



Vidya Jyothi Institute of Technology (Autonomous)

(Accredited by NBA & NAAC Approved By A.I.C.T.E., New Delhi, Permanently Affiliated to JNTUH)

Aziz Nagar, C.B.Post, Hyderabad -500075

Department of Humanities and Sciences

I B. Tech I Semester- (2024-25)

Branch: CSE, CSE(AI&ML) and CSE (DS)

BASIC ELECTRICAL ENGINEERING (BEE)

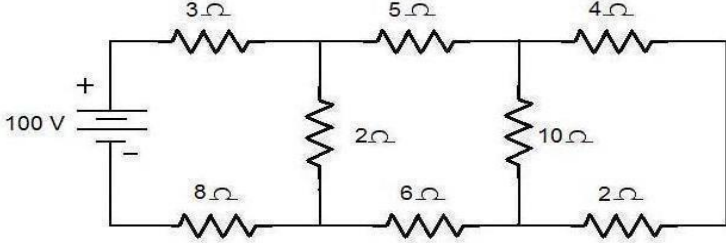
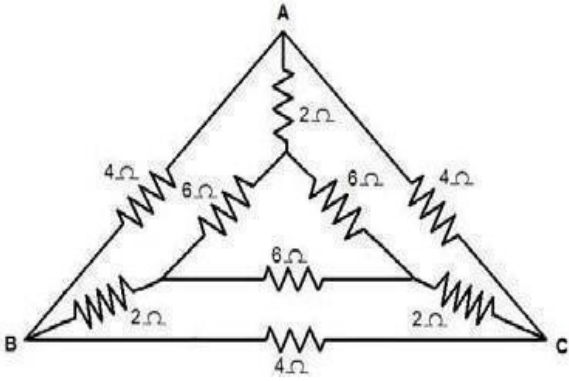
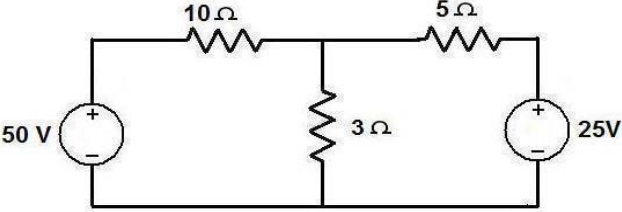
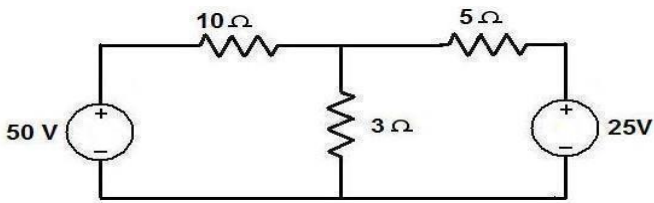
QUESTION BANK

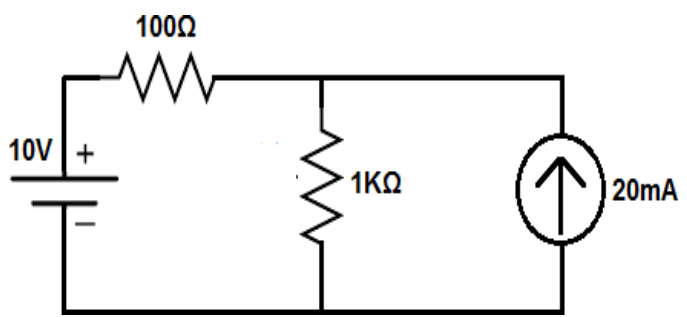
UNIT-I Introduction to Electrical Engineering & DC Circuits

