

**GREENLAWNS HIGH SCHOOL
TERMINAL EXAMINATION 2017-18**

**SUB : PHYSICS
TIME : 2 HOURS**

**CLASS : X
MARKS : 80**

Note: Do not write during the first ten minutes. Use this time to read this paper and plan your work. The two hours at the head of these ten minutes is for answering this paper. Be neat, concise and use scientific terms when needed. Omission of essential working will result in the loss of marks. The intended marks for questions or parts of questions are given in brackets.

Section I is compulsory

Section II Attempt any 4 complete questions.

Section I – 40 marks

All questions in this section are compulsory.

[2 x 5]

Q.1 A . Define the moment of couple. Write its SI unit

B) An electric motor of power 0.2kW is used to drive the stirrer in a water bath. If 65% of the energy supplied by the motor is spent in stirring the water. Calculate the work done on the water in 2 minutes.

C) State any two factors affecting the internal resistance of a cell.

D) How will you turn the path of ray of light using a prism in order to use it in a binocular & camera

E) State the work energy theorem and give its mathematical expression.

Q.2. A) Name the rule to determine the direction of the-

[2 x 5]

i) force experienced by a straight conductor carrying current placed in a magnetic field which is perpendicular to it.

ii) current induced in a circuit by the changing magnetic flux due to the motion of a magnet.

B) State the transformation of energy taking place in i- Electroplating, ii-Steam engine.

C) Name the subjective property of sound related to its frequency & of light related to its wavelength.

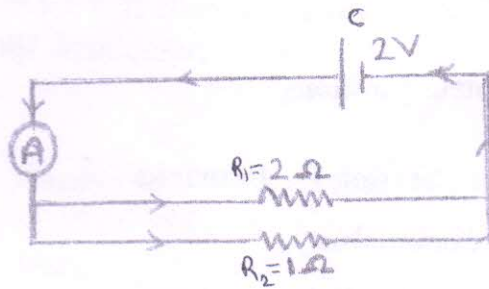
D) Define – Power of a lens. How will you distinguish two lenses having power of lens of same magnitude?

E) What do you mean by an electromagnetic spectrum? Arrange the electromagnetic spectrum before the visible light in decreasing order of their frequencies.

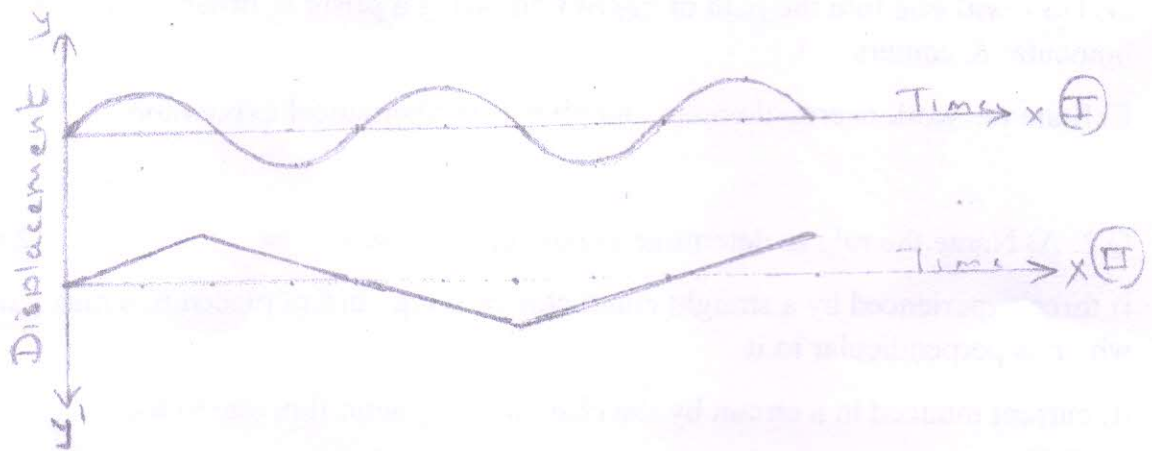
Q.3 A) State two conditions necessary for a ray of light to pass undeviated [2 x 5] when it passes from one transparent medium to the other transparent medium.

B) Which radiations are preferred over ordinary visible light for taking photographs in fog? Why?

C) In the circuit diagram given below calculate the reading shown by the ammeter A.



D) Observe the diagram given below and comment on the pitch and frequency of two wave forms.



E) Draw a diagram of single pulley system for each where i) Mechanical advantage > 1
ii) mechanical advantage < 1

Q.4. A) Name the lens for which magnification can be one. For what position [2 x 5] of the object will the magnification be one?

- B) The voltage applied to a given rheostat is made four times its initial value. By what factor will the resistance of the rheostat change? Justify your answer.
- C) Two identical guitars are played by two person to give notes of the same pitch and loudness. Will they differ in quality? Give reason.
- D) State when the moment of force is positive and when it is negative?
- E) A monochromatic point source of light 'X' is viewed by an observer through a prism 'P' as shown in the figure. Complete the diagram to show the image formed by the prism and as seen by the observer. Label the image by the letter 'I'.

