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

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

ಎಸ್.ಎಸ್.ಎಲ್.ಸಿ. ಪರೀಕ್ಷೆ, ಮಾರ್ಚ್ / ಏಪ್ರಿಲ್ — 2020

S. S. L. C. EXAMINATION, MARCH/APRIL, 2020

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ದಿನಾಂಕ : 30. 03. 2020]

Date : 30. 03. 2020]

ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E (Phy)**

CODE NO. : 83-E (Phy)

ವಿಷಯ : ವಿಜ್ಞಾನ

Subject : SCIENCE

(ಭೌತಶಾಸ್ತ್ರ / Physics)

(ಹೊಸ ಪಠ್ಯಕ್ರಮ / New Syllabus)

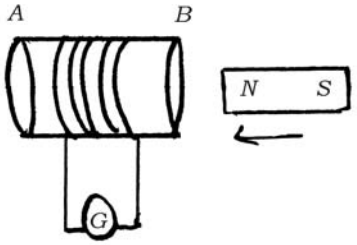
(ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ & ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ/ Private Fresh & Private Repeater)

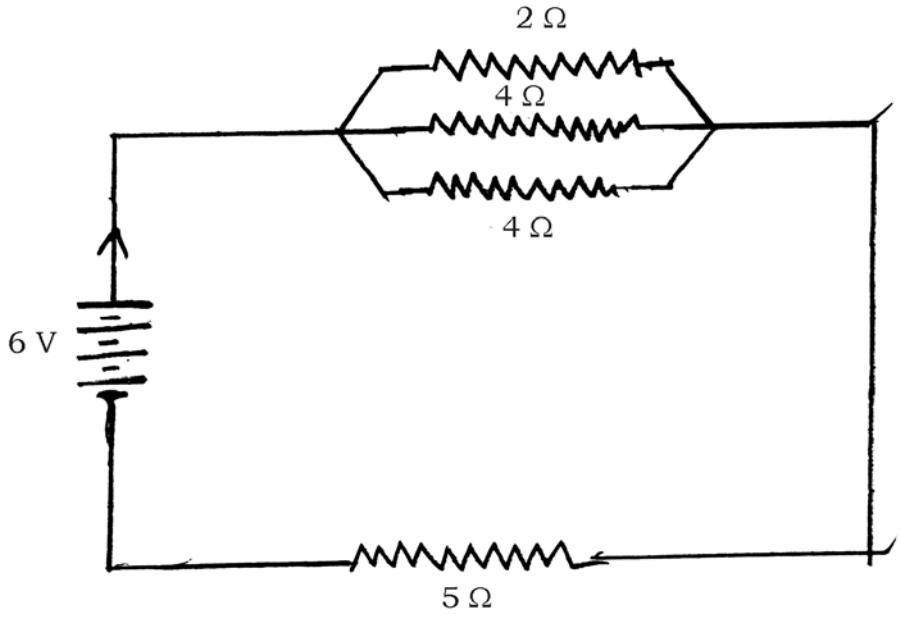
(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

