Candidates' Name: ……..……..

Signature: …….....……..……

Random No.					Personal No.		

(Do not write your school / Center name or Number anywhere on this booklet)

535/1

PHYSICS

Paper 1

JULY/AUGUST 2023

2 ¼ hours

KAMTEC EXAMINATIONS BOARD

UGANDA CERTIFICATE OF EDUCATION

PHYSICS

Paper one

2 hours 15 minutes

INSTRUCTIONS TO CANDIDATES

Section **A** *contains 40 objective type questions. You are required to write the correct answer* ***A,B,C*** *or* ***D*** *in blue or black ink against each question in the box on the right hand side*

Section **B** *contains* ***10*** *structured questions. Answers are to be written in the spaces provided on the question paper*

Do not use pencil **except** *for drawings. Any work done in pencil will* ***not*** *be marked*

Acceleration due to gravity =10ms^{-1}

Specific heat capacity of water =4200Jkg^{-1}K^{-1}

For Examiner's Use Only

Q.41	Q.42	Q.43	Q.44	Q.45	Q.46	Q.47	Q.48	Q.49	Q.50	MCQ	Total

 TURN OVER

1. Which of the following reduces when an iron rod is heated?
    A. Mass
    B. Weight
    C. Length
    D. Density
2. The refractive index of a material of glass is 1.5, find the critical angle of glass
    A. 41.8^0
    B. 60^0
    C. 26^0
    D. 30^0
3. A soft magnetic material is the one which
    A. Can break easily
    B. Weakly attracted by a magnet
    C. Can be magnetized easily
    D. Can retain its magnetism for a long time

4. The mode of heat transfer by means of electromagnetic waves is called
    A. Convection
    B. Conduction
    C. Radiation
    D. Evaporation

5. The velocity of a 3kg object changes by $14ms^{-1}$ when a force is applied on for 7s.Find the force applied on the object
    A. $\frac{3x14}{7}\ N$
    B. $\frac{14X7}{3}N$
    C. $\frac{3X7}{14}\ N$
    D. $\frac{14}{3X7}\ N$

6. A given mass of air occupies a volume of $200cm^3$ at a temperature of 27^0C.Find the volume of the same mass of air if its temperature is raised to 54^0C at constant pressure
    A. $400cm^3$
    B. $654cm^3$
    C. $32.7cm^3$
    D. $218cm^3$
7. Which of the following correctly describes the nature of the images formed by a driving mirror in a car?
    A. Magnified and real
    B. Diminished and virtual
    C. Erect and same size as object

D. Inverted and magnified

8. M kg of hot water at 80^0C is poured into a pot containing 2kg of cold water at 25^0C.If the steady temperature of the mixture is 60^0C, find the value of M
   A. 0.6kg
   B. 0.3kg
   C. 1.8kg
   D. 3.5kg

9. The energy transformation that takes place when a dry cell is producing electricity is
   A. Chemical to light
   B. Heat to electrical
   C. Chemical to electrical
   D. Electrical to chemical

10. Which of the following is not a basic unit ?
   A. newton
   B. Metre
   C. Kilogram
   D. Second

11. Which of the following statements are true about evaporation?
   A. It occurs throughout the liquid
   B. It occurs at the surface of the liquid
   C. It occurs at a constant
   D. It involves formation of bubbles

12. A man standing some distance from a vertical wall beats a drum that makes a loud sound. He hears the echo after 1.5 seconds. If the speed of sound in air is $330ms^{-1}$, how far is the man from the wall?
   A. 110.0m
   B. 247.5m

   440.0m

   C. 990.0m

13. Complementary colours are two colors that;
   A. Do not mix
   B. Produce white light when mixed together
   C. Additive in nature
   D. Can easily mix to form one colour

14. The basic difference between transverse and longitudinal waves is in;
    A. Amplitude
    B. Direction of vibration
    C. Wavelength
    D. Medium through which waves travel

