PHYSICS 101

QUESTIONS ON CHAPTER 5&6

1. A boy is pulled 35m along a horizontal plane with a constant force of 75N applied parallel to the plane.What is the work done.

A 350N

B 415N

C 525N

D 600N

2. Work done in gravitational and electric fields depends on.

A Both the position and the path taken

B the position only

C the path taken only

D energy

3.A body of mass 25g is released from a height of 20m and it's moving with a velocity of 40m/s.If the body penetrates a distance of 2m calculate the average resistance force exerted by the sand.

A 37.5N

B 26.67N

C 10N

 D 100N

4.A rocket of mass 400,000kg is propelled by a force of 10^6N acquires a speed if 3000m/s.Determine the power expended.

 A 7.5Mwatts

B 3.0GWatts

C 7.5pwatts

D 3.0pwatts

 5.A man pushes a box of 60kg up a plane inclined at 45° to the horizontal, if the man applies a force of 10N and the box moves a distance of 30m,what is the work done by the man.

A 150√2J

B150√3J

C 150J

D 200J

6.What is the Velocity ratio of an inclined plane of length 8m and 2m above the ground.

A 1/4

B 4

 C 16

D 14.5

7.A wheel and axle is used to man whose weight is 600N by the application of 200N.The radii of the wheel and axle are 800mm and 200mm respectively. What is the efficiency?

 A 80%

 B 75%

C 100%

D 50%

8.With the use of a pulley, a man raises a load of 100kg to a height of 30m in 25mins.Find the average power required.

A 19.6N

B 1200N

 C120N

 D 21N

9.Which of these are examples of a first class lever.

I.Crowbar

II.Wheel barrow

III.Scissors

IV.Sugar tongs

V.Pliers

A I,II,IV

B I,III,IV

C I,III,V

D II,III,V

10. Locate the center of mass of three particles M1=2kg M2=4kg M3=8kg all along the x-axis at X1=2cm X2=5cm X3=10cm

A 7cm

B 7.4cm

C 1.6cm

D 3.8cm

11. The center of mass between two bodies lies closer to_____

A the one with a lesser mass

B The one with a greater mass

C It does not depend on the individual mass of the bodies

D None of the above

12. A system is said to be isolated when_____

A The net external force on a system is equal to the momentum

B. The net external force is <1

C The net external force on a system is Zero

D The total momentum of the system is not constant.

13 The of collision where kinetic energy is conserved is known as

A elastic

B Inelastic

C perfectly elastic

D perfectly inelastic

14 A body of mass 4kg moving with a velocity U collides with another body if mass 2kg at rest. At what Velocity would the second body move.

A ½ the velocity if the first body

B same velocity as the first body

C ¼ the velocity of the first body

D Twice the velocity of the first body

15. Which of the following describes Newton's law of restitution?

A V1-U1=-e(V2-U2)

B V1- V2=-e(U1-U2)

C V1+V2=e(U1+U2)

D V1/V2=-e(U1/U2)

16. Two bodies of equal mass move with equal but opposite velocities,what are their velocities after undergoing elastic collision?

A final velocity is zero

B. final velocity>initial velocity

C final velocity<initial velocity

D Initial equals final.

17. The coefficient of restitution for inelastic collision is

A 0

B 1

C -1

D >1

18 A body of 6kg mass makes an elastic collision with another at rest and continue to move in the original direction but with¼ it's original speed.What is the mass of the struck body?

A 1.2kg

B 10kg

C 8kg

D 3.6kg

19. A 90kg cannon fires 70kg shell with muzzle velocity of 75m/s.Calculate the recoil velocity of the cannon relative to the ground.

A. 68.33m/s

B. -58.33m/s

C. 96.4m/s

D. -96.4m/s

20. .A 8kg ball moving at 10m/s collides with a stationary ball of mass 12kg and the they stick together. Calculate the final velocity and the kinetic energy lost in the impact.

A 4m/s;400J

B 4m/s;240J

C 2m/s;160J

D 2m/s;240J

21 Energy transformation where energy in food is used to drive nervous function is chemical to

A chemical

B electrical

C mechanical

D no transformation

22 1hp is

A 746w

B 766w

C 744w

D 750w

23 The 3rd class lever is represented by

A FEL

B FLE

C LFE

D None

24 Calculate the V.R of a screw with pitch 40mm and diameter 12cm

A 1.54

B 15.4

C 11.0

D 1.1

25 A block and tackle pulley system has 4 movable pulleys and 2fixed pulleys ,what is the V.R

A 6

B 32

C 36

D 4

26 Coefficient of restitution for elastic collision is

A -1

B 1

C 2

D 0

27 The center of mass of 3particles M_2,M_2,M_3 located at (3,4)(-2,-1)(4,-3) in M is

A (2,2)

B (-1.9,1.8)

C (-1.9,0.8)

D (1.9,-0.8)

