

For more sample papers visit : [www.4ono.com](http://www.4ono.com)



ST. JOHN'S UNIVERSAL  
FIRST PRELIM EXAMINATION

PHYSICS  
Science Paper - 1  
Grade X  
Two hours

DATE: 10/11/14

MARKS: 80

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

Section I is compulsory. Attempt any four questions from Section II. The intended marks for questions or parts of questions are given in brackets [ ].

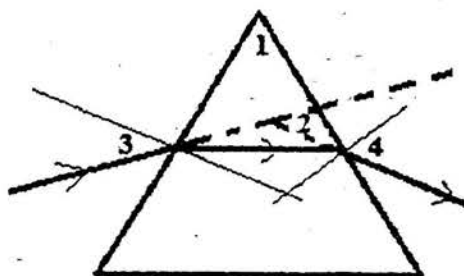
SECTION I (40 marks)  
(All questions are compulsory)

Question 1

- Define gravitational unit of weight. [2]
- State two points of distinction between single fixed and single movable pulley [2]
- Can the light passing from air to water suffer total internal reflection? Why? [2]
- State two points of distinction between loudness and intensity of sound. [2]
- The power generating station electric power is generated at 11 KV, however it is transmitted over long distance at 132 KV. Explain. [2]

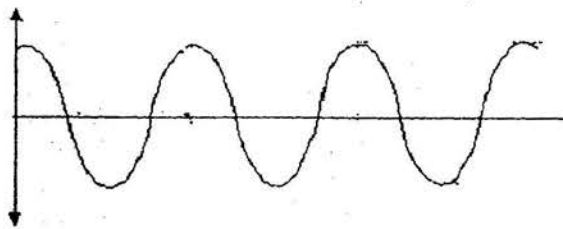
Question 2

- State the energy transformation in an A.C generator and D.C motor. [2]
- The following are examples of levers. State the class of levers to which each one belongs [2]
  - Scissors
  - Nut cracker
  - Sugar tongs.
  - pliers.
- State one application of convex lens when object is placed (i) at  $2F$  and (ii) between  $F$  and  $2F$ . [2]
- Why is calorimeter made of thin sheet of copper? [2]
- The diagram below shows a ray of light passing through a prism. Name the angles labelled as 1, 2, 3 and 4. [2]

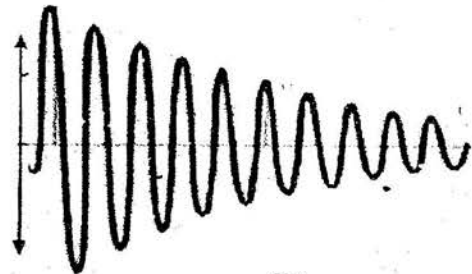


**Question 3**

- a. Give two points of difference between centripetal force and centrifugal force. [2]  
 b. What are the essential properties of a good thermionic emitter? [2]  
 c. Find the time taken by 500W heater to raise the temperature of 50kg of material of specific heat capacity  $960 \text{ J kg}^{-1}\text{K}^{-1}$  from  $18^\circ\text{C}$  to  $38^\circ\text{C}$ . [2]  
 d. Why are the metal pins of the plug split in the middle? [2]  
 e. The diagram below is a displacement – time graph of a vibrating body. [2]



(A)



(B)

- (i) Identify these vibrations  
 (ii) State one point of difference.

**Question 4**

- (i) ~~What is the function of a deflecting system in the hot cathode ray tube?~~  
 (ii) Observe the following table and pick a good thermionic emitter. Give reason for your answer.

| Metal | Work function in eV |
|-------|---------------------|
| X     | 4.27                |
| Y     | 1.89                |
| Z     | 3.03                |

- b. State two point of difference between e.m.f of a cell and terminal potential difference. [2]  
 c. Explain with the help of a graph the dependence of angle of deviation on angle of incidence. [2]  
 d. A lever of 80cm is used to lift a load of 80gf places at 60 cm. If the fulcrum is at one end and effort is applied at other end find the effort required. Which class does this lever belong to? [2]  
 e. Give one advantage and one disadvantage of nuclear energy. [2]

**Section II (40 marks)**

(Attempt any four questions from this section)

**Question 5**

- a. For an electromagnet  
 (i) give one similarity with a bar magnet  
 (ii) one way to increase the strength of its magnetic field.  
 (iii) give one use. [3]

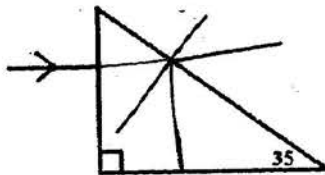
- b. (i) While celebrating Diwali, Raj observed that there is a small time interval between seeing the fireworks in the sky and listening to their sound. What is the reason for Raj observation?  
 (ii) Give one more point of difference between the two phenomenon.  
 (iii) State one subjective property of sound which depends upon its waveform. [3]
- c. (i) Define the term resistivity and state its S.I unit.  
 (ii) A wire 10cm long has resistance  $30 \Omega$ , calculate the change resistance and resistivity if the wire is stretched to 30 cm. [4]

