**NAME: ……………………………………………………………………………………………**

**INDEX NO ……………………………………………..SIGNATURE……………………….**

**535/1**

**PHYSICS**

**PAPER 1**

**Nov 2020**

**2 ½ hours**

**ST. MARYS’ KITENDE**

***Uganda Certificate of Education***

**RESOURCEFUL MOCK EXAMINATION 2020**

**PHYSICS**

**PAPER 1**

**2 HOURS 15 MINUTES**

**INSTRUCTIONS TO CANDIDATES:**

* Section A contains 40 objectives type questions. You are required to write the correct answer A, B, C or D against each question in the box on the right hand side
* Section B contains 10 structured questions answers to this section are to be written in the space provided on the question paper.
* Mathematical tables, slide rulers and silent non programmable calculators may be used
  + *Acceleration due to gravity = 10ms-2.*
  + *Specific heat capacity of water = 4200Jkg-1 k-1.*
  + *Speed of light in air = 3 x 108ms-1.*
  + *Density of water = 1000kgm-3*

**FOR EXAMINERS USE ONLY**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **MCQ** | **Q.41** | **Q.42** | **Q.43** | **Q.44** | **Q.45** | **Q.46** | **Q.47** | **Q.48** | **Q.49** | **Q.50** | **TOTAL** |
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**SECTION A**

1. A notch in a beam can be reduced by keeping the beam under
2. Tension force C. Friction force
3. Compression force D. Magnetic force
4. The rate at which the distance covered by a body in a particular direction changes with time is called.
5. Speed C. Acceleration
6. Velocity D. Displacement
7. Which of the following changes when a body moves around a horizontal circular path.
8. Inertia C. Weight
9. Speed D. Velocity
10. The sharpness of an image formed in a pin hole camera may be increased by:
11. Illuminating the object more strongly
12. Making the pin-hole smaller
13. Placing the camera near the object
14. Increasing the distance between the pin hole and the screen.
15. Which of the following properties of musical notes is determined by presence of overtones?
16. Timber C. Pitch
17. Loudness D. Intensity
18. A nucleus emitts two beta particles followed by an alpha particle. It changes to Y having;-
19. 85 protons and 140 nucleons B. 90 protons and 140 nucleons
20. 90 protons and 142 nucleons D. 96 protons and 142 nucleons
21. A constant horizontal force is applied to a body at rest on a smooth surface which of the following will not change during the application of force?
22. The K.e of the body C. The position of the body
23. The momentum of the body D. The acceleration of the body
24. A measuring cylinder contains 20cm3 of water. A piece of brass of mass 24g and density 8gcm-3 is submerged in water in the cylinder. The new reading of water level in the cylinder is
25. 13cm3 C. 123cm3
26. 18cm3 D. 50cm3
27. A ball falls from rest through a height of 92.5cm in 0.45 seconds. Find the acceleration due to gravity.

C. 

1. 

D. 

B. 

