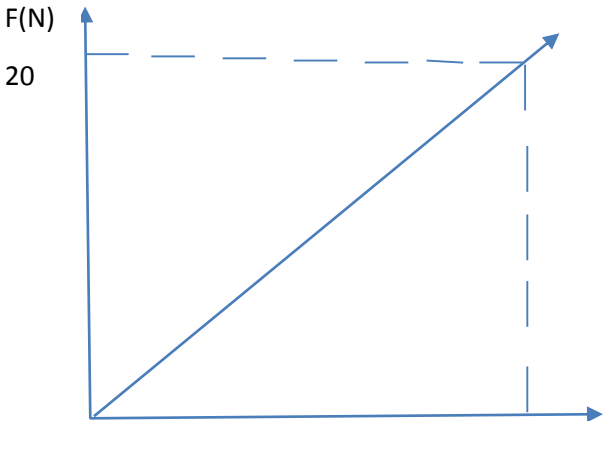
UMMUL QURA HIGH SCHOOL
AROWONA BUS-STOP, AMULOKO-AKANRAN ROAD, IBADAN.
2020/2021 THIRD TERM EXAMINATION

SUBJECT: Physics DURATION : 2hrs : 45mins

CLASS: SS1 INSTRUCTION: Attempt section A and B

SECTION A: OBJECTIVES

1. The diagram below illustrates a free distance graph for the motion of a body. ***Determine*** the work done in the block.



   A. 2J
   B. 20J
   C. 100J
   D. 200J

2. A 100m is heated by means of charcoal fire. A man standing away from the fire is warmed ***by***
   A. Conduction
   B. Reflection
   C. Convection
   D. Radiation

3. The increase in the ***volume*** of $10cm^3$ of mercury when the temperature rises by 100^0c is 0.182cm. What is the ***cubic*** expansivity?
   A. $0.000182K^{-1}$
   B. $0.0001182K^{-1}$
   C. $0.000178K^{-1}$
   D. $0.000187K^{-1}$

4. Which of the following is a ***scalar*** quantity?
   A. Velocity
   B. Momentum
   C. Temperature
   D. Force

5. When an ***object*** is heated, its temperature
   A. Is constant
   B. Decreases
   C. Increases
   D. First increases and then decreases

6. A brass rod 2m long at a certain temperature. What is its ***length*** for a temperature rise of 100k, if the linear expansivity is $1.8 \times 10^{-6}k^{-1}$?
   A. 2.0036m
   B. 2.0018m
   C. 2.1800m
   D. 2.0360m

7. On a cold morning, the metal ***blade*** of a cutlass
   A. The blade is at a lower temperature than the handle
   B. The head is at a lower temperature than both blade and handle
   C. The blade is a batter conductor of heat than the handle
   D. The handle is a better conductor of heat than the blade
8. A man of mass 50kg ascends a flight of stairs 5m high is 5seconds. If acceleration due to gravity is $10m/s^2$, the power expanded ***is***
   A. 100N
   B. 200N
   C. 250N
   D. 500N
9. The heat from the ***sun*** reaches the earth mainly by the process ***of***
   A. Conduction
   B. Radiation
   C. Convection
   D. Evaporation
10. A boy cycles through a distance of 1.0km in 5mins. ***Calculate*** his average speed
    A. $0.2ms^{-1}$
    B. $0.3ms^{-1}$
    C. $3.3ms^{-1}$
    D. $33.3ms^{-1}$
11. Slope of a velocity – time graph ***gives***
    A. The distance
    B. The displacement
    C. The acceleration
    D. The speed
12. The following can detect radiant heat ***except***
    A. Radiometer
    B. Thermopile
    C. Human skin
    D. Thermostat
13. Which of the following has the ***greatest*** thermal conductivity?
    A. Iron
    B. Aluminium
    C. Silver
    D. Copper
14. The slope of free distance graph ***indicates***
    A. Velocity
    B. Energy
    C. Silver
    D. Copper
15. It is advisable to wear white dresses in the tropic because white ***can***
    A. Absorb sweat readily
    B. Absorb all radiant heat
    C. Conduct heat away more readily from the body
    D. Reflect radiant heat
16. Which of the following is a ***derived*** unit?
    A. Kg
    B. K
    C. N
    D. S
17. The weight of a body in ***measured*** with _____
    A. Spring balance
    B. Bean balance
    C. Chemical balance
    D. Weighing balance

