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FOR KARNATAKA CLASS 10 PREPARATION

Karnataka SSLC Model Question Paper 2027 for Elements Of Electrical Engineering IV (Paper 2) Key Answers

EXAM	YEAR	TYPE
Karnataka Class 10	2027	Answer Key

51

ಕರ್ನಾಟಕ ಶಾಲಾ ಪರೀಕ್ಷೆ ಮತ್ತು ಮೌಲ್ಯನಿರ್ಣಯ ಮಂಡಲಿ.

6 ನೇ ಅಡ್ಡ ರಸ್ತೆ, ಮಲ್ಲೇಶ್ವರಂ, ಬೆಂಗಳೂರು – 560003

KARNATAKA SCHOOL EXAMINATION AND ASSESSMENT BOARD.

6 th Cross, Malleshwaram Bengaluru-560003

2026-27 ರ ಎಸ್, ಎಸ್, ಎಲ್, ಸಿ. ಮಾದರಿ ಪ್ರಶ್ನೆಪತ್ರಿಕೆ –2

ಮಾದರಿ ಉತ್ತರಗಳು

MODEL ANSWER

OF S S L C MODEL QUESTION PAPER-2:2026-27

ವಿಷಯ : ಎಲಿಮೆಂಟ್ಸ್ ಆಫ್ ಎಲೆಕ್ಟ್ರಿಕಲ್ ಇಂಜಿನಿಯರಿಂಗ್–IV

SUBJECT: ELEMENTS OF ELECTRICAL ENGINEERING -IV

ವಿಷಯ ಸಂಕೇತ : **51** ಗರಿಷ್ಠ ಅಂಕ:**80**

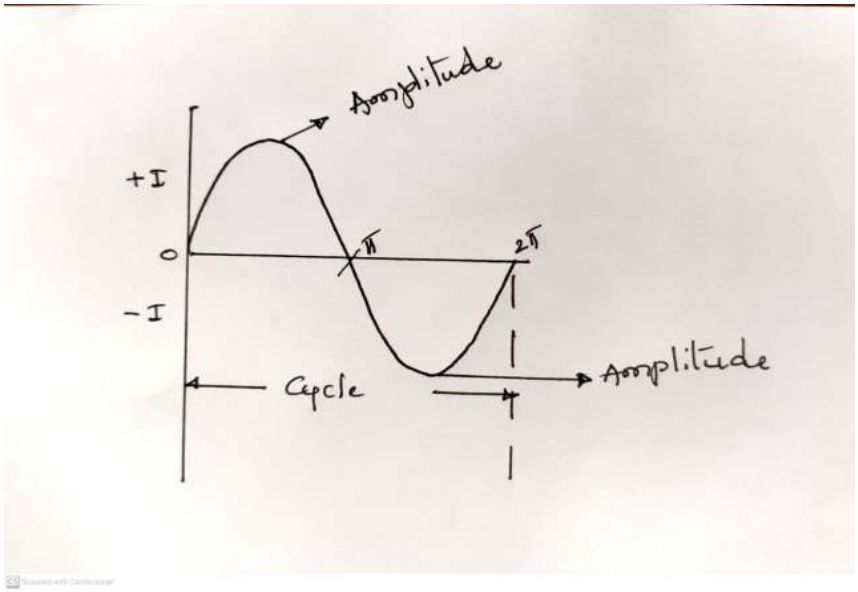
SUBJECT CODE: 51 **MAXIMUM MARKS:80**

Qn. Nos.	Value Points	Total marks
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 frequency is (A)Seconds (B) volt (C)Volt (D) Hertz **Ans: (D) Hertz**	**1**

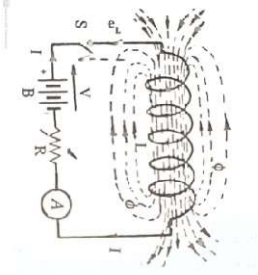
2	For a sine wave form factor is (A) 0.637 (B) 1.11 (C) 0.707 (D) 1.41 **Ans: (B) 1.11**	**1**
3	The slip ring is made of (A) Brass (B)Cast iron (C) Aluminium (D) Copper **Ans: (A) Brass**	**1**
4	An A C generator works on the principal of (A) Len'z law (B) Ohm's law (C) Faraday's laws of electromagnetic induction (D) Right hand thumb rule **Ans: (C)** Faraday's laws of electromagnetic induction	**1**
5	The core of the transformer is made of (A) Silicon steel (B) Cast iron (C) Copper (D) Aluminium **Ans: (A) Silicon steel**	**1**
6	Electrical motors is an example for (A) Magnetic effect (B) Heating effect (C) Lighting effect (D) Chemical effect **Ans:(A) Magnetic effect**	**1**