Short Answer Questions/Multiple Choice Questions/Fill in the Blanks

| | |
|----|---|
| 1 | Define Voltage and current. |
| 2 | State Ohm's law. |
| 3 | Define Active and Passive elements. |
| 4 | What is practical voltage source? |
| 5 | State Kirchhoff's voltage law. |
| 6 | Compare series and parallel circuit. |
| 7 | Write the expressions for star to delta transformation. |
| 8 | State superposition theorem. |
| 9 | State Thevenin's theorem. |
| 10 | If the resistors 2Ω and 3Ω are connected in parallel across a 20A source. Find the Current flowing in the 2Ω resistor. |
| 11 | If a 2Ω , 4Ω and 6Ω resistors are connected in delta. Then the equivalent star connection resistances are----- (A) 0.67Ω , 2Ω , 1Ω (B) 4Ω , 5Ω , 2Ω (C) 2Ω , 4Ω , 6Ω (D) 3Ω , 0.9Ω , 6Ω |
| 12 | Two resistors 4Ω and 12Ω are connected in parallel. The equivalent resistance is---- |
| 13 | Which of the following is not a bilateral element (A)Resistor (B)Inductor (C)Capacitor (D)Diode |
| 14 | Voltage dependent current source gives (A) Voltage as a function of current (B) Voltage as a function of voltage (C) Current as a function of voltage (D) Current as a function of current |
| 15 | In Thevenin's theorem V_{Th} is the (A)Open circuited current (B)Short circuited current (C)Open circuited voltage (D)Short circuited voltage |
| 16 | Which of the following quantities remain same in all parts of a parallel circuit? (A)Power (B)Resistance (C)Current (D)Voltage |
| 17 | Super Position Theorem is not applicable to ----- network (A)Single Source (B)Multi Source (C)Bilateral (D) Linear |
| 18 | In superposition theorem, when we consider the effect of one voltage source, all the other voltage sources are----- |
| 19 | An ideal voltage source should have ----- resistance. |
| 20 | Practical current source consists of an internal resistance connected in----- |

Long Answer Questions

| | |
|---|--|
| 1 | Explain about (i) Basic circuit elements. (ii) Kirchhoff's laws. |
| 2 | Explain about types of sources. |
| 3 | Derive the expressions for delta to star and star to delta transformations. |
| 4 | <p>Calculate the equivalent resistance across the terminals of the supply and total current for the following network.</p>  |
| 5 | <p>Obtain the equivalent resistance between B and C for the following network by using Δ-Y and Y-Δ transformations.</p>  |
| 6 | <p>Find the current in 3Ω resistor for the following circuit by using superposition theorem.</p>  |
| 7 | State Thevenin's theorem and write the procedure for finding the current in a load resistance by using Thevenin's theorem. |
| 8 | <p>Determine the current in 3Ω resistor for the following circuit by using Thevenin's theorem.</p>  |

| | |
|----|---|
| 9 | <p>State superposition theorem and determine the current flowing through the $1\text{K}\Omega$ resistor for the following circuit by using superposition theorem.</p>  |
| 10 | <p>Derive the Expression for equivalent resistance for series and parallel circuits.</p> |



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BASIC ELECTRICAL ENGINEERING (BEE)

QUESTION BANK

UNIT-II A.C. Circuits

| Short Answer Questions/Multiple Choice Questions/Fill in the Blanks | |
|--|---|
| 1 | Differentiate D.C and A.C. quantities. |
| 2 | Define time period and frequency. |
| 3 | Define peak value and instantaneous value. |
| 4 | Define R.M.S value of an alternating quantity. |
| 5 | Define form factor and peak factor. |
| 6 | What is phase and phase difference? |
| 7 | Define active and reactive powers. |
| 8 | Draw the phasor diagram of series R-L circuit. |
| 9 | Define resonance. |
| 10 | Write the voltage and current relations of delta connection three phase balanced circuit. |
| 11 | In a pure capacitive circuit A) The current leads the voltage by 90° B) The current lags the voltage by 90° C) The current is in phase with the voltage by 90° D) The current lags the voltage by 60° |
| 12 | Form factor of Sine wave is----- |
| 13 | The time period of an alternating quantity is 0.02 second. Its frequency will be ----- Hz |
| 14 | Which of the following is incorrect about direct current? A) Magnitude is constant B) Frequency is zero C) Can be transported to larger distances with less loss in power D) Flows in one direction |
| 15 | Define power factor. |
| 16 | Line voltage in star connected three phase system is----- |
| 17 | The impedance of a series RL circuit is----- |
| 18 | The impedance of an electrical circuit is $(30-j50)\ \Omega$. Determine the resistance and capacitance,when the circuit is connected to a 230V, 50Hz supply. |
| 19 | Inductive Reactance is----- A) $2\pi f C$ B) $\frac{1}{2\pi f C}$ C) $\frac{1}{2\pi f L}$ D) $2\pi f L$ |
| 20 | Resonant frequency is---- A) $\frac{1}{2\pi\sqrt{LC}}$ B) $2\pi\sqrt{LC}$ C) 0 D) $2\pi LC$ |

