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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, ಸೆಪ್ಟೆಂಬರ್, 2020

S.S.L.C. EXAMINATION, SEPTEMBER, 2020

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ದಿನಾಂಕ : 28. 09. 2020]

Date : 28. 09. 2020]

ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E (Phy)**

CODE NO. : 83-E (Phy)

ವಿಷಯ : ವಿಜ್ಞಾನ

Subject : SCIENCE

(ಭೌತಶಾಸ್ತ್ರ / **Physics**)

(ಹೊಸ ಪಠ್ಯಕ್ರಮ / New Syllabus)

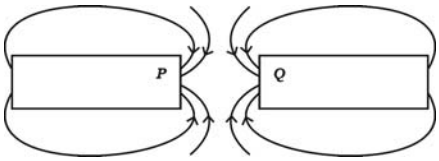
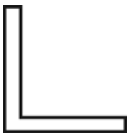
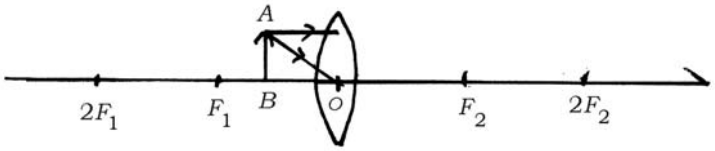
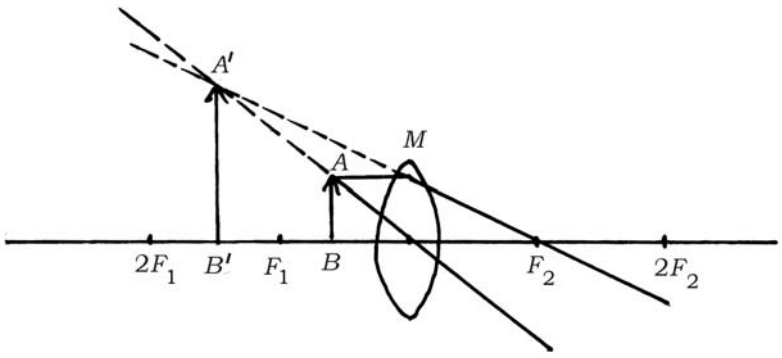
(ಪುನರಾವರ್ತಿತ ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / Regular Repeater)

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

[ಗರಿಷ್ಠ ಅಂಕಗಳು : **80**

[Max. Marks : 80

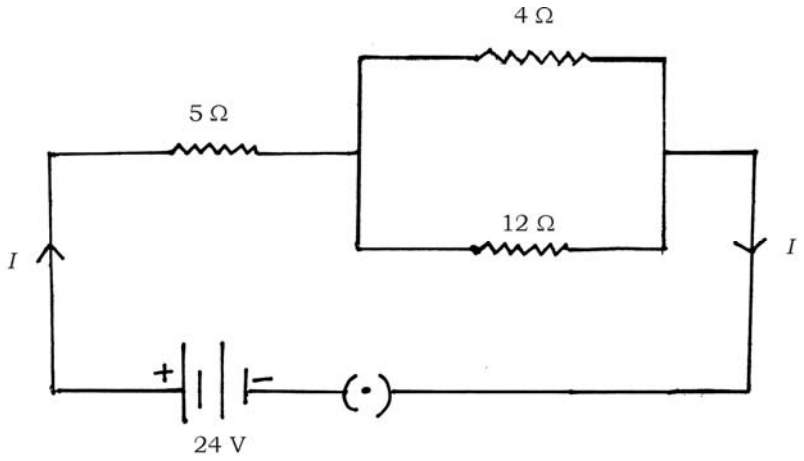
Qn. Nos.	Value Points	Total
3.	The sky as seen from the surface of the moon appears dark because, (A) only a little of the blue and violet colours are scattered (B) all the colours are absorbed by the atmosphere present in the moon (C) all the colours are scattered (D) atmospheric particles needed to scatter the light are not present. *Ans.* : (D) atmospheric particles needed to scatter the light are not present.	1

