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

KARNATAKA SECONDARY EDUCATION EXAMINATION BOARD, MALLESHWARAM, BENGALURU, 560 003

ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪರೀಕ್ಷೆ, ಜೂನ್ / ಜುಲೈ, 2022

S.S.L.C. EXAMINATION, JUNE / JULY, 2022

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ದಿನಾಂಕ : 27. 06. 2022]   ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E (Phy)**

Date :   27. 06. 2022]   CODE NO. : **83-E (Phy)**

ವಿಷಯ : ವಿಜ್ಞಾನ

Subject : SCIENCE

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

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

(**Private Repeater / NSR & NSPR**)

(ಭೌತಶಾಸ್ತ್ರ / **Physics**)

(ಇಂಗ್ಲಿಷ್ ಮಾಧ್ಯಮ / **English Medium**)
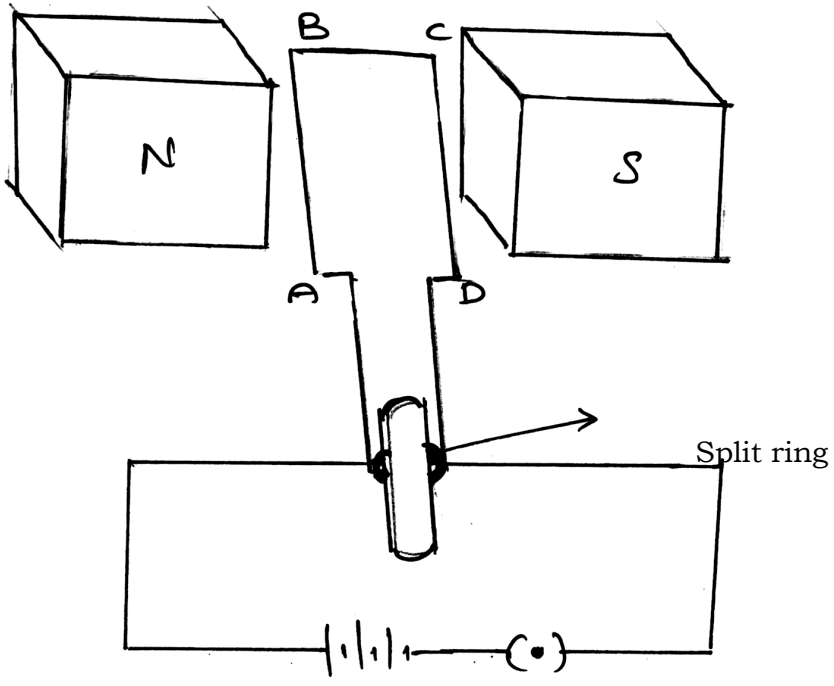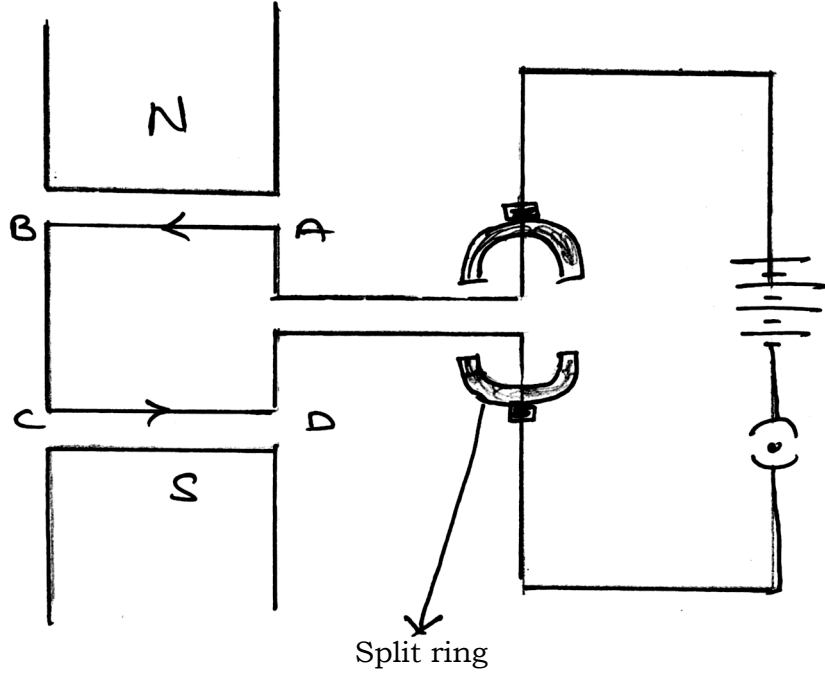
[ಗರಿಷ್ಠ ಅಂಕಗಳು : **100**

