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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, ಜೂನ್ — 2018

S. S. L. C. EXAMINATION, JUNE, 2018

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWERS

ದಿನಾಂಕ : 23. 06. 2018] ಸಂಕೇತ ಸಂಖ್ಯೆ : **71**

Date : 23. 06. 2018] **CODE NO. : 71**

ವಿಷಯ : ಎಲಿಮೆಂಟ್ಸ್ ಆಫ್ ಇಂಜಿನಿಯರಿಂಗ್

Subject : ELEMENTS OF ENGINEERING

(ಹಳೆಯ ಪಠ್ಯಕ್ರಮ / Old Syllabus)

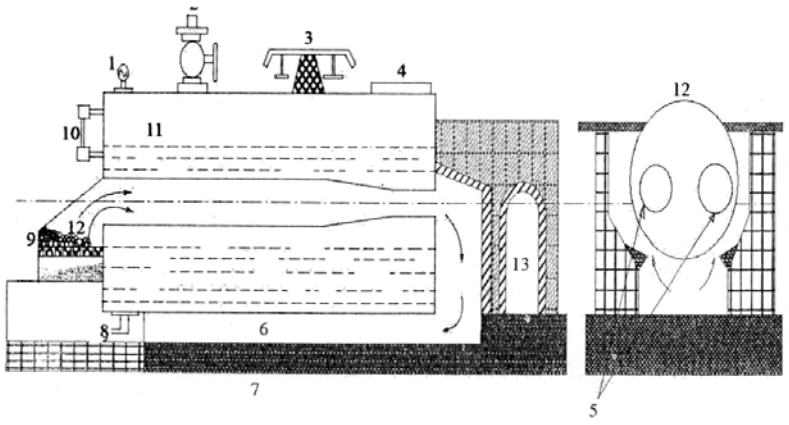
(ಪುನರಾವರ್ತಿತ ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / Regular Repeater)

[ಗರಿಷ್ಠ ಅಂಕಗಳು : **50**

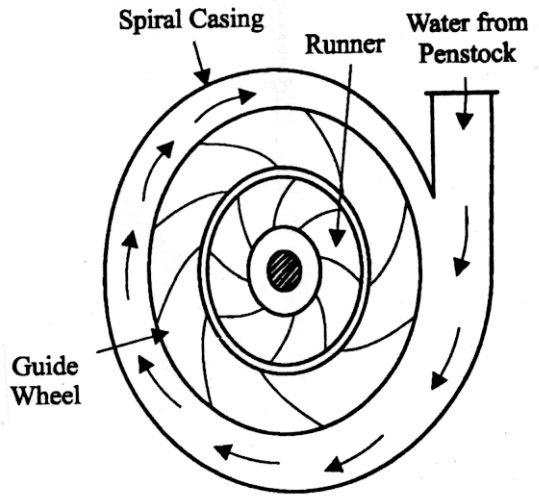
[Max. Marks : 50

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
		SECTION - A	
1.		Fill in the blanks with the appropriate term selecting from the choices given in the brackets : 10 × 1 = 10	
	a)	The winding to which the load is connected, is called ..... . (*primary, secondary, core*) *Ans.* secondary	
	b)	The cleat wiring is used for ..... purpose. (*temporary, permanent, both*) *Ans.* temporary	

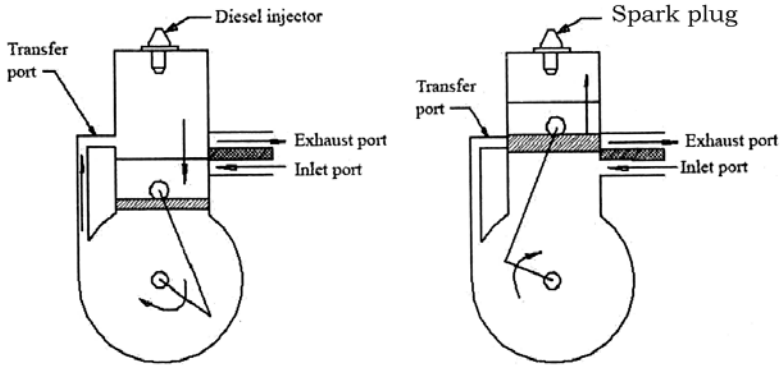
Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	c)	Commutator segment are made of ..... . (*aluminium, cast iron, copper*) *Ans.* copper	
	d)	Filament of incandescent lamp is made of ..... . (*copper, tungsten, eureka*) *Ans.* tungsten	
	e)	The pressure coil of wattmeter is connected in ..... . (*parallel, series, series-parallel*) *Ans.* parallel	
	f)	Feed pump is used for ..... . (*decreasing the pressure of feed water, increasing the feed water pressure, reducing the temperature of water*) *Ans.* increasing the feed water pressure	
	g)	Impellers are used in ..... . (*reciprocating pump, rotary pump, centrifugal pump*) *Ans.* centrifugal pump	
	h)	Fusible plug is used to save the boiler against ..... . (*overheating, low water level, high steam pressure*) *Ans.* overheating	
	i)	In petrol engine ..... is used to ignite the fuel. (*injector, spark plug, fly wheel*) *Ans.* spark plug	