LONG ANSWER QUESTIONS

| | |
|----|---|
| 1 | Derive the RMS and average values for sinusoidal waveform. |
| 2 | Explain the concept of phase, phase difference and j-notation in A.C. circuits. |
| 3 | Obtain the steady state analysis of pure R and L circuits for sinusoidal excitation. |
| 4 | Explain the steady state analysis of series RL circuit for sinusoidal excitation. |
| 5 | Derive the steady state analysis of series RC circuit for sinusoidal excitation. |
| 6 | Analyze the steady state analysis of series RLC for sinusoidal excitation. |
| 7 | A resistance of 10Ω is connected in series with a 50mH inductor across a 230V, 50Hz Supply. Calculate i) Current flowing in the circuit ii) Phase angle iii) Voltage across resistor and inductor and iv) Active and Reactive powers. |
| 8 | A resistance of 10Ω , inductance of 0.5H and capacitance of $10\mu\text{F}$ are connected in series to the supply of 50V, 50Hz supply. Calculate the voltage across each element and active power |
| 9 | Obtain the resonance condition for series RLC circuit. If elements $R=8k\Omega$, $L=20\text{mH}$ and $C=80\text{nF}$ are connected in series and circuit is in resonant condition, find resonant frequency. |
| 10 | Derive the voltage and current relations of star connected three phase balanced circuit. |



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Department of Humanities and Sciences

I B. Tech I Semester- (2023-24)

Branch: AI, CSE, CSE (AI&ML), AI&DS and CSE (DS)

BASIC ELECTRICAL ENGINEERING (BEE)

UNIT-III Transformers

| Short Answer Questions/Multiple Choice Questions/Fill in the Blanks | |
|---|---|
| 1 | What is transformer? Write the main parts of a transformer. |
| 2 | Why the rating of a transformer given in KVA? |
| 3 | Write the E.M.F equation of transformer and define transformation ratio. |
| 4 | Write the conditions of an ideal transformer. |
| 5 | Draw the equivalent circuit of a transformer. |
| 6 | Define efficiency of a transformer and write its expression at half load condition. |
| 7 | Define voltage regulation of a transformer and write its expression. |
| 8 | In OC test L.V winding is used as primary and H.V winding is used as secondary, why? |
| 9 | Define self and mutual inductances. |
| 10 | Write the principle of operation of a transformer. |
| 11 | Function of transformer is to A) Convert AC to DC B) Step up or down the DC voltages and currents C) Convert DC to AC D) Step up or down the AC voltages and currents |
| 12 | Transformer core is laminated in order to----- A) Minimize eddy current loss B) Reduce cost C) Simplify its construction D) Reduce hysteresis loss |
| 13 | The main purpose of performing open-circuit test on a transformer is to measure its..... A) Cu loss B) Core loss C) Total loss D) Insulation resistance |
| 14 | While conducting short-circuit test on a transformer which side is short circuited A) High voltage side B) Low voltage side C) Primary side D) Secondary side |
| 15 | Transformer Primary voltage is 220V and Secondary voltage is 110V, if the primary current is 10A the what is the secondary current? A)10A B)20A C)30A D)40A |
| 16 | The purpose of the transformer core is to provide----- A) Low reluctance path B) High inductive path C)High Capacitive path D) High reluctance path |
| 17 | Which of the following is incorrect for an ideal transformer? A) No losses B) Zero winding resistance C) Zero leakage flux D) Zero permeability |
| 18 | Transformers windings are generally made of----- |
| 19 | Transformer works on the principle of----- |
| 20 | Short circuit test on transformer is conducted to determine----- |