Qn. Nos.	Value Points	Total
5.	Observe the diagram.  The magnetic poles represented by P and Q respectively are (A) south (S) and south (S) (B) north (N) and south (S) (C) north (N) and north (N) (D) south (S) and north (N). *Ans.* : (A) south (S) and south (S)	1
7.	The image of the English letter  in convex mirror looks like (A)  (B)  (C)  (D)  *Ans.* : (B) 	1
11.	Observe the given incomplete diagram.  *Ans.* :  	1

Qn. Nos.	Value Points	Total
14.	A student sitting in the last bench has difficulty in reading the blackboard writing. Which is the defect of vision the student has ? How can it be corrected ? *Ans.* : ★ The student is suffering from Myopia. $\frac{1}{2}$ ★ This defect is corrected by using a concave lens of suitable power. $\frac{1}{2}$	1
16.	Suggest any two measures to avoid overloading in domestic circuits. *Ans.* : ★ Live and neutral wires should not come into direct contact. OR ★ There should not be any short-circuit in the circuit. $\frac{1}{2}$ ★ Too many appliances should not be connected to a single socket. $\frac{1}{2}$ ★ Should always use quality wires and good quality electrical appliances. (Any *two*)	1
20.	Object distance and image distance of a lens are –30 cm and –10 cm respectively. Find the magnification and decide the type of lens used and nature of the image. *Ans.* : ★ Here, object distance $u = -30$ cm image distance $v = -10$ cm $\therefore$ Magnification, $m = \frac{v}{u}$ $= \frac{-10 \text{ cm}}{-30 \text{ cm}}$ $= \frac{1}{3} = +0{\cdot}33.$ 1 ★ Here, as v is negative, the used lens is concave lens. $\frac{1}{2}$ ★ As the magnification is positive and less than one [having positive sign] the image formed is erect, virtual and diminished. $\frac{1}{2}$	2

Qn. Nos.	Value Points	Total

23. Observe the given circuit diagram.



Calculate the total resistance and the total current flowing through the circuit.

Ans. :

★ Here, $R_1 = 5\ \Omega$, $R_2 = 4\ \Omega$, $R_3 = 12\ \Omega$, $V = 24$ V.

Total resistance of the circuit R_T = ?

Total current flowing through the circuit, I = ?

OR

Total resistance of the circuit,

$$R_T = R_1 + \left[\frac{1}{R_2} + \frac{1}{R_3}\right]$$

$$= R_1 + \left[\frac{R_2 \times R_3}{R_2 + R_3}\right]$$

$$= 5\ \Omega + \left[\frac{4\Omega \times 12\Omega}{4\Omega + 12\Omega}\right]$$