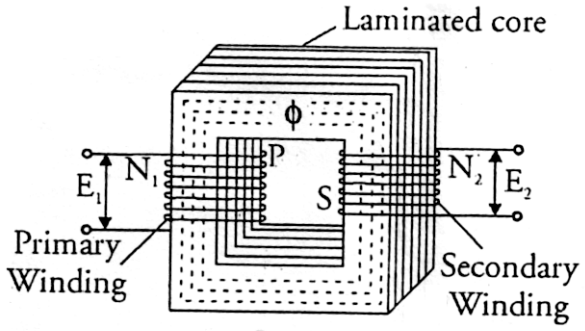
Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	j)	Compression ratio of diesel engines may have a range of ..... . (*8 to 10, 10 to 15, 16 to 22*) *Ans.* 16 to 22	
2.	a)	What is a boiler ? 2 *Ans.* Boiler is a closed metallic vessel in which the water is heated by the application of heat and converted into steam.	2
	b)	How are the boilers classified ? 2 *Ans.* The boilers are classified as : i) Fire tube boiler (smoke tube boiler) ii) Water tube boiler.	2 × 1 = 2
	c)	Draw a neat sketch of Lancashire boiler and mark its important parts. 6 *Ans.* LANCASHIRE BOILER  1-Pressure gauge, 2-Steam stop valve, 3-Lever safety valve, 4-Manhole, 5-Hot flue tubes, 6-Flue gas flow path, 7-Bed, 8-Blow off valve, 9-Furnace, 10-Water level indicator, 11-Steam space, 12-Boiler shell.	Sketch = 4 Parts 4 × $\frac{1}{2}$ = 2

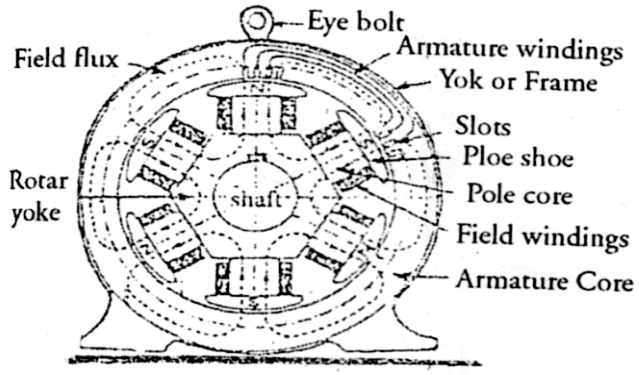
<table>
<tr><th>Qn. Nos.</th><th>Sub. Qn.No.</th><th>Value Points</th><th>Marks</th></tr>
<tr><td>3.</td><td>a)</td><td>What is priming ? 2
Ans.
Removal of air, if any, inside the pump casing is called priming.</td><td>2</td></tr>
<tr><td></td><td>b)</td><td>Differentiate between reciprocating pump and centrifugal pump. 2
Ans.
<table>
<tr><th>Reciprocating pump</th><th>Centrifugal pump</th></tr>
<tr><td>a) Works on the principle of reciprocating motion</td><td>a) Works on the principle of centrifugal force</td></tr>
<tr><td>b) More number of parts</td><td>b) Less number of parts</td></tr>
<tr><td>c) Air vessels are used</td><td>c) Air vessels are not used</td></tr>
<tr><td>d) Mere wear & tear</td><td>d) Less wear & tear</td></tr>
<tr><td>e) Priming not necessary</td><td>e) Priming is necessary</td></tr>
<tr><td>f) Maintenance cost is more</td><td>f) Maintenance cost is less</td></tr>
<tr><td>g) Cannot handle dirty water</td><td>g) Can handle dirty water</td></tr>
</table></td><td>2 × 1 = 2</td></tr>
</table>

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	c)	Draw a neat sketch of centrifugal pump and explain briefly. 6 *Ans.* The pump which employs a centrifugal force to convey the liquid from one place to another place is called centrifugal pump. It consisting of i) Impellers ii) Runner iii) Pump casing iv) Shaft. The impellers are fixed on runner.  	Sketch = 4 Explanation = 2

