

ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ.

ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು - 560003

KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD.

Malleshwaram Bengaluru-560003

2025-26ರ ಎಸ್, ಎಸ್, ಎಲ್, ಸಿ. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ

S.S.L.C MODEL QUESTION PAPER 2025-26

ವಿಷಯ : ಎಲಿಮೆಂಟ್ಸ್ ಆಫ್ ಎಲೆಕ್ಟ್ರಿಕಲ್ ಇಂಜಿನಿಯರಿಂಗ್-IV

SUBJECT: ELEMENTS OF ELECTRICAL ENGINEERING -IV

ಸಮಯ : 3 ಗಂಟೆ

ವಿಷಯ ಸಂಕೇತ : 51

ಗರಿಷ್ಠ ಅಂಕಗಳು : 80

Subject Code: 51

General instruction to the candidate:

1. This question paper consists of 17 questions.
2. This question paper has been sealed by reverse jacket. **You have to cut on the Right side to open the paper** at the time of commencement of the examination **(Follow the arrow mark). Do not cut the left side to open the paper.** Check Whether all the pages of the question paper are intact.
3. Follow the instructions given against the questions.
4. Figures in the right-hand margin indicate maximum marks for the questions.
5. The maximum time to answer the paper is given at the top of the question paper. It includes 15 minutes for reading the question paper.
6. Ensure that the Version of the question paper distributed to you and the Version Printed on your admission ticket are the same.



Note: Answer all the questions

**I . Four alternatives are given for each of the following questions / incomplete statements.
Select the most appropriate alternative and write it in the answer book along with its alphabet.**

10X1=10

1. The S I unit of time period is
(A) Hertz (B) Seconds
(C) Volt (D) Watt

2. For a sine wave Average value is
(A) 0.637 (B) 1.11
(C) 0.707 (D) 1.41

3. The core of the alternator is made of
(A) Brass (B) Silicon steel
(D) Aluminium (D) Copper

4. An A C Motor converts
(A) Mechanical energy in to DC electrical energy
(B) Mechanical energy in to chemical energy
(C) AC electrical energy into mechanical energy
(D) Mechanical energy in AC electrical energy

5. In step up transformer
(A) $N_1 > N_2$ (B) $I_1 = I_2$
(E) $N_1 < N_2$ (D) $N_1 = N_2$

6. Electrical heater is an example for
(A) Magnetic effect (B) Heating effect
(C) Lighting effect (D) Chemical effect



7. Which among the following is a renewable sources of energy

- (A) Diesel energy (B) Solar energy
(C) Nuclear energy (D) Tidal energy

8. Which of the power plant uses water?

- (A) Hydroelectric power plant (B) Wind power plant
(C) Solar power plant (D) Diesel power plant

9. An impurity that donates electron is called

- (A) Acceptor impurity (B) Pentavalent impurity
(C) Trivalent impurity (D) Donar impurity

10. A pure semiconductor is called

- (A) Extrinsic semiconductor (B) P-type semiconductor
(C) Intrinsic semiconductor (D) N-type semiconductor



II. Answer all the questions

11. a) Define A.C **---2**

b) Explain the following terms. **---3**

i) Average value

ii) Amplitude

c) Draw the neat diagram of sine wave and mark the following:

i) Negative half cycle **---5**

ii) Frequency

- 12.** a) Define A C Motor. ---2
b) List any six parts of A C generator. ---3
c) Explain the phenomenon of electromagnetic induction. ---5
- 13 .**a) List the applications of transistor. ---2
b) Explain with neat diagram mutually induced emf. ---3
c) Draw the neat diagram of wound rotor induction motor and Label the parts. ---5
- 14.** a) Define semiconductor. ---2
b) Write any three applications of transformer. ---3
c) Draw the neat diagram of transformer and label the parts. ---5
- 15.** a) What are the sources of energy. ---2
b) Write short notes on thermal power plant. ---3
c) Draw the neat diagram of wind power plant and label the parts. ---5
- 16.** a) Draw the symbolic representation of PNP-transistor. ---2
b) Write the comparison between renewable and Non- renewable sources of energy. ---3
c) Draw the neat diagram of fluorescent lamp and label the parts. ---5
- 17.** a) Define doping. ---2
b) Explain the following terms. ---3
i) Time period
ii) Power factor
c) Explain with neat diagram forward biasing of diode. ---5



Karnataka State Board
SSLC Examination
Model Answers 2026



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ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWER

