STANDARD HIGH SCHOOL – ZZANA

S.3 PHYSICS PAPER 1 SET TWO 2020

TIME: 2Hours

INSTRUCTIONS

- Section **A** contains **40** objectives type questions. You are required to circle the most correct answer **A**, **B**, **C**, **D**.
- Section **B** contains 5 structured questions.
- Answers are to be written in the space provided on the question paper.

Mathematical tables and silent non – programmable calculators maybe used.

Acceleration due to gravity g = $10ms^{-2}$.

- Forward scanned answer sheets to **stahiza2020@gmail.com**

SECTION A

1. The following are scalar quantities except.
   A. Mass
   B. Volume
   C. Weight
   D. Energy
2. By which process does smelly gas at the back of the laboratory spread throughout the room when released from its container?
   A. Osmosis
   B. Diffusion
   C. Expansion
   D. Capillarity
3. The speed of a car increases uniformly from $Okmh^{-1}$ to $72kmh^{-1}$ in 25seconds. What is the acceleration in ms^{-2}
   A. 7.2
   B. 3.6
   C. 2.9
   D. 0.8
4. Fig 1

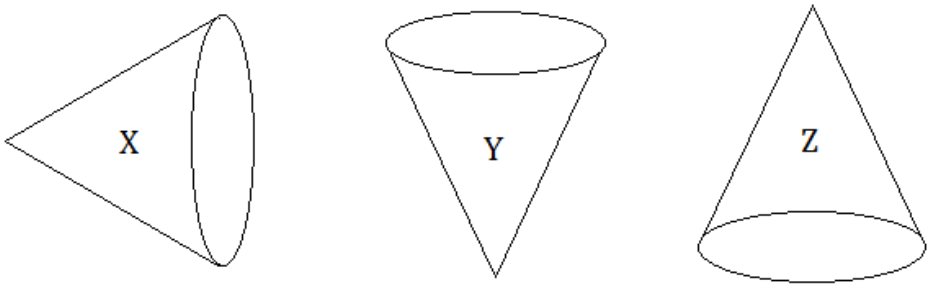


Figure 1 show shows a cone in three different positions which of the following arrangements correctly describes the type of stability.

	X	Y	Z
A	Unstable equilibrium	Neutral equilibrium	Stable equilibrium
B	Neutral equilibrium	Unstable equilibrium	Stable equilibrium
C	Stable equilibrium	Neutral equilibrium	Unstable equilibrium
D	Stable equilibrium	Unstable equilibrium	Neutral equilibrium

5. Calculate the pressure exerted on the ground by a car of mass 750kg in the area of contact with the ground of each tyre is $30cm^2$
   A. $2.25x10^6$ pa
   B. $6.25x10^5$ pa
   C. $4.0x10^4$ pa
   D. $2.5x10^4$ pa
6. Which of the following is a set of quantities which are described by both magnitude and direction?
   A. Speed, distant, mass, time.
   B. Displacement, velocity, force, electric field.
   C. Moment, acceleration, time, energy.
   D. Velocity, power, week, pressure.
7. A rectangular block of metal has length 0.5m and thickness 0.01m. Calculate its width if its mass is 0.365kg and density $7.3x10^3 kgm^{-3}$
   A. 0.01m
   B. 0.1m
   C. 1.0m
   D. 10m
8. Fig.2