UNIT-III LONG ANSWER QUESTIONS

| | | | | | | | | | |
|---|--|--------------------|-------|------|------|--------------------|-------|------|-------|
| 1 | State and explain the Faraday's laws of electromagnetic induction. | | | | | | | | |
| 2 | With neat sketch explain the constructional details of a transformer. | | | | | | | | |
| 3 | Explain the principle of working of single-phase transformer with neat sketch. | | | | | | | | |
| 4 | Derive the EMF equation of a transformer. | | | | | | | | |
| 5 | <u>Explain the various losses in a transformer.</u> | | | | | | | | |
| 6 | Explain the operation of an ideal transformer at no load with phasor diagram. | | | | | | | | |
| 7 | Explain the working of a practical transformer on no load with phasor diagram. | | | | | | | | |
| 8 | Explain the Open circuit and short circuits tests of the transformer with neat circuit diagrams. | | | | | | | | |
| 9 | A single phase 2200/250 V, 50 Hz transformer has a net core area of 36 sq.cm and a maximum flux density of 0.6Wb/m ² .Calculate the number of turns of primary and secondary winding. | | | | | | | | |
| 10 | The following readings were obtained from O.C and S.C tests on 8KVA, 400/120 V, 50Hz Transformer. | | | | | | | | |
| | <table><tr><td>OC test on LV side</td><td>120 V</td><td>4 A</td><td>75 W</td></tr><tr><td>SC test on HV side</td><td>9.5 V</td><td>20 A</td><td>110 W</td></tr></table> | OC test on LV side | 120 V | 4 A | 75 W | SC test on HV side | 9.5 V | 20 A | 110 W |
| | OC test on LV side | 120 V | 4 A | 75 W | | | | | |
| SC test on HV side | 9.5 V | 20 A | 110 W | | | | | | |
| Calculate the voltage regulation and efficiency at full load, 0.8 power factor lagging. | | | | | | | | | |



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Department of Humanities and Sciences

I B. Tech II Semester- (2023-24)

Branch: ECE&IT

BASIC ELECTRICAL ENGINEERING (BEE)

QUESTION BANK

UNIT-IV- DC Machines & Induction Motors

| Short Answer Questions/Multiple Choice Questions/Fill in the Blanks | |
|---|---|
| 1 | List the main parts of a D.C.machine. |
| 2 | Write the function of commutator in D.C machines. |
| 3 | State Fleming's left hand rule. |
| 4 | What is an electric motor? State it's principle of working. |
| 5 | Define back e.m.f. Write the significance of back e.m.f in D.C.motor. |
| 6 | Write the voltage and torque equations of a D.C Motor. |
| 7 | A three phase induction motor does not run at synchronous speed. Why? |
| 8 | Compare squirrel cage and slip ring rotors. |
| 9 | Define synchronous speed and slip. |
| 10 | Write the working principle of a single phase induction motor. |
| 11 | Which of the following law/rule can be used to determine the direction of rotation of D.C motor? A)Lenz's B)Faraday's C)Coulomb's D)Fleming's |
| 12 | Which part will tell that given motor is DC motor and not an AC type? A)Winding B) Shaft C)Commutator D)Stator |
| 13 | Which material is commonly used in brushes? A)Copper B)Carbon C)Silicon D)Steel |
| 14 | The current drawn by the armature of DC motor is directly proportional to A) Torque B) Speed C) The voltage across the terminals D) Cannot be determined |
| 15 | The stator core of a 3- phase induction motor is laminated in order to reduce the A)Eddy current loss B) Hysteresis loss C)Both eddy current and hysteresis losses D)Weight of the stator |
| 16 | In squirrel cage induction motors, the rotor slots are usually given slight skew in order to---- A)Reduce windage losses B)Reduce eddy current losses C)Eliminate magnetic locking between stator and rotor D)Reduce accumulation of dirt and dust |
| 17 | Induction motor is also called as----- A)Asynchronous Motor B)Synchronous Motor C)DC motor D) Induction generator |
| 18 | Which of the following motor is not self-starting----- A)DC motor B)Three phase Induction motor C)Single phase induction motor D)AC motor |
| 19 | Synchronous speed of Induction motor is----- |
| 20 | The slip of a 4 pole 50Hz induction motor rotating at 1400 rpm is----- |