15. A uniform half metre rule is freely pivoted at the 15cm mark and balances horizontally when a body of mass 40g is suspended from the 2cm mark. Calculate the mass of the half metre rule
    A. 0.52g
    B. 5.2g
    C. 52g
    D. 520g

16. Find the velocity ratio of an inclined plane of length 12m, given that the height from the ground is 3m
    A. 6 B. 2
    C. 3 D.4

17. A boy of mass 4kg develops an average power of 250W when running up a flight of stairs. How long does he take to climb a vertical height of 400cm?
    A. 720S
    B. 72S
    C. 7.2S
    D. 0.72S

18. Which of the following parts of a thermos flask reduces heat loss by radiation?
    A. Cork
    B. Vacuum seal
    C. Silvered surface
    D. Double walled -vessel

19. Eve is 1.6m tall, if she stands 4.0m away from the pin-hole camera which is 20.0cm long, what will be the height of her image?
    A. 8.0cm
    B. 0.05cm
    C. 3.0cm
    D. 20.0cm

20. The force that opposes the motion between two surfaces in contact is;
    A. Gravity
    B. Centripetal
    C. Weight
    D. Friction

21. An area where direct light from a source of light can not reach due to obstruction by an opaque object is called;
    A. Penumbra
    B. Umbra
    C. Shadow
    D. Eclipse
22. The distance between eight consecutive crests of a transverse wave is 35cm.calculate its wave length
    A. 5cm B.10cm
    C.15cm D.20cm
23. The type of collision that involves conservation of both kinetic energy and momentum is;
    A. Uniform collision
    B. Elastic collision
    C. Linear collision
    D. Inelastic collision
24. A body of volume $0.002m^3$ and density $600kgm^{-3}$ floats in a given liquid with ¼ of it exposed. Calculate the density of the liquid
    A. $700kgm^{-3}$
    B. $800kgm^{-3}$
    C. $900kgm^{-3}$
    D. $1000kgm^{-3}$
25. Which of the following is the S.I unit for volume?
    A. ml
    B. cm^3
    C. mm^3
    D. m^3
26. The base of a Bunsen burner is made broad in order to;
    A. Make its vertical line through the centre of gravity fall out its base
    B. Raise its centre of gravity
    C. Lower its centre of gravity
    D. Reduce its centre of gravity
27. A cylindrical object has a base area 4cm2 and height 2cm.If its mass is 20g,find its density in gcm^{-3}
    A. $\frac{20}{4X2}$
    B. $\frac{4X2}{20}$
    C. $\frac{2X20}{4}$
    D. $\frac{4}{2X20}$

28. A stone is projected vertically upwards with a velocity of $10ms^{-1}$. Find the time taken to reach the maximum height? (*acceleration due to gravity,g =10ms^{-2})*

A. 0.5s
B. 1.0s
C. 5.0s
D. 10.0s

29. The coils of a solar heater are blackened because;
A. Reflect all the heat energy better
B. Radiate heat quickly and better
C. Absorb radiant energy faster and better
D. Retain heat

30. Soft sound is produced by a source which has;
A. High frequency
B. Low frequency
C. Large amplitude
D. Small amplitude

31. The effect of change in speed for light travelling from one medium to another is called
A. Dispersion
B. Reflection
C. Refraction
D. Diffraction

32. Which of the following is true about a body moving with uniform velocity?
i) Its resultant force is zero
ii) Its momentum is constant
iii) Its acceleration is zero
iv) Its resultant force is increasing
A. (i) and (ii)
B. (i),(ii) and (iii)
C. (ii),(iii) and (iv)
D. (i),(ii),(iii) and (iv)

33. Which of the following quantities are defined by only magnitude?
A. Mass, length and time
B. Displacement, weight and time
C. Energy, power and work
D. Pressure, work and velocity

34. A vibrator produces a sound wave that travels a distance of 900m in 3s.If the wavelength of the wave is 10m,find the frequency of the vibrator

