A BOO
., 1, Rangoli, Vas
akur Village, Kandivali
Mumbai - 400 101.
Mob. 9821263050.

BAI AVABAI F. PETIT GIRLS' HIGH SCHOOL

FIRST PRELIMINARY EXAMINATION (2018 – 2019)

SCIENCE (PAPER-1)

PHYSICS

STD: X **DATE: 28 .11. 2018**

MARKS: 80 **TIME: 2 Hrs. + 15 Mins. Reading Time.**

Answers to this Paper must be written on the paper provided separately.
*You will not be allowed to write during the first **15 minutes**.*
This time is to be spent in reading the question paper.
The time given at the head of this Paper is the time allowed for writing the answers.

---

*Attempt all questions from **Section I** and any **four** questions from **Section II**.*
The intended marks for the questions or parts of questions are given in the brackets [ ].

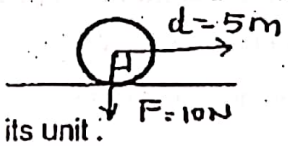
SECTION I (40 Marks)

Attempt *all* questions from this section

Question 1

(a) When will a force applied on a body produce a rotational effect? Give one example of it. [2]

(b) What will be the work done if a force 'F'=10N displaces an object by a distance 'd'=5m in the given direction as shown in the figure? [2]



(c) Define: Power of a lens. State its unit. [2]

(d) Show graphically two waves having the same loudness but different pitch. [2]

(e) What are superconductors? Give one example. [2]

Question 2

(a) A single fixed pulley of a well is used to lift a bucket of 1.8kg with an effort of 20N Find the mechanical advantage of the pulley ($g=10ms^{-1}$) [2]

(b) The critical angle of water is 48^0. Draw a diagram to depict it. [2]

(c) Name the part of the electromagnetic spectrum which has a frequency, a little above the visible range .State one use of the above. [2]

(d) The heat capacity of a vessel is $42JK^{-1}$. How much heat energy is required to raise its temperature from 10^0C to 20^0C ? [2]

(e) What fuse rating will you use for a device having a power rating of 2kW - 200V ? [2]

Scanned by CamScanner

Question 3

(a) i) What is the energy conversion in a biogas burner? [2]

ii) What is the commercial unit of electrical energy?

(b) A mass of 2 kg is thrown upwards on vertical journey with a velocity of $20ms^{-1}$. [2]
What is the total energy at its highest point? Also find out its total energy halfway through its journey. ($g=10ms^{-1}$)

(c) Arrange α, β, γ in: [2]

i) Decreasing order of their speeds.

ii) Increasing order of their ionization.

(d) Which colour light will deviate more on passing through a prism, green or orange? [2]
Why?

(e) Where will the centre of gravity lie for a very thin circular disc? Will the position of [2]
the centre of gravity change if a piece of the disc breaks off?

Question 4

(a) 200g of hot water at 80^0C is added to 300g of cold water at 10^0C. Calculate the final [2]
temperature of the mixture. Consider the amount of heat taken by the calorimeter to be negligible. (Specific heat capacity of water $=4200Jkg^{-1}K$)

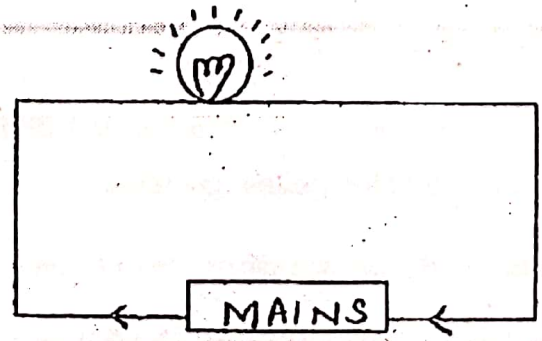
(b) i) What class of lever can have MA <,>,= 1 ? [2]

ii) Give one example of the above lever with M.A.=1

(c) A bulb of 100W -220V is connected across a 220 voltage supply .How much of [2]
energy will it consume in half an hour ? How much will it cost to run 5 similar bulbs if the rate per unit is ₹ 5 ?

(d) What are forced vibrations ? Give one example. [2]

(e) Redraw the circuit diagram after inserting a switch and fuse in the circuit [2]



AMBIKA BOOK DEPOT
Shop No. 1, Rangoli, Vasant Utsav,
Thakur Village, Kandivali (E),
Mumbai - 400 101.
Mob. 9821263050.

Scanned by CamScanner

Mumbai - 400 101.
Mob. 9821263050.

Section II (40 Marks)

Attempt any 4 questions from this Section

Question 5

(a) Draw a neat labelled diagram to show a block and tackle system of pulleys having a velocity ratio = 5 . [4]

i) Mark the load ,effort and tension.

ii) Find the effort required to lift 600kgf , if the efficiency of the pulley system is 80%.

(b) i) A car travels with a uniform velocity of $20ms^{-1}$ on a level road .If the power of the engine is 20kW , find the friction offered by the road . [3]

ii) How is watt different from watt hour?

