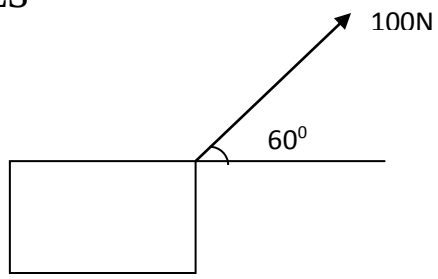
UMMUL QURA HIGH SCHOOL
AROWONA BUS-STOP, AMULOKO-AKANRAN ROAD, IBADAN.
2020/2021 SECOND TERM EXAMINATION

SUBJECT: Physics DURATION : 2hrs : 30mins

CLASS: SS 2 INSTRUCTION: Attempt section A and B

OBJECTIVES

1. A force of 70N is inclined at an angle 30^0 to the horizontal. ***Calculate*** its horizontal and vertical components respectively
   A. 60.6N AND 35.0N
   B. 40.4N AND 60.6N
   C. 40.4N AND 35.0N
   D. 35.ON AND 60.6N
2. The friction which ***exists*** between two layers of liquid in relative motion ***is***
   A. capillarity
   B. surface tension
   C. viscosity
   D. cohesion
3. Which of the following ***source of energy*** is renewable?
   A. Sun
   B. Petroleum
   C. Coal
   D. Natural gas
4. A steel needle floating on water sinks when kerosene is added to the water. This is ***because*** the kerosene
   A. increases the surface tension of water
   B. reduces the surface tension of water
   C. reduces the density of water
   D. reduces upthrust on the needle
5. In the figure below, the ***workdone*** by the force load inclined at an angle of 60^0 to the object dragged horizontally to a distance of 8m ***is***



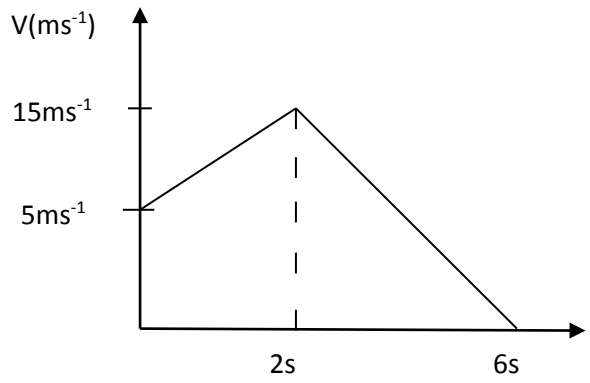
   A. 100J
   B. 400J
   C. 600J
   D. 800J
6. The silver coating in the inside of a vacuum flask ***reduces*** heat loss ***by***
   A. conduction
   B. radiation
   C. condensation
   D. convection
7. Which of the following is ***not*** correct about the mass and weight of a body?
   A. Mass is a scalar quantity
   B. Weight is a function of the gravitational pull
   C. Mass on earth and in moon is the same
   D. Weight at the equator and at the pole is the same
8. The process by which molecules of different substances move ***randomly*** is ***called***
   A. Osmosis
   B. Capillarity
   C. Diffusion
   D. Surface tension