    A. 30Hz
    B. 270Hz
    C. 300Hz
    D. 3000Hz

35. Which of the following materials becomes permanently magnnetised by induction when subjected to the same magnetising force
    A. Steel
    B. Iron
    C. Copper
    D. Brass

36. An upright image can be produced by a convex mirror when the object is
    A. Close to the mirror
    B. At any position along the principal axis infront of the morro
    C. At the principal focus
    D. At the Centre of curvature

37. The type of electromagnetic wave system used in a television remote control is;
    A. Ultra violet radiation
    B. Gamma radiation
    C. X rays
    D. Infra red radiation

38. A stone weighs 100N in air, appears to weigh 50N in liquid Y and 70N in water. Determine the density of liquid Y in gcm^{-3}

    A. 0.6
    B. 1.2
    C. 1.7
    D. 3.3

39. A bullet of mass 30g is fired with a speed of $40ms^{-1}$ from a riffle. The riffle recoils with a speed of $4.0ms^{-1}$,find the mass of the bullet.

    A. 0.6kg
    B. 0.3kg
    C. 6.0kg
    D. 3.0kg

40. Which of the following devices changes mechanical energy to electrical energy?

    A. Motor
    B. Generator
    C. Microphone
    D. Loudspeaker

SECTION B (40) MARKS

Answer **all** the questions in this section

All working must be shown clearly in the spaces provided

41. (a) Define apparent weight of a body (01mark)

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(b) A metal cube of side 2cm weighs 22.4N in air. Calculate the apparent weight of the cube when completely immersed in a liquid of density 800kgm^{-3} (03marks)

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42. (a) state the law of moments (01mark)

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(b) state two factors which affect the stability of a body (01mark)

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(c) why does a body thrown upwards eventually come back to the ground? (02marks)

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43. . (a) What is meant by inertia of a body? (01mark)

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(b) State Newton's third law of motion (01mark)

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(c) A truck of 1000 kg travelling at 25ms^{-1} accelerates uniformly to 40ms^{-1} in 5s.Calculate the accelerating force (02marks)

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44.(a) Define velocity ratio of a machine (01mark)

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(b) In a pulley system made of 5 wheels, an effort of 250N is used to move a load of 1000N.Calculate

(i) The mechanical advantage of the system (01mark)

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(ii)The efficiency of the system (01mark)

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(iii) How can the efficiency of the pulley in part (b) be increased (01mark)

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45 .(a) Define;

(i)Wave length (01mark)

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(i)Frequency (01mark)

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(b) CBS radio station broadcasts at a frequency of 89.2 MHz, calculate the wave length of the radio signals (02marks)

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46.(a) State the laws of reflection of light (02 marks)

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(b) State two characteristics of images formed in a plane mirror (01mark)

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(c) Calculate the number of images formed by two plane mirrors inclined to each other at an angle of 60^0 (01mark)

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47.(a) Distinguish between kinetic energy and potential energy (02marks)

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(b) A stone of mass 2kg falls freely from rest through a vertical height of 3.2m.Find the ;

(i) kinetic energy of the stone just before it hits the ground (01mark)

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(ii) The velocity with which the stone hits the ground (01mark)

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48.(a) Define the term specific heat capacity of a substance (01mark)

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(b) A piece of pure melting ice of mass 0.5kg was mixed with 0.44kg water at 0^0C.After continuous stirring of the mixture, the final temperature of the mixture became 4^0C,calculate the heat energy supplied (Latent heat of fusion of ice =336000Jkg^{-1}) (03marks)

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49.(a) What is meant by a scalar quantity (01mark)

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(b) (i)State the law of conservation of momentum (01mark)

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(ii) A car of mass 800kg moving with a speed of $10ms^{-1}$ crushes into a solid wall and comes to rest in 0.4s,find the average force exerted by the wall (02marks)

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50.(a) Define;

(i) magnetic saturation (01mark)

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(ii) magnetic field (01mark)

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(b) In the space provided below, draw the magnetic field line pattern between two bar magnets placed closely with their North poles facing each other. (02marks)

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