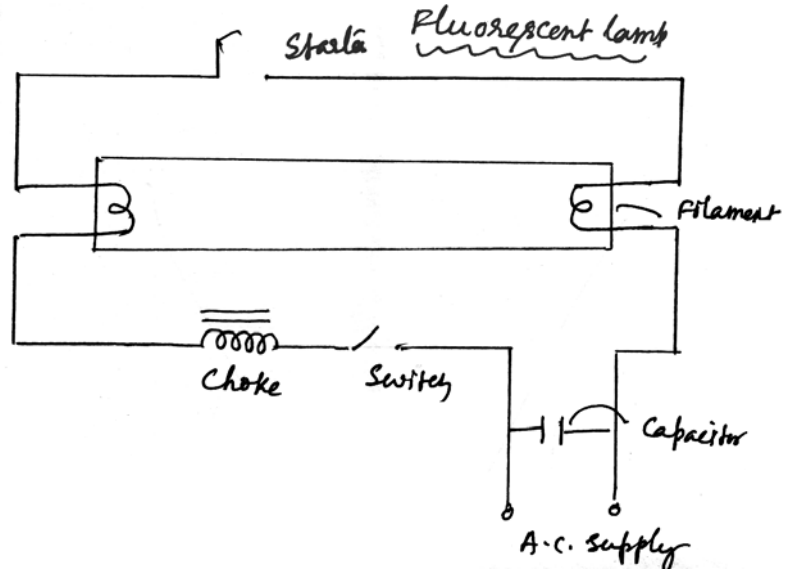
Qn. Nos.	Sub. Qn.No.	Value Points	Marks
4.	a)	Define I.C. engine. 2 *Ans.* Any device in which the combustion takes place inside the engine cylinder and converted into mechanical energy is called I.C. engine.	2
	b)	How are the hydraulic turbines classified ? 2 *Ans.* The hydraulic turbines are classified as i) Impulse turbine ii) Reaction turbine iii) Axial flow turbine iv) Radial flow turbine v) Mixed flow turbine vi) Tangential flow turbine vii) Low specific speed turbine viii) High specific speed turbine.	2 × 1 = 2

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	c)	Draw a neat sketch of two-stroke petrol engine and explain briefly. 6 *Ans.* Two-stroke petrol engine : In two-stroke petrol engine all the operations are completed in one revolution of the crank shaft or two strokes of the piston. The charge is ignited with the help of spark plug. They require inlet and exhaust ports instead of valves. In these engines two operations are completed in one stroke. **Two-Stroke Petrol Engine**  	Sketch = 3 Explanation = 3
		SECTION - B	
5.	a)	What is *d.c.* motor ? 2 *Ans.* D.C. motor is an electromagnetic machine which converts direct current electrical energy into mechanical energy.	2

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	b)	Draw a neat sketch of a transformer and label the parts. 3 *Ans.*  Transformer Sketch - 2 Parts -1	3
	c)	Mention the applications of transformer. 5 *Ans.* Applications of transformer : i) Transformers are extensively used in all A.C. power transmission and distribution system to step-up and step-down voltage ii) Step-up transformers are used in generating station iii) Step-down transformers are used in master unit substation iv) Core type transformers are used in higher capacity v) Shell type transformer are used in lower capacity. 5 × 1	5

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
6.	a)	Define amplitude. 2 *Ans.* Amplitude of an alternating quantity (voltage or current) is the instantaneous value of that alternating quantity when it reaches the maximum value, either in the positive direction or negative direction.	2
	b)	State Fleming's right hand rule. 3 *Ans.* Stretch the forefinger, the middle finger and the thumb right angles to each other. Hold the hand in such a way that the forefinger indicates the direction of flux. The thumb indicates the direction of motion of the conductor. The middle finger indicates the direction of *e.m.f.* induced in the conductor.	3
	c)	Draw a neat sketch of an alternator and label its parts. 5 *Ans.*  Alternator Sketch = 3 Parts = 2	5

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
7.	a)	List the applications of shunt motor. 2 *Ans.* It is a general purpose motor and is conveniently used in the following conditions : i) For Shunt motor almost a constant speed and a medium starting torque is required ii) It is used for Lathe machines, wood working machines, machine tools, centrifugal pumps, fans etc. 2×1	2
	b)	State Faraday's laws of electromagnetic induction. 3 *Ans.* 1st Law : It states that whenever the flux linking with a conductor changes in an *e.m.f.* is induced in the conductor. 2nd Law : It states that the magnitude of *e.m.f.* induced in a conductor or coil is equal to the rate of change of flux linking with the conductor. $2 \times 1\frac{1}{2}$	3

Qn. Nos.	Sub. Qn.No.	Value Points	Marks
	c)	Draw a neat sketch of fluorescent lamp and explain briefly. 5 *Ans.*  Fluorescent lamp is a gas discharge lamp that is manufactured in standard wattage rating of 20 W, 40 W and 80 W and 250 V ratings. Working : In normal condition the starter terminal are in open condition. When the supply is switched on, the potential applied between the starter terminals starts discharge through helium gas. Due to this discharge heat is developed and the starter's strip bends and close the circuit. Now heavy current flows through the filament and hence they are heated, they start emitting electrons, by this time the gas in starts cool down the starter contact, opens this induced voltage above 1000 V. Argon and mercury vapour the tube. This discharge produce visible light. Sketch = 2 Explanation = 3	5