

**CCE PF  
CCE PR**

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 — 2018

**S. S. L. C. EXAMINATION, MARCH/APRIL, 2018**

ಮಾದರಿ ಉತ್ತರಗಳು

**MODEL ANSWERS**

ದಿನಾಂಕ : 02. 04. 2018 ]

ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E (Phy)**

Date : 02. 04. 2018 ]

**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 )

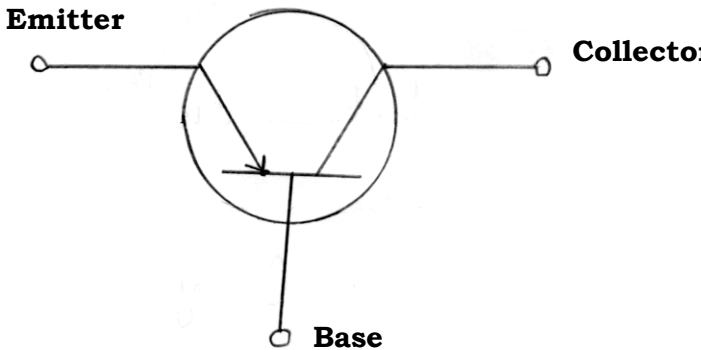
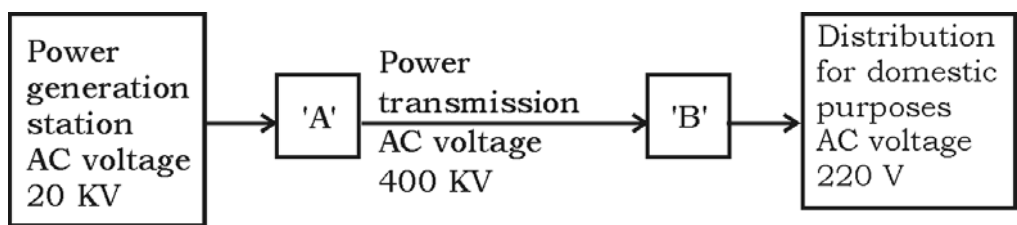
[ ಗರಿಷ್ಠ ಅಂಕಗಳು : 100

