CCE PF
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NSR & NSPR

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ಕರ್ನಾಟಕ ಪ್ರೌಢ ಶಿಕ್ಷಣ ಪರೀಕ್ಷಾ ಮಂಡಳಿ, ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು – 560 003

KARNATAKA SECONDARY EDUCATION EXAMINATION BOARD, MALLESHWARAM, BANGALORE – 560 003

ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪರೀಕ್ಷೆ, ಮಾರ್ಚ್ / ಏಪ್ರಿಲ್ — 2022

S. S. L. C. EXAMINATION, MARCH/APRIL, 2022

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ದಿನಾಂಕ : 11. 04. 2022] ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E (Phy)**

Date : 11. 04. 2022] **CODE NO. : 83-E (Phy)**

ವಿಷಯ : ವಿಜ್ಞಾನ

Subject : SCIENCE

(ಭೌತ ವಿಜ್ಞಾನ, ರಸಾಯನ ವಿಜ್ಞಾನ ಮತ್ತು ಜೀವ ವಿಜ್ಞಾನ / Physics, Chemistry & Biology)

(ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ & ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / ಎನ್.ಎಸ್.ಆರ್. & ಎನ್.ಎಸ್.ಪಿ.ಆರ್.)

(Private Fresh & Private Repeater / NSR & NSPR)

(ಭೌತಶಾಸ್ತ್ರ / Physics)

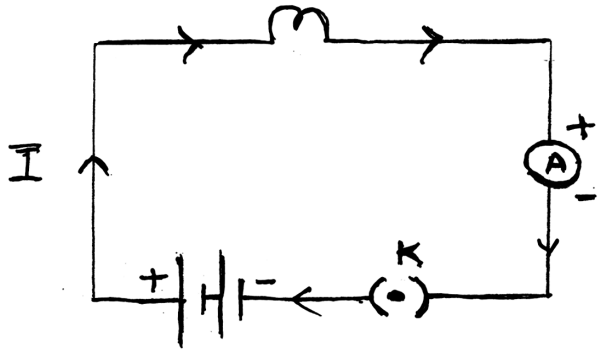
(ಇಂಗ್ಲಿಷ್ ಮಾಧ್ಯಮ / English Medium)

[ಗರಿಷ್ಠ ಅಂಕಗಳು : **100**

[Max. Marks : 100

Qn. Nos.	Value Points	Total
	PART - A	
	(PHYSICS)	
I.	Multiple Choice : $4 \times 1 = 4$	
1.	The device used to produce electricity is	
	(A) Galvanometer (B) Electric generator	
	(C) Ammeter (D) Electric motor.	
	Ans. :	
	(B) Electric generator	1

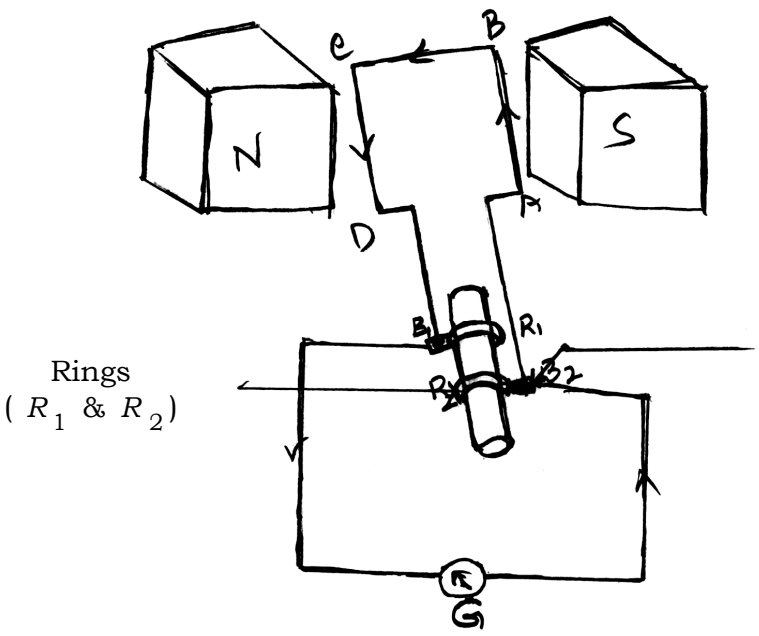
Qn. Nos.	Value Points	Total
2.	The correct formula that shows the relationship between potential difference, electric current and resistance in an electric circuit is (A) $I = \frac{R}{V}$ (B) $I = VR$ (C) $V = \frac{I}{R}$ (D) $R = \frac{V}{I}$. *Ans.* : (D) $R = \frac{V}{I}$	1
3.	In Fleming's right hand rule, the middle finger indicates the direction of (A) induced electric current (B) magnetic field (C) motion of the conductor (D) mechanical force. *Ans.* : (A) induced electric current	1
4.	To get diminished and real image of an object from a convex lens, the object should be placed (A) at principal focus F_1 (B) between principal focus F_1 and $2F_1$ (C) beyond $2F_1$ (D) between principal focus F_1 and optical centre *O*. *Ans.* : (C) beyond $2F_1$	1
II.	Answer the following questions : $2 \times 1 = 2$	
5.	Magnetic field lines do not intersect each other. Why ? *Ans.* : At the point of intersection the compass needle would point towards two directions which is not possible.	1
6.	Mention the SI unit of power of lens. *Ans.* : dioptre	1