ವಿಷಯ : ಎಲಿಮೆಂಟ್ಸ್ ಆಫ್ ಎಲೆಕ್ಟ್ರಿಕಲ್ ಇಂಜಿನಿಯರಿಂಗ್-IV

SUBJECT : ELEMENTS OF ELECTRICAL ENGINEERING -IV

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ಗರಿಷ್ಠ ಅಂಕಗಳು : 80

SUBJECT CODE: 51

MAXIMUM MARKS :80

Qn. Nos.	Value Points	Total
I	Four alternatives are given for each of the following questions / incomplete statements. Select the most appropriate alternative and write it in the answer book along with its alphabet	
1	The S I unit of time period is (A) Hertz (B) Seconds (C) Volt (D) Watt Ans: (B) Seconds	1
2	For a sine wave Average value is (A) 0.637 (B) 1.11 (C) 0.707 (D) 1.41 Ans: (A) 0.637	1



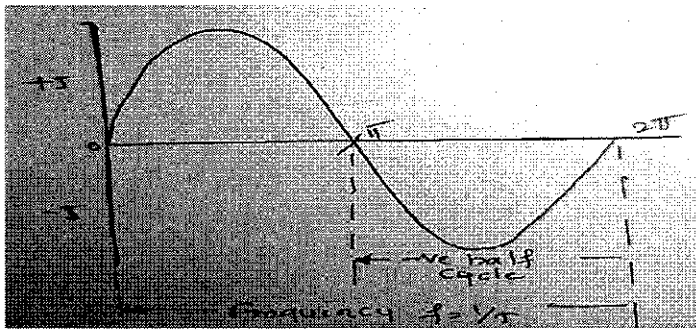
3	<p>The core of the alternator is made of</p> <p>(A) Brass (B) Silicon steel</p> <p>(D) Aluminium (D) Copper</p> <p>Ans: (B) Silicon steel</p>	1
4	<p>An A C Motor converts</p> <p>(A) Mechanical energy in to DC electrical energy</p> <p>(B) Mechanical energy in to chemical energy</p> <p>(C) AC electrical energy into mechanical energy</p> <p>(D) Mechanical energy in AC electrical energy</p> <p>Ans: (C) AC electrical energy into mechanical energy</p>	1
5	<p>In step up transformer</p> <p>(A) $N_1 > N_2$ (B) $I_1 = I_2$</p> <p>(C) $N_1 < N_2$ (D) $N_1 = N_2$</p> <p>Ans: (C) $N_1 < N_2$</p>	1
6	<p>Electrical heater is an example for</p> <p>(A) Magnetic effect (B) Heating effect</p> <p>(C) Lighting effect (D) Chemical effect</p> <p>Ans: (B) Heating effect</p>	1
7	<p>Which among the following is a renewable sources of energy</p> <p>(A) Diesel energy (B) Solar energy</p> <p>(C) Nuclear energy (D) Tidal energy</p> <p>Ans: solar enrgy</p>	1



8	<p>Which of the power plant uses water?</p> <ul style="list-style-type: none">(A) Hydroelectric power plant(B) Wind power plant(C) Solar power plant(D) Diesel power plant <p>Ans: (A)Hydroelectric power plant</p>	1
9	<p>An impurity that donates electron is called</p> <ul style="list-style-type: none">(A) Acceptor impurity(B)Pentavalent impurity(C) Trivalent impurity(D)Donor impurity <p>Ans: (D)Donor impurity</p>	1
10	<p>A pure semiconductor is called</p> <ul style="list-style-type: none">(A) Extrinsic semiconductor(B) P-type semiconductor(C) Intrinsic semiconductor(D) N-type semiconductor <p>Ans: (C) Intrinsic semiconductor</p>	1

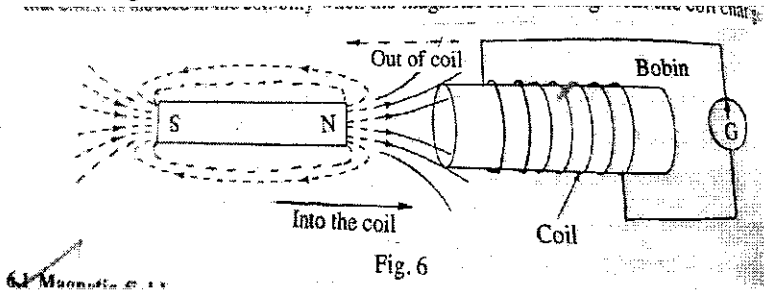


II	Answer all the following questions	
11	a) A C :The current whose magnitude and direction varies with respect to time is called alternating current	2
	b) Average value : When direct current flow through the conductor it transfers charge as transferred by alternating current for the same period of time. $I_{avg} : 0.637$ $V_{avg} : 0.637$ Amplitude : It is the maximum value of an Alternating quantity.	3

	c) Sine wave 	5
12	a) A C Motor : It is an electromagnetic machine which converts alternating electrical energy into mechanical energy	2
	b) six parts of A C Generator 1. Yoke 2. Eyebolt 3. field pole 4. field winding 4. Armature core 5. Armature winding 6. Bed 7. End shields	3



c) electromagnetic induction



5

Changing flux linking with the conductor induces emf this is called electromagnetic induction.