[ಗರಿಷ್ಠ ಅಂಕಗಳು : **100**

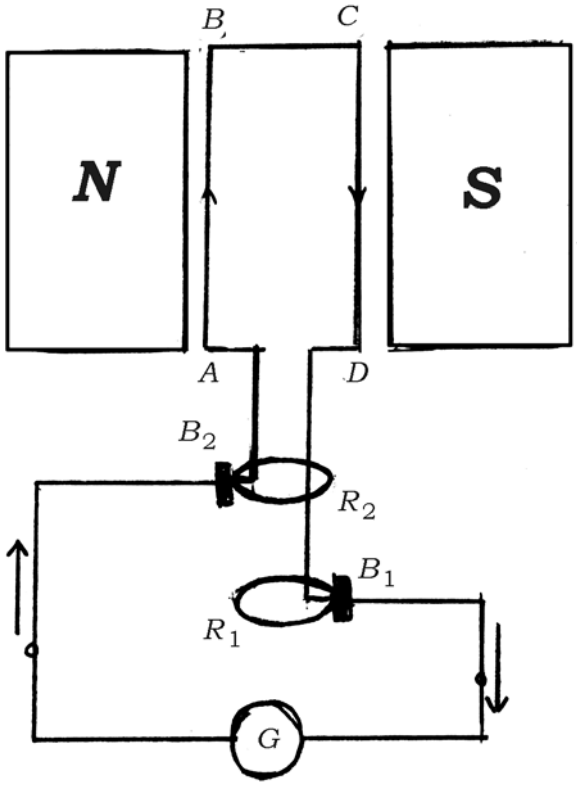
[Max. Marks : 100

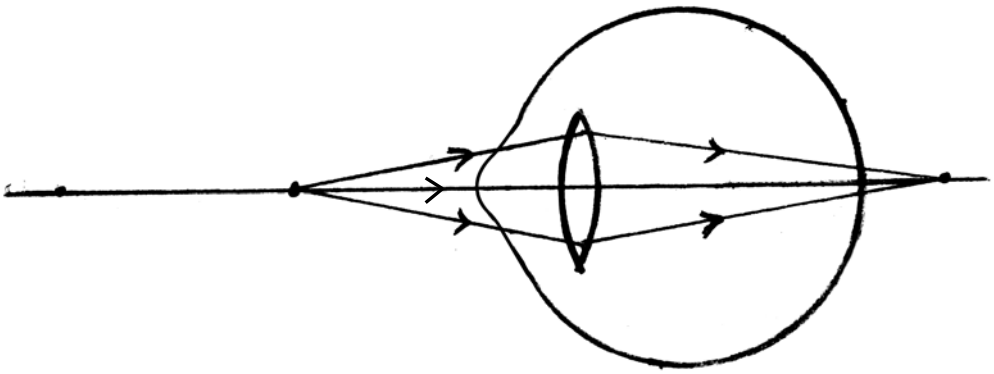
Qn. Nos.	Value Points	Total
1.	The inner surface of solar cooker is coated with black paint to (A) absorb more heat (B) reflect light (C) prevent rusting (D) converge the light rays. *Ans.* : (A) — absorb more heat	1
4.	An object is kept at the centre of curvature of a concave mirror. The position and nature of the image formed is (A) between *F* and *C* and inverted (B) behind the mirror and erect (C) between *F* and *P* and erect (D) at the centre of curvature and inverted. *Ans.* : (D) — at the centre of curvature and inverted.	1

Qn. Nos.	Value Points	Total
5.	The power plant in which natural source of energy is directly used to rotate turbines is (A) thermal power plant (B) hydro-electric power plant (C) nuclear power plant (D) solar power plant. *Ans.* : (B) — hydro electric power plant	1
10.	What is the SI unit of potential difference ? Name the device used to measure the potential difference. *Ans.* : ★ Volt $\frac{1}{2}$ ★ Volt meter $\frac{1}{2}$	1
13.	"Biogas plant is a boon to farmers." Why ? *Ans.* : ★ The slurry left behind is used as excellent manure, rich in nitrogen and phosphorous $\frac{1}{2}$ ★ It provides a safe and efficient method of waste disposal besides supplying energy and manure. $\frac{1}{2}$	1
16.	Observe the given figure.  What type of current is induced in the coil by doing the experiment related to this figure ? Give reason for your answer. *Ans.* : ★ Alternating current $\frac{1}{2}$ ★ Because the deflections in the galvanometer would just be opposite to the previous. $\frac{1}{2}$ (Or galvanometer deflections are in opposite directions)	1

Qn. Nos.	Value Points	Total
20.	The resistivity of manganese wire of length 1 m is $1{\cdot}84 \times 10^{-6}$ Ω m at 20°C. If the diameter of the wire is 3×10^{-4} m, what will be the resistance of the wire at that temperature ? OR Observe the given circuit :  Calculate the total resistance in the circuit and the total current flowing in the circuit. *Ans.* : ★ Resistivity $\rho = 1{\cdot}84 \times 10^{-6}$ Ωm Length $l = 1$ m Diameter $d = 3 \times 10^{-4}$ m Area of cross-section $A = \frac{\pi d^2}{4}$ $= \frac{22}{7} \times \frac{3 \times 10^{-4} \times 3 \times 10^{-4}}{4}$ $\frac{1}{2}$ $= \frac{99}{14} \times 10^{-8}\ m^2$.	