$$= 5 + \frac{48}{16}$$

$$= 5 + 3$$

$$\therefore\ R_T = 8\ \Omega$$

Total resistance of the circuit,

$$R_T = R_1 + \left[\frac{1}{R_2} + \frac{1}{R_3}\right]$$

$$= 5\ \Omega + \left[\frac{1}{4\Omega} + \frac{1}{12\Omega}\right]$$

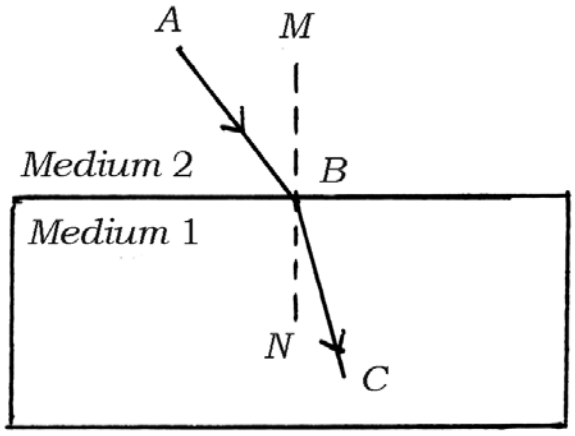
$$= 5 + \left[\frac{3+1}{12}\right]$$

$$= 5 + \frac{4}{12}$$

$$= 5 + \frac{1}{3}$$

$$= 5 + 3$$

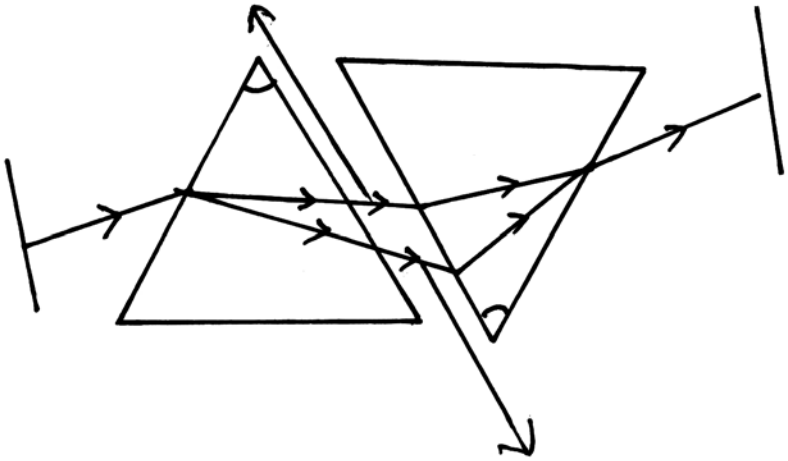
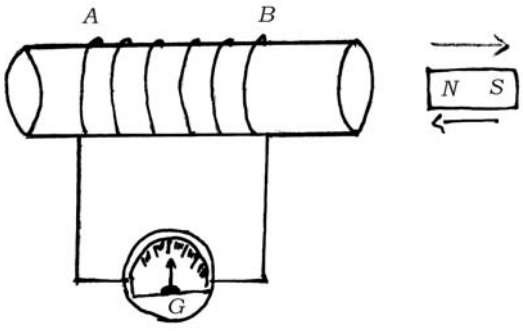
$$\therefore\ R_T = 8\ \Omega$$ 1

Qn. Nos.	Value Points	Total
	★ Total current flowing through the circuit, $I = \frac{V}{R_T}$ $= \frac{24\,V}{8\,\Omega}$ $\therefore \quad I = 3A.$ 1	2
25.	a) State the laws of refraction of light. b) In the given figure, *AB* is the incident ray, *BC* is the refracted ray and *MN* is the normal at the point of incidence. Which medium is more denser ? Why ?  OR a) Differentiate between convex mirror and concave mirror. b) Define the principal focus of a convex lens. *Ans.* : a) *Laws of refraction of light* : ★ 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 ★ 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. 1 OR ★ If i is the angle of incidence and r is the angle of refraction, then, $\frac{\sin i}{\sin r}$ = constant.	

Qn. Nos.	Value Points	Total
	b) ★ Medium 1 is more denser. $\frac{1}{2}$ ★ When a ray of light travels from rarer medium to denser medium, it always bends towards the normal. $\frac{1}{2}$	
	OR	
	a) *Convex mirror* / *Concave mirror* ★ Reflecting surface is curved outwards / ★ Reflecting surface is curved inwards ★ Always forms virtual and erect images / ★ Forms real and inverted images. (Except the case when object is kept between *P* and *F*) ★  / ★  ★ Diverges the light rays / ★ Converges the light rays. 2	
	b) ★ The rays of light falling on a convex lens parallel to the principal axis, after refraction from the lens converge to a point on the principal axis. This point on principal axis is called the 'principal focus' of the convex lens. 1	3
28.	a) Explain how is nuclear energy generated in power reactors. How is electricity produced from nuclear energy ? b) Mention two hazards of nuclear power reactor. OR a) Explain why we are looking at the alternative sources of energy. b) Mention the advantages and disadvantages associated with solar cells.	