| LONG ANSWER QUESTIONS | |
|-----------------------|--|
| 1 | Describe the construction of a D.C machine with neat sketch. |
| 2 | Explain the principle and operation of a D.C motor. |
| 3 | Derive the expression for the armature torque of a D.C motor. |
| 4 | With neat diagrams, explain the construction of a three phase induction motor. |
| 5 | Explain the principle and working of a three phase induction motor. |
| 6 | Draw and explain the torque-slip characteristics of three phase induction motor. |
| 7 | Explain the working principle of a single phase induction motor. |
| 8 | A 4pole wave winding DC Generator has 50 slots & 24 conductors per slot, flux per pole is 10mwb. Determine Induced EMF in the armature if it is rotating at a speed of 700 rpm. |
| 9 | A 200V, 4 pole, lap wound DC Shunt motor has 800 conductors on its armature. The resistance of the armature winding is 0.5Ω and that of shunt field winding is 200Ω . The motor takes a current of 21A, the flux /pole is 30mWb. Find the speed and the torque developed in the motor. |
| 10 | A 4- pole ,3-phase induction motor supplied from 415 V,50Hz supply and has a rotor speed of 1425r.p.m .Calculate i) Synchronous speed and ii) % slip and iii) Rotor frequency |



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BASIC ELECTRICAL ENGINEERING (BEE)

Question Bank

UNIT-V -AC Generator & Electrical Installation

| Short Answer Questions/Multiple Choice Questions/Fill in the Blanks | |
|---|---|
| 1 | Why A.C. Generator is called synchronous generator? |
| 2 | Write the advantages of stationary armature and rotating field. |
| 3 | Write about the types of rotors in three phase alternator. |
| 4 | Write the working principle of a three-phase alternator. |
| 5 | Write the EMF equation of an alternator. |
| 6 | What is a fuse and circuit breaker? |
| 7 | What are the desirable characteristics of fuse element materials? |
| 8 | Write the differences between a fuse and circuit breaker. |
| 9 | Differentiate primary and secondary batteries. |
| 10 | What is battery backup? |
| 11 | An alternator generates----- |
| 12 | Synchronous generator is always runs with A) Less than synchronous speed B) Greater than synchronous speed C) The synchronous speed D) Less than or equals to synchronous speed |
| 13 | The stator core of an alternator is laminated in order to reduce----- |
| 14 | Best material for a fuse wire is----- |
| 15 | The fuse rating is expressed in A) Current B) Voltage C) VAR D) KVA |
| 16 | Which among the following is not related to UPS? A) It is a battery backup B) It is a uninterruptible power supply C) It is a uninterruptible power source D) It is a primary battery |
| 17 | Which type of battery used in Electric Vehicles and Mobiles? A) Lead acid battery B) Lithium ion battery C) Nickel cadmium battery D) Nickel metal hydride battery |
| 18 | For low speed alternators, which type of rotor is generally used? A) Salient pole type B) Cylindrical type C) Squirrel cage Rotor D) Non Salient pole type |
| 19 | -----supply is given to the field winding of an alternator. |
| 20 | The type of rotor used in thermal power plants is----- |

| UNIT-V- LONG ANSWER QUESTIONS | |
|--------------------------------------|---|
| 1 | Explain the construction of three phase alternator with neat sketch. |
| 2 | Compare salient pole and non-salient pole type of rotors of an alternator. |
| 3 | Explain the principle of operation of synchronous generator. |
| 4 | Derive the EMF equation of a three-phase alternator. |
| 5 | Explain the working of fuse and circuit breaker. |
| 6 | Write the differences between fuse and circuit breaker. |
| 7 | Explain the types of batteries. |
| 8 | Write the advantages, disadvantages, and applications of secondary batteries. |
| 9 | Explain about the battery backup and write its applications. |