



**FIRST TERM FIRST YEAR (1ST TERM) B.E.(ELECTRICAL) REGULAR
EXAMINATION 2009 OF 09-BATCH.**

ELECTRICAL ENGINEERING-I

Dated: 11-05-2009.

Time Allowed: 03 Hours.

Max.Marks-80.

NOTE. ATTEMPT ANY FIVE QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q.No.

- 01 (a) What is the effect of temperature on resistivity? The resistivity of a material is also called as specific resistance why?
(b) A motor winding has a resistance of 80Ω at the room temperature of 20°C before switching on to a 230V. After 4 hours run the winding resistance is 100Ω . Find the temperature rise if the material resistance temperature co-efficient is $1/234.5 /^\circ\text{C}$
- 02 (a) Solve the network given below for unknown currents I_1 , I_2 & I_3 and voltage V_A , given $V_B = 105$ Volts.
- 03 (a) A capacitor of $4\mu\text{F}$ capacitance is charged to a p.d of 400V and then connected in parallel with an uncharged capacitor of $2\mu\text{F}$ capacitance. Calculate the p.d across the parallel capacitors.
(b) A variable air capacitor has 15 movable plates and 16 fixed plates. The area of each Plate is 15 cm^2 and separation between opposite plates is 0.2 mm. Determine
(i) The maximum capacitance of this variable capacitor.
(ii) The capacitance when 1/4 th area of movable plates is overlapping the fixed plates.
- 04 (a) What is the response of inductance in D.C circuit? Compare resistive and Inductive currents in D.C circuit?
(b) What is time constant? Derive the formula for decay of current in Inductive and resistive circuits. Also draw the wave form of current.
- 05 (a) What is the difference between self and mutual inductance. Derive the formula for self and mutual inductance and mutually induced emf.
(b) A Coil having 400 turns is wound on iron core with relative permeability of 2500 and of 50cm in length and cross-sectional area of 5 cm^2 . Determine (a) Inductance of coil (b) the emf induced in the coil when current 2A is uniformly reduced to zero in 10 mili-seconds.

Cont'd on P/-2....

- 06 (a) Explain with help of phasor diagram and wave forms the relationship between A.C voltage and current when applied to pure capacitance. Also, obtain the expression for capacitance reactance.
- (b) Three voltages represented by $e_1 = 10\sin\omega t$, $e_2 = \sin(\omega t + \pi/4)$ and $e_3 = 20\cos(\omega t - \pi/6)$ act together in a circuit. Show graphically and find an expression for the resulting voltage
- 07 (a) What do you mean by reactance and impedance. Show and derive how the p.f could be found from impedance triangle.
- (b) A voltage of 125 Volt at 50 Hz is applied across a non – inductive resistor connected in series with a capacitor. The current in the circuit is 2.2 A. The power loss in the resistor is 96.8 w and that in the capacitor is negligible. Calculate the resistance and capacitance.
- 08 Describe any three of the following:
- (i) Kirchoff's laws
 - (ii) Characteristics of D.C series and Parallel circuits
 - (iii) Power & Power factor.
 - (iv) Average and RMS value in non-sinusoidal alternating current.

-----THE END-----



**FIRST TERM FIRST YEAR (1ST TERM) B.E.(ELECTRICAL) REGULAR
EXAMINATION 2008 OF 08-BATCH.**

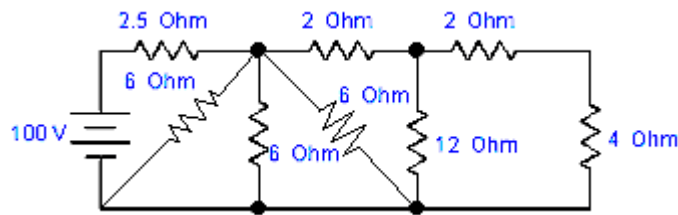
BASIC ELECTRICAL ENGINEERING

Dated: 12-05-2008. Time Allowed: 03 Hours. Max.Marks-80.
NOTE. ATTEMPT ANY FIVE QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