Consider a bobbin wound some wires on it and connect both ends of the wire to the galvanometer. When we move the bar magnet in to the bobbin it cuts the magnetic flux and induces emf. The galvanometer deflects in clockwise direction. When we remove the bar magnet from the bobbin again it cuts the magnetic flux and induced emf. The galvanometer deflects in anticlockwise direction. If we keep the bar magnet stationary no flux cut by the conductor induced emf is zero.

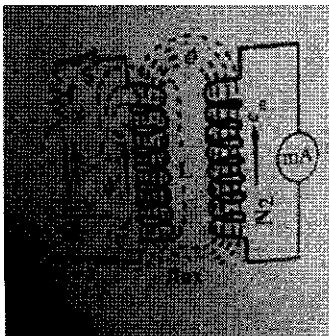
13

a) Applications of transistor

- 1.it is in amplifier
- 2.it is used as switch
- 3.it is used in shift oscillators
4. it is used in logical and digital circuits
- 5.it is used in clipping and clamping circuits

2

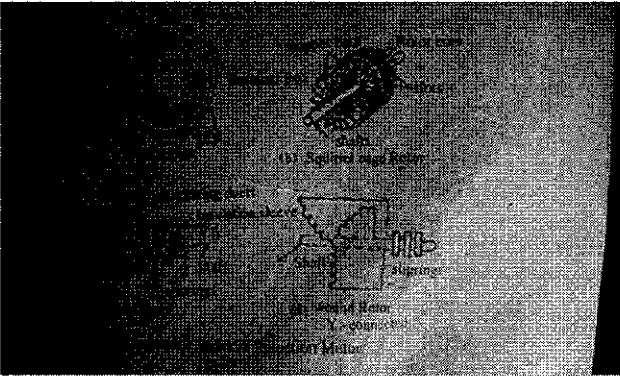
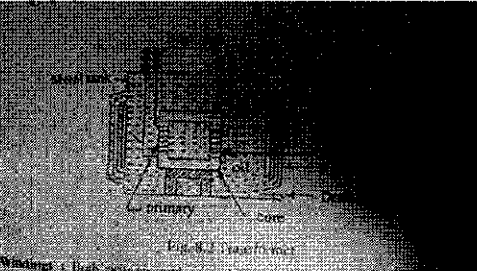
b) Mutual induced emf




3

The emf is induced in the conductor due to Changing flux created by current flow through the Neighbouring coil is called mutual induced emf.

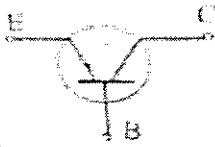
Consider two coil A and B. when current flow through coil A it produces magnetic flux,these magnetic flux links with the coil B.and induces emf in coil B only.

	<p>c) Wound rotor induction motor</p> 	5
14.	<p>a) Semiconductor : it is the property of the material which is a lie between conductor and insulator it is called Semiconductor.</p>	2
	<p>b) Applications of transformer</p> <ol style="list-style-type: none"> 1. it is used in generating stations 2.it is used in substations 3.it is used for distribution purpose 4. Small transformer used is invertors, TV. Mobiles charges And Other electrical and electronic goods 	3
	<p>c) Diagram of transformer</p> 	5