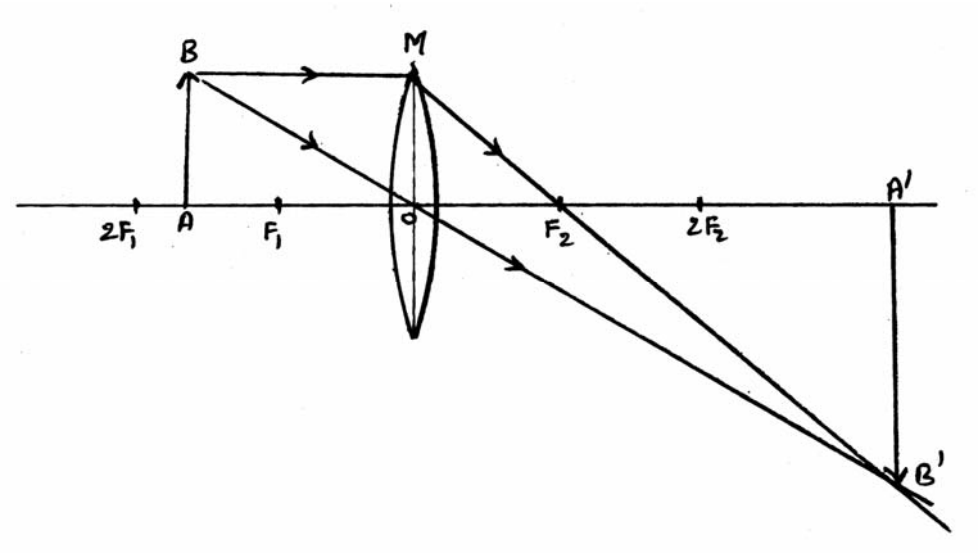
Qn. Nos.	Value Points		Total
	Resistance $R = \frac{\rho \times l}{A}$	$\frac{1}{2}$	
	$= \frac{1 \cdot 84 \times 1 \times 14 \times 10^{-6}}{99 \times 10^{-8}}$	$\frac{1}{2}$	
	$= \frac{25 \cdot 76 \times 10^{2}}{99}$		
	$= 26 \cdot 02\ \Omega$	$\frac{1}{2}$	2
	OR		
	★ In parallel connection,		
	$\frac{1}{R_p} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} \Rightarrow \frac{1}{R_p} = \frac{1}{2} + \frac{1}{4} + \frac{1}{4}$	$\frac{1}{2}$	
	$\Rightarrow R_p = 1\ \Omega.$	$\frac{1}{2}$	
	Total resistance in the circuit		
	$R = R_p + R_4$		
	$= 1 + 5$		
	$= 6\ \Omega$	$\frac{1}{2}$	
	$\therefore$ Current $I = \frac{V}{R} = \frac{6}{6} = 1\ A.$	$\frac{1}{2}$	2
24.	Draw the diagram of a simple electric generator. Label the following parts :		
	i) Brushes		
	ii) Rings.		

Qn. Nos.	Value Points			Total
	Ans. : 	Figure	$1\frac{1}{2}$	
	B_1 , B_2 — brushes R_1 , R_2 — rings	Parts	$\frac{1}{2}$	2
25.	Explain how overloading occurs in domestic electric circuit ?			
	Ans. : ★ Over loading can occur when the live wire and the neutral wire come into direct contact ★ It can also occur due to an accidental hike in the supply voltage. ★ Sometimes overloading is caused by connecting too many appliances to a single socket.	Any *two*	1 + 1	2

Qn. Nos.	Value Points	Total
28.	Draw the diagram showing the hypermetropic eye. *Ans.* :  Hypermetropic eye	2
34.	In domestic wiring electrical appliances are not connected in series. Why ? *Ans.* : ★ In series arrangement if one appliance fails to work, then the circuit is broken and remaining appliances do not work. 1 ★ The appliances in series draw same current in the circuit and hence do not operate properly. 1	2
35.	State Joule's law of heating. Explain the working of electric filament bulb. OR State Ohm's law. How ammeter and voltmeter should be connected in electric circuit ? What is the use of these instruments, in the circuit ? *Ans.* : ★ The heat produced in a resistor is i) directly proportional to the square of the current for a given resistance. $\frac{1}{2}$ ii) directly proportional to the resistance for a given circuit. $\frac{1}{2}$	

Qn. Nos.	Value Points	Total
	iii) directly proportional to the time for which the current flows through the resistor. $\frac{1}{2}$ ($H = I^2Rt$ formula is written then $\frac{1}{2}$ mark)	
	★ A strong metal with high melting point such as tungsten is used for making bulb filaments. $\frac{1}{2}$	
	★ The bulbs are usually filled with chemically inactive nitrogen and Argon gases to prolong the life of the filament. $\frac{1}{2}$	
	★ Most of the power consumed by the filament appears as heat, but a small part of it is in the form of light radiated. $\frac{1}{2}$	3
	OR	
	★ The potential difference V across the ends of a given metallic wire in an electric circuit is directly proportional to the current flowing through it at constant temperature. 1	
	★ Ammeter should be connected in series. $\frac{1}{2}$	
	★ Voltmeter should be connected in parallel in the circuit. $\frac{1}{2}$	
	★ Ammeter is used to measure current. $\frac{1}{2}$	
	★ Voltmeter is used to measure potential difference. $\frac{1}{2}$	
40.	An object is kept on the principal axis of a concave mirror of focal length 12 cm. If the object is at a distance of 18 cm from the mirror, calculate the image distance. Determine the nature of the image formed by calculating the magnification produced by the mirror.	
	OR	
	A doctor prescribes a corrective lens of power – 0·5 D to a person. Find the focal length of the lens. Is this lens diverging or converging ? Give reason. How does the property of this lens can be used to correct eye defects ?	
	Ans. :	
	Focal length of concave mirror f = – 12 cm Object distance u = – 18 cm	

