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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 — 2019

S. S. L. C. EXAMINATION, MARCH/APRIL, 2019

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ದಿನಾಂಕ : 02. 04. 2019]

Date : 02. 04. 2019]

ಸಂಕೇತ ಸಂಖ್ಯೆ : **83-E (Phy)**

CODE NO. : 83-E (Phy)

ವಿಷಯ : ವಿಜ್ಞಾನ

Subject : SCIENCE

(ಭೌತಶಾಸ್ತ್ರ / **Physics**)

(ಹಳೆ ಪಠ್ಯಕ್ರಮ / Old Syllabus)

(ಪುನರಾವರ್ತಿತ ಖಾಸಗಿ ಅಭ್ಯರ್ಥಿ / Private Repeater)

(ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version)

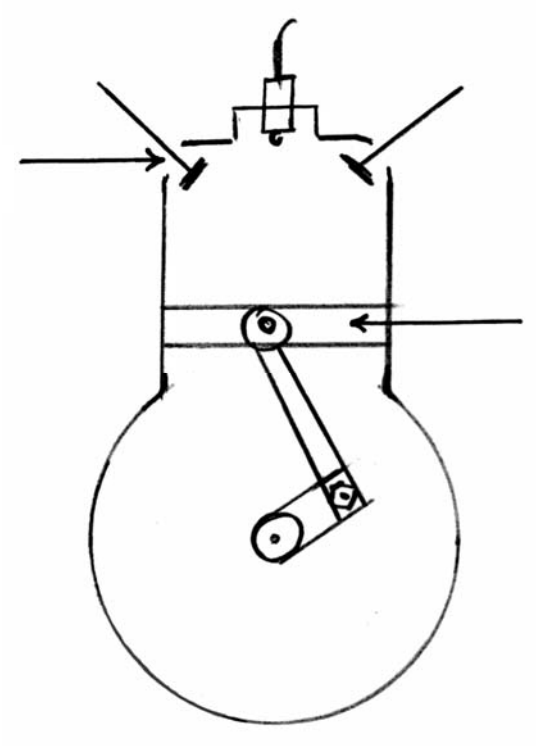
[ಗರಿಷ್ಠ ಅಂಕಗಳು : **100**

[Max. Marks : 100

Qn. Nos.	Value Points	Total
1.	The principle of working of solar cells is (A) magnetic effect (B) electromagnetic induction (C) chemical effect (D) photovoltaic effect *Ans.* : (D) — photovoltaic effect	1

Qn. Nos.	Value Points	Total
4.	The device used to increase or decrease the input A.C. voltage is (A) motor (B) induction coil (C) transformer (D) commutator *Ans.* : (C) — transformer	1
6.	The frequency of the current produced in A.C. dynamo depends on the (A) rate of rotation of the armature (B) strength of the magnetic field (C) number of turns of the coil (D) size of the dynamo *Ans.* : (A) — rate of rotation of the armature	1
12.	Wind mills cannot be installed in all the regions. Why ? *Ans.* : i) The potential of wind varies from region to region ii) In all regions the speed of wind will not be between 8 ms^{-1} and 22 ms^{-1}. (Any *one*) (Or any suitable answer)	1

Qn. Nos.	Value Points	Total
13.	Doppler effect of sound is not experienced by the listener when the listener and the source of sound move with the same speed and in the same direction. Why ? *Ans.* : Doppler effect is experienced only when there is a relative motion between the source of sound and the listener. OR There is no relative motion between the source of sound and the listener.	1
21.	A tuning fork vibrates 6000 times in 60 seconds. If the sound wave produced travels at 330 ms^{-1} then, find its wavelength. *Ans.* : Number of vibrations = 6000 Total time taken = 60 s Frequency (n) = $\frac{6000}{60}$ $\frac{1}{2}$ n = 100 Hz Wave velocity (v) = $n\lambda$ $\frac{1}{2}$ Wavelength λ = $\frac{v}{n}$ = $\frac{330}{100}$ $\frac{1}{2}$ = 3·3 m $\therefore$ Wavelength = 3·3 m $\frac{1}{2}$	2

Qn. Nos.	Value Points	Total
22.	Draw the diagram of a petrol engine. Label the following parts : (i) Inlet valve (ii) Piston. *Ans.* :  Petrol Engine $1 + \frac{1}{2} + \frac{1}{2}$	2
27.	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. IInd Law : The magnitude of induced e.m.f. is directly proportional to the rate of change of magnetic field linked with the conductor.	2