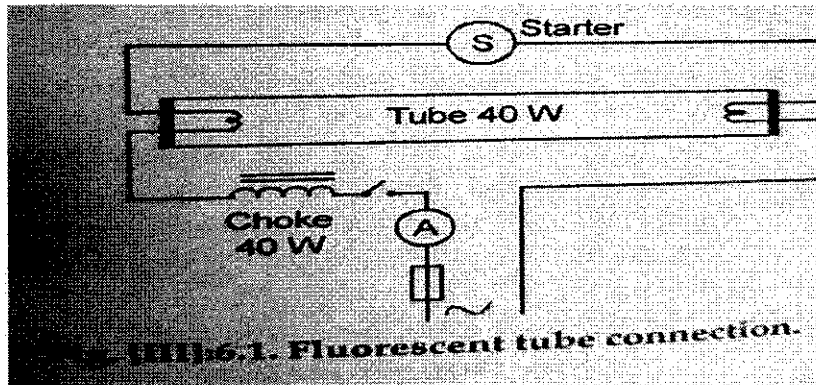
15	<p>a)Sources of energy</p> <ol style="list-style-type: none"> 1. Renewable sources of energy 2. Non-renewable sources of energy 	2
	<p>b) Thermal Power Plant: Naturally available coal is made use of as a fuel to heat the water in water boilers. Thus the steam is generated. The high pressure of steam so generated is passed on to steam turbines to run them at high speeds. These turbines in turn rotate electric generators coupled to them which generate electricity. Such generating stations are called as thermal power stations.</p> <p>Ex: Raichur thermal station in karnataka, Ramagundam thermal station in Andrapradesh, Nayveli thermal plant in Tamilnadu,</p>	3
	<p>c)Wind power plant</p>  <p>The diagram shows a three-bladed wind turbine mounted on a tall tower. Handwritten labels with arrows point to the 'wind blades', the 'wind turbine' (the nacelle and hub), and the 'tower'.</p>	5



16	<p>a) Symbolic representation of PNP transistor</p>  <p>(c) PNP</p>	2										
	<p>b) Difference between renewable and non renewable sources of energy.</p> <table border="0"> <thead> <tr> <th data-bbox="263 1003 821 1077">Renewable source</th> <th data-bbox="837 1003 1125 1077">Non renewable</th> </tr> </thead> <tbody> <tr> <td data-bbox="263 1086 821 1198">Regenerate naturally over a short period. within a Human life span take millions of years to form</td> <td data-bbox="837 1086 1125 1198">Cannot be replaced</td> </tr> <tr> <td data-bbox="263 1243 821 1400">Regenerate naturally over a short period. within a human of years to form</td> <td data-bbox="837 1243 1125 1400">Cannot be replaced lifespan; take millions</td> </tr> <tr> <td data-bbox="263 1433 821 1668">Typically have a lower environmental pollution Impact and carbon footprint. degradation extraction.</td> <td data-bbox="837 1433 1125 1668">Often contribute to and environmental through emissions and</td> </tr> <tr> <td data-bbox="263 1702 821 1859">Solar, wind, water (hydroelectric), and oil, and Geothermal energy. minerals like</td> <td data-bbox="837 1702 1125 1859">Fossil fuels like coal, natural gas, as well as gold and copper.</td> </tr> </tbody> </table>	Renewable source	Non renewable	Regenerate naturally over a short period. within a Human life span take millions of years to form	Cannot be replaced	Regenerate naturally over a short period. within a human of years to form	Cannot be replaced lifespan; take millions	Typically have a lower environmental pollution Impact and carbon footprint. degradation extraction.	Often contribute to and environmental through emissions and	Solar, wind, water (hydroelectric), and oil, and Geothermal energy. minerals like	Fossil fuels like coal, natural gas, as well as gold and copper.	3
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Solar, wind, water (hydroelectric), and oil, and Geothermal energy. minerals like	Fossil fuels like coal, natural gas, as well as gold and copper.											



c) Fluorescent lamp



5

17

a) **Doping** : The process of adding impurity to the pure semiconductor is called doping

2

b) **Time period** : The time taken by an alternating quantity to complete one cycle is called the time period. It is denoted by T. And it is measured in seconds.

$$T = 1/f \text{ in seconds}$$

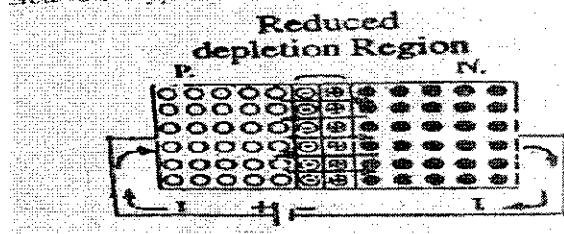
Power factor : cosine of the angle between applied voltage and
Total current of the circuit is called power factor of that circuit.
It is a number and is always less than one

3



c) Forward biasing of diode

5



The positive terminal of the battery is connected to P-type semiconductor and negative terminal of the battery is connected to N-type semiconductor. Then the diode is said to be forward biased.

When the diode is forward biased the electrons are repelled by the negative terminal of the battery and holes repelled by the positive terminal of the battery. Thus reduces the potential barrier at the junction. Hence electrons cross the barrier and continue to move to the left through the holes in the p-type material. When valence electrons reach the left end of the crystal they move to the right end of the crystal and flow to the negative terminal of the sources. Thus action constitutes the forward bias current.