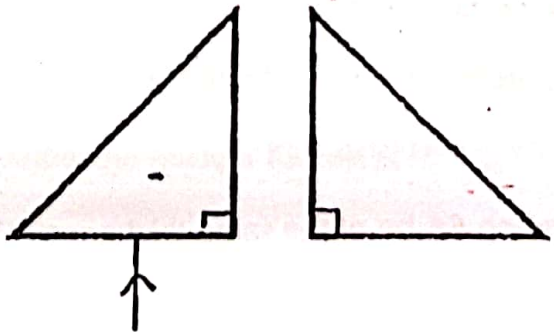
(c) On a 60 g uniform meter scale hinged at 40cm,two masses of 10g and 40 g are placed such that it remains horizontal The 10g is placed at 90m mark .What will be the position of the 40g mass ? Draw a diagram of the arrangement. [3]

Question 6

(a) The diagram below shows two isosceles right angled prisms with a ray of light incident on one prism as shown. [3]

i) Complete the path of the incident ray till it emerges from both the prisms.

ii) What is the total angle by which the ray gets deviated by both prisms together?



(b) Draw a diagram to show how a lens can be used as a slide projector. [3]

(c) i) Why is the colour red used in danger signals? [4]

ii) State one similarity and one difference between ultraviolet and infrared radiations.

Scanned by CamScanner

Question 7

(a) i) Two sound waves have the same frequency and amplitudes 1m & 4m respectively. Compare their : pitch and loudness [4]

ii) Calculate the wavelength of an electromagnetic wave of frequency 15 MHz.

(b) Sometimes when a vehicle is driven, a rattling sound is heard. [3]

i) Give the name of the phenomenon taking place.

ii) Explain briefly why this happens.

iii) Suggest one way by which rattling could be stopped.

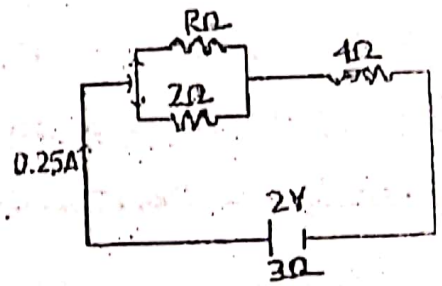
(c) i) Name the part of an electric appliance which is earthed. [3]

ii) What is the material used for the earthing wire?

iii) What is the potential of the earthing wire?

Question 8

(a) The circuit alongside shows three resistance 2Ω, 4Ω and RΩ connected to a battery of emf 2V and internal resistance 3Ω. A main current of 0.25A flows through the circuit: Calculate [4]



i).p.d across the internal resistance of the cell.

ii) Calculate the value of 'R'.

iii) What is the terminal voltage?

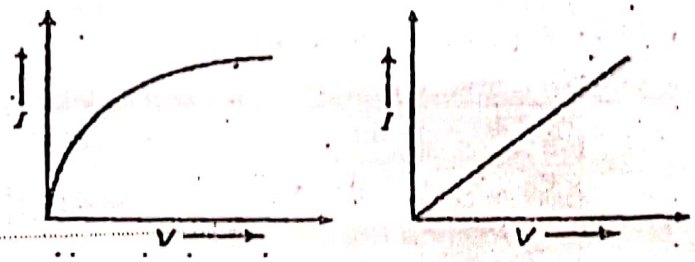
(b) 'A fuse for an oven has a rating of 20 A' [4]

i) Explain the above statement.

ii) What are the properties of a fuse wire?

iii)Will a fuse wire of rating 5A be of the same thickness? Explain

(c) [2]



i) Distinguish between the V-I graphs shown (two points)

AMBIKA BOOK DEPOT
Shop No. 1, Rangoli, Vasant Utsav,
Thakur Village, Kandivali (E),
Mumbai - 400 101.
Mob. 9821263050.

Scanned by CamScanner

Thakur Village, Kandivali (E),
Mumbai - 400 101.
Mob. 9821263050.

Question 9

(a) In a laboratory experiment for finding specific latent heat of ice,100 g of water at 30 °C was taken in calorimeter made of copper and of mass 10 g. When 10 g of ice at 0 °C was added to the mixture and kept within the liquid till the ice melted completely, the final temperature of the mixture was found to be 20 °C. [4]

Calculate specific latent heat of ice;

(Specific heat capacity of water and copper being 4.2 J/g °C and 0.4 J/g °C respectively)

(b) i) Explain why the surroundings become pleasantly warm when water in a lake starts freezing in cold countries. [3]

ii) The specific latent heat of melting of ice is 336J/g,Explain the statement.

(c) i) What are isobars? [3]

ii)The isotope of uranium $^{238}U_{92}$ decays by an alpha emission to an isotope of thorium (Th). The thorium isotope decays by a beta emission to an isotope of Protactinium (Pa). Write down the equations to represent these two nuclear changes.

Question 10

(a) i) What is nuclear fission ? State one use of it [3]

ii) Write an expression to show the nuclear fission of $^{235}U_{92}$

(b) i)Distinguish between nuclear fusion and nuclear fission(2 points) [4]

ii) Name the unit generally used to express the energy given out due to nuclear reactions.

iii) State one safe way in which you can dispose off radioactive waste.

(c) i) Name the most harmful of the radioactive radiations. Explain why. [3]

ii) How are ultra violet ways detected?

Scanned by CamScanner