Qn. Nos.	Value Points	Total
III.	Answer the following questions : $5 \times 2 = 10$	
7.	Draw the schematic diagram of an electric circuit comprising electric cell, electric bulb, ammeter and plug key. *Ans.* :  	2
8.	An object is placed at 25 cm in front of a concave mirror of focal length 15 cm. At what distance from the mirror should a screen be placed in order to obtain a sharp image ? OR A concave lens has focal length of 15 cm. At what distance should the object from the lens be placed so that it forms an image at 10 cm from the lens ? *Ans.* : $\frac{1}{v} + \frac{1}{u} = \frac{1}{f}$ $\frac{1}{2}$ $\frac{1}{v} = \frac{1}{f} - \frac{1}{u} = \frac{1}{-15} - \frac{1}{-25}$ $\frac{1}{2}$ $\frac{1}{v} = \frac{-5+3}{75} = \frac{-2}{75}$ $\frac{1}{2}$ $v = \frac{75}{-2} = -37{\cdot}5$ cm $\frac{1}{2}$ The screen should be placed at a distance of 37·5 cm, in front of the concave mirror. OR	2

Qn. Nos.	Value Points	Total
	$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$ $\frac{1}{2}$ $\frac{1}{u} = \frac{1}{v} - \frac{1}{f} = \frac{1}{-10} - \frac{1}{-15}$ $\frac{1}{2}$ $\frac{1}{u} = \frac{-3+2}{30} = \frac{-1}{30}$ $\frac{1}{2}$ $u = -30$ cm $\frac{1}{2}$ The object is placed at a distance of 30 cm from the concave lens.	2
9.	In an electric circuit three resistors of resistance 5 Ω , 10 Ω and 30 Ω are connected to a battery in parallel. Find the total resistance produced in an electric circuit. *Ans.* : $\frac{1}{R_P} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}$ $\frac{1}{2}$ $\frac{1}{R_P} = \frac{1}{5} + \frac{1}{10} + \frac{1}{30}$ $\frac{1}{2}$ $\frac{1}{R_P} = \frac{6+3+1}{30} = \frac{10}{30}$ $\frac{1}{2}$ $R_P = 3\ \Omega$. $\frac{1}{2}$	2
10.	How can a simple electric motor be converted into a commercial motor ? *Ans.* : ★ Using an electromagnet in the place of permanent magnet ★ By increasing number of turns in the current carrying coil ★ By using a soft iron core on which the coil is wound. (Any *two*) 1 + 1	2
11.	Draw the diagram of a electric generator. Label the following parts : i) Brushes ii) Rings. *Ans.* :	

Qn. Nos.	Value Points	Total

Electric generator :



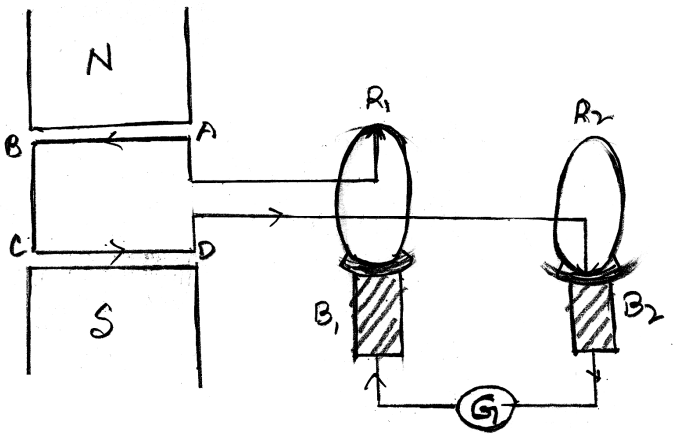
Rings (R_1 & R_2)

Brushes (B_1 & B_2)