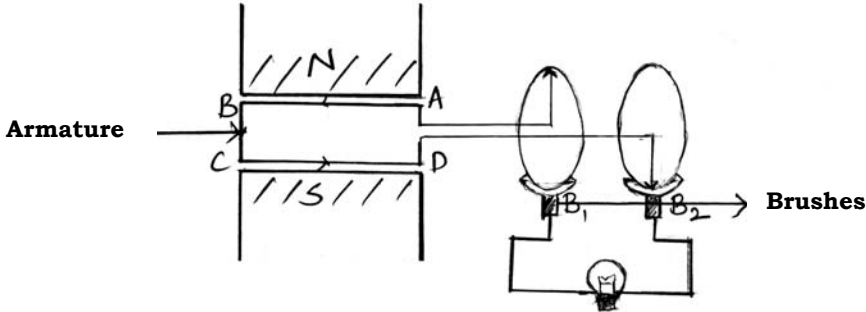
[ Max. Marks : 100

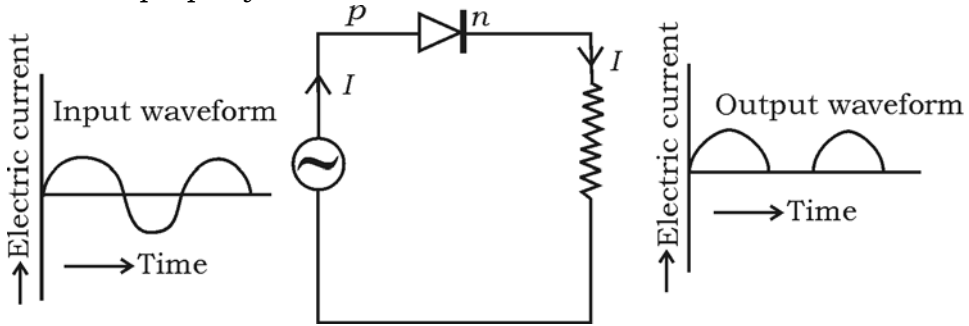
Qn. Nos.	Value Points	Total
1.	“Coal is a non-renewable source of energy.” Because, Ans. : (C) — the reserves of coal are depleting at a fast rate and it is difficult to replenish	1
4.	A man who is standing at a distance of 850 m from a sound reflecting surface claps loudly. If the velocity of the sound in air is $340 \text{ ms}^{-1}$ , then the time taken by the echo to reach him is Ans. : (A) — 5 s	1
6.	Steam engine cannot be started instantaneously because, Ans. : (B) — steam should be produced by heating water	1
7.	The principle of working of a motor is Ans. : (D) — a conductor carrying electrical current experiences mechanical force if kept in a magnetic field.	1