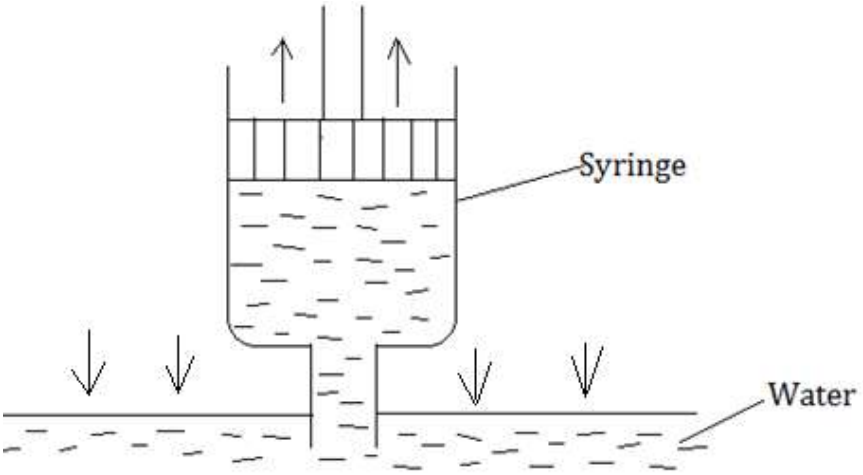


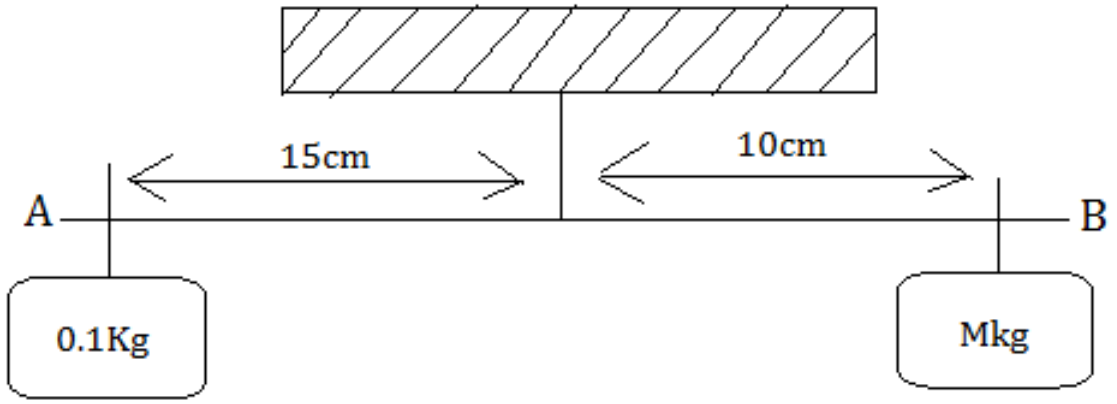
Figure 2 shows the principle of operation of a syringe which of the following best explains the observation.

A. When the piston is pushed down, atmospheric pressure acts upwards on the surface of the water.
B. When the piston is pulled upwards atmospheric pressure acts upwards on the surface of the water.
C. The upward stroke causes the barrel to be filled with air which prevents upward movement of water.
D. The down ward stroke pushes air out of the barrel so that on the upward stroke atmospheric pressure pushes water up the syringe.

9. An empty glass flash has a mass of 100g and volume 250cm^3. What will be its mass when full of liquid of density 950kgm^3
A. 380.0g
B. 363.2g
C. 337.5g
D. 237.5g

10. A newton is defined as:
A. unit of force
B. force which produces an acceleration of 1ms^{-2}.
C. force which gives a mass of 1kg an acceleration of 1ms^{-2}.
D. Force which produces an acceleration of any magnitude of a mass of 1kg.

11. AB is a uniform half meter rule of mass Mg balanced as shown in fig 3.



Find the value of M
A. 0.15kg B. 1.5kg C. 0.02kg D.0.03kg

12. Which of the following is NOT the same mass as others?
A. 10 Milligrams B. 100grams C.10^{-4}megagrams D. 10^{-1}kilograms

13. In an experiment to determine the size of an oil molecule by the oil drop method, one of the assumptions made is that oil molecules.
A. Are exactly small.
B. Dissolve in water.
C. Have low surface tension.

D. Spread until they form a single layer.

14. A block of mass 10kg accelerates uniformly at a rate of $3ms^{-2}$ along a horizontal table when a force of 40N acts on it. Find the friction force between the block and the table.
    A. 10N B.13.3N C. 30N D. 70N
15. A car of mass $1.5x10^{3}$kg climbs a hill in 900s. if the top of the hills is 50m above the starting point, find the average power output of the engine.
    A. 1380W B. 833W C. 5000W D. $7.50x10^{2}$W
16. The strength of magnetism can be maintained in the bar magnets by:
    A. Suspending them on strings and make them face east – west.
    B. Hammering them when they are facing east – west.
    C. Keeping them in pairs, and placing soft – iron pieces.
    D. Heating them when they are facing east – west
17. A spring has an unstretched length of 15.0cm and length of 15.6cm when a load of 3N is put at the bottom of the spring. The load on the spring when the stretched length is 15.8cm in Newton is……
    A. 10 B. 8 C. 4 D. 6
18. An effort of 100N moves a distance of 20m to raise a load of 800N through a height of 2m. Calculate the efficiency of the machine.
    A. 80% B. 20% C. 40% D. 60%
19. A ball of mass 0.2kg is dropped from a height of 20m. On impact with the ground, it loses 30J of energy. Calculate the height it reaches on rebound.
    A. 20m B. 10m C. 5m D. 40m
20. A rider on a horse back falls forward when the horse suddenly stops. This is due to…….
    A. Inertia of the horse
    B. Inertia of the rider
    C. Large weight of the horse
    D. Losing of the balance
21. The direction of the induced current in a conductor moving in a magnetic field can be predicted by applying……..
    A. Fleming's right-hand rule
    B. Fleming's left-hand rule
    C. Lenz's law
    D. Faraday's law
22. Fig 4 below shows three forces acting on a body. What is the net force on the body?