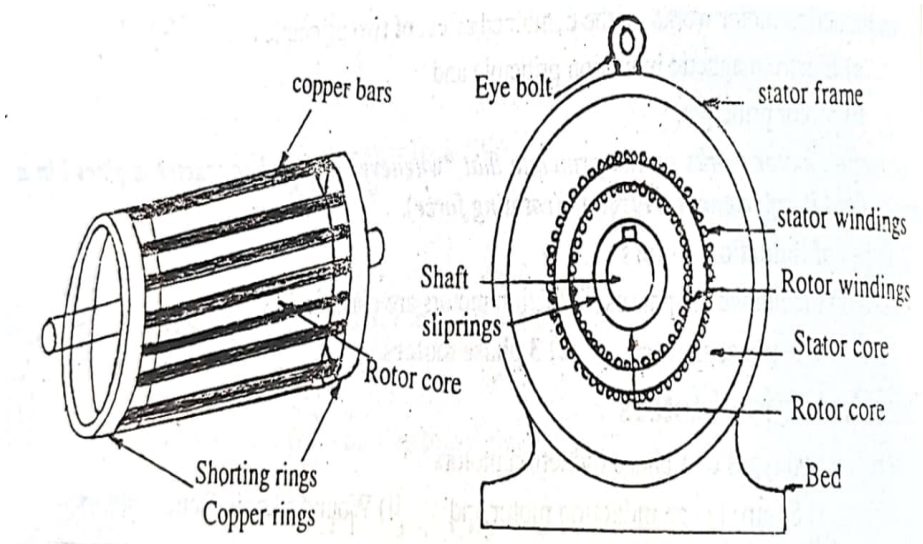
7	Which among the following is a renewable source? (A) Diesel energy (B) Solar energy (C) Nuclear energy (D) Tidal energy **Ans: (B) Solar energy**	**1**
8	Which of the power plant uses coal ? (A) Hydroelectric power plant (B) Thermal power plant (C) Solar power plant (D) Diesel power plant **Ans: (B) Thermal power plant**	**1**
9	An impurity that accepts electron is called (A) Acceptor impurity (B)Pentavalent impurity (C) Trivalent impurity (D)Donor impurity **Ans: (A) Acceptor impurity**	**1**
10	A diode has (A) Three terminal (B) One terminal (C) Two terminal (D) Four terminal **Ans: (C) Two terminal**	**1**

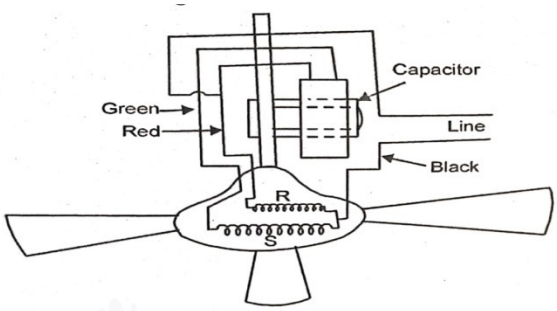
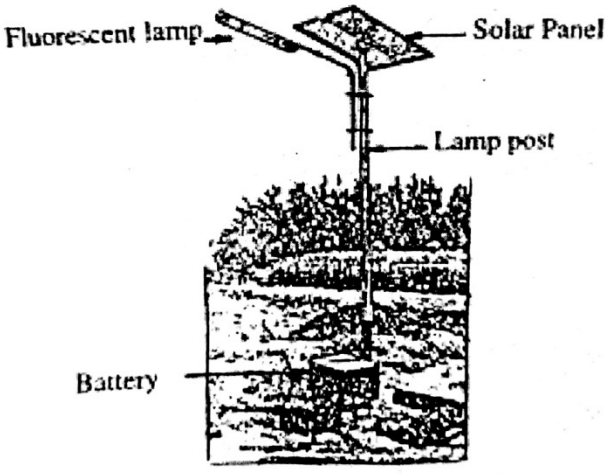
II	**Answer all the following questions**	
11	a) **Amplitude:** It is the maximum value of an alternating quantity either in positive half cycle or negative half cycle it is called amplitude.	**2**
	b) **A C**: The current whose magnitude and direction varies with respect to time is called alternating current. **Frequency:** number of cycles completed by an alternating current per minute is called frequency. It is measured in hertz.	**3**

	c) Sine wave  	**5**
12	**a)A C generator :** It is an electromagnetic machine which converts mechanical energy into alternating current electrical energy	**2**