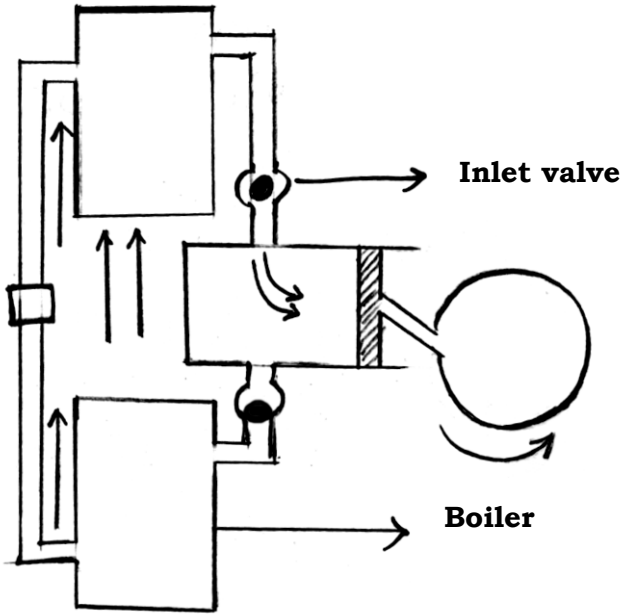
**PF & PR-7017 (PHY)**

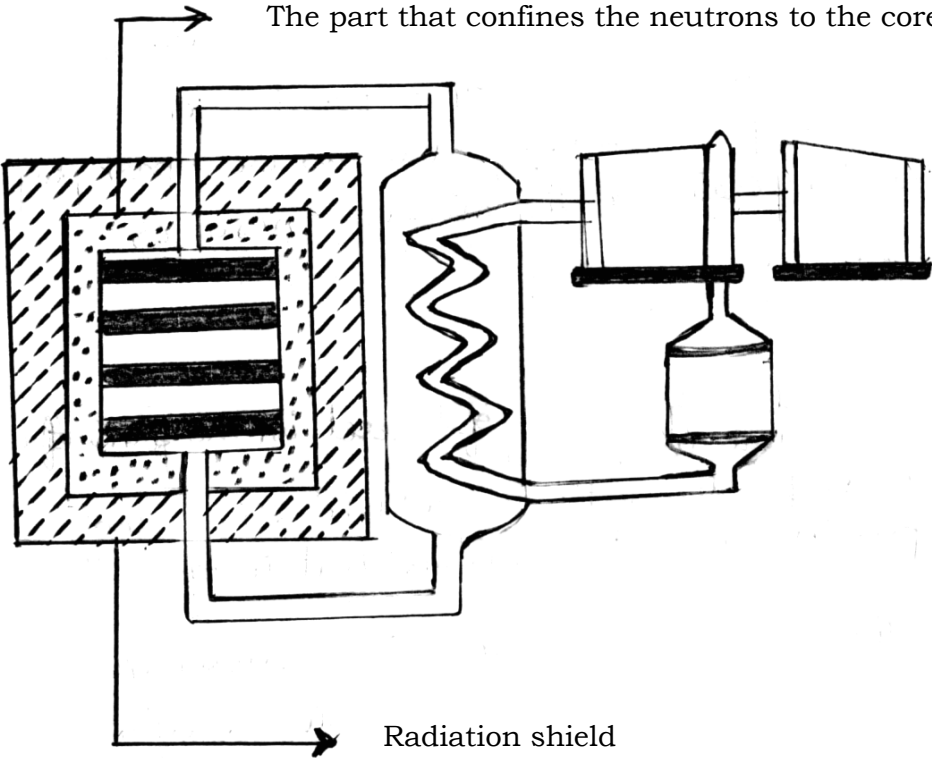
[ Turn over

Qn. Nos.	Value Points	Total
12.	<p>Nowadays bio-diesel is used in transportation vehicles as an alternate to diesel. Write two advantages of this measure.</p> <p>Ans. :</p> <ul style="list-style-type: none"> <li>★ Ecofriendly / reduces the environmental pollution</li> <li>★ Renewable source of energy</li> <li>★ Reduces the carbon dioxide content in the atmosphere.</li> </ul> <p style="text-align: right;">( any two )</p>	$\frac{1}{2} + \frac{1}{2}$ 1
13.	<p>Write the circuit symbol of <i>p-n-p</i> transistor.</p> <p>Ans. :</p> <div style="text-align: center;">  </div>	1
15.	<p>The schematic diagram indicating the transmission of electricity is given below :</p> <div style="text-align: center;">  </div> <p>Name the devices to be used in the places indicated as 'A' and 'B'.</p> <p>Ans. :</p> <p>A — Step-up transformer</p> <p>B — Step-down transformer.</p>	$\frac{1}{2}$ $\frac{1}{2}$ 1

Qn. Nos.	Value Points	Total
21.	<p>What is Doppler effect ? Mention the two applications of Doppler effect. OR List the uses of ultrasonic waves due to their high frequency. Ans. : The apparent change in the frequency of a wave, whenever there is a relative motion between the source of the wave and the observer. 1 Doppler effect is used to — ★ track artificial satellites ★ determine the velocity of the submarines ★ gauge the movement of stars / galaxies relative to earth ★ to study the rings of Saturn. ( any two ) <math>\frac{1}{2} + \frac{1}{2}</math></p> <p>OR</p> <p>Ultrasonic waves are used ★ to prepare homogeneous mixture of two immiscible liquids ★ in the manufacture of alloys and emulsion for photographic films ★ in dry cleaning to remove grease and dirt ★ as insect repellants ★ to kill bacteria ★ to cure neuralgic and rheumatic pains ★ in bloodless surgery ★ to break gall stones ★ in SONAR, ultrasound scanner. ( any four ) <math>4 \times \frac{1}{2}</math></p>	2
22.	<p>Draw the diagram of AC dynamo and label the following parts : (i) Armature (ii) Brushes. Ans. :</p>  <p>For figure — 1 Correct parts — <math>\frac{1}{2} + \frac{1}{2}</math></p>	2

Qn. Nos.	Value Points	Total
28.	<p>Observe the following figure. Which property of diode is indicated here ? Explain that property.</p>  <p>Ans. :</p> <ul style="list-style-type: none"> <li>★ Rectifying action / Rectifier. <span style="float: right;">1</span></li> <li>★ When the diode is forward biased it allows the current but when it is reverse biased the diode does not allow the current.</li> </ul> <p style="text-align: center;">OR</p> <p>The diode allows the current to pass through only in one direction. Hence it is used to convert AC into DC. <span style="float: right;">1</span></p>	2
34.	<p>The wavelength of a wave is 3 m. If the velocity of the wave is <math>330 \text{ ms}^{-1}</math>, then find the frequency of that wave. Calculate the time period if the frequency of that wave is reduced to half of its value.</p> <p>Ans. :</p> $V = n\lambda$ $n = \frac{V}{\lambda} \quad \quad \quad \frac{1}{2}$ $= \frac{330}{3}$ $n = 110 \text{ Hz} \quad \quad \quad \frac{1}{2}$ $n = \frac{1}{2} \times 110$ $n = 55 \text{ Hz} \quad \quad \quad \frac{1}{2}$ $T = \frac{1}{55} \quad \quad \quad \frac{1}{2}$ <p style="text-align: center;">or</p> $T = 0.018 \text{ s} \quad \quad \quad \frac{1}{2}$	2

