

Sl. No.

# SSLC MODEL EXAMINATION, FEBRUARY - 2020

## PHYSICS

(English)

Time : 1½ Hours

Total Score : 40

### General Instructions :

- The First 15 minutes is the cool-off time. You may use the time to read and plan your answers.
- Answer the questions only after reading the instructions and questions thoroughly.
- Answer each question by considering the score.

### SECTION - A

Score

(Answer any four questions. Each question carries 1 score.)

- Identify the relationship in the first pair and complete the second one. 1  
Storage battery [while charging] - Chemical effect  
\_\_\_\_\_ - Heating effect
- Which of the following is not representing the power of an electric circuit ? 1  
 $\left[ P = I^2R ; P = VI ; P = IR^2 ; P = \frac{V^2}{R} \right]$
- For the same reflecting surface area, which of the following has maximum field of view ? 1  
[Concave mirror, Plane mirror, Convex mirror]
- Find the odd one from the given list and justify your answer. 1  
[Hyper metropia, Myopia, Power of accommodation, Pressbyopia]
- Name the system that converts Nuclear energy to electrical energy. 1

### SECTION - B

(Answer any four questions. Each question carries 2 scores.)

- Suppose you have to replace an incandescent lamp at your house. Following lamps are available. 2  
Incandescent lamp, CFL, LED, Fluorescent lamp  
Which of these lamp would you select ? Justify your selection.

P.T.O.

7. (a) Write any two important parts of a moving-coil loud speaker. Score  
1  
 (b) Write the working principle of this device. 1
8. "Energy crisis is the consequence of increasing demand but decreasing availability". Write any four possible steps to be taken to reduce the energy crisis as far as possible. 2
9. Match the column A appropriately with column B. 2

A	B
To find the direction of force in a current carrying conductor	Joule's law
To find the direction of magnetic field around a current carrying conductor	Maxwell's Right hand thumb rule
Direction of current in electromagnetic induction	Fleming's Left hand rule
	Fleming's Right hand rule

10. Draw the ray diagram of image formation when an object is placed at the  $2F$  of a convex lens. 2

### SECTION - C

(Answer any four questions. Each question carries 3 scores.)

11. An LED of 1 Volt is connected to the two terminals of a toy motor. The LED lights up when the armature is rotated at a high speed.  
 (a) Write the two main parts of a dc motor. 1  
 (b) How this device produces emf while rotating its armature? Explain. 2

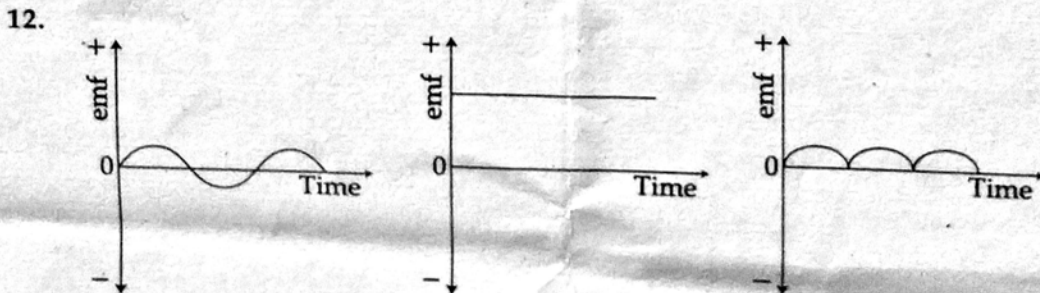


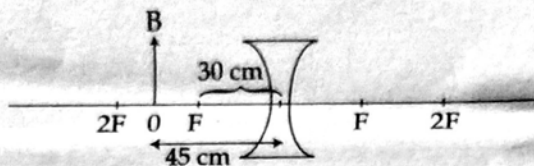
Fig. (1)

Fig. (2)

Fig. (3)

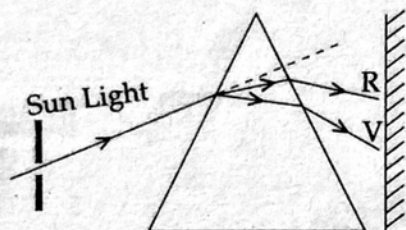
- (a) Identify the graphs which represent direct current. 1  
 (b) Compare the nature of electromotive forces that produce the direct current represented by the graphs. 2

13. Observe the figure.



- (a) Write the values of  $u$  and  $f$  by using Cartesian sign convention. 1  
 (b) Calculate the distance of the image from the lens. 2

14. Analyse the figure.



- (a) Why violet ray is more deviated? 1  
 (b) Which phenomenon causes the splitting up of light in the above prism? 1  
 (c) On the basis of this phenomena, explain how a rainbow is formed? 1

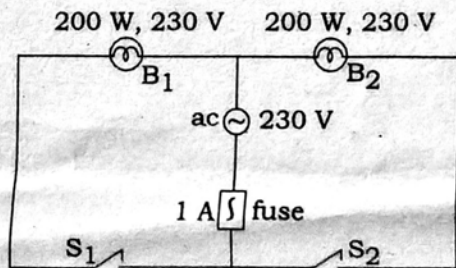
15. Hydrogen is the most efficient fuel while considering the calorific value.

- (a) What is meant by calorific value? 1  
 (b) Why hydrogen is not used as a domestic fuel? 1  
 (c) Write any two properties of a good fuel. 1

### SECTION - D

(Answer any four questions. Each question carries 4 scores.)

16. Analyse the figure and answer the following questions.



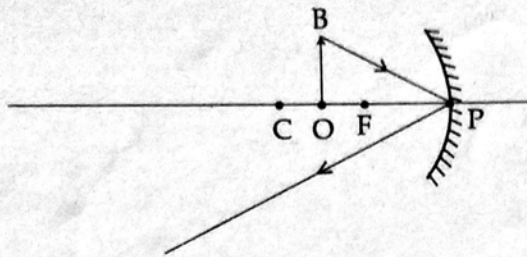
- (a) If the switch  $S_1$  is on, which bulb will glow? How much current is flowing through the fuse at this time? 2  
 (b) If both the switches are on, what changes can be observed in the circuit? Justify your answer. 2



Score

17. (a) List out the difference in the designs of a step-up and step-down transformer. 2
- (b) A transformer without any loss in power has 5000 turns in the primary. The input voltage and output voltage are 240 Volts and 24 Volts respectively. If the current through the primary is 0.4 A : 2
- (i) Calculate the number of turns in the secondary.
- (ii) Calculate the current in the secondary.

18. An object is placed in between the points F and C of a concave mirror as shown.



- (a) Locate the position of the image by drawing another ray. 2
- (b) Write the characteristics of the image obtained here. 1
- (c) Write any one application of this type of mirror. 1

19. Speed of light in certain media are given in the table given below. Analyse the table and answer the following questions.

Media	Speed of light (m/s)
Vacuum	$3 \times 10^8$
Water	$2.25 \times 10^8$
Diamond	$1.25 \times 10^8$
Glass	$2 \times 10^8$

- (a) Re-arrange the given media in the increasing order of their optical density. 1
- (b) If light enters obliquely making the same angle of incidence from air to these media separately, which media will give the largest value of the angle of refraction ? 1
- (c) What do you mean by absolute refractive index ? Calculate the absolute refractive index of glass from the given data. 2
20. (a) Name two defects of eye that can be rectified using convex lens. 1
- (b) What are the reasons for these defects ? 2
- (c) How these defects of eye are rectified by using a convex lenses ? 1