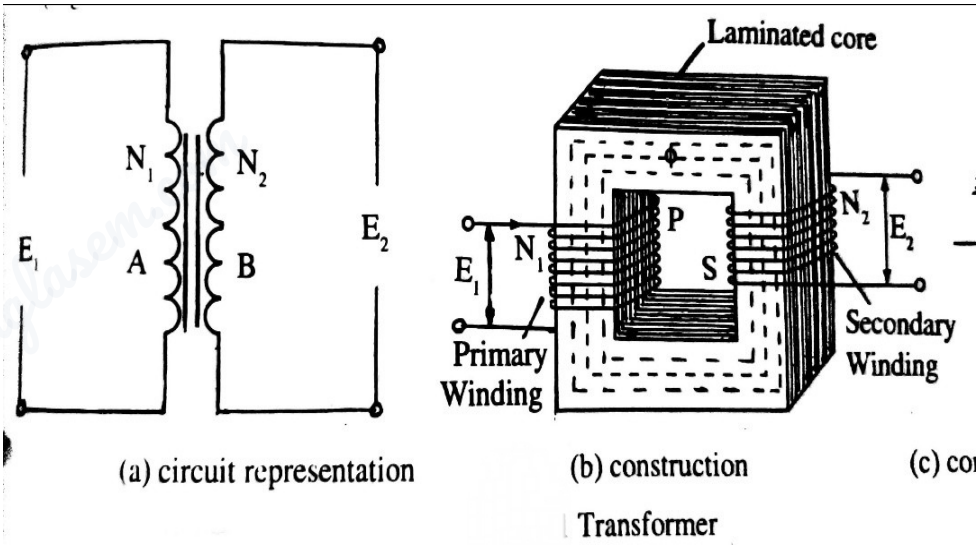
	b) Applications of A C Generator 1. It is used in generating stations. 2.Used in research centres 3.Used in school, colleges 4. Used in hospital in case of power failure. 5.Used in shopping malls 6. Used in functions for temporary power supply.	**3**

	d) Faraday's laws of electromagnetic induction **First law** : It states that " When ever changing flux links with the conductor induces emf" **Second law :** It states that " the magnitude of the induced emf is directly proportional to the rate of change of flux linking with the conductor" $E = N \, d\Phi/dt$ in volts	**5**
13	**a) Transistor:** Transistor is a three terminal semiconductor device, formed by joining a layer of one semiconductor (P or N) in between two layers of another type semiconductor (N or P).	**2**
	b) Self induced emf 	**3**

	The emf is induced in the conductor due to Changing flux created by the current flow through the same coil is called self induced emf. Consider a coil. When current flow through coil it produces magnetic flux, these magnetic flux links with the same coil and induces emf in same coil only.	
	c) squirrel cage rotor induction motor  Fig 12.2 Induction motor construction Scanned with CamScanner	**5**
14.	**a) Types of semiconductor** : 1. Intrinsic semiconductor 2. Extrinsic semiconductor	**2**
	b) six parts of transformer 1. Metal tank. 2. Primary winding. 3. Secondary winding. 4. Transformer core. 5. Bushings. 6. Bchholds relay. 7. Drain cock.	**3**

	c) Diagram of electric fan  Fig.[IV]:2.28. Ceiling Fan.	**5**
15	**a) Renewable Sources of energy** 1.Solar energy 2.Wind energy 3.Biomass	**2**
	b)Hydroelectric Power Plant: Naturally available water in streams and rivers is stored in huge reservoirs. This water is made to flow through water turbines to run them at high speeds. These turbines in turn rotate electric generator coupled to them and generates electricity such generating stations are called hydroelectric power plants. Ex: Sharavati,Tungabhdra, Alamatti dam, KRS Mysore,	**3**
	c) Solar power plant  Fig. 1.5 Solar Power	**5**

<table>
<tr><td>16</td><td>a) NPN Transistor :
When a P-type semiconductor is sandwiched between two N-type semiconductors the resultant is NPN transistor.</td><td>2</td></tr>
<tr><td></td><td>b)Difference between renewable and non renewable sources of energy.
<table><tr><th>Renewable source</th><th>Non renewable source</th></tr><tr><td>Regenerate naturally over a short period.</td><td>Cannot be replaced within a Human life span take Millions of years to form.</td></tr><tr><td>Regenerate naturally over a short period.</td><td>Cannot be replaced within a human lifespan; take millions of years to form.</td></tr><tr><td>Typically have a lower environmental Impact and carbon footprint.</td><td>Often contribute to pollution and environmental degradation Through Emissions and extraction.</td></tr><tr><td>Solar, wind, water (hydroelectric), and Geothermal energy.</td><td>Fossil fuels like coal, oil, and natural gas, as well as minerals like Gold and copper.</td></tr></table></td><td>3</td></tr>
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	c)working principle of transformer  Transformer **Transformer works on the principle of mutual induction. That is "when ever the flux produced by coil A links with another coil B an emf induced in the coil B". This induced emf is proportional the rate of change of flux and the number of turns on B.**	**5**
17	**a)Diode:** It is a two elements semiconductor device formed by joining a piece of P-type semiconductor to a piece of N-type semiconductor.	**2**
	b)RMS value: When direct current flowing through a given circuit for a given time produces the same amount of heat as produced by alternating current flowing through the same circuit for the same time. **Power factor :** The 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) Integrated Circuit (IC)**:** A large number of discrete components put on a silicon chip to act as a functional block constitutes an integrated circuit (IC). **Advantages of IC** 1. Occupy less space. 2. Power consumption is less. 3. High accuracy. 4. Lighter in weight. 5. Smaller in size. 6. Cheaper in cost.	**5**