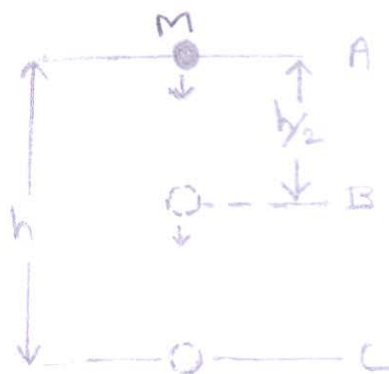


Section - II

Attempt any 4 complete questions from this section .

Q.5. Observer the diagram and answer the following questions. [3]

- A) An apple of mass 'M' falls freely under gravity from a height 'h'
- i) Write an expression for its mechanical energy at point B which is at a distance of $h/2$ from A.
- ii) What can you say about the total energy at points A & C.
- iii) Name an important principle demonstrated in this example.



B) A lighted candle is placed in front of a thick plane mirror and viewed obliquely [3]

i) How many images will be formed?

ii) Which image is the brightest? Why?

C) i) Name the radiations of an electromagnetic spectrum having frequency range [4]

3×10^{16} Hz to 7.5×10^{14} Hz.

ii) Name the material of prism required for obtaining the spectrum of radiations mentioned by you in Q 5 C – i.

iii) Also give any two uses of these radiations.

Q.6.

A) Find the cost of operating on electric toaster for two hours if it draws 8A [3]

current on a 110V circuit. The cost of electric energy is Rs. 2.50 per kWh.

B) Give scientific reasons. [3]

1) The sound produced by an aeroplane is considered as noise.

2) The sky at noon appears white

3) Two lenses of same material can have different focal lengths.

C) A man fires a gun and hears its echo after 5 s. The man then moves 310 m [4]
towards the hill and fires his gun again. This time he hears the echo after 3s.

Calculate the speed of sound.

Q.7.

A) What should be the length of a nickel wire of area of cross section 3mm^2 [3]
used for making a rheostat of 750Ω ?

[specific resistance of nickel = $6.9 \times 10^{-8} \Omega\text{m}$] Also find its conductivity.

B) Can a foot treadle be used to obtain gain in force? Why? [3]

C) Define [4]

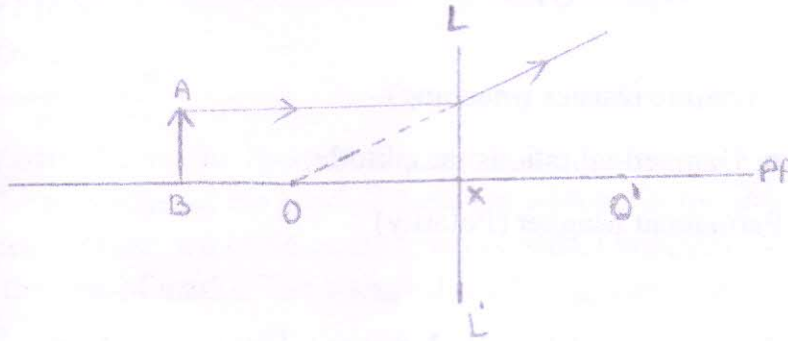
i) Efficiency of a machine

ii) Dispersion

iii) Superconductor

iv) Echo

Q.8 A) Study the figure given below and answer the questions that follow. [3]



- i) Name the lens LL'
- ii) What are the points O & O' called?
- iii) Copy the figure in your answersheet and complete it to form the image of the object AB .

B) How are the household electric appliances connected with the mains, in series [3] or in parallel? Why? (Give 2 points)

C) i) Name two safety devices which are connected to the live wire of a household electric circuit. [4]

ii) Give one important function of each of these two devices.

Q.9.

A) A person is tuning his radio set to a particular station. [3]

- i) What is the person trying to do to tune it?
- ii) Name the phenomenon involved in tuning the ratio set.
- iii) Define the above phenomenon.

B) Two resistances 4Ω & 6Ω are connected in series. The combination is connected with a battery of e.m.f $6V$ & negligible internal resistance. Calculate the heat produced per minute in each resistor. [3]

C) i) State two conditions necessary for the total internal reflection. [4]

ii) Give two reasons of using a total reflecting prism as a reflector in place of a plane mirror.

Q.10.

A) Distinguish between the following pairs on the basis of what is given in the brackets. [3]

- i) Ohmic resistor & non ohmic resistor (meaning)
- ii) Natural vibrations & Damped vibrations (amplitude)
- iii) Electromagnet & Permanent Magnet (Polarity)

B) A convex lens of focal length 10 cm is placed at a distance of 12 cm from a wall. How far from the lens should an object be placed so as to form its image on the wall? Also describe the image formed in terms of nature & its size. [3]

C) A pulley system with a velocity ratio of 4 is used to lift a load of 250 kgf through a vertical height of 30 m. The effort required is 50 kgf in the downward direction. Calculate. [4]

- i) the distance moved by the effort
- ii) the work done by the effort
- iii) the mechanical advantage
- iv) the efficiency of the pulley system.