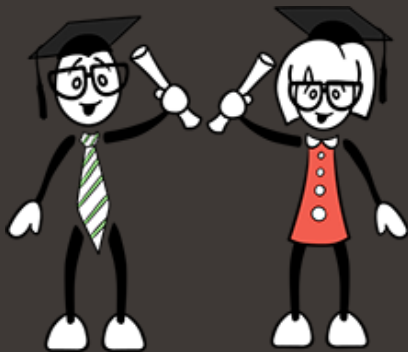# exam18
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exam 18

GREENLAWNS HIGH SCHOOL
PRELIMINARY EXAMINATION YEAR

SUBJECT : PHYSICS   CLASS : X
TIME : 2 HOURS   MARKS : 80

Note - Answers to this paper must be written on the paper provided separately. You will not be, allowed to write during the first 10 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. Section I is compulsory. Attempt any 4 questions from Section II. The intended marks for questions are given in the bracket (   ).

Section I (40 Marks) Compulsory.

Question 1

Q 1 A) If 'm' is the mass of a body, 'v' its velocity & 'p' the momentum then write a
relationship between change in momentum, mass & velocity of the body when -
i. 'v' is almost equal to 'c'. the velocity of light.
ii. 'v' is very less as compared to 'c' the velocity of light.

B) State the energy changes that take place in the following when they are in use.
i) A photovoltaic cell
ii) A thermocouple
C) A person having myopic eye uses a concave lens of focal length 50cm. What is the power of the lens?
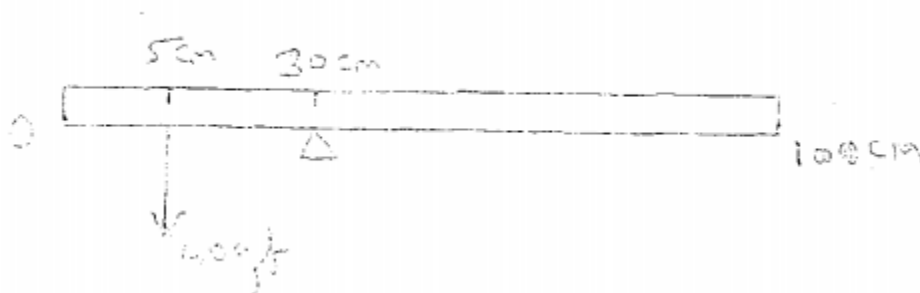
D) Fill in the blanks:

When a beam of white light enters a prism _____ and _____ take
Place at the first & second of it respectively.

E) What is resistance offered by a 100 W bulb if the line voltage is 220V

Question 2

A) A uniform metre rule is in equilibrium position as shown in the diagram below Calculate the mass of
the metre rule.

B) Copy & complete the following diagram to show the path of ray of monochromatic light as it enters & emerges out prism. Mark the angles wherever necessary.　　　($\angle = 42°$)
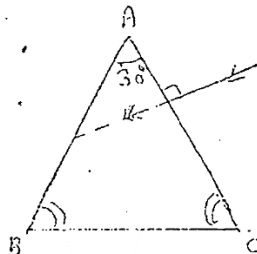
C) It is said that work done by a machine is always less than the works done the machine, then what is the use of the machine?　(Give 2 points)

D) State two ways how electromagnet can be made stronger.

Question 3
a) Calculate the kinetic energy of a body of mass 0.1 kg & momentum 40kg ms/s.
b)　State the factor which determines: -
　　i) Loudness of sound heard.
　　ii) quality of note.
c)　Choose the correct option.

　　i) According to new convention, the neutral wire is _____.
　　　a) Red b) brown c) light blue d) green

　　ii) The other way of writing AV^{-1} is _____.
　　　a) ohm b) mho^{-1} c) siemen d) coulomb

d)　Define specific heat capacity & give its SI unit.
e)　The nucleus of element X (Atomic number 92 & atomic mass number 335)emits 2ce & 3β particles. The final nucleus is Y. Find a & b.

