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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 — 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)

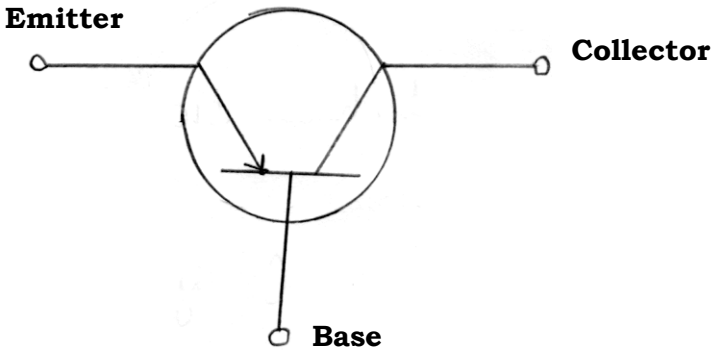
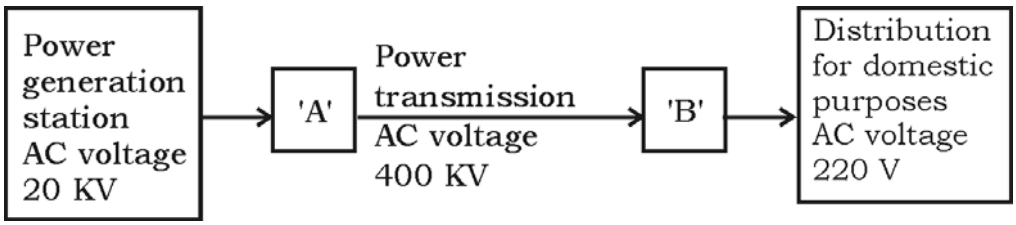
(ಶಾಲಾ ಅಭ್ಯರ್ಥಿ & ಪುನರಾವರ್ತಿತ ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / Regular Fresh & Regular Repeater)

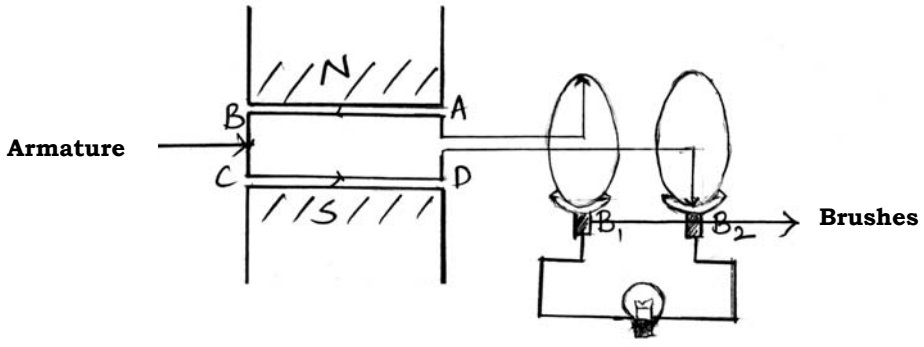
(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