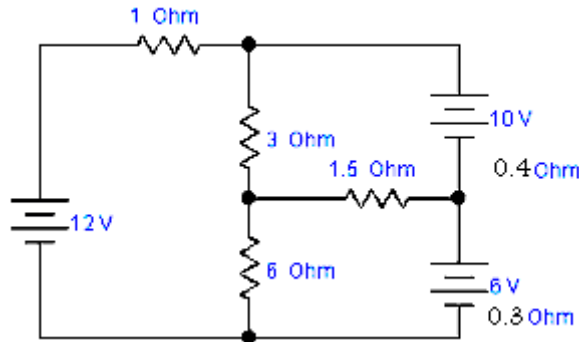
Q.No.

- 01 (a) What is the effect of Temperature on resistance of different materials?. What is the effect of temperature on Resistivity? Derive the formula.
- (b) A specimen of copper wire has a specific resistance of 1.72×10^{-6} ohm-cm at 0°C and has a temperature coefficient of $1/264.5$ at 30°C . Find the temperature coefficient and specific resistance at 80°C .

- 02 (a) Two coils are connected in parallel and a voltage of 200 volts is applied to the terminals. The total current taken is 25 amp. and the power dissipated in one of the coils is 1500 watts. What is the resistance of each coil.
- (b) Determine current I in the circuit shown in the given figure. All the resistances are given in Ohms.



- 03 Determine the current supplied by the battery of 12 volts in the given circuit.



- 04 (a) Define Capacitor, Capacitance and discharge of Capacitor through resistor. Drive an expression.
- (b) A Capacitor is charged by a d.c source through a resistor of $1 \text{ M}\Omega$. If in one second, the p.d across the capacitor reaches 80% of the final value. Calculate the capacity of the capacitor.

Cont'd on P/-2.....

- 05 (a) In a magnetic circuit, which part (Iron or Air) requires most of the ampere-turns to set up flux, tell why?
- (b) An Iron ring of mean length 1 m has an air gap of 1 m.m and a winding of 200 turns. If the relative permeability of iron is 500 when a current of 1 ampere flows through the coil. Find the flux density.
- 06 (a) What do you mean by Time constant in R/L circuit. Derive the formula for decay of current in an inductive and resistive circuit.
- (b) Consider a series R-L circuit connected to a battery source of 1 volt. If $R=1 \Omega$ and $L= 1$ Henry. Find the current $i(t)$ through the inductance. Find the voltage across Resistance and inductance separately at the time of switching the supply and when sufficient time has elapsed after the switching the source.
- 07 (a) A wooden ring has mean diameter of 150 m.m and a cross-sectional area of 250 m.m^2 . It is wound with 1500 Turns of insulated wire. A second coil of 800 turns is wound on the top of the 1st. Assuming that all flux produced by the 1st coil links with the second coil. Calculate the mutual inductance.
- (b) An alternating current when passed through the resistance of an immersion rod placed in water for 16 minutes. It raises the temp. of water to boiling point. When a direct current of 4 amp. was passed through the same resistance under identical conditions, it took 25 minutes to just boil the water. Find the peak value of alternating current varying sinusoidally.
- 08 Discuss the following.
- (i) Statically induce emf & Mutually induced emf
 - (ii) Permeability & Permittivity.
 - (iii) Electric circuit & Magnetic circuit.

-----THE END-----



MEHRAN UNIVERSITY OF ENGINEERING AND TECHNOLOGY,
JAMSHORO.

FIRST TERM FIRST YEAR (1ST TERM) B.E.(ELECTRICAL)
FOR 07-BATCH REGULAR EXAMINATION 2007.

BASIC ELECTRICAL ENGINEERING-I

Dated: 30-05-2007.

