



AKTU

B.Tech I-Year

Electrical Engg.

Most Imp. Questions



Avinash Sir



- **Unit -1: (DC Circuits)** Electrical circuit elements (R, L and C), Concept of active and passive elements, voltage and current sources, concept of linearity, unilateral and bilateral elements. Kirchhoff's laws, Mesh and nodal methods of analysis.
- **Unit-2: (Steady State Analysis of Single Phase AC Circuits)** 6 Representation of Sinusoidal waveforms – Average and effective values, Form and peak factors. Analysis of single phase AC Circuits consisting R-L-C combination (Series and Parallel) Apparent, active & reactive power, Power factor. Concept of Resonance in series & parallel circuits, bandwidth and quality factor. Three phase balanced circuits, voltage and current relations in star and delta connections.
- **Unit-3: (Transformers)** 6 Magnetic circuits, ideal and practical transformer, equivalent circuit, losses in transformers, regulation and efficiency.
- **Unit-4: (Electrical machines)** 8 DC machines: Principle & Construction, Types, EMF equation of generator and torque equation of motor, applications of DC motors (simple numerical problems) Three Phase Induction Motor: Principle & Construction, Types, Slip-torque characteristics, Applications (Numerical problems related to slip only) Single Phase Induction motor: Principle of operation and introduction to methods of starting, applications. Three Phase Synchronous Machines: Principle of operation of alternator and synchronous motor and their applications.
- **Unit-5: (Electrical Installations)** 4 Introduction of Switch Fuse Unit (SFU), MCB, ELCB, MCCB, ACB. Types of Wires, Cables and Bus-bars. Fundamentals of earthing and lightning protection. Types of Batteries

Unit-1 (Important Questions)

DC Circuits

V.V.Imp with Examples.

2 marks

1. Linear & Nonlinear Element, Unilateral and Bilateral Element, Active & Passive Element,

2 marks

Lumped and Distributed Network. Mesh and Loop, Node and Junction.

V.V.Imp 2 marks

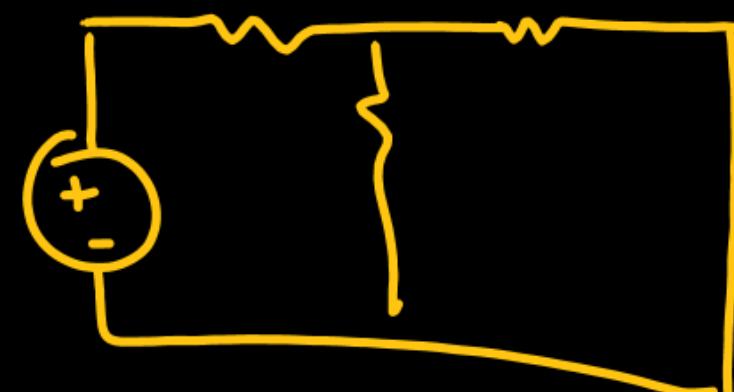
2. Explain Ideal and Practical Current Source and Voltage Source.

✓ 2 mark

3. Can we apply KVL in a loop having current?

✓ 4. Explain KVL and KCL. 1 Theory

Long:- Numerical on Mesh Analysis



Numerical on Nodal Analysis

Short:-

Q.1 Determine form Factor and Peak Factor of a Sine Wave.

Q.2 What is the average power in a pure inductive and pure capacitive circuit.

Q.3 Define Power Factor & Quality Factor./What is the physical significance of Power factor

and Quality Factor? Explain the importance of Power factor and method of improvement of power factor

Q.4 Why series resonant circuit is known as acceptor circuit or voltage resonance circuit & parallel resonant circuit as rejecter circuit or current resonance circuit?

Q.5 Advantages of 3 phase system.

(Steady State Analysis of Single Phase AC Circuits)

Long

Q.1 Determine Form factor and peak factor of half and full wave rectifier output.