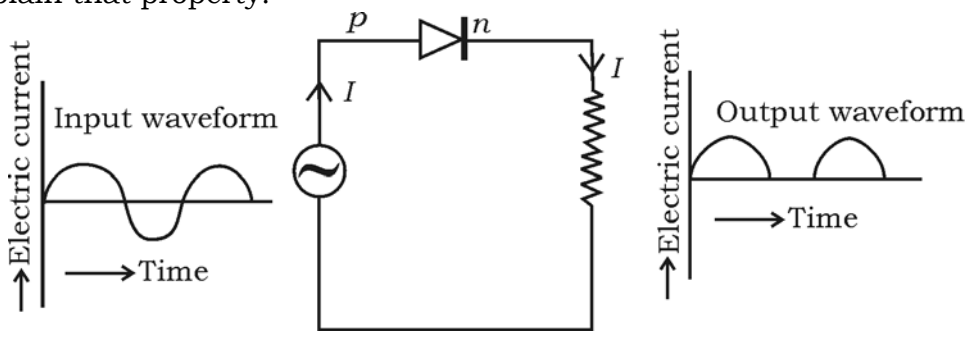
[ಗರಿಷ್ಠ ಅಂಕಗಳು : **80**

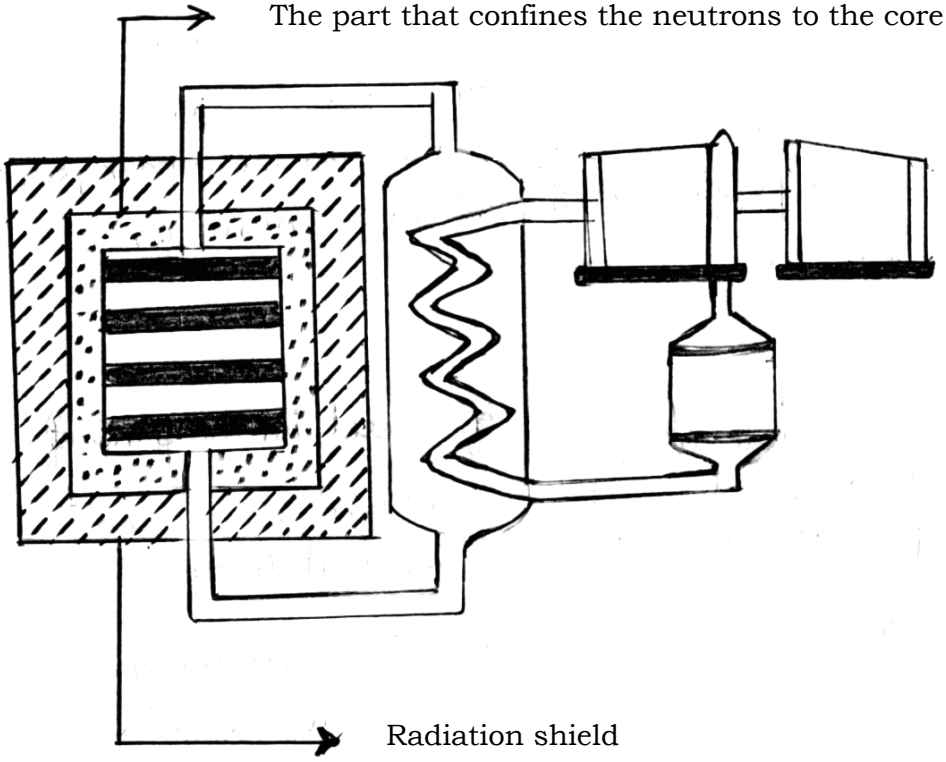
[Max. Marks : 80

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 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

Qn. Nos.	Value Points	Total
12.	Nowadays bio-diesel is used in transportation vehicles as an alternate to diesel. Write two advantages of this measure. *Ans.* : ★ Ecofriendly / reduces the environmental pollution ★ Renewable source of energy ★ Reduces the carbon dioxide content in the atmosphere. (any *two*) $\frac{1}{2}+\frac{1}{2}$	1
13.	Write the circuit symbol of *p-n-p* transistor. *Ans.* :  	1
15.	The schematic diagram indicating the transmission of electricity is given below :  Name the devices to be used in the places indicated as *'A'* and *'B'*. *Ans.* : *A* — Step-up transformer $\frac{1}{2}$ *B* — Step-down transformer. $\frac{1}{2}$	1

Qn. Nos.	Value Points	Total
21.	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*) $\frac{1}{2} + \frac{1}{2}$ OR 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*) $4 \times \frac{1}{2}$	2 2
22.	Draw the diagram of AC dynamo and label the following parts : (i) Armature (ii) Brushes. *Ans.* :  For figure — 1 Correct parts — $\frac{1}{2} + \frac{1}{2}$	2

