any point in a close system is A: zero B: unity C: constant
88. When a lift moves downwards with an acceleration, a, the unbalanced force or the weight, W of the object in the lift is given by A: W = m(a + g) B: W = 0 C: W = m(g – a)
89. When a lift accelerates upwards with an acceleration a, the unbalanced force or the weight, W of the object in the lift is given by A: W = m(a + g) B: W = m(g – a) C: W = 0
90. Energy is never created or destroyed but only changed from one form to another is refer to as which principle? A: Conservation of energy B: Conservation of momentum C: Conservation of power
91. The following are all source of energy except------- A: Oil and gas B: Wind C: Plastic
92. --------- is the product of a force and displacement? A: Work B: Power C: Momentum
93. The energy associated with the position of a body in a gravitational field is the ---------- of the body A: Potential Energy B: Kinetic Energy C: Light energy
94. A ball is thrown vertically upwards. The quantity which remains constant is A: acceleration B: velocity C: kinetic energy
95. The acceleration of a moving object is equal to the A: gradient of a velocity – time graph B: area below a speed – time graph C: area below a velocity – time graph
96. The idea of inertia is postulated by A: principle of momentum B: Newton's second law C: Newton's first law
97. Two bodies of masses collide and the total kinetic energy is not conserved, this kind of collision is referring to? A: Inelastic collision B: Collision theory C: unconserved collision
98. A scalar quantity is completely specified by a A: number and unit B: volume and number C: unit and direction
99. Which of the following pairs are scalar quantities? A: Work and Energy B: Displacement and Length C: Frequency and Tension

100. A vector is described by A: magnitude, unit and direction B: magnitude and scale C: magnitude and size

101. Which of the following is not a vector? A: direction B: momentum C: displacement

102. Which of the following is not a vector? A: Acceleration due to gravity B: Force of gravity C: Work, Energy and Power

103. If a particle moves 2 m due east and 2 m due west in a straight line, its total displacement is A: 4 m due west B: 4 m due east C: 0 m

104. Which of the following units cannot be used to measure speed? A: kms⁻¹ B: mh⁻¹ C: kgs⁻¹

105. The acceleration of a body falling under gravity on the surface of the earth is ---------- A: constant B: increasing C: decreasing

106. The area under a velocity – time graph represents A: Acceleration B: Moment C: Distance

107. The gradient of a displacement–time graph represents A: Velocity B: Acceleration C: Total distance

108. The mass of a load is doubled while the force acting on it is halved. The resulting acceleration of the load is A: Quadrupled B: Quartered C: Halved

109. Which of the following statements about a moving object is correct? A: When accelerating, the resultant force acting on it must be equal to zero B: There must always be a non-zero resultant force acting on it C: At a steady velocity, the resultant force acting on it must be equal to zero

110. The time rate of increase in velocity is called A: Momentum B: Acceleration C: Speed

111. Which of the following quantities is a vector? A: Volume B: Momentum C: Energy

112. In an elastic collision, Kinetic energy is conserved as well as A: velocity B: momentum C: potential energy

113. When the linear momentum of a body is constant, the net force acting on it A: is zero B: increases C: decreases

114. Which of the following is equivalent to Watt? A: kgm⁻² B: kgm² s⁻³ C: kgm² s²

115. The total area under a force-velocity graph represents A: Energy B: Momentum C: Power

116. A body is pulled along a horizontal plane by a constant force of 10 N applied parallel to the plane, calculate the work done in moving the body a distance of 20 m. A: 150 J B: 200 J C: 250 J

117. What work is done if a body is pulled along a horizontal plane by a constant force of 10 N in a direction making an angle 60^o to the horizontal? A: 200 J B: 250 J C: 100 J

118. A man of mass 80 kg carries a load of bricks of mass 20 kg up a vertical ladder of length 6 m. What work has he done [take g=10 m/s²)? A: 5000 J B: 6000 J C: 4000 J

119. A body of mass 100 kg is released from a height of 200 m with what energy does the body strike the ground (take g = 10 m/s²)? A: 150 kJ B: 300 Kj C: 200 Kj

120. A boy of mass 30 kg is running with a speed of 4 m/s. What is his kinetic energy? A: 200 J B: 270 J C: 240 J

121. A bullet of mass 40 g is moving with a speed of 216 km/h. Calculate its kinetic energy. A: 72 J B: 240 J C: 933 kJ

122. A stone of mass 0.5 kg is thrown vertically upwards with a velocity of 10 m/s. Find the potential energy at the greatest height h (assume g = 10 m/s² and neglect air resistance) A: 25 J B: 30 J C: 55 J

123. A body of mass 2 kg falls from rest through a height of 20 m and comes to rest having penetrated a distance of 0.5 m into sandy ground. Calculate the average force exerted by the sand in bringing the body to rest (take g= 10 m/s²). A: 400 N B: 500 N C: 800 N

124. A ball of mass 2 kg falls from rest from a height of 200 m, calculate its kinetic energy after falling a distance of 50 m (take g= 10 m/s² and neglect air resistance). A: 0.5 kJ B: 1.5 Kj C: 1.0 kJ

125. Calculate the power of a pump which lifts 500 kg of water through a vertical height of 4 meters in 5 seconds (assuming g= 10 m/s²). A: 2 kW B: 3 Kw C: 4 kW