Qn. Nos.	Value Points	Total
	Ans. :	
	a) ★ Nuclear fission reaction is carried out in nuclear power reactors. The nucleus of heavy atom (such as uranium, plutonium or thorium) when bombarded with low-energy neutrons, can be split apart into lighter nuclei. 1	
	★ When this is done, a tremendous amount of energy is released at a controlled rate. $\frac{1}{2}$	
	★ The released energy is used to produce steam and further generate electricity. $\frac{1}{2}$	
	b) *Hazards of nuclear power reactor* :	
	★ Improper / unscientific storage and disposal of spent or used fuels.	
	★ Accidental leakage of nuclear radiations.	
	★ High cost of installation of nuclear power reactor.	
	★ Limited availability of uranium.	
	★ High risk of environmental contamination.	
	(Any *two* points) $\frac{1}{2}+\frac{1}{2}$	3
	OR	
	a) The reasons for our looking at alternative sources of energy are ;	
	★ the conventional sources of energy like fossil fuels are in danger of getting exhausted soon.	
	★ conventional sources of energy are not sufficient to run the machines to do more and more tasks.	
	★ unlimited use of conventional sources of energy has led to the problem of energy crisis	
	★ uncontrolled use of conventional sources of energy has created many problems of environmental pollution.	
	(For any *two* reasons) $\frac{1}{2}+\frac{1}{2}$	

Qn. Nos.	Value Points	Total
	b) *Advantages associated with solar cells* : ★ They have no moving parts ★ They require little maintenance ★ They work quite satisfactorily without the use of any focussing device ★ They can be set up in remote and inaccessible hamlets or very sparsely inhabited areas in which laying of a power transmission line may be expensive. (Any *two* advantages) $\frac{1}{2}+\frac{1}{2}$ *Disadvantages associated with solar cells* : ★ Availability of special grade silicon for making solar cells is limited. ★ The process of manufacture of solar cells is very expensive. ★ Silver used for interconnection of the cells in the panel is very costly. ★ Their efficiency is low. (Any *two* advantages) $\frac{1}{2}+\frac{1}{2}$	3
31.	Draw the diagram to show the recombination of the spectrum of white light and label the following parts. a) The ray of light that bends the most b) The ray of light that bends the least.	

Qn. Nos.	Value Points	Total
	Ans. : *Recombination of spectrum of white light* : The ray of light that bends the least.  The ray of light that bends the most For diagram — 2 For parts — $\frac{1}{2}+\frac{1}{2}$	3
36.	Observe the given diagram. Explain the experiment related to this diagram. What conclusions can be drawn from this experiment ?  *Ans.* : ★ The ends of the copper coil (*AB*) are connected to a galvanometer. The north pole of the bar magnet (*NS*) is moved inside the coil. Induced current is produced in the coil and hence the needle of the galvanometer shows momentary deflection in one direction. 1	

Qn. Nos.	Value Points	Total
	★ When the north pole of the magnet is withdrawn from the coil, the needle of the galvanometer is deflected in the opposite direction. $\frac{1}{2}$ ★ When the magnet is held stationary inside the coil, the deflection of the galvanometer drops to zero (shows no deflection). $\frac{1}{2}$ ★ When the magnet is moved inside the coil with greater force, galvanometer shows greater deflection and when the magnet is moved with smaller force, the galvanometer shows smaller deflection. When the magnet is stationary and the coil is moved towards / away from the magnet, galvanometer show deflection. 1 *Conclusions that can be drawn from this experiment* : ★ Motion of the magnet with respect to the coil produces an induced potential difference, which sets up an induced electric current in the circuit. 1 OR ★ The direction of the induced current depends on the direction of the movement of the magnet inside the coil. ★ The amount of induced current is directly proportional to the force with which the magnet is moved into or withdrawn from the coil.	4
38.	What is the meaning of the statement "The potential difference between two points is 1 V" ? Name the device used to measure potential difference. What is resistance of a conductor ? What is electric power ? Write three formulae used to find it. *Ans.* : ★ If 1 Joule (1J) of work is done to move a charge of 1 Coulomb (1 C) from one point to another point in a current carrying conductor, the potential difference between the two points is 1 volt (1 V). 1 ★ The device used to measure it is voltmeter. $\frac{1}{2}$	

Qn. Nos.	Value Points	Total
	★ The property of a conductor to restrain or to retard the motion of electric charges flowing through it is called resistance of a conductor. 1	
	★ The rate at which electric energy is dissipated or consumed in an electric circuit is called electric power. 1	
	★ Three formulae used to find electric power are	
	→ $P = VI$ or $P = IV$ / $P = \frac{W}{t}$ $\frac{1}{2}$	
	→ $P = I^2R$ $\frac{1}{2}$	
	→ $P = \frac{V^2}{R}$ $\frac{1}{2}$	5