Question 4
a.　Distinguish between A.C generator & D.C motor (Give any 2 points)
b.　Why are infrared radiations preferred over ordinary visible light for taking photographs in fog?

c) Gear P & Q are used in combination for an experiment. Suggest which should be used as driving gear & which one should as a driven fear for obtaining the following results.
 i) Gain in speed ii) Gain in torque
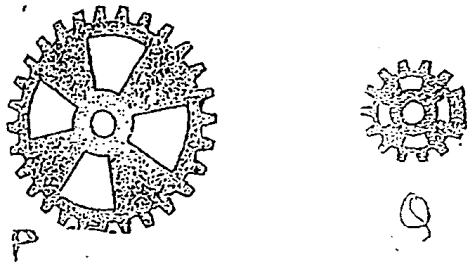
d) If a rat & an elephant both run with the same kinetic energy, who will win the race? Why?
e) In terms of radioactivity state which of the emissions are
    i) the most ionizing
    ii) Not deflected by electric or magnetic field.

Section II
Attempt any 4 questions from this section.

Q.5   (3+3+4)

a) The refractive index of air with respect to glass is defined as $\mu = \frac{\sin i}{\sin r}$
    i) Write down a similar expression for μ in terms of angles i & r.
    ii) In Q5- I above if ∠r= 90°, what is corresponding ∠ i called.
    iii) What is the physical significance of ∠ I as in the part Q 5 ii above.
b) Draw a neat labelled diagram of combination of pulleys using one fixed pulley & other movable pulleys having mechanical advantage = 4. Show the directions of load, effort & tension in each strand.
    How much is the effort in equilibrium position for the same system?

c) A 30g ice cube of 0° C is dropped into 100g of water at 30°C. Calculate the final temperature of water when the whole ice cube melted. Latent heat of ice = 80 calg⁻¹,specific heat capacity of water = 1 calg⁻¹ °C⁻¹

Question 5

a) Observe the figure given below. If the resistance between A & B is 4Ω, find the value of R.
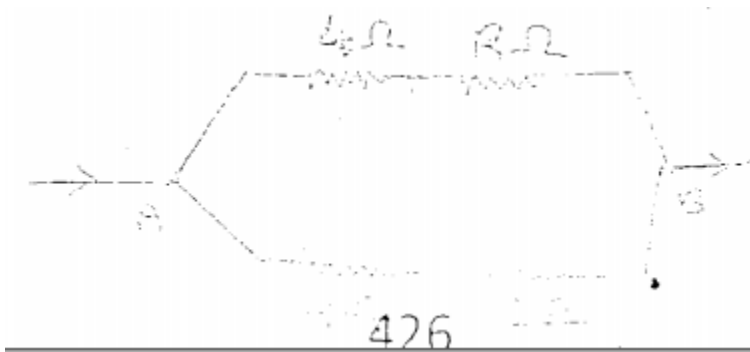
b) The diagram shows a vibrating tuning fork. It takes $\frac{1}{156}$th of second the move from A to B. Find

   i) Time period of the wave
   ii) Frequency of the wave
   iii) Is the wave audible to us?
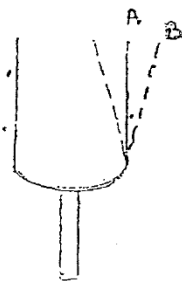
C) i) Give any 2 factors affecting thermionic emission.
   ii) Give any 2 examples of the ground radiations.