Qn. Nos.	Value Points	Total						
37.	<p>Write the differences between <i>n</i>-type and <i>p</i>-type semiconductors.</p> <p>Ans. :</p> <table border="1" data-bbox="263 392 1321 672"> <thead> <tr> <th data-bbox="263 392 769 443"><i>n</i>-type semiconductor</th> <th data-bbox="769 392 1321 443"><i>p</i>-type semiconductor</th> </tr> </thead> <tbody> <tr> <td data-bbox="263 443 769 577">★ Pentavalent impurity is added to get this type of semiconductor</td> <td data-bbox="769 443 1321 577">★ Trivalent impurity is added to get this type of semiconductor. <span style="float: right;">1</span></td> </tr> <tr> <td data-bbox="263 577 769 672">★ Majority charge carriers are electrons</td> <td data-bbox="769 577 1321 672">★ Majority charge carriers are holes. <span style="float: right;">1</span></td> </tr> </tbody> </table>	<i>n</i> -type semiconductor	<i>p</i> -type semiconductor	★ Pentavalent impurity is added to get this type of semiconductor	★ Trivalent impurity is added to get this type of semiconductor. <span style="float: right;">1</span>	★ Majority charge carriers are electrons	★ Majority charge carriers are holes. <span style="float: right;">1</span>	2
<i>n</i> -type semiconductor	<i>p</i> -type semiconductor							
★ Pentavalent impurity is added to get this type of semiconductor	★ Trivalent impurity is added to get this type of semiconductor. <span style="float: right;">1</span>							
★ Majority charge carriers are electrons	★ Majority charge carriers are holes. <span style="float: right;">1</span>							
41.	<p>Draw the diagram showing the expansion stroke of steam engine and label the following parts.</p> <p>(i) Boiler (ii) Inlet valve.</p> <p>Ans. :</p> <div style="text-align: center;">  </div> <p style="text-align: right;">For the figure — 1 Correct parts — <math>2 \times \frac{1}{2}</math></p>	2						
43.	<p>What is a galaxy ? Name the types of galaxy.</p> <p>Ans. :</p> <p>The system of billions of stars, gas and dust held by gravitational force. <span style="float: right;"><math>\frac{1}{2}</math></span></p> <p>Types of galaxy :</p> <p>i) Elliptical galaxy <span style="float: right;"><math>\frac{1}{2}</math></span></p> <p>ii) Spiral galaxy <span style="float: right;"><math>\frac{1}{2}</math></span></p> <p>iii) Irregular galaxy. <span style="float: right;"><math>\frac{1}{2}</math></span></p>	2						

Qn. Nos.	Value Points	Total
45.	<p>Draw the diagram of a nuclear power reactor and label the following parts.</p> <p>(i) The part that confines neutrons to the core</p> <p>(ii) Radiation shield.</p> <p>Ans. :</p>  <p style="text-align: right;">For the figure — 2 Correct parts — <math>2 \times \frac{1}{2}</math></p>	3
47.	<p>Explain intake stroke and compression stroke in the working of a petrol engine.</p> <p style="text-align: center;">OR</p> <p>Explain the working of a diesel engine.</p> <p>Ans. :</p> <p><i>Intake stroke :</i></p> <ul style="list-style-type: none"> <li>★ The vapourised mixture of petrol and air is let through inlet valve. <math>\frac{1}{2}</math></li> <li>★ The outlet valve is closed. <math>\frac{1}{2}</math></li> <li>★ Piston moves away from the spark plug. <math>\frac{1}{2}</math></li> </ul>	