Qn. Nos.	Value Points	Total
31.	Mention any four limitations of steam engine. OR What is a heat engine ? Mention the function of crank shaft in heat engine. *Ans.* : Limitations of steam engine : i) Steam engine is bulky. ii) The efficiency of steam engine is very low. iii) Steam engine cannot be started instantly. iv) There is a chance of bursting of boiler due to the storing of steam at high pressure. v) Steam engine is not suitable for light weight vehicles. ($4 \times \frac{1}{2}$)	2
	OR A heat engine is a device which converts heat energy into mechanical energy. 1 Crank shaft converts linear motion of the piston into circular motion. 1	2
32.	Ultrasonic sound waves sent by a ship return after 6s by reflection from the sea bed. If the speed of ultrasonic wave in sea water is 1530 ms^{-1} then, find the depth of the sea in kilometres.	

Qn. Nos.	Value Points	Total

Ans. :

Time (t) = 6 s

Speed (v) = 1530 ms^{-1}

Distance (d) = ?

$d = \frac{vt}{2}$ $\frac{1}{2}$

$d = \frac{1530 \times 6}{2}$ $\frac{1}{2}$

$= 1530 \times 3$

d = 4590 m $\frac{1}{2}$

$d = \frac{4590}{1000}$

= 4·59 km $\frac{1}{2}$

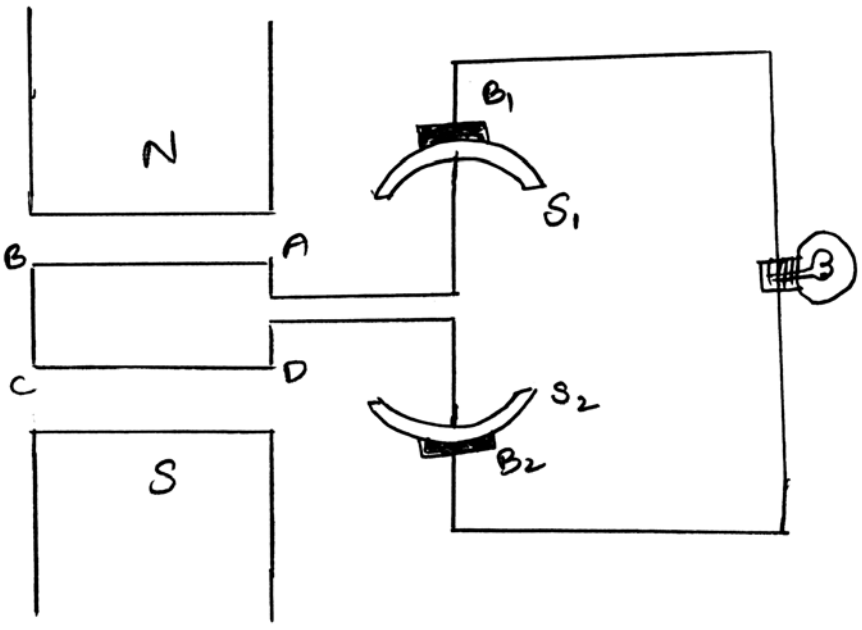
$\therefore$ Depth of the ocean = 4·59 km. 2

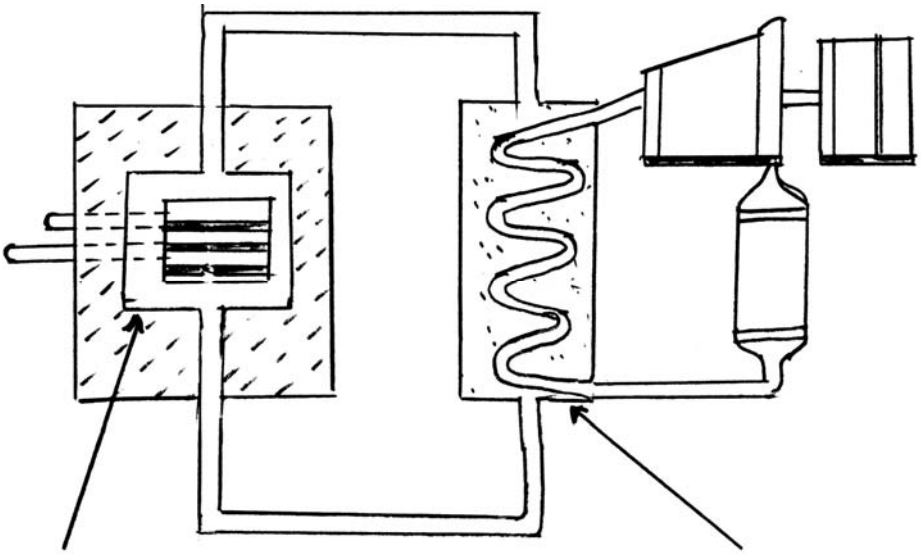
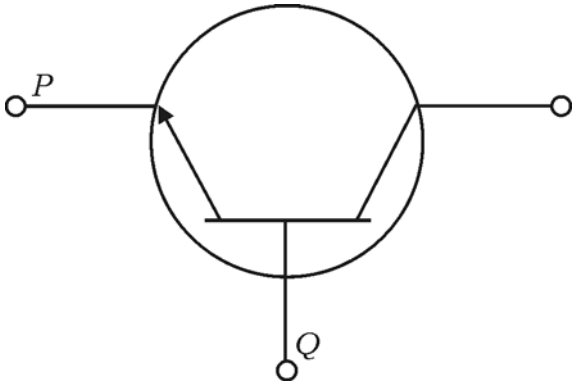
35. Mention any two differences between longitudinal waves and transverse waves.