1. Two progressive waves each of amplitude 5m and frequency 200Hz travelling in opposite direction with a velocity of 100ms-1 meet when out of phase. Find the distance between successive nodes.
2. 0.25 B. 0.5 C. 1.0 D. 2.5
3. When a resistor of 6Ω is connected across the terminals of a battery of 12V and negligible internal resistance, the number of coulombs passing through the resistor per second is
4. 0.5 B. 2 C. 24 D. 72
5. Which of the following instruments is used to determine the purity of milk?
6. Hydrometer C. Hypsometer
7. Hygrometer D. Pyrometer
8. A force of 40N produces an extension of a spring by 20mm. Calculate the extension of the same spring when a body of mass 0.5kg is attached to its lower end.
9. 0.2mm B. 1.0mm C. 2.5mm D. 5mm
10. If an object is placed 21cm from a converging lens, the image formed is slightly smaller than the object. If the object is placed 19cm from the lens, the image formed is slightly larger than the object. The approximate focal length of the is?
11. 10cm B. 18cm C. 20cm D. 22cm
12. A pendulum bob completes 50 oscillation in 2 minutes. The frequency of the bob is;
13. 0.02Hz C. 2.5Hz
14. 0.42HzD. 25Hz
15. The resultant force of two forces acting perpendicular to each other on a body of mass 3kg is 13N. The two possible forces are
16. 3N and 10N C. 13N and 17N
17. 5N and 12N D. 13N and 30N
18. Which of the following would cause the production of hard x-rays?
19. Increasing current through ting sten filament
20. Increasing the distance between the cathode and target
21. Using heavy metal as a target
22. Increasing the p.d across the tube
23. A filament lamp is connected to a constant p.d of 240V. As the filament heats up, its resistance;
24. Decreases and current through it increases
25. Decreases and current through it decreases
26. Increases and current through it increases
27. Increases and current through it decreases
28. A cyclist travelling at a constant acceleration of 2ms-1 passes through two points A and B in a straight line. If the speed at A is 10ms-1 and the points are 75m apart, find the speed at B
29. 15.8ms-1 C. 20.0ms-1
30. 17.3m-1 D. 400.0ms-1
31. A ticker timer is connected to the main supply of frequency 40Hz. Find the time taken to point 5 consecutive dots.
32. 0.05s C. 0.10s
33. 0.08s D. 0.125s
34. The engine of a car of mass 1000kg provides a driving force of 1500N at a speed of 40ms-1. Find the power developed.
35. 1500Kw C. 40Kw
36. 60Kw D. 37.5Kw
37. The slope of a velocity time graph is the
38. Speed of the body
39. Velocity of the body
40. Acceleration of the body
41. Distance travelled by the body
42. The emf induced in a coil of wire rotating in the magnetic field depends on:
43. Speed of rotation of the coil
44. Number of turns in the coil
45. Strength of the magnetic field
46. (i) only C. (ii) and (iii)
47. (i) and (ii) only D. (i), (ii) and (iii)
48. A bird flying above water is seen by the fish, the position of the fish as seen by bird is
49. Slightly displaced upwards
50. Slightly displaced downwards
51. Slightly displaced side ways
52. Within the water
53. An electric bell is connected to a sealed gas jar and switch on what happens as air is removed from the jar?
54. The electric circuit stops working
55. The pitch of the bell decreases
56. The loudness of the bell decreases
57. The loudness of the bell increases
58. Which of the following affects the velocity ratio of an inclined plane.
59. Increase in the angle of inclination of the plane
60. Increase in the load being drawn up the plane
61. Increase in the effort applied to the load
62. Increase the length of the plane
63. Which of the can produce heating effect?
64. Expansion of a gas
65. Compression of a gas
66. Evaporation of a liquid
67. (i) only C. (iii) only
68. (ii) only D. (i), (ii) and (iii)
69. The length of a mercury column in a thermometer is 7.5cm in pure melting ice and 27.5cm in steam at 1000C. What does it read when the temperature is 400C.
70. 0.5cm B. 15.5cm C. 20.0cm D. 43.0cm
71. Two resistors of resistance 5Ω and 10Ω are connected in parallel. When current is passed through them, the power dissipated in a resistor of 5Ω is 40W. What is the power dissipated in a resistor of 10Ω?
72. 10W B. 20W C. 40W D. 80W
73. In an oil experiment to estimate the size of a molecule, 0.005cm3 of oil was dropped on lycopodium powder on a water surface. The mean diameter of the oil patch was 5cm. The thickness of a molecule of oil in;
74.  B.  C.  D. 
75. When a body is brought near the cap of a negatively charged electroscope a decrease in divergence is observed. This may mean that the body is
76. Positively charged
77. Negatively charged
78. A conductor
79. (i) ad (ii) only C. (i) only
80. (i) and (iii) only D. (iii) only
81. When a force of 30N is applied to a stationary ball, the ball moves through a distance of 10m in 20 seconds in the direction of the force. The average power developed by the ball is
82. 6.67W B. 7.5W C. 15W D. 60W
83. In a dry cell, the carbon powder
84. Acts as an electrolyte
85. Prevents polarization
86. Connects the carbon rod to zinc plate
87. Increases the conducting surface of the carbon rod
88. An electron beam is directed into a magnetic field as shown below