[**Max. Marks : 100**

Qn. Nos.	Value Points	Total
	PART - A	
	(PHYSICS)	
I.	Multiple choice : 2 × 1 = 2	
1.	The correct statement among the following related to the concave lens is	
	(A) converges the light rays	
	(B) diverges the light rays	
	(C) forms inverted image	
	(D) forms real image.	
	Ans. :	
	(B) diverges the light rays	1
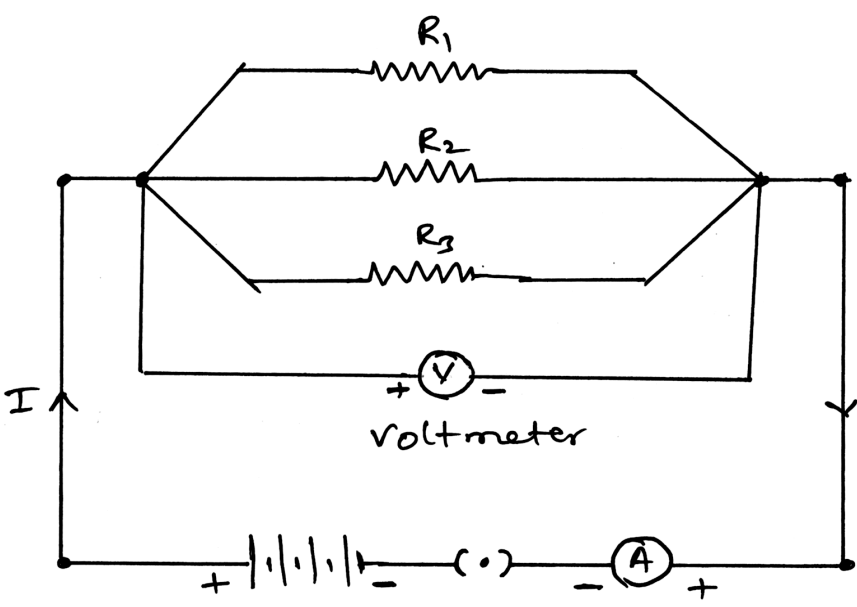
Qn. Nos.	Value Points	Total
2.	The SI unit of resistivity is (A) ohm (B) volt (C) watt (D) ohm-metre. *Ans.* : (D) ohm-metre	1
II.	Answer the following questions : $3 \times 1 = 3$	
3.	Calculate the power of convex lens with a focal length of + 0·5 m. *Ans.* : Focal length (f) = + 0·5 m Power of lens = $\dfrac{1}{\text{focal length}}$ $\qquad \dfrac{1}{2}$ $\qquad P = \dfrac{1}{f}$ $\qquad P = \dfrac{1}{0·5}$ $\qquad \dfrac{1}{2}$ $\qquad P = +2\,\text{D}$	1
4.	What are the reasons for occurring overload in an electric circuit ? *Ans.* : ★ Accidental hike in the supply voltage ★ Connecting too many appliances to a single socket ★ When live wire and neutral wire come into direct contact. (Any *two*) $\qquad \dfrac{1}{2} + \dfrac{1}{2}$	1
5.	What is a solar cell ? *Ans.* : The device that converts solar energy into electrical energy.	1

