RBK School, Mira Road
(Managed by Babubhai Kanaiya Education Trust)
School Code: MA069

SECOND PRELIM EXAM 18-19

Std: X

Date: 7/1/19

Subject: PHYSICS

Marks: 80

Dur. : 2 Hrs

SECTION A

(ALL QUESTIONS IN THIS SECTION ARE COMPULSORY)

Question 1

a) What does Flemings Right Hand rule help us determine? 2

b) Calculate the kinetic energy of a body of mass 100g and having momentum of 20kgm/s . 2

c) Why are the cutting edges of a metal cutter smaller than the cutting edges of scissors. 2

d) Draw a labelled sketch of a class II lever. Which part of the human body exhibits this kind of lever? 2

e) 10 bulbs of 100W each are connected in parallel to 200V main supply. Find the resistance of each bulb. 2

Question 2

a) Name the physical quantity measured in terms of Horse power. Express an horse power in terms of the SI unit of the quantity. 2

b) . Define temperature .State its SI unit. 2

c) A pulley system consist of 5 pulleys, state the combination of pulleys you would consider to obtain the value of MA, i) equal to the no. of pulleys, ii) greater than the no. of pulleys. 2

d) Name the high energetic wave of the invisible spectrum which helps in the study of the structure of crystals. State an additional use of the wave mentioned. 2

e) A 2cm long object is placed at a distance of 30cm from a concave lens of focal length of 10cm.Find the size and nature of the image. 2

Question 3

a) Define Refractive index with respect to Snell's law. 2

b) Why is the colour red used as a sign of danger ? 2

c) What is the effect of pressure on, i) the boiling point and ii) the melting point of a substance. 2

d) With reference to the terms MA, VR and Efficiency of a machine, name the term that will not change for a machine of a given design. Define the term mentioned. 2

e) Draw a neat and labelled diagram of the transformer used at the grid station of a power generating complex. 2

Question 4

a) Which of the two cables, one of 2A and other of 10A will be thicker and why? 2

b) In an insulated calorimeter how is heat loss by i) convection and ii) radiation prevented. 2

c) What is the purpose of a fuse in an electrical circuit ? 2

d) An isotope $^{233}Y_{90}$ undergoes radioactive decay emitting first an α particle and then a β particle. Write down the mass number and atomic number of the final product. 2

e) State Ohm's law. 2

SECTION B

(ATTEMPT ONLY FOUR OF THE QUESTIONS IN THIS SECTION)

Question 5

a) State the factors on which the magnitude of the Lorentz force depends. 3

b) Find the cost of operating an electric toaster for two hours if it draws 8A current on a 110 volt circuit. The cost of electrical energy is Rs.2.50kWh. 3

c) i) What are 'superconductors'. Give an example.

ii) Mention the factors affecting the resistivity of a substance. 4

Question 6

a) A converging lens is used to obtain an image of an object placed in front of it. The inverted image is formed between F_2 and $2F_2$ of the lens.

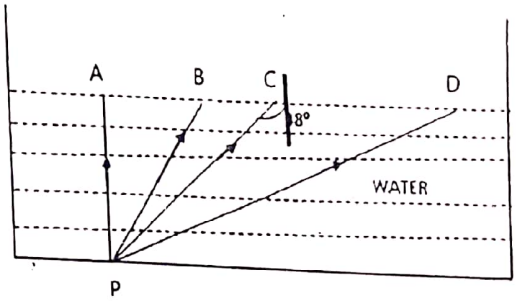
1.Where is the object placed?

2.Draw a ray diagram to illustrate the formation of the image obtained. 3

b) An object 1.4cm high when placed in front of a convex lens at a distance of 6cm,forms a virtual image at a distance of 24cm from the lens.

Calculate i) the focal length ii) the size of the image. 3

c) The diagram below shows a point source inside a water container. Four rays A,B,C,D starting from P are shown .Copy and complete to show the path of these rays after striking the water surface. 4



48°

Question 7

a) State the energy possessed in the following:

i) A wound up watch spring , ii) a vibrating body, iii) fossil fuels. 3

b) Justify the amount of work done by the force of gravity on a body of mass *m* ,

i) when it is thrown upwards to a height *h*. ii) a free fall of the body from the same height. 3

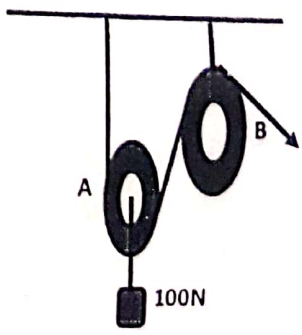
c) Diagram shows a pulley system. Copy and, 4

i) Mark the direction of force due to tension.

ii) What is the purpose of the pulley B

iii) Assuming Efficiency =100%, what is the MA?

iv) Calculate the effort E.



Question 8

a) Define Nuclear Fusion. Write the reaction to show its occurrence in the core of the Sun . 3

b) i) Name the radioactive radiations which have the least penetrating power.

ii) A nucleus , $^{202}J_{84}$,emits an alpha particle and forms the nucleus Y. Represent this change in the form of an equation. 3

c) i) State two advantage of AC over a DC source.

ii) A radioactive substance is oxidized. What change would you expect to take place in its radioactivity and why? 4

Question 9

a) i) Name the type of waves used in sound ranging.

ii) Why are these waves as mentioned not audible to us?

iii) Give one use of sound ranging. 3

b) List 3 points of difference between Mechanical and electromagnetic waves. 3

c) i) Draw a displacement –time graph for a body executing free vibrations. Where can a body execute these vibrations?

ii) A man stands at a distance of 68m from a cliff and fires a gun. After what time interval will he hear the echo, if speed of sound in air is 340m/s? 4

Question10

a) i) Explain why farmers fill their fields with water in cold countries. 3

ii) What is meant by the statement,' the heat capacity of a substance is 50 J/K'.

b) 200g of hot water at 80^0C is added to 300g of cold water at 10^0 C. Calculate the final temperature of the mixture of water. Consider the heat taken by the container to be negligible. (Specific heat capacity of water is 4200Jkg^{-1} ^{0}C^{-1}) 3

c) Draw a temperature –time graph to represent the change in phases when 1kg of ice at 0°C is heated at a constant rate and its temperature is noted after every 30s till steam is formed at 100°C. Label the phases in the graph. 4