126. A car travelling at a constant speed of 20 m/s overcomes a constant frictional resistance of 300 N. What is the horse power of the engine (take 1 h.p = ¾ kW). A: 4 h.p B: 6 h.p C: 8 h.p

127. A 2 kg body is allowed to roll down an inclined plane 4 m long with angle of inclination 30^o . Calculate the work done (take g = 10 m/s²). A: 30 J B: 40 J C: 50 J

128. A bullet of mass 0.05 kg has a speed of 400 m/s. If it hits a wall of which the average resistive force is 10,000 N, calculate the distance penetrated by the bullet. A: 20 cm B: 40 cm C: 60 cm

129. A ball of mass 8 kg falls from rest from a height of 100 m. Neglecting air resistance, calculate its kinetic energy after falling a distance of 30 m (take g= 10 m/s²) A: 0.4 kJ B: 1.4 Kj C: 2.4 kJ

130. A body whose mass is 40 kg runs up a flight of 30 steps each 150 mm high, in 6 seconds. Find the average power developed (take g = 10 m/s²). A: 100 W B: 200 W C: 300 W

131. A man strikes a nail into a wooden block, with an average force of 200 N. If he continues to strike the nail with that force, estimate how much heat energy will be generated by the time the nail penetrates a depth of 0.05 m. A: 25 J B: 20 J C: 10 J

132. An engine raises 100 kg of water through a height of 60 m in 20 s. What is the power of the engine (take g= 10 m/s²)? A: 2.5 kW B: 4 Kw C: 3 kW

133. A body of mass 10 kg and initially at rest is subjected to a force of 20 N for 1 second. Calculate the change in kinetic energy of the body during that time. A: 20 J B: 10 J C: 15 J

134. A certain coil spring with an unstretched length of 1 m requires a force of 5 N to stretch it 0.1 cm. What work is done in stretching it by 1 cm if the elastic limit is still not exceeded? A: 2.5 J B: 1.5 J C: 2.0 J

135. A car travelling at 30 m/s overcomes a frictional resistance of 100 N while moving. Calculate the power developed by the engine A: 0.23 hp B: 0.40 hp C: 4.00 hp

136. A boy drags a bag of rice along a smooth horizontal floor with a force of 2 N applied at an angle 60^o to the floor. The work done after a distance of 3 m is A: 6 J B: 3 J C: 4 J

137. A constant force of 40 N acting on a body initially at rest gives an acceleration of 0.1 m/s² for 4 s. Calculate the work done by the force. A: 8 J B: 10 J C: 32 J

138. An engine raises 100 kg of water through a height of 60 m in 20 s. What is the power of the engine? Take g = 10 m/s² A: 3000 W B: 2500 W C: 4000 W

139. The engine of a train produces a force of 300 N when moving at 3 m/s. Calculate the power of the engine A: 9.0 x 10⁴ W B: 7.25 x 10⁴ W C: 8.5 x 10⁴ W

140. How long will it take a 60 kg man to climb a height of 22 m if he expended energy at the rate of 0.25 kW? (g = 10 m/s²) A: 5.3 s B: 34.5 s C: 52.8 s

141. A car of mass 800 kg attains a speed of 25 m/s in 20 seconds. The power developed in the engine is A: 1.25 x 10⁴ W B: 2.50 x 10⁴ W C: 1.25 x 10⁶ W

142. A body of mass 5 kg falls from a height of 10 m above the ground. What is the kinetic energy of the body just before it strikes the ground? (Neglect energy losses and take g = 10m/s²) A: 350 J B: 450 J C: 500 J

143. A body of mass 4 kg is acted on by a constant force of 12 N for 3 seconds. The kinetic energy gained by the body at the end of the time is A: 162 J B: 144 J C: 72 J

144. A ball of mass 200 g falls from a height of 5 m on to a hard floor and rebounds to a height of 3 m. What energy is lost by the ball as a result of the impact of the floor. (g = 10m/s²) A: 4 J B: 4.5 J C: 5.4 J

145. A body rolls down a slope from a height of 100 m. Its velocity at the foot of the slope is 20 m/s. What percentage of its potential energy is converted into kinetic energy? (g = 10m/s²) A: 40% B: 35% C: 20%

146. A box of mass 40 kg is being dragged along the floor by a rope inclined at 60^o to the horizontal. The frictional force between the box and the floor is 100 N and the tension on the rope is 300 N. How much work is done in dragging the box through a distance of 4 m? A: 680 J B: 400 J C:200 J

147. A ball of mass 0.1 kg is thrown vertically upwards with a speed of 10 m/s from the top of a tower 10 m high. Neglecting air resistance, its total energy just before hitting the ground is (g = 10 m/s²) A: 15.0 J B: 12.5 J C: 14.15 J

148. If a body of mass 5 kg is thrown vertically upwards with velocity U, at what height will the potential energy equal to the kinetic energy? A: h = U²/4g B: 2U²/g C: U²/2g

149. A girl whose mass is 20 kg climbs up 25 steps each of height 15 cm in 10 seconds. Calculate the power expended? (g = 10 m/s²) A: 75 W B: 65 W C: 85 W

150. If a water pump at Kainji dam is capable of lifting 1000 kg of water through a vertical height of 10 m in 10 s, the power of the pump is (g = 10 m/s²) A: 10.0 Kw B: 12.5 kW C: 15. kW