18. Which of the following can be used for compare the relative magnitude of charge in ***two*** given bodies?
    A. The electrophorus
    B. Ebonite rod
    C. Gold – leaf electroscopes
    D. Capacitor
19. The linear expansivity of a substance is $1.2 \times 10^{-4}k^{-1}$, a cube of this substance has a volume of 8.0×10^{3} cm^3at 30^0c, ***calculate*** the increase in its volume at
    A. $1.44 \times 10^2cm^3$
    B. 14.46×10^2cm
    C. $1.5 \times 10^{-4}k^{-1}$
    D. $2.5 \times 10^{-4}k^{-1}$
20. Which of the following surfaces will absorb radiant heat ***best***?
    A. White
    B. Black
    C. Blue
    D. Yellow
21. If L, S and V are the linear, area and volume expansivities of a given metal respectively, which of the following equation is ***correct***?
    A. L – S = 0
    B. V – 2s = 0
    C. S – 2L = 0
    D. 2s – L = 0
22. Calculate the ***weight*** of a body of mass 500g
    A. 500N
    B. 25N
    C. 15N
    D. 5N
23. The motion of a tennis ball in play ***is***
    A. Translational only
    B. Translational and oscillatory
    C. Translational and rotational
    D. Rotational only
24. The main function of a thermoflask is
    A. To keep the temperature of the content constant
    B. To keep the pressure and temperature of the content constant
    C. To reduce the temperature and increases the pressure of the content
    D. To keep the volume constant
25. The smallest indivisible particle of an element is ***known*** as
    A. Atom
    B. Mole
    C. Molecules
    D. Matter
26. Which of the following statement is ***Not*** true?
    A. The molecules of liquids are fixed due to intermolecular forces
    B. Solids have definite shape and volume
    C. The molecules of liquids are more free to move than solids
    D. The molecules of gaseous are in constant motion
27. The **S. I** unit of linear expansivity is
    A. $/K^{-1}$
    B. $/^0C$
    C. K^{-2}
    D. $/^0C^{-1}$
28. Liquids expands more than solids ***because***

A. Strong intermolecular forces
B. The molecules are further apart
C. Weak intermolecular forces
D. Molecules are in constant state of motion

29. A body accelerates uniformly from rest $2ms^{-2}$. ***Calculate*** its velocity after travelling 9m
A. $36ms^{-1}$
B. $18ms^{-1}$
C. $6ms^{-1}$
D. $4.5ms^{-1}$

30. A solid of linear expansivity $1.2 \times 10^{-5}k^{-1}$ is heated through $20^{0}c$, ***calculate*** its area expansivity
A. $2.4 \times 10^{-5}K^{-1}$
B. $3.6 \times 10^{-4}K^{-1}$
C. $1.8 \times 10^{-5}K^{-1}$
D. $4.8 \times 10^{-4}K^{-1}$

31. When a glass nod is rubbed with silk, the rod ***acquires***
A. Negative charge
B. Positive charge
C. Neutral
D. No charge

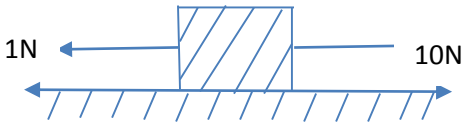
32. Which of the following instructions can be used to ***compare*** the relative magnitudes of charge on two given bodies?
A. The electrophorus
B. Ebonite rod
C. Gold-leaf electroscope
D. Capacitor

33. The vacuum in a thermoflask reduces heat loss ***resulting*** from
A. Radiation only
B. Conduction and convection only
C. Radiation and convection only
D. Conduction only

34. The time rate of change in velocity is ***called***
A. Force
B. Momentum
C. Acceleration
D. Speed

35. An object at rest ***posseses***
A. Potential energy
B. Kinetic enrgy
C. Chemical energy
D. Electrical enrgy

36.



A block is acted upon by two horizontal forces as illustrated in the diagram above. The block accelerated at $1.5ms^{-2}$. ***Calculate*** the mass of the block.
A. 6kg
B. 9kg
C. 10kg
D. 15kg

37. In a school composed a girl walks 40m due east from the laboratory to the staff room to submit her report. Then she returns and walks 30m due north to her classroom. ***Determine*** the magnitude of her displacement from the laboratory
A. 10m