Diagram — 1

Labelling — $\frac{1}{2}+\frac{1}{2}$ 2

OR



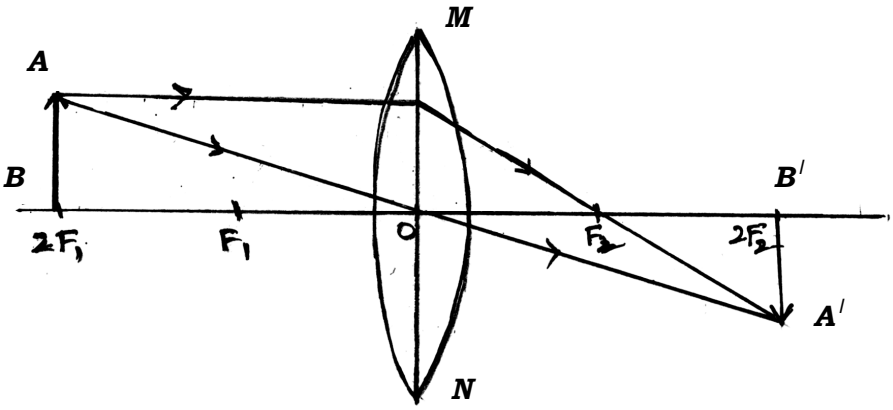
B_1 and B_2 — Brushes

R_1 and R_2 — Rings

Diagram — 1

Labelling — $\frac{1}{2}+\frac{1}{2}$ 2

Qn. Nos.	Value Points	Total
IV.	Answer the following questions : $3 \times 3 = 9$	
12.	Which is the major component of biogas ? Write four characteristics of a good source of energy. OR Which element is used in making solar cell ? Write any four advantages of solar cells. *Ans.* : ★ Methane / CH_4 1 Characteristics of a good source of energy : ★ Which has do a large amount of work per unit volume or mass $\frac{1}{2}$ ★ Must be easily accessible / available $\frac{1}{2}$ ★ Must be easy to store and transport $\frac{1}{2}$ ★ Must be economical. (Any other suitable answer) $\frac{1}{2}$ OR ★ Silicon / Si 1 The advantages of solar cells : ★ They have no moving parts ★ Little maintenance ★ Work quite satisfactorily without the use of any focusing device ★ Can be set up in remote areas where people cannot reach easily ★ Can set up in those areas too, where laying of power transmission line is not possible. (Any *four*) $4 \times \frac{1}{2}$	3 3
13.	Draw the ray diagram to show the image formation by a convex lens, when the object is kept at $2F_1$ of the lens. With the help of the ray diagram mention the position and nature of the image formed. [F_1 : Principal focus of the lens]	

Qn. Nos.	Value Points	Total
	Ans. :  Position of the image — At $2F_2$ $\frac{1}{2}$ Nature of the image — Real and inverted $\frac{1}{2}$ (Figure) 2	3
14.	What are the functions of an earth wire ? It is necessary to connect the electric appliances having metallic body to earth wire in domestic electric circuit. Why ? Explain. OR Explain Faraday's experiment related to electromagnetic induction. Mention the difference between direct and alternate current. *Ans.* : Functions of the earth wire : ★ This is used as a safety measure for appliances have a metallic body in domestic circuit ★ This provides a low resistance conducting path for the current ★ Any leakage of current in the appliances keeps its potential to that of the earth and the user may not get a severe electric shock. 1 + 1 + 1	3
	OR ★ Take a coil of copper wire having a large number of turns connect the ends of the coil to a galvanometer $\frac{1}{2}$ ★ Take a strong magnet and move its one pole into the coil $\frac{1}{2}$ ★ There is a deflection in the needle of the galvanometer. This indicates the presence of a current in the coil $\frac{1}{2}$ ★ Likewise, when the magnet is withdrawn back then also the needle of galvanometer deflects and this indicates the presence of electric current. $\frac{1}{2}$	

Qn. Nos.	Value Points	Total
	★ *Direct Current* | *Alternating current* Direct current flows in one direction | Periodically alternating current reverse its direction — 1	3
V.	Answer the following question : $1 \times 4 = 4$	
15.	a) What are the advantages of connecting electrical devices in parallel in an electric circuit instead of connecting them in series ? b) How are ammeter and voltmeter connected in an electric circuit ? What are their function ?	
	Ans. : a) Advantages of connecting electrical devices in parallel are : ★ The parallel circuit divides current through the electrical gadgets. ★ When one component fails, the circuit does not fail ★ The total resistance in parallel circuit decreases, so that ★ Electrical gadgets get current as per their resistance required. (Any *two*) $1 + 1$	
	b) ★ In an electrical circuit ammeter is connected in series $\frac{1}{2}$ ★ In an electrical circuit voltmeter is connected in parallel $\frac{1}{2}$ ★ Ammeter measures the rate of electric current in a circuit $\frac{1}{2}$ ★ Voltmeter measures the potential difference across the ends of a conductor $\frac{1}{2}$	4
VI.	Answer the following question : $1 \times 5 = 5$	
16.	a) What is refraction of light ? State two laws of refraction of light. b) What is refractive index of light ? "The refractive index of diamond is 2·42." What is the meaning of this statement ?	
	Ans. : a) ★ Light travelling obliquely from one medium to another, the direction of propagation of light in the second medium changes ★ The incident ray, the refracted ray and the normal to the interface of two transparent media at the point of incidence all lie in the same plane ★ The ratio of sine of angle of incidence to the sine of angle of refraction is constant for the light of given colour and for the given pair of media / $\frac{\sin i}{\sin r}$ = constant $1 + 1 + 1 = 3$	
	b) The ratio of speed of light in air and the speed of light in medium. The ratio of speed of light in air and the speed of light in diamond is 2·42. $1 + 1 = 2$	5