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

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

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S. S. L. C. EXAMINATION, JUNE, 2019

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ದಿನಾಂಕ : 24. 06. 2019] ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E (Phy)**

Date : 24. 06. 2019] **CODE NO. : 83-E (Phy)**

ವಿಷಯ : ವಿಜ್ಞಾನ

Subject : SCIENCE

(ಭೌತಶಾಸ್ತ್ರ / **Physics**)

(ಹಳೆ ಪಠ್ಯಕ್ರಮ / Old Syllabus)

(ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / Private Repeater)

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

[ಗರಿಷ್ಠ ಅಂಕಗಳು : **100**

[Max. Marks : 100

Qn. Nos.	Value Points	Total
1.	The solar device used for seasoning of wood and desalination of sea water is (A) solar cell (B) solar collector (C) solar heater (D) solar lamp. *Ans.* : (C) — solar heater	1

Qn. Nos.	Value Points	Total
4.	The component in Sonar, that converts ultrasonic waves into electrical signals is (A) detector (B) transmitter (C) converter (D) analyser. *Ans.* : (A) — detector	1
7.	The device which works on the principle of mutual induction is (A) motor (B) dynamo (C) transistor (D) transformer. *Ans.* : (D) — transformer	1
14.	Tidal energy is more reliable than wind energy. Why ? *Ans.* : Fluctuations are comparatively less	1
17.	Name the type of current produced when slip rings are replaced by split rings in a dynamo. *Ans.* : Direct Current (D.C.)	1

Qn. Nos.	Value Points	Total
19.	Write any two differences between longitudinal waves and transverse waves. *Ans.* :	

Transverse waves	*Longitudinal waves*
i) Particles vibrate in the direction perpendicular to the direction of wave propagation.	i) Particles vibrate along the direction (parallel) of the propagation.
ii) The wave propagates in the form of crests and troughs.	ii) The wave propagates in the form of compressions and rarefactions.
iii) Alternate crests and troughs constitute a wave.	iii) Alternate compressions and rarefactions constitute a wave.

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

22. Explain the intake stroke in the working of a petrol engine.

Ans. :

Intake Stroke :

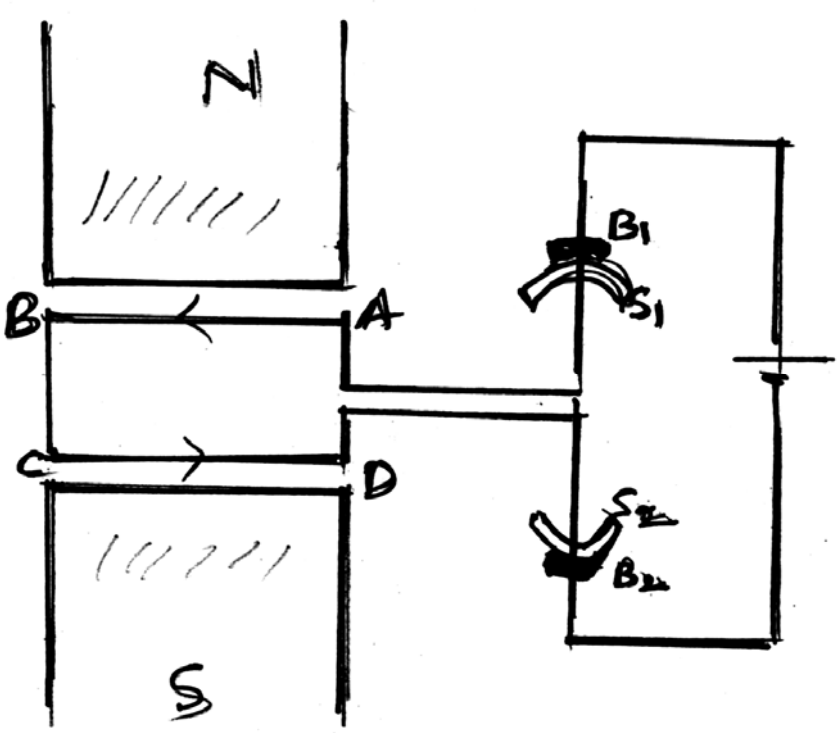
(i) Inlet valve opens and outlet valve is closed