B. 35m
C. 50m
D. 70m

38. Under which of the following ***conditions*** is work done ?
    A. A man supports a heavy load above his head with his head
    B. A woman hold a pot of water
    C. A boy climbs into a table
    D. A pushes against a stationary petrol tanker
39. A car travelling at $30ms^{-1}$ over comes a frictional resistance of 100N while moving. ***Calculate*** the power developed by the engine (1hp = 0.75kw)
    A. 0.23hp
    B. 0.40hp
    C. 4.10hp
    D. 4.40hp
40. The **S.I** unit of heat is
    A. J
    B. K
    C. W
    D. A
41. The thermopile 1, a device for ***detecting***
    A. Radioactive radiations
    B. Radiant energy
    C. X – rays
    D. The presence of electrons
42. An electric motor ***converts***
    A. Mechanical to electrical energy
    B. Electrical energy to mechanical energy
    C. Mechanical energy to sound energy
    D. Electrical energy to thermal energy
43. A device that ***converts*** mechanical energy to electrical energy is
    A. A dynamo
    B. An electric motor
    C. An induction coil
    D. A transformer
44. The dimension of force is
    A. MLT^{-1}
    B. MLT^{-2}
    C. $ML^{-1}T^{-2}$
    D. $ML^{-2}T^{-2}$
45. A lightening conductor is made of
    A. Copper
    B. Iron
    C. Glass
    D. Ebonite
46. If a force is applied at angle Θ with the horizontal direction, work done is equal ***to***
    A. FS sin Θ
    B. FS cos Θ
    C. FS tan Θ
    D. FS sec Θ
47. To keep a vehicle moving at a constant speed V requires power P from the engine. The force provided by the engine ***is***
    A. $\frac{P}{V}$
    B. $\frac{P}{2V}$
    C. pv
    D. $\frac{P}{v^2}$
48. A stone of mass M kg is held h metres above the floor ***for*** 50secs. The workdone is joule over this period is
    A. mh

B. $\frac{mgh}{50}$
C. mgh
D. 0

49. Which of the following process of transfer of heat ***does not*** require medium?
A. Convection
B. Conduction
C. Radiation
D. Reflection

50. The cubic expansivity of mercury is $1.8 \times 10^{-5}k^{-1}$ and the linear expansivity of glass is $8.0 \times 10^{-6}k^{-1}$, ***calculate*** the apparent expansivity of mercury in a glass container.
A. $1.5 \times 10^{-4}K^{-1}$
B. $1.8 \times 10^{-4}K^{-1}$
C. $3.6 \times 10^{-4}K^{-1}$
D. $3.0 \times 10^{-4}K^{-1}$

SECTION B: THEORY PART
INSTRUCTION: ANSWER ANY FOUR QUESTIONS
ALL QUESTIONS CARRY EQUAL MARK

1. State ***four*** assumptions of kinetic theory of matter

b. In tabular form, state ***four*** differences between heat and temperature

c. A metal rod is 3m long at 20^0c, if its linear expansivity, is $1.2 \times 10^{-5}k^{-1}$, to what temperature would it have to heated in other to gain an extension of 0.4cm?

2. What do you ***understand*** by the terms work, energy transformation that occur in the following

i. Car engine

ii. Microphone

iii. Electric motor

iv. Electric bulb.

c. The linear expansivity of a cube is $12 \times 10^{-5}k^{-1}$, if the length of each side of the cube is 10cm, ***find*** the area of one face of the cube and the ***volume*** of the cube when its temperature is raised by 50k

3. A body at ***rest*** given an initial acceleration of $8.0ms^{-2}$ for 20s after which the acceleration is reduced to $6.0ms^{-2}$ for the next 30s. The body maintains the ***speed*** attained for 40s after which it was brought to rest in 20s.

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. Average retardation as the body is being brought to ***rest***.
iii. Total distance travelled during the first **60s**.
iv. Average speed during the same interval as **in (iii).**

4a. State ***four*** effects of expansion in solids

b. A glass bottle full of mercury has mass 500g is being heated through 35^0c, 2.43g of mercury are expelled. ***Calculate*** the mass of mercury remaining in the bottle (cubic expansivity of mercury is $1.8 \times 10^{-4}k^{-1}$, linear expansivity if glass is $8.0 \times 10^{-6}k^{-1}$).

c. Define the following:

i. Vaporization

ii. Evaporation

iii. Fusion

5a. State ***two*** practical application of good conductors of heat.

b. A car of mass 1200kg moves with a speed of $20ms^{-1}$ round a curve of radius 20.0m in a level road, ***calculate*** the coefficient of friction between the wheel and the road.

c. Draw a labeled diagram of a vacuum (thermos) flask. Explain the function of its essential parts.

6a. ***Describe*** how lightening conductor protects buildings from ***lightening*** (support your answers with a ***well labeled*** diagram).

b. State ***two*** uses of the following instruments:

i. Gold-leaf electroscope

ii. The electrophorus

c. Define electrostatic induction

d. Distinguish ***between*** electrostatic conductors and insulators.