* **P**
* **R**

|  |
| --- |
| **N** |

**Electron beam**

|  |
| --- |
| **S** |

The beam will be directed

1. Downwards towards R
2. Upwards towards P
3. Into the paper
4. Out of the paper
5. The stability of a passenger bus is increased when the heave load in placed below the seats because the
6. Pressure on the types is increased
7. Total friction between the tyres and road is increased
8. Centre of gravity is raised
9. Centre of gravity is lowered
10. A convex mirror may be used as a
11. Driving mirror C. Magnifying glass
12. Shaving mirror D. Security mirror
13. Paints and dyes are regarded as impure because they;
14. absorb only one colour of light
15. reflect more than one colour of light
16. are produced by mixing many colours
17. are in form of solutions and powder.
18. A rectifier
19. Converts a.c to d.c
20. Converts d.c to a.c
21. Steps down a.c voltage
22. Steps down a.c voltage
23. A bullet of mass 80g is fired from a gun of mass 5kg with a velocity of 400ms-1. Calculate the recoil velocity of the gun.
24.  C. 
25.  D. 
26. The temperature of an ideal gas at which its molecules exertno pressure on the walls of the container is called.
27. Kelvin temperature
28. Thermodynamic scale
29. Absolute zero
30. Saturated temperature

**SECTION B**

41. (a) Define the term **evaporation** (1 mark)

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(b) Explain what happens to the temperature of a body when it sweats?(1 mark) ……………………………………………………………………………………………………… ……………………………………………………………………………………………………… ………………………………………………………………………………………………………

(c) 80cm3 of hydrogen is collected at 150C and 75 cm of mercury. What is its

volume at s.t.p (2 marks)

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42. (a) Define the term a **couple** with reference to forces (1 mark)

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(b) Nam two practical applications of the principle of moments. (1 mark)

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(c) A uniform half metre rule pivoted at the 10cm mark balances horizontally

when 150N is placed at the zero mark. Find the mass of the half metre

rule. (2 marks)

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43. (a) What is a **wave?**  (1 mark)

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(b) How is the frequency of vibration of an object related to the pitch of the

sound note produced. (1 mark)

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(c) A man standing 99m from the foot of tall wall claps his hands and hears

the echo 0.6 seconds later. Calculate the speed of sound in air. (2 marks)

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44. (a) What is meant by **terminal velocity.** (1 mark)

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(b) Draw a sketch of a velocity –line graph for a spherical body moving freely

in a column of oil (1 mark)

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(c) A piece of wax with iron embedded in it weighs 1.51N in air and 0.43N

when in water. Calculate the mass of the iron. (Density of iron 7.0g/cm3, Density of wax 20.95gcm-3) (2 marks)

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45. (a) Differentiate between ammeters and voltmeters in terms of their

construction. (1 mark)

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(c)Three identical cells of emf 1.5V and internal resistance of 0.5Ω are

connected as shown to a 1.25Ω fixed resistor.

**1.25Ω**

**K**

Find the ammeter reading when K is closed? (2 marks)

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46. (a) Give two reasons why a practical transformer cannot be ideal (1 mark)

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(b) Why is electricity transmitted at high voltages to distant places. (1 mark)

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(c) A transformer connected to 240V a.c supply delivers 9.0A at 80V to run a motor. If 10% of the energy taken from the supply is lost in the transformer.Find the current in primary coil. (2 mark)

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47. (a) State **one** application of a convex lens with an object between the

optical centre and focal point. (1 mark)

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(b) A transparent material has a refractive index of 1.333. Find its critical

angle? (2 marks)

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(c) State the nature of images formed in a pin-hole camera. (1 mark)

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48. (a) Define **tensile strain**  (1 mark)

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(b) Why is a hollow pipe preffered to a solid rod to support a heavy load?

(1 mark)

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(c) A wire of length 2m extends by 4mm when a load of 1500N is applied on it.

Find the strain in the wire (2 marks)

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49. (a) State the principle of conservation of energy? (1 mark)

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(b) Name **one** device used to transform mechanical energy to electrical energy.

(1 mark)

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(c) A water pump raises 5kg of water per second through a height of 20m.

Find its power rating. (2 marks)

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50. (a) What is a **radioactive** substance? (1 mark)

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(b) Name **two** medical uses of radio isotopes? (1 mark)

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(c) 80g of a radio isotope has a half-life of 6 days. Find the mass that decays

after 30 days. (2 marks)

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**END**