28 In elastic collisions

A total P.E and K.E are conserves

B total K.E and momentum are conserved

C K.E equals P.E before and after collision

D all of the above

29 A hydraulic press has a larger cylindrical piston of circumference 88cm. If the radius of the smaller piston is 7cm. Cal. The V.R

A 4

B 10

C 6

D.14

30 When a perpendicular force is applied to a horizontal motion, which of the following change might occur

A directional change

B velocity change

C A&B

D none

31 The human forearm is an example of a lever. It's effort is at

A shoulder

B elbow

C. wrist

D. hand

32. Calculate the coefficient of restitution e, (in terms of L)in a perfectly inelastic collision if the initial velocity of the colliding bodies are L and 3/2L respectively. And the final velocity of the first body is L^2 whereas the second body is at rest

A 1

B -2L

C -L^3/2

D -L

33 Which of the following is non-renewable

A solar

B wind

C hydro

D nuclear

34 Which of these is a 2nd class lever

A claw hammer

B nut cracker

C sugar tong

D seesaw

35 The work done when a perpendicular force is acting on a horizontal motion is

A 90J

B min

C max

D 0J

36 watt is all but

A js^-1

B Nms^-1

C kgm^2S^-1

D kgm^2S^-3

37 A head on collision occurs between two balls of equal mass 7kg. The first ball moves with a velocity of 12m/s. The 2nd ball is at rest. Find the velocity of the 2nd ball after collision

A 0m/s

B. 6m/s

C. 12m/s

D. none

38 From the previous question,the velocity of the 1st ball after collision

A 0m/s

B. 6m/s

C. 12m/s

D. none

39. Which of the following is not correct?

(A) Work is said to be done when a force moves an object through a distance.

(B) Power is a scalar quantity

(C) The workdone on a particle around any closed path of a conservative force is non zero.

(D) Frictional forces are not conservative.

40 A 5.0kg mass was thrown vertically upwards from the ground to a maximum height of 30m. Calculate the initial kinetic energy.

(A) 75J

(B) 1500J

(C) 2250J

(D) 150J.

41 _____of a body is a line in space about which the particles of a rigid body move in a circular path.

(A) Centre of gravity

(B) angular acceleration

(C)axis of rotation

(D)angle of dip.

42 Power relates to workdone as

(A) Amount of work performed

(B) force associated with work

(C) rate at which work is done

(D) workdone by Power.

43 What speed will a 60kg object move off with if a 10gm bullet travelling at 400m/s strikes it.
(A)0.076m/s

(B) 0.067m/s

(C) 0.006m/s

(D) 0.007m/s

44 Gravitational and Electric fields are sometimes referred to as conservative force fields because workdone in these fields depends on

(A) path.

(B) position

(C) energy

(D) strength.

45. A wheel and axle have a radii 80cm and 10cm respectively, if the efficiency of the machine is 0.85, what load will an applied force of 1200N to the wheel raise?

(A) 81.6 N

(B) 51.6N

(C) 70.0 N

(D) 21.7 N.

46 An ideal machine is one with efficiency of

(A) 100%

(B) 0%

(C) 50%

(D) 80%

47 The center of gravity and the center of mass of an object are coincident

(A) if the object is a uniform and homogeneous body.

(B) if the acceleration due to gravity does not vary over the object.

(C) in all circumstances

(D) if the object is very heavy.

48 A body is pulled 20m along a horizontal plane by applying a force of 10N parallel to the plane. Calculate the workdone.

(A) 100J

(B) 200J

(C) 150J

(D) 250J.

49 The energy stored in the spring of a watch is

(A) kinetic energy

(B) electrical energy

 (C) elastic potential energy

(D) solar energy.

50. If a riffle fires a bullet of mass 0.01kg with a velocity of 300m/s, find the recoil velocity if the mass of the riffle is 6kg

. (A) 2m/s

 (B) 3.5m/s

(C)1.5m/s

(D) 0.5m/s.

51. A 4kg ball moving at 8m/s collides with a stationary ball of mass 12kg and they stick together. Calculate the kinetic energy lost in the impact.

(A) 75J

(B) 106J

(C) 96J

(D) 20J.

52. A revolver of Mass 6kg releases a bullet of mass 0. 05kg at a speed of 200m/s. What is the revolver's speed of recoil?

 (A) 2.7m/s

(B) 3m/s

 (C) 2.2m/s

 (D)1.67m/s

53 Calculate the power of a pump which lifts 100kg of water through a distance of 2m in 2 seconds (Take g= 10m/s².

54 An elastic collision is one which

(A) Total potential and kinetic energies are conserved

(B) Total kinetic energy and momentum are conserved

(C) kinetic energy equals potential energy before and after collision

(D) All of the above.

55. The simplest type of machine is the

(A) Screw

(B) Lever

(C) Pulley

(D) hydraulic press.

Have fun