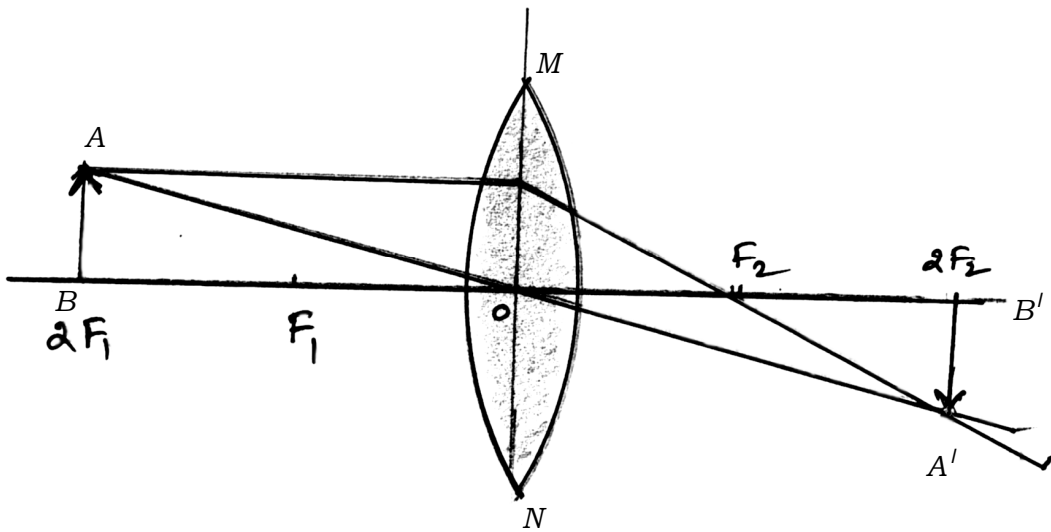| Qn. Nos.	Value Points	Total
III.	Answer the following questions : $\qquad$ $6 \times 2 = 12$	
6.	An electric bulb with a resistance of 50 Ω is connected to 10 V battery in an electric circuit. Calculate the electric current flowing through the electric bulb and electric power of the bulb.	
	Ans. :	
	$R = 50\ \Omega$	
	$V = 10\ V$	
	$I = ?$	
	$P = ?$	
	$V = IR$	$\frac{1}{2}$
	$I = \dfrac{V}{R}$	
	$\quad = \dfrac{10}{50}$	
	$\quad = 0{\cdot}2\ A$	$\frac{1}{2}$
	Electric current flowing through bulb is 0·2 A	
	$P = VI$	
	$P = 10 \times 0{\cdot}2$	$\frac{1}{2}$
	$P = 2\ W$	
	Power of bulb = 2 watt = 2 W.	$\frac{1}{2}$	2
7.	Draw the diagram of a simple electric motor and label 'Split rings' ?	
	Ans. :	

Qn. Nos.	Value Points	Total
	Electric motor	

Electric motor

Split ring

$1\frac{1}{2}$

$\frac{1}{2}$

2

OR

Split ring

$1\frac{1}{2}$

$\frac{1}{2}$

$[\ 1\frac{1}{2} + \frac{1}{2}\ ]$

Qn. Nos.	Value Points	Total
8.	Write any two limitations of producing electricity from wind energy. *Ans.* : i) Wind energy forms (wind mills) cannot be established everywhere. ii) The wind speed should be higher than 15 km/h to maintain the required speed of the turbine. iii) Wind energy farms require large area of land. iv) The initial cost of establishment of the farm is quite high. (Any *two*)　　1 + 1	2
9.	State Fleming's right hand rule. *Ans.* : Stretch the thumb, forefinger and middle finger of right hand so that they are perpendicular to each other. If the forefinger indicates the direction of the magnetic field and the thumb shows the direction of motion of conductor, then the middle finger will show the direction of induced current.	2
10.	Draw the diagram showing the connection of three resistors in parallel in an electric circuit and label 'voltmeter'. *Ans.* :	