1 NumSine or wave

✓ Q.2 Derive the relation for average power and reactance for pure inductance and pure

Capacitance also draw the related waveforms

V·V Imp

✓ Q.3 Explain Resonance in series RLC circuit and derive relation for resonance frequency.

Impedance and Quality Factor and Derive relation for Cutoff frequencies and bandwidth of

a Series RLC resonance circuit.

J.V.N.V·V Imp

Q.4 Derive the relationship between line and phase current & voltage for a star and delta

connected 3-phase balanced system.

✓ 2 Num

Unit-3

Transformers

Short

✓ 2 mark Imp

Q.1 What happens if dc supply is given to the transformer?

Imp

✓ Q.3 What do you mean by voltage regulation of Transformer?

Q.4 Why Transformer are rated in KVA not in KW?

Imp

Q.5 State different losses in a transformer.

Losses
Core loss
Copper loss

Q.6 Give the expression for the load current when the transformer operates at its maximum efficiency?

✓ Imp

Q.7 Draw the no load phasor diagram of an ideal transformer.

Q.8. What do you mean by voltage regulation of Transformer?

Unit-3

Transformers

Short

✓ Q.1 Explain Construction and Working of Transformer.

Q.2 Explain ideal and practical transformer on no load (V.Imp). Also draw its Phasor

Diagram.

✗ Q.3 Derive EMF equation of Transformer.(V.Imp.)

Q.4 Draw and explain equivalent circuits of transformer. (M.Imp.)

Q.5 Derive relation for maximum efficiency of a transformer. (M.Imp.)

Q.6 Explain Different Types of Losses in a Transformer.

V.Imp

and on load

Their own

{ one Q. 10%
+ Num

Unit-4

Electrical machines

Short

Q.1 What do you mean by back emf?

Q.2 Why d.c. series motor should never start on no load?

Q.3 What are the applications of DC series motor and Shunt motor?

Q.4 Derive relation of slip for a 3 phase Induction Motor? And how slip affect rotor frequency

Q.5 Why a three phase induction does not run at synchronous speed. (Why Induction Motor is also called Asynchronous Motor.)

Q.6 How the direction of 3 phase induction motor can be reversed?

Q.7 Why synchronous motor is not self-start? How can we make it self start?

Q.8 Why synchronous motor is called as doubly excited motor?

Unit-4

Electrical machines

Long

V.Imp

Q.1 Derive Relation for EMF equation of DC generator or Derive relation for torque equation of dc motor.

Num

Q.2 Explain Different types of dc machines.

Imp

Q.3 Explain working of 3-phase Induction Motor. and explain Torque –Slip Characteristic of 3 phase induction motor.

S.V.Imp

Num

Q.4 Why single phase motor is not self-starting? Explain different method of starting a single phase induction motor.

S.V.Imp

Q.5 Explain Principle of Operation of synchronous generator (Alternator).

Q.6 Explain Principle of Operation of synchronous motor. method of Starting V.V.Imp

Unit-5

Electrical Installations

Short

Q.1 Define the purpose of Earthing the electrical appliances

Q.2 What is difference between primary and secondary batteries?

Q.3 . What is the necessity of earthing?

Q.4. Why Earth pin is made thicker and bigger than line and neutral?

Q.5 What are the factors that affect the battery capacity?

Q.6 What do you mean by busbar and lightening arrester.

V. Imp

merit

Unit-5

Electrical Installations

Long

V.V.Imp 1 Ques ①

Q.1 Write notes on (I)MCB (ii) MCCB (iii)SFU (iv)ELCB (V) ACB

Q.2 Describe the classification of earthing based on the purpose, with the help of examples.

V.V.Imp

Or

Q.3 What do you mean by earthing? Give the name of all methods of earthing and discuss any two of them?

Q.4 What are the primary and secondary battery? Explain in detail working operation of any secondary battery with neat diagram.

Q.5 Describe different types of cables and draw the cross sectional diagram of a 3- core armoured cable.

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Thank You