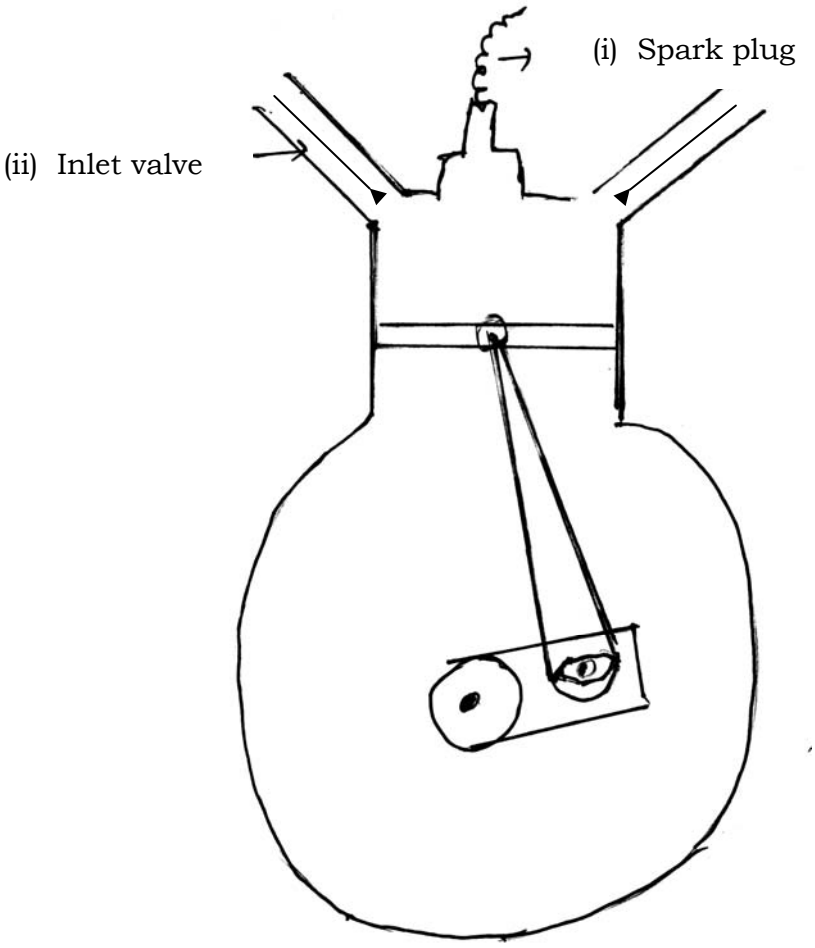
(ii) Piston moves away from the head of the cylinder

(iii) The fuel mixture (petrol + air) enters into the cylinder through inlet valve.