Qn. Nos.	Value Points	Total
	Parallel connection of resistors : $1\frac{1}{2}+\frac{1}{2}$	2
11.	Write any two differences between convex mirror and concave mirror. *Ans.* :	

	Convex mirror	*Concave mirror*
i)	Reflecting surface is curved outward	i) Reflecting surface is curved inward
ii)	Diverges the light rays	ii) Converges the light rays
iii)	Always produces virtual and erect image	iii) Always produces real and inverted image except when the object kept between *P* and *F*

(Any *two*)   1 + 1 | 2 |

| IV. | Answer the following questions :   3 × 3 = 9 | |
| 12. | a) State the two laws of refraction of light.
b) "The refractive index of diamond is 2·42." Write the meaning of this statement. | |

Qn. Nos.	Value Points	Total
	Ans. :	
	a) Laws of refraction	
	i) 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. 1	
	ii) The ratio of sine of angle of incidence to the sine of angle of refraction is a constant for the light of a given colour and for the given pair of media. OR $\dfrac{\sin i}{\sin r}$ = Constant. 1	
	b) The ratio of the speed of light in air and the speed of light in diamond is 2·42. 1	3
13.	Draw the ray diagram of image formation when the object is kept at $2F_1$ of the convex lens. With the help of the ray diagram, mention the position and nature of the image formed. [F_1 : Principal focus of the lens] OR Draw the ray diagram of image formation when the object is kept between C and F of the concave mirror. With the help of the ray diagram mention the position and the nature of the image formed. [F : Principal focus of the mirror, C : Centre of curvature of mirror] *Ans.* :	

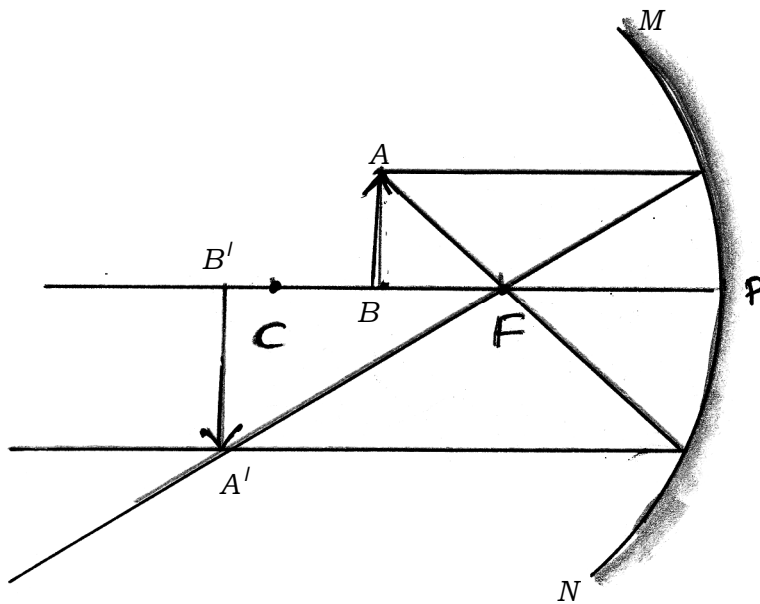| Qn. Nos.	Value Points	Total
	Position of the image : At $2F_2$ Nature of the image : Real and inverted 1 OR Position of the image : Beyond C Nature of the image : read and inverted. 1 $[\,2 + \frac{1}{2} + \frac{1}{2}\,]$	3