9. What ***type*** of motion does the skin of a talking drum perform when it is struck with a drum?
   A. Random
   B. Rotational
   C. Translational
   D. Vibratory
10. Which of the following physical process ***can not*** be explained by the molecular theory of matter?
   A. Evaporation
   B. Thermal conduction
   C. Radiation of heat
   D. Convection currents in fluids
11. The expansion of liquids can be considered as ***disadvantage*** in
   A. fire alarm system
   B. thermostat
   C. riveting of steel
   D. fitting of a wheel on a rims
12. How ***far*** will a body move in 4s if uniformly accelerated from rest at a rate of $2ms^{-2}$?
   A. 32m
   B. 24m
   C. 16m
   D. 12m
13. A solid metal cube of side $10cm^3$ is heated from 10^0C to 60^0C. If the linear expansivity of the metal is $1.2 \times 10^{-5}\ k^{-1}$, ***calculate*** the increase in volume
   A. $0.6cm^3$
   B. $1.2cm^3$
   C. $1.8cm^3$
   D. $3.6cm^3$
14. Which of the following is ***not*** a conductor of electricity?
   A. Human body
   B. Silver
   C. Glass
   D. Earth
15. At what ***angle*** to the horizontal must the nozzle of a machine gun be kept when firing to obtain a ***maximum*** horizontal range for the bullets?
   A. 40^0
   B. 45^0
   C. 50^0
   D. 90^0
16. The heat from the sun reaches the earth by the ***process*** of
   A. insulation
   B. precipitation
   C. convection
   D. radiation
17. Which of the following is a ***scalar*** quantity?
   A. Momentum
   B. Distance
   C. Acceleration
   D. Force
18. A 500kg car initially at rest was travelling with acceleration of $5ms^{-2}$. It ***kinetic energy*** after 4s ***was***
   A. 10^5J
   B. 2.5×10^3 J
   C. 2×10^3 J
   D. 5×10^3 J
19. Which of the following substance is ***most*** viscous at room temperature?
   A. Water
   B. Alcohol
   C. Petrol
   D. Palm oil
20. The slope of straight line velocity-time graph ***represents***
   A. Uniform acceleration
   B. Uniform speed
   C. Total distance covered
   D. Work done
21. Two forces, whose resultant is 100N, are perpendicular to each other, ***if*** one of them makes an angle of 60^0

with the resultant. ***Calculate*** its magnitude. (Sin 60^0 = 0.8660, Cos 60^0 = 0.500)

A. 200.0N
B. 173.2N
C. 115.5N
D. 86.6N

22. A room is heated by means of a charcoal fire. A man standing away is from the fire is to armed ***by***
    A. Conduction
    B. Reflection
    C. Radiation
    D. Convection
23. Which of the following surfaces will absorb radiant heat energy ***best***?
    A. White
    B. Red
    C. Yellow
    D. Black
24. The range of a projectile projected at $\boldsymbol{\Theta^0}$ to the horizontal with a velocity **U** is given ***by***:
    A. $\frac{U^2 \sin 2\Theta}{g}$
    B. $\frac{U^2 \sin 2\Theta}{2g}$
    C. $\frac{2U^2 \sin 2\Theta}{g}$
    D. $\frac{U^2 \sin {}^2\Theta}{g}$
25. Which of the following ***quantities*** is a vector?
    A. Speed
    B. Distance
    C. Energy
    D. Momentum
26. A body of mass 25kg, moving at $3ms^{-1}$ in a rough horizontal floor, is brought to rest after sliding through a distance of 2.50m on the floor. ***Calculate*** the coefficient of sliding friction (g = $10ms^{-2}$)
    A. 0.09
    B. 0.18
    C. 0.36
    D. 0.54
27. It is advisable to wear ***white*** dresses in the tropics ***because***
    A. absorb sweat readily
    B. absorb all radiant heat
    C. conduct heat away more readily from the body
    D. reflect radiant heat
28. Calculate the ***acceleration*** in the graph below



    A. $5ms^{-1}$
    B. $7.5ms^{-2}$
    C. $2.5ms^{-2}$
    D. $10ms^{-2}$
29. Which of the following is a reason ***why*** a concrete floor feels colder to the bare feet ***than*** a mat in the same floor?
    A. Mat loses heat to the bare feet than the feet
    B. Mat loses heat to the bare feet while the concrete floor extracts heat from them
    C. Concrete floor is a better conductor of heat than the mat
    D. Mat is a better conductor of heat that the floor