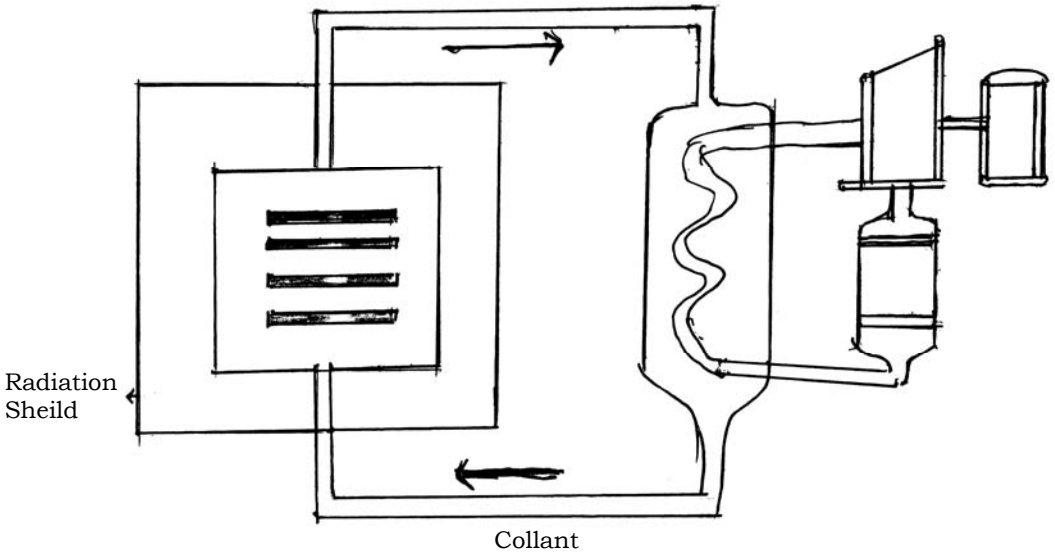
(Any *two*) 1 + 1 2

Qn. Nos.	Value Points	Total
25.	The efficiency of a heat engine is 30. If 60,000 joules of heat is supplied to the engine then calculate the work done by the engine.	
	Ans. :	
	$\eta = \frac{W}{H} \times 100$ | $\eta = 30$ $\frac{1}{2}$	
	$30 = \frac{W}{60000} \times 100$ | $H = 60{,}000$ $W = ?$ $\frac{1}{2}$	
	$30 \times 600 = W$ $\frac{1}{2}$	
	18000 joules = Work done $\frac{1}{2}$	2
28.	A ship sends ultrasonic sound. This sound reflects from seabed and returns after 6 seconds. If the speed of ultrasonic sound through seawater is 1·5 km s^{-1}, find the depth of the sea.	
	Ans. :	
	Distance = 2 × depth of the sea $V = 1{\cdot}5\ \text{kms}^{-1}$	
	$V = \frac{2d}{t}$ $t = 6$ sec.	
	$d = \frac{Vt}{2}$ $\frac{1}{2}$	
	$d = \frac{1{\cdot}5 \times 6}{2}$ $\frac{1}{2}$	
	$d = 1{\cdot}5 \times 3 = 4{\cdot}5$ km $\frac{1}{2}$	
	Depth of the sea = 4·5 km. $\frac{1}{2}$	2

Qn. Nos.	Value Points		Total
31.	Draw the diagram of D.C. motor. Label the following parts : (i) Brushes (ii) Coil on armature. *Ans.* :		
	 	1	
	ABCD → Coil on armature B_1 , B_2 → Brushes	$\frac{1}{2}+\frac{1}{2}$	2
35.	Draw the diagram of petrol engine. Label the following parts : (i) Spark plug (ii) Inlet valve. *Ans.* :		

Qn. Nos.	Value Points	Total
	 1 $\frac{1}{2}+\frac{1}{2}$	2
38.	State Faraday's laws of electromagnetic induction. *Ans.* : *Faraday's laws of electromagnetic induction.* Ist Law : Whenever a magnetic field linked with a conductor changes, an induced e.m.f. is generated in the conductor. 1 IInd Law : The magnitude of induced e.m.f. is directly proportional to the rate of change of magnetic field linked with the conductor. 1	2