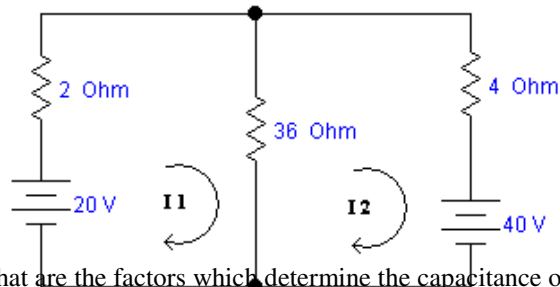
Time Allowed: 03 Hours.

Max.Marks-80.

NOTE. ATTEMPT ANY FIVE QUESTIONS. ALL QUESTIONS CARRY EQUAL MARKS.

Q.No.

- 01 (a) State and explain ohm's law
(b) Describe briefly about the sources of electricity
- 02 (a) State Kirchoff's 1st and 2nd law
(b) Find the currents I_1 and I_2 for the following circuit:



- 03 (a) Define capacitance. What are the factors which determine the capacitance of a parallel plate capacitor?
(b) A $100 \mu\text{F}$ capacitor is connected in series with $8 \text{ k}\Omega$ resistor across a 100 V d.c supply. Calculate:
i. initial charging current
ii. current and the p.d across the capacitor 3.2 s after it is connected to the supply
- 04 State and explain Faraday's Law of electromagnetic induction. How on emf is induced in a coil when it rotates in magnetic field. What are the laws for determination of direction of induced emf?
- 05 (a) Define time constant in inductive circuits. Explain in detail about current growth in an inductor.
(b) Express formula of inductance in terms of flux linkages per ampere. A coil of 150 turns, wound on a core of non-magnetic material, has an inductance of 10 mH . Calculate the flux produced by current of 4 A .
- 06 Define the term Magnetic domain. What is Hysteresis Loss? Why it occurs in Ferromagnetic cores? Explain in detail about the Hysteresis loop with the help of a neat diagram.
- 07 What is difference between single phase and three phase system? Derive a selection between phase and line current, phase and line voltage in star and delta connection.
- 08 Write Short notes on the following:
1. Permeability and permittivity
2. Resistors in series and Parallel
3. Charging and discharging of a capacitor
4. Electrical quantities represented by phasor.

-----THE END-----



FIRST TERM FIRST YEAR (1ST TERM) 09-BATCH OF B.E (ELECTRICAL) REGULAR PRACTICAL EXAMINATION 2009

SUBJECT:-	ELECTRICAL ENGINEERING-I	ID. NO.	
Dated: 27 – 05 – 2009		Time Allowed: 30 Minutes	
		Max. Marks:- 15	
Marks Obtained:-		Signature {	1. Internal Examiner -----
In Words -----			2. External Examiner -----

1. Fill in the Blanks

- Fleming’s right hand rule determines the direction of dynamically induced e.m.f in a conductor which is given by _____
- A meter is always connected inwith load.
- The Volt meter has a coil which is known ascoil.
- Ten resistances of 10 ohm each are available. The minimum equivalent resistance of all these will be _____ ohm.
- Unit of electrical power is _____ and that of electrical energy is _____

2. Write T if statement is correct other wise F

- Reciprocal of resistance of conductor is called conductance.
- The job of battery is to provide static electricity.
- The job of T/F is to transform electrical power.
- Current flow which does not change direction is called a.c
- V.drop in a resistor is directly proportional to current flow through it.

3. Tick the correct answer.

- The dielectric of capacitor should have,
(a) low permittivity (b) high permittivity (c) should have, same as that of air
- The resistance is added in;
(a) Series (b) parallel (c) Both
- Transformer cores are laminated in order to
(a) reduce cost (b) reduce hysteresis loss (c) minimum eddy current loss
- The primary no of turns of step up Transformer should be
(a) Greater (b) Lesser (c) Equal
- Transformer Works on the bases of;
(a) Self induction (b) Mutual induction (c) None of them

- Draw an experimental circuit diagram showing the connections of charging and discharging of capacitor.
- Draw wave forms of voltage and current of capacitor during charging and discharging of capacitor.

THE END