### Question 6

- a. (i) When  ${}^{235}_{92}\text{U}$  undergoes radioactive disintegration by emitting 8 alpha particles and 4 beta particles. Express the above in an equation.  
 (ii) Arrange alpha particle, beta particle and gamma ray in the descending order of their ionising power. [3]
- b. (i) To which wire the switch should be connected? Explain  
 (ii) Give the colour coding according to new convention for Live and Neutral wire. [3]
- c. 45g of water at  $50^\circ\text{C}$  in a beaker is cooled when 50 g of copper at  $18^\circ\text{C}$  is added to it. The contents are stirred till a final temperature is reached. Calculate this final temperature. The specific heat capacity of copper is  $0.39 \text{ J g}^{-1} \text{ K}^{-1}$  and that of water is  $4.2 \text{ J g}^{-1} \text{ K}^{-1}$ . State the assumption used. [4]

### Question 7

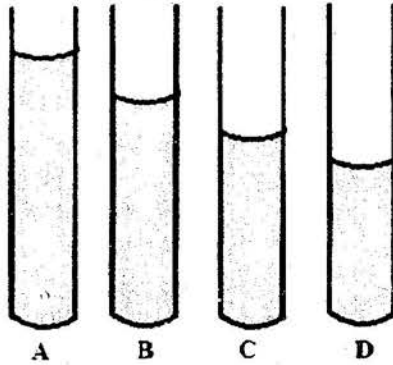
- a. Name the following  
 (i) These waves are produced by klystron tubes.  
 (ii) These waves have the highest frequency in the electromagnetic spectrum.  
 (iii) These waves are detected as other objects are seen in their presence. [3]
- b. (i) Define the unit with which the power of a lens is measured.  
 (ii) How can the magnifying power of a microscope be increased? [3]
- c. Complete the following diagram. Explain the phenomenon which is involved in the diagram. [4]



### Question 8

- a. Draw a block and tackle pulley with 5 pulley and having V.R. = 5.  
 If the efficiency of the system is 80%, find the effort required to lift a load of 40N. [3]
- The following diagram shows four test tubes each 20 cm long. In A, B and D water is filled up to 17 cm, 15 cm, 11 cm and 8 cm.  
 If a vibrating tuning fork is placed over the mouth of test tube A, a loud sound is heard.

- (i) Describe the observation in test tube B, C and D when the vibrating tuning fork is placed over the mouth of these tubes.
- (ii) State the condition for the phenomenon observed. [3]

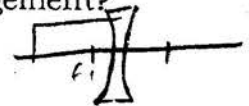


- c. State the principle of conservation of energy. Also prove theoretically that for a freely falling body the total mechanical energy is constant. [4]

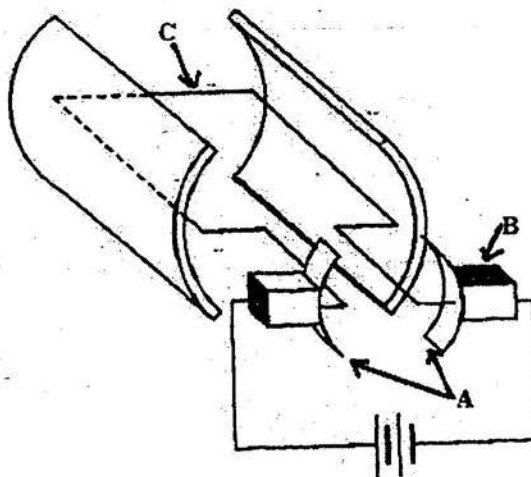
### Question 9

- a. (i) Give one example of a body having constant speed, though acceleration is present.
- (ii) State one point of difference between centrifugal force and centripetal force. *resman forced ob*
- (iii) Draw a diagram of path followed by a body attached to a string, performing circular motion when the string breaks. [3]

- b. A concave lens of focal length 20 cm is placed at a distance of 50 cm from an object of size 15 cm. Draw a ray diagram to show the position and nature of the image formed. What is the application of this arrangement? (Scale 5 cm = 1 cm) [3]

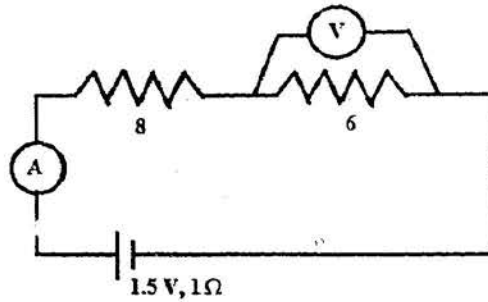


- c. (i) Identify and name the electrical device shown in the diagram.
- (ii) Identify and name the part labelled B and C
- (iii) State the function of the part labelled A.
- (iv) State the law which determines the direction of force experienced by C. [4]



**Question 10**

- a. Explain why the colour of sky is different during different time of the day. [3]  
 b. What is an ideal machine? Why is a machine not 100% efficient in practice? [3]  
 c. (i) In the following diagram, find the reading in A and V.



- (ii) What does this sign indicate? What is the use of it? [4]



\*\*\*\*\*