Qn. Nos.	Value Points	Total
28.	Observe the following figure. Which property of diode is indicated here ? Explain that property.  *Ans.* : ★ Rectifying action / Rectifier. 1 ★ When the diode is forward biased it allows the current but when it is reverse biased the diode does not allow the current. OR The diode allows the current to pass through only in one direction. Hence it is used to convert *AC* into *DC*. 1	2
34.	The wavelength of a wave is 3 m. If the velocity of the wave is 330 ms^{-1}, then find the frequency of that wave. Calculate the time period if the frequency of that wave is reduced to half of its value. *Ans.* : $V = n\lambda$ $n = \frac{V}{\lambda}$ $\frac{1}{2}$ $= \frac{330}{3}$ n = 110 Hz $\frac{1}{2}$ $n = \frac{1}{2} \times 110$ n = 55 Hz $\frac{1}{2}$ $T = \frac{1}{55}$ $\frac{1}{2}$ or or T = 0·018 s $\frac{1}{2}$	2

Qn. Nos.	Value Points	Total
35.	Draw the diagram of a nuclear power reactor and label the following parts. (i) The part that confines neutrons to the core (ii) Radiation shield. *Ans.* :  For the figure — 2 Correct parts — $2 \times \frac{1}{2}$	3
37.	Explain intake stroke and compression stroke in the working of a petrol engine. OR Explain the working of a diesel engine. *Ans.* : *Intake stroke :* ★ The vapourised mixture of petrol and air is let through inlet valve. $\frac{1}{2}$ ★ The outlet valve is closed. $\frac{1}{2}$ ★ Piston moves away from the spark plug. $\frac{1}{2}$	

Qn. Nos.	Value Points	Total
	Compression stroke : ★ Both inlet valve and outlet valves are closed. $\frac{1}{2}$ ★ The mixture of air and petrol is compressed by the piston moving towards the spark plug. $\frac{1}{2}$ ★ The temperature of the mixture increases. $\frac{1}{2}$ OR ★ During the intake stroke, filtered air is sent into the cylinder and compressed. $\frac{1}{2}$ ★ The compression ratio is 14 : 1 to 25 : 1 and compression generates enough heat to ignite the fuel. $\frac{1}{2}$ ★ At the end of compression stroke diesel in the form of micelles is injected into the cylinder. $\frac{1}{2}$ ★ Diesel bursts into flame instantaneously, the products of combustion are high pressure gases. $\frac{1}{2}$ ★ Due to the expansion of gases the piston is pushed. $\frac{1}{2}$ ★ Spent gases are ejected out of the cylinder during exhaust stroke. $\frac{1}{2}$	3 3
40.	(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 ? (b) Define escape velocity with respect to earth. What do *R* and *g* indicate in the mathematical formula of escape velocity ? OR (a) Explain the supernova stage of a star. Mention the main feature of a black hole. (b) State the law of conservation of momentum. "Propellants are necessary for the working of rockets." Why ? *Ans.* : a) In the red giant stage of a star, ★ As the radiation pressure increases beyond the gravitational pull, the star begins to swell. $\frac{1}{2}$ ★ The surface area of the star becomes more. There is a radiation loss. $\frac{1}{2}$	

Qn. Nos.	Value Points	Total
	★ The temperature of the star decreases and it emits light with low frequency radiation and becomes red. $\frac{1}{2}$	
	The mass of a star. $\frac{1}{2}$	
	b) 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	
	$R \rightarrow$ radius of the earth. $\frac{1}{2}$	
	$g \rightarrow$ acceleration due to gravity. $\frac{1}{2}$	4
	OR	
	a) ★ The stars having the mass five times than the mass of the sun undergo this stage called supernova. $\frac{1}{2}$	
	★ 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. $\frac{1}{2}$	
	★ When the iron core is formed, after the repetition of fusion cycles, the star explodes and the event is called supernova. $\frac{1}{2}$	
	★ Intense gravitational force / very high density. $\frac{1}{2}$	
	b) The total momentum of the system is conserved when the net force acting on the system is zero. 1	
	★ Propellants are required to launch the rockets. $\frac{1}{2}$	
	★ Rockets need to work even in vacuum. $\frac{1}{2}$	
	★ 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. $\frac{1}{2}$	
	(Any *two*)	4