Ans. :

Transverse waves	*Longitudinal waves*
i) Particles vibrate in the direction perpendicular to the direction of wave propagation.	i) Particles vibrate along the direction 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

Qn. Nos.	Value Points	Total
37.	What is a diode ? Write two applications of diode. *Ans.* : A single crystal of semi-conducting material whose one side is doped with donor impurity and the other side is doped with acceptor impurity forms a *p-n* junction. This is called *p-n* junction diode or semi-conductor diode. 1 Applications of diode. i) Diodes are used to convert A.C. into D.C. (Diodes are used to convert alternating current to direct current) ii) Used in voltage regulation system. iii) Used in logic circuits of computers. $\frac{1}{2}+\frac{1}{2}$	2
40.	Draw the diagram of D.C. dynamo. Label the following parts : (i) Coil on armature (i) Split rings. *Ans.* :  *ABCD* → armature S_1S_2 → Split rings $1+\frac{1}{2}+\frac{1}{2}$	2

Qn. Nos.	Value Points	Total
45.	Draw the diagram of a nuclear power reactor. Label the following parts : (a) Reflector (b) Heat exchanger. *Ans.* :  Reflector Heat exchanger ($2 + \frac{1}{2} + \frac{1}{2}$)	3
47.	Observe the given circuit symbol of a transistor and answer the following questions :  	

Qn. Nos.	Value Points	Total
	(a) Name the regions of the transistor marked as *P* and *Q* and mention their function. (b) Mention the type of this transistor. *Ans.* : (a) *P* → Emitter $\frac{1}{2}$ *Q* → Base $\frac{1}{2}$ *Emitter* : It supplies a large number of majority charge carriers. $\frac{1}{2}$ *Base* : It regulates the flow of charges from emitter to collector. $\frac{1}{2}$ (b) Type of transistor : *npn* transistor. 1	3
50.	(a) Explain the protostar stage in the stellar evolution. (b) State the law of conservation of momentum. Write the two factors on which acceleration of the rocket depend OR (a) Explain the black hole stage in the stellar evolution. Based on what factors the existence of black hole can be identified ?	

Qn. Nos.	Value Points	Total
	(b) Mention the relationship between orbital velocity and escape velocity. What is the meaning of the statement "Escape velocity is $11{\cdot}2\ kms^{-1}$" on the earth.	
	Ans. :	
	(a) (i) Mutual attraction of hydrogen clouds.	
	(ii) Increase in density and pressure due to contraction of gases	
	(iii) The central portion accounts for 99% of the mass of the cloud.	
	(iv) the sphere formed at the centre of the cloud due to the unidirectional force (gravitation force) $4 \times \frac{1}{2} = 2$	
	(b) The total momentum of the system is conserved when the net force acting on the system is zero. 1	
	Acceleration of the rocket depends on amount of fuel burnt and exhaust velocity. 1	4
	OR	
	(a) The remnant of supernova explosion of a massive star compressed into a very small region of intense gravitational field and is called a black hole. 1	
	A black hole can be recognised by its impact of gravitational force on the nearer objects and its density. 1	

Qn. Nos.	Value Points	Total
	(b) Orbital velocity $V_o = \sqrt{Rg}$ Escape velocity $V_e = \sqrt{2Rg}$ $\therefore \quad V_e = \sqrt{2} \times V_o$ 1 The minimum velocity with which a body must be projected so that it escapes from the earth's gravitational field should be 11·2 kms^{-1}. 1	4