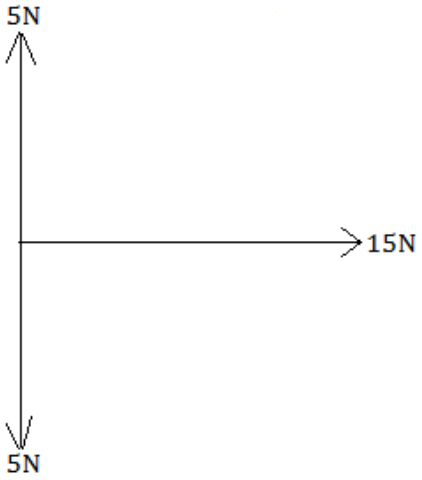
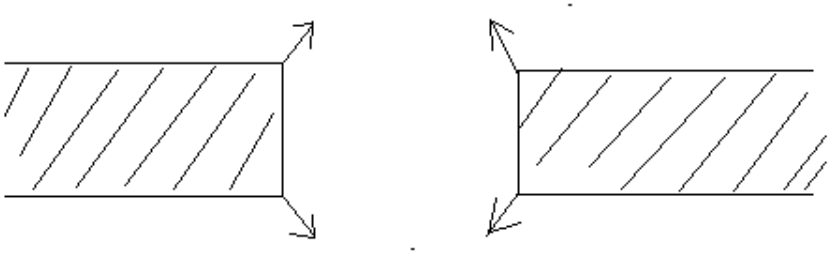


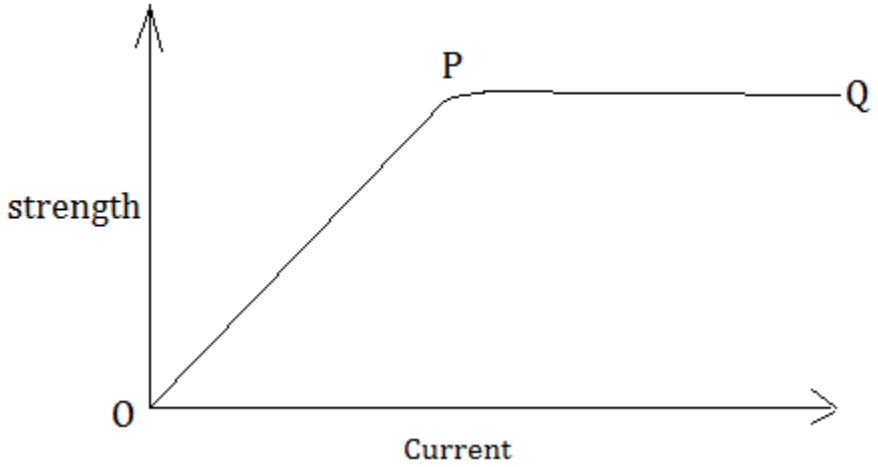
fig 4

23. Which of the following is a ferromagnetic material?
    A. Silver
    B. Diamond
    C. Iron
    D. Brass
24. The ability of a material to withstand an external force without breaking is called……
    A. Strength
    B. Ductility
    C. Stiffness
    D. Brittleness
25. Which of the following is true?
    A. Magnetic lines of force are concentric
    B. Like poles attract
    C. Magnetic lines of force cross at the neutral point
    D. A single pole cannot exist
26. Fig 5

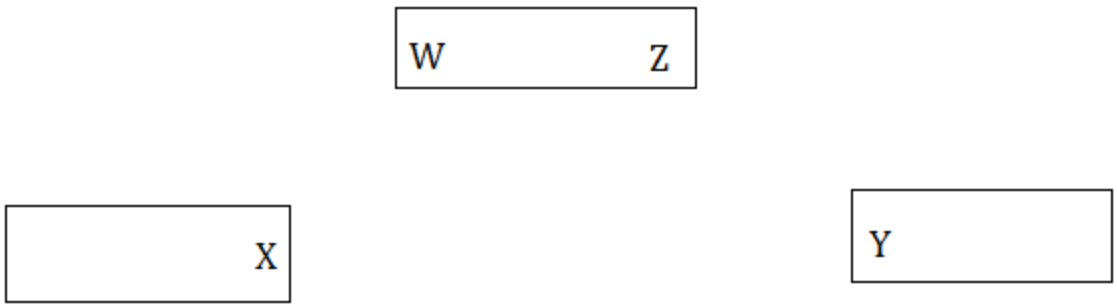


Which of the following have to be brought together to produce the magnetic field pattern shown in the above diagram.
    A. N – pole and S – pole
    B. N – pole and N – pole
    C. S – pole and S – pole
    D. S – pole and N – pole

27. When you look at yourself in a mirror you see an image of yourself. The image is…..
    A. On the surface of the mirror.
    B. A real image behind the mirror.
    C. An inverted virtual image.
    D. A virtual image behind the mirror.
28. Fig 6 below shows the strength of am electromagnet with a fixed number of turns of wire as a function of the steady current passing through the turns.