Qn. Nos.	Value Points	Total
41.	Mention any two differences between nuclear fission and nuclear fusion. *Ans.* : (i) A heavy nucleus splits into two lighter nuclei with liberation of energy and neutrons — *Nuclear fission* (i) Two or more nuclei fuse to form a heavy nucleus with the liberation of energy — *Nuclear fusion* (ii) Nuclear fissions can be controlled — *Nuclear fission* (ii) At present there is no mechanism to control fusion reactions — *Nuclear fusion* (iii) The process of fission does not require high temperature — *Nuclear fission* (iii) The process of fusion requires extremely high temperature of the order 10^6 K — *Nuclear fusion* (iv) Causes radiation pollution problems due to radioactive products — *Nuclear fission* (iv) Does not cause radiation pollution since the products are not radioactive. — *Nuclear fusion* (Any *two*) (2 × 1)	2
43.	Mention any two applications of simple harmonic motion. *Ans.* : (i) Simple harmonic motion of pendulum is used for the measurement of time. (ii) Tuning of the musical instrument is done with the vibrating tuning fork which executes simple harmonic motion. (iii) Wave is consequence of simple harmonic motion. Study of waves is indirectly the study of simple harmonic motion. (iv) We can study the molecular structure because molecules are in simple harmonic motion. This study is called vibration spectroscopy. (Any *two*) 2 × 1	2

Qn. Nos.	Value Points	Total
45.	Draw the diagram of nuclear power reactor. Label the following parts : (i) Radiation sheild (ii) Coolant. *Ans.* :  $2 + \frac{1}{2} + \frac{1}{2}$	3
48.	(a) Write two differences between *p*-type and *n*-type of semiconductors. (b) Write any two applications of diode. OR (a) Write two differences between intrinsic and extrinsic type of semiconductors. (b) Write any two applications of super conductors. *Ans.* :	

Qn. Nos.	Value Points	Total

(a) *n-type semiconductor*	*p-type semiconductor*
★ When pentavalent impurity atoms like As, Sb etc. are added to the intrinisic semi-conductor. We get *n*-type semiconductor	★ When trivalent impurity like gallium and indium etc. are added in the intrinisic semiconductor. We get *p*-type semiconductor. 1
★ The majority carriers in *n*-type semiconductor are electrons and minority carries holes due to thermal energy.	★ The majority carriers are holes, minority carriers are electrons. 1

(b) (i) Used to convert A.C. to D.C.

(ii) Used in voltage regulation system

(iii) Used in logic circuits in computers.

(Any *two*) $\frac{1}{2} + \frac{1}{2}$ 3

OR

(a) *Intrinisic semiconductor*	*Extrinisic semiconductors*
★ Intrinisic semiconductors are the crystals of pure elements like germanium and silicon	★ When some impurity atoms are added in the intrinisic semiconductor an extrinisic semiconductor is obtained. 1
★ The number of electrons is equal to the number of holes ($n_e = n_h$)	★ The number of electrons is not equal to the number of holes ($n_e \neq n_h$) 1

Qn. Nos.	Value Points	Total
	(b) (i) Used in powerful magnets (ii) High temperature super conductors are used in microwave devices (iii) Super conductor magnets are used in magnetic resonance imaging (MRI). (Any *two*) $\frac{1}{2} + \frac{1}{2}$	3
50.	(a) Mention the stages in the life cycle of a star and explain its beginning stage. (b) Why do stars appear in different colours ? OR (a) Explain Big bang theory. (b) Write the relationship between escape velocity and orbital velocity. *Ans.* : (a) (i) Protostar (ii) Steady state (iii) Red giant (iv) White dwarf (v) Supernova (vi) Black holes. 2 *Protostar* : The gaseous clouds contract due to their mutual attraction as the cloud contracts. There will be increase in density which in turn leads to increase in pressure, gradually there will be aggregation of matter like hydrogen with spherical mass at the centre of the cloud. 1 (b) Intrinisic temperature / refraction of light. 1 OR	4

Qn. Nos.	Value Points	Total
	(a) The concept of big bang theory comes into light, based on the model of supernova explosion of stars that led to the formation of new stars, it is proposed that the universe might have begun with a start of explosion. 2 Everything that we have in the universe was once concentrated in a very small, hot place called Primordial Fire Ball. Fire ball exploded with a bang and the matter in it was thrown away with tremendous speed. Thus the universe is formed. The evidence for this is the red shift of the light originating from galaxies. 1 (b) $V_e = \sqrt{2}\ V_o$ 1	4