Question 7

a) Classify the following pairs of elements in Isotone, Isotope & Isobar.

   i) $^{23}_{11}Na$ $^{23}_{12}Mg$

   ii) $^{235}_{92}U$ $^{232}_{92}U$

   iii) $^{23}_{11}Na$ $^{24}_{12}Mg$
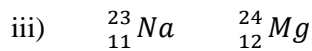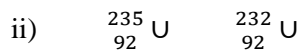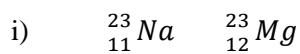
b) Observe the circuit diagram given below & calculate the reading of A when
   i) K is opened
   ii) K is closed
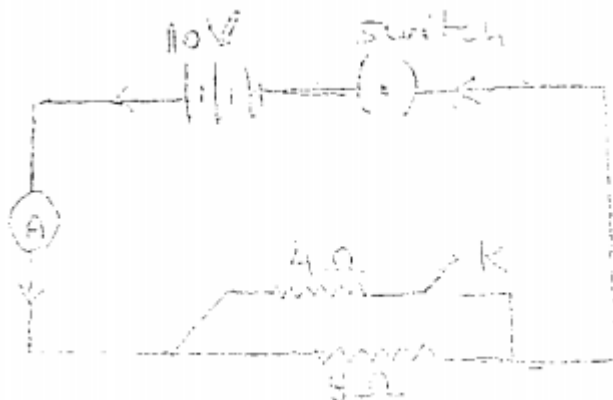
C)   i) Draw a ray diagram to show how a converging lens can form an image beyond $2F_2$
        ii) Write the nature & the size of the image formed in Q7 C –j.

Question8   (3+3+)

a)   Briefly explain a quality/property of any 3 materials that surround a calorimeter, which reduce the heat transfer.

b)   Give scientific reasons.
        1.   A couple is needed while tightening the cap of an inkpot.
        2.   The base of an electric iron is made thick.
        3.   The sky appears black in the absence of atmosphere.

c)   Observe the diagram given below & answer the questions that follow.
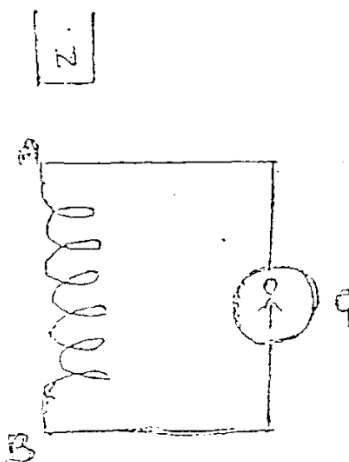
i) What will you observe when: -
        a) the magnet is dropped into the coil.
        b) the number of turns of the coil is increase?
ii) What will be the direction of current flowing through the coil when the magnet is dropped in?
iii) State the law which explains this observation.

Question 9 (3+3+4)

a) Draw a neat labelled ray diagram to show the real & apparent position of an air bubble that is trapped in a rectangular glass block when it is viewed from directly above.

From your diagram write an expression that gives refractive index of this glass block.

b) State any three properties that are common to & shown by both beta rays & cathode rays.

c) i) Sometimes when a vehicle is driven, a rattling sound is heard. Explain briefly why this happens

   ii) Give the name of the phenomenon taking place.

   iii) Suggest one way by which rattling could be stopped

Question 10

a) The figure given below shows a monochromatic ray of light entering a glass block from air. Which figure is accurate? Why? Also name the phenomenon shown in the figure.
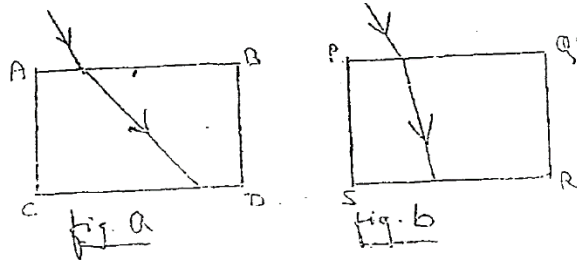
b) Tom fires a gun towards a hill & hears its echo after 5 second. He then moves 320 m towards the hill & fires his gun again. This time he learns he hears the echo after 3 second. Calculate the velocity of sound

c) Define
   i) Dispersion
   ii) Super conductor
   iii) Global warming
   iv) Thermionic emission

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