Qn. Nos.	Value Points	Total
	$\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ $\frac{1}{2}$	
	$\frac{1}{v} = \frac{1}{f} - \frac{1}{u}$	
	$= -\frac{1}{12} - (-\frac{1}{18})$ $\frac{1}{2}$	
	$= -\frac{1}{12} + \frac{1}{18}$	
	$= \frac{-3+2}{36}$	
	$\therefore \quad \frac{1}{v} = -\frac{1}{36} \quad \Rightarrow \quad v = -36$ cm $\frac{1}{2}$	
	Magnification $m = \frac{-v}{u}$ $\frac{1}{2}$	
	$= -(\frac{-36}{-18})$	
	$= -2$ $\frac{1}{2}$	
	The image formed is inverted real and enlarged. $\frac{1}{2}$	3
	OR	
	★ $p = \frac{1}{f}$, here $p = -0{\cdot}5$ D	
	$f = \frac{1}{p} \Rightarrow f = -\frac{1}{0{\cdot}5} = -2$ m 1	
	★ This lens is diverging $\frac{1}{2}$	
	★ Because power of a lens is negative means the given lens is concave. $\frac{1}{2}$	
	★ The diverging property of the lens is used to correct myopia. In myopic eye the image of a distant object is formed in front of the retina and not on the retina. $\frac{1}{2}$	
	★ A concave lens of suitable power diverges the light rays and brings the image back on the retina. $\frac{1}{2}$	3
42.	Draw the ray diagram when the object is kept between F_1 and $2F_1$ of the convex lens. With the help of the 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-beyond $2F_2$ 2 Nature-real inverted and enlarged. $\frac{1}{2}+\frac{1}{2}$	3
46.	How do you trace the magnetic field lines around a bar magnet using compass needle ? Explain. Write the properties of magnetic field lines. *Ans.* : ★ Take a small compass and a bar magnet. Place a magnet on a sheet of white paper fixed on a drawing board. Mark the boundary of the magnet. ★ Place the compass near the north pole of the magnet mark the position of two ends of the needle. ★ Now move the needle to a new position such that the south pole occupies the position previously occupied by its north pole. ★ In this way proceed step by step till we reach the south pole of the magnet. Join the points marked on the paper by a smooth curve. This represents field line. ★ Repeating above procedure we can draw as many lines as possible. $\frac{1}{2} \times 5$	

Qn. Nos.	Value Points	Total
	Properties of magnetic field lines : ★ Field lines emerge from north pole and merge at the south pole. ★ At the poles field lines are crowded. ★ No two field lines are found to cross each other. $\frac{1}{2} \times 3$	4
48.	Explain the experiment conducted by Newton to show that white light contains seven colours. Sun appears red in colour during sunrise but appears white at noon. Explain with the reasons. *Ans.* : ★ Isaac Newton was the first to use a glass prism to obtain the spectrum of sun light. $\frac{1}{2}$ ★ He tried to split the colours of the spectrum of white light further by using similar prism. He could not get any more colours. $\frac{1}{2}$ ★ He then placed a second prism (identical) in an inverted position with respect to the first prism. This allowed all the colours of the spectrum to pass through the second prism. $\frac{1}{2}$ ★ He found a beam of white light emerging from the other side of the second prism. This observation gave Newton the idea that the sun light is made up of seven colours. $\frac{1}{2}$ ★ Light from the sun near the horizon passes *through thicker* layers of air and *larger distance* in the earths atmosphere before reaching our eyes. 1 ★ Near the horizon most of the blue light and shorter wavelengths are scattered away by the particles. $\frac{1}{2}$	

Qn. Nos.	Value Points	Total
	★ Therefore the light that reaches our eyes is of longer wavelength. This gives the reddish appearance to the sun. $\frac{1}{2}$	
	★ However light from the sun overhead would travel relatively *shorter distance*. $\frac{1}{2}$	
	★ At noon, the sun appears white as only a little of the blue and violet colours are scattered. $\frac{1}{2}$	5