Qn. Nos.	Value Points	Total
	<p><i>Compression stroke :</i></p> <ul style="list-style-type: none"> <li>★ Both inlet valve and outlet valves are closed. <math>\frac{1}{2}</math></li> <li>★ The mixture of air and petrol is compressed by the piston moving towards the spark plug. <math>\frac{1}{2}</math></li> <li>★ The temperature of the mixture increases. <math>\frac{1}{2}</math></li> </ul> <p style="text-align: center;">OR</p> <ul style="list-style-type: none"> <li>★ During the intake stroke, filtered air is sent into the cylinder and compressed. <math>\frac{1}{2}</math></li> <li>★ The compression ratio is 14 : 1 to 25 : 1 and compression generates enough heat to ignite the fuel. <math>\frac{1}{2}</math></li> <li>★ At the end of compression stroke diesel in the form of micelles is injected into the cylinder. <math>\frac{1}{2}</math></li> <li>★ Diesel bursts into flame instantaneously, the products of combustion are high pressure gases. <math>\frac{1}{2}</math></li> <li>★ Due to the expansion of gases the piston is pushed. <math>\frac{1}{2}</math></li> <li>★ Spent gases are ejected out of the cylinder during exhaust stroke. <math>\frac{1}{2}</math></li> </ul>	3
50.	<p>(a) Explain the red giant stage of a star. Which is the factor that decides the next stage of a star after its red giant stage ?</p> <p>(b) Define escape velocity with respect to earth. What do <math>R</math> and <math>g</math> indicate in the mathematical formula of escape velocity ?</p> <p style="text-align: center;">OR</p> <p>(a) Explain the supernova stage of a star. Mention the main feature of a black hole.</p> <p>(b) State the law of conservation of momentum. "Propellants are necessary for the working of rockets." Why ?</p> <p><i>Ans. :</i></p> <p>a) In the red giant stage of a star,</p> <ul style="list-style-type: none"> <li>★ As the radiation pressure increases beyond the gravitational pull, the star begins to swell. <math>\frac{1}{2}</math></li> <li>★ The surface area of the star becomes more. There is a radiation loss. <math>\frac{1}{2}</math></li> </ul>	3

Qn. Nos.	Value Points	Total
	<p>★ The temperature of the star decreases and it emits light with low frequency radiation and becomes red. <math>\frac{1}{2}</math></p> <p>The mass of a star. <math>\frac{1}{2}</math></p>	
b)	<p>The minimum velocity with which a body must be projected so that it escapes from the gravitational field of the earth is called escape velocity. 1</p> <p><math>R \rightarrow</math> radius of the earth. <math>\frac{1}{2}</math></p> <p><math>g \rightarrow</math> acceleration due to gravity. <math>\frac{1}{2}</math></p>	4
OR		
a)	<p>★ The stars having the mass five times than the mass of the sun undergo this stage called supernova. <math>\frac{1}{2}</math></p> <p>★ Several nuclear reactions are ignited. Fusion of helium forms carbon core and fusion of carbon nuclei liberates energy and heavier elements like oxygen, magnesium and silicon are synthesized. <math>\frac{1}{2}</math></p> <p>★ When the iron core is formed, after the repetition of fusion cycles, the star explodes and the event is called supernova. <math>\frac{1}{2}</math></p> <p>★ Intense gravitational force / very high density. <math>\frac{1}{2}</math></p>	
b)	<p>The total momentum of the system is conserved when the net force acting on the system is zero. 1</p> <p>★ Propellants are required to launch the rockets. <math>\frac{1}{2}</math></p> <p>★ Rockets need to work even in vacuum. <math>\frac{1}{2}</math></p> <p>★ Propellants contain oxidizer with fuel which help the fuel to burn even in the absence of oxygen ( or in vacuum ). Hence propellants are necessary for the working of rockets. <math>\frac{1}{2}</math></p> <p style="text-align: right;">( Any two )</p>	4