    Why can the strength of the electromagnet not be increased above the above the line PQ.
    A. The turns of wire get too hot.
    B. The current through the turns cannot be increased further.
    C. The small magnets (domains) within the core have been aligned by point P.
    D. The core gets too hot.
29. Solids are not easily compressed because their molecules,
    A. Are far apart
    B. Are closely packed
    C. Vibrate about their mean position.
    D. Have strong adhesive force between them.
30. The mercury thread is 13cm long at 93^0C. Find the temperature in degrees centigrade. (^{0}C) when the thread is 5cm long.
    A. 18.6 B. 28.0 C. 35.8 D. 241.8
31. The figure 7 shows a magnetic field pattern around magnetic poles. W, X, Y, and Z.



Which of the following is correct about the poles W, X, Y and Z.

A. X and Y repel each other and they are North poles
B. Z and Y attract each other and will have a neutral point between them.
C. X and Z repel each other and will have a neutral point between them.
D. Y and W repel each other and they are both North poles.

32. The object placed at the center of curvature of the concave mirror. The image is formed is.

A. Behind the mirror.
B. At the principal focus.
C. Between the centre of curvature and the principal focus.
D. At the center of curvature.

33. Which of the following is true about concave and convex mirror?

	Concave mirror	**Convex mirror**
A	Converges light	Diverges light
B	Diverges light	Converges light
C	Refracts light	Reflects light
D	Has a wide field of view	Has a narrow field of view

34. The focal length of a concave mirror is the

A. Distance between the pole of curvature and the mirror.
B. Distance between the centre of curvature and the mirror.
C. Distance between the object and the mirror
D. Diameter of the sun

35. A body which is accelerating

A. Experiences zero force
B. Decreases its velocity to zero
C. Travels with increasing velocity
D. Travels only in a straight line

36. Fig 8 shows a bent between

Which one f the following parts is under tension?

A. W
B. X
C. Y
D. Z

37. When a steel rod is stroked using a bar magnet, the

(i) rod attracts small steel pins
(ii) rod will be charged
(iii) magnet dispoles will be aligned

A. (i) only
B. (i) and (ii) only
C. (ii) and (iii) only
D. (i) and (iii) only

38. In an elastic collision

A. bodies move a common velocity
B. kinetic energy is not conserved
C. kinetic energy is conserved
D. bodies stick together

39. The recoil velocity of a gun will depend on:

(i) mass of the shell
(ii) muzzle velocity of shell
(iii) muzzle diameter of the gun
(iv) mass of the gun

A. (i) only
B. (iii) only
C. (ii) and (iii) only
D. (i), (ii) and (iv) only

40. A volt per ampere is equivalent to;

A. Watt
B. Coulomb
C. Joule
D. Ohm

SECTION B

Answer all questions in this section. All working must be shown clearly in the spaces provided.

41.(a) What are girders? (01mark)

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(b) State two ways of reducing the notch effect from spreading in a piece of wood. (01mark)

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(c) A mass of 10kg stretches a spring by 4cm. find the spring constant. (02marks)

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42.(a) What is a magnetic field? (01mark)

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(b) What is meant by magnetic saturation? (01mark)

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(c) Explain why a freely suspended bar magnet swings until it points North – South P. (02marks)

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43.(a) Define the joules. (01mark)

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(b) The work done to move a body through a distance of 5m is 30J. Find the force that acts on the body. (04marks)

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44.(a) What is meant by efficiency of a machine? (01marks)

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(b) Draw a single pulley system of velocity ratio 3. (03marks)

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(c) State one reason why the efficiency of a machine is always less than 100%

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45.(a) Define the following terms as applied to curved mirrors.

(i) The principal focus, F (01mark)

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(ii) The radius of curvature (r) (01mark)

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(iii) Aperture (½ mark)

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(b) Draw a ray diagram to determine the position of the image when the object is placed between C and F (Centre of curvature and the principal focus) and Determine the nature of the image formed using concave mirror.

(2 ½ marks)

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END