Qn. Nos.	Value Points	Total
14.	List the properties of the magnetic field due to the flow of electric current in a solenoid. What are the two methods of increasing magnetic field in a solenoid ?	
	Ans. :	
	★ The magnetic field in a current carrying solenoid is similar to that of magnetic field produced in a bar magnet. 1	
	★ The magnetic field is uniform inside the solenoid. 1	
	The two methods to increase magnetic field in a solenoid.	
	i) By increasing the number of turns of the coil. $\frac{1}{2}$	
	ii) By increasing the current flowing through solenoid. $\frac{1}{2}$	3
V.	Answer the following questions : $2 \times 4 = 8$	
15.	a) Write any four uses of concave mirror.	
	b) An object is placed at a distance of 15 cm on the principal axis infront of a concave lens with a focal length of 10 cm. Find the image distance.	
	Ans. :	
	a) Used of concave mirror.	
	i) Uses in torches, search-lights	
	ii) Used in vehicles head lights	
	iii) Used as shaving mirrors	
	iv) The dentists used to test / examine teeth of patients	
	v) Used in solar furnace.	
	(Any *four*) $4 \times \frac{1}{2}$	

Qn. Nos.	Value Points	Total
	b)　Given f = – 10 cm, u = – 15 cm	
	$\dfrac{1}{f} = \dfrac{1}{v} - \dfrac{1}{u}$ 　　　　　　　　　　　　　$\dfrac{1}{2}$	
	$\dfrac{-1}{10} = \dfrac{1}{v} + \dfrac{1}{15}$	
	$\dfrac{1}{v} = -\dfrac{1}{10} - \dfrac{1}{15}$ 　　　　　　　　　$\dfrac{1}{2}$	
	$\dfrac{1}{v} = \dfrac{-3-2}{30}$	
	$\dfrac{1}{v} = \dfrac{-5}{30}$ 　　　　　　　　　　　　　$\dfrac{1}{2}$	
	$\dfrac{1}{v} = \dfrac{-1}{6}$	
	v = – 6 cm. 　　　　　　　　　　　　　$\dfrac{1}{2}$	
	Image distance = – 6 cm.	4
16.	a)　State Joule's law of heating. Name any two devices that work on the application of this law.	
	b)　Why are the alloys like nichrome used in electrical heating devices ?	
	OR	
	a)　State Ohm's law. In domestic electric circuit electrical appliances are not connected in series. Why ?	
	b)　Write the factors on which resistance of a conductor depends.	
	Ans. :	
	a)　The heat produced in a resistor is	
	i)　directly proportional to the square of current for a given resistance 　　　$\dfrac{1}{2}$	
	ii)　directly proportional to the resistance for a given current 　$\dfrac{1}{2}$	
	iii)　directly proportional to the time for which the current flows through the resistor. 　　　$\dfrac{1}{2}$	
	$H = I^2 Rt$ 　　　[1 mark can be alloted for formula]	

Qn. Nos.		Value Points		Total
		The devices that work on this law are		
		Electric Toaster		
		Electric Oven		
		Electric Kettle		
		Electric Bulb		
		Electric Fuse (Any *two*)	$\frac{1}{2}$	
	b)	Resistivity of alloys are more than / higher than that of metals.		
		Alloys do not oxidise (burn) readily at high temperature.		
		Alloys have high melting point. (Any *two*)	1 + 1	4

<div align="center">OR</div>

Qn. Nos.		Value Points		Total
	a)	The potential difference (V) across the ends of a given metallic wire in an electric circuit is directly proportional to the current (I) flowing through it, provided its temperature remains the same.	1	
		$$V = IR$$		
		[1 mark can be allotted for formula]		
	★	In a series circuit the current is constant throughout the electric circuit due to this all electrical appliances not possible to work at the same value.	$\frac{1}{2}$	
	★	In a series connection, when one component fails, the circuit is broken.	$\frac{1}{2}$	
	b)	Factors on which resistance of a conductor depends :		
		i) Length of a conductor		
		ii) Area of cross-section of a conductor		
		iii) Nature of the material		
		iv) Temperature.	2	4