30. Solid friction, ***like*** viscosity is
    A. independent of the surface areas in contact
    B. independent of the relative motion between layers
    C. dependent on normal reaction
    D. in opposition to motion
31. The reading ***accuracy*** of a stop watch is
    A. 1s
    B. 0.1s
    C. 0.01s
    D. 0.001s
32. The ***energy*** possessed by a body by virtue of its position is ***known*** as
    A. Kinetic energy
    B. potential energy
    C. nuclear energy
    D. internal energy
33. Heat transfer ***by convection*** takes place in
    A. solids and liquids
    B. liquid and gases
    C. solid and gases
    D. solids, liquids and gases
34. One of the following is ***not*** an example of practical application of convection
    A. Cooking utensils
    B. Use of rugs in floors
    C. Ventilation
    D. All of the above
35. The ***S.I unit*** of electric ***current*** is
    A. coloumb
    B. ampere
    C. watt
    D. joule
36. Which of the following ***units*** is equivalent to joule?
    A. Nm^{-2}
    B. $Kgms^{-2}$
    C. Nm
    D. Nm^{-1}
37. A body of mass 2kg is released from rest on a smooth plane inclined at an angle of 60^0 to the horizontal. ***Calculate*** the acceleration of the body down the plane (g = kms^{-2})
    A. $3.1ms^{-2}$
    B. $5.2ms^{-2}$
    C. $6.0ms^{-2}$
    D. $8.7ms^{-2}$
38. A body is projected vertically upwards with a speed of $10ms^{-1}$ from a point 2m above the ground. ***Calculate*** the time taken for the body to reach the ground (g = $10ms^{-2}$)
    A. 1s
    B. 2s
    C. 4s
    D. 8s
39. The cracking noise produced by aluminium roofing sheets on a house during a hot sunny day is as a ***result of***
    A. thermal expansion of the sheets
    B. thermal equilibrium of the sheets
    C. conduction of heat by the sheets
    D. contraction of the sheets
40. The magnitude of the force required to make an object of mass **M** move with speed **V** in a circular path of radius **r** is
    A. $\frac{mr}{v}$
    B. w = vr
    C. $\frac{mr^2}{v}$
    D. $\frac{mv^2}{r}$
41. A wooden block of mass 1.6kg rest on a rough horizontal surface. If the limiting frictional force ***between*** the block and the surface is 8N. ***Calculate*** the coefficient of friction. (g= $10ms^{-2}$)

A. 0.15
B. 0.25
C. 0.35
D. 0.50

42. An object is released from the top at a height of 25m. ***Calculate*** the time it takes to fall to the ground (g = $10ms^{-2}$)
    A. 25.00s
    B. 10.00s
    C. 2.50s
    D. 2.24s
43. The slope of a straight line displacement-time graph ***indicates*** the
    A. distance travelled
    B. uniform velocity
    C. uniform acceleration
    D. uniform speed
44. Which of the following is ***not*** a consequence of force field?
    A. weight
    B. surface tension
    C. gravitational force
    D. magnetic force
45. The ***unit*** of linear expansivity ***is***
    A. K
    B. K^{-1}
    C. $^{0}C^{-2}$
    D. K^{-2}
46. The ***dimension*** of surface tension ***is***
    A. ML^2T^{-1}
    B. MT^{-1}
    C. MT^{-2}
    D. ML^2T^2
47. Another term for ***fusion*** is
    A. Freezing
    B. Vaporization
    C. Evaporation
    D. Melting
48. Which of the following ***can not*** be obtained from velocity-time graph?
    A. Acceleration
    B. Retardation
    C. Distance
    D. Displacement
49. A body is said to be moving with uniform acceleration ***if*** it experience ***equal***
    A. Increase in velocity in equal time interval
    B. Decreases in velocity at equal time interval
    C. Increases in speed at equal time interval
    D. Decreases in speed at equal time interval
50. Which of the following ***units*** is equivalent to watt?
    A. Js^{-2}
    B. Js^{-1}
    C. Nm^{-1}
    D. Nm

SECTION B: THEORY PART

INSTRUCTION: ANSWER ANY FOUR QUESTIONS IN THIS SECTION

1(a). Distinguish ***between*** adhesion and cohesion 2marks

(b). A tennis ball is thrown vertically upward with initial velocity of $20ms^{-1}$. ***Find***

(i). its ***velocity*** after 6seconds

3marks

(ii). the ***maximum height*** attained and time taken to reach it.

4marks

(iii). the ***total time taken*** for the ball to return to the ground again (neglect air resistance and take g = $10ms^{-1}$)

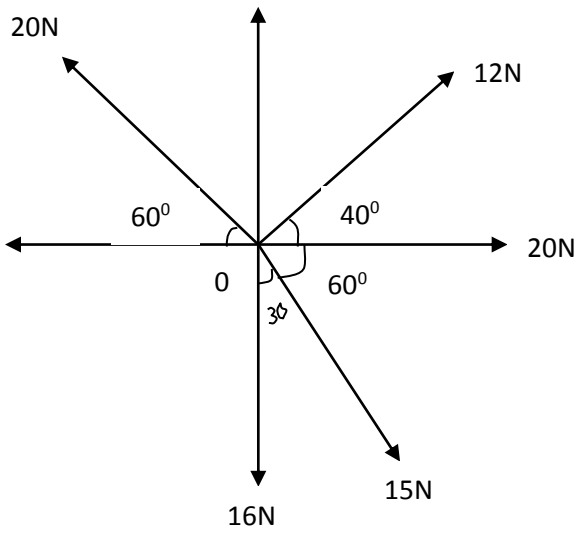
4marks

(c). Mention ***four*** effects of surface tension 4marks

2(a). State the parallelogram ***law*** of vector

2marks

(b). ***Calculate*** the resultant of five coplanar forces of values 10N, 12N, 16N, 20N, 15N acting on an object at O as ***shown*** in the figure ***below***.



(c). Two force whose resultants ***50N*** are perpendicular to each other. If the one of them makes angle of 30^0 with the resultant, calculate its magnitude to the nearest whole number. 3marks

3(a). A body at rest is given an initial acceleration of $6.0ms^{-2}$ for 20s after which the acceleration is reduced to $4.0ms^{-2}$ for the next 10s. The body maintains speed ***attained*** for 30s.

Draw the ***velocity –time graph*** of the motion using the information given above. From the graph, ***calculate***:

(i). ***maximum speed*** attained during the motion

(ii). ***total distance*** travelled during the first 30s.

(iii). ***average speed*** during the same interval as in ***(ii)*** above.

(b). A body thrown vertically upward reaches a maximum height of 60m above the level of projection. ***Calculate***:

(i). ***speed*** of the thrown

(ii). ***time taken*** to reach the ***maximum*** height 5marks

4(a). Define ***projectile*** and state ***two (2) applications*** of projectile in our real life experience 3marks

(b). Define the following:

(i). time of flight 1½ marks

(ii). range of projectiles 1½ marks

(c). A body of mass **40g** projected vertically upward in vacuum returns to the point of projection after 2.4s. ***Calculate*** the speed of projection (Take g = $10ms^{-2}$)
3marks

(d). A stone is projected from the ground at an angle Θ to the horizontal with a velocity of $30ms^{-1}$. it reaches a maximum height of 11.25m. ***Calculate***

(i). the ***value*** of Θ

(ii). the ***time taken*** to strike the ground

(iii). the ***range***
6marks

5(a). Distinguish ***between*** land and sea breezes 2marks

(b). Explain the ***three*** modes of heat transfer and state the major differences between them 8marks

(c). Draw a ***labeled diagram*** of a vacuum (thermos) flask. ***Explain*** how its construction minimizes heat exchanges with the surroundings. ***5marks***

6(a). What is meant by the ***statement***: the linear expansivity of a solid is $1.0 \times 10^{-5}k^{-1}$?
1mark

(b). A piece of brass of mass 170kg has its temperature raised from 0^0C to 30^0C. ***Calculate*** its increase in volume, given the density of brass at 0^0C as 8.5×10^3 Kgm^{-3} and its cubic expansivity as $5.7 \times 10^{-5}k^{-1}$. 6marks

(c). State ***four*** (4) effects of heat energy on a matter. 4marks

(d). State ***four*** (4) practical application of capillarity. 4marks