Scheme – I

Sample Question Paper

Program Name : **Electrical Engineering Program Group**
Program Code : **EE/EP/EU**
Semester : **Second**
Course Title : **Fundamentals of Electrical Engineering**
Marks : **70** **Time: 3 Hrs.**

22212

Instructions:

(1) All questions are compulsory.

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data if necessary.

(5) Preferably, write the answers in sequential order.

Q.1) Attempt any FIVE of the following. **10 Marks**

a) Define power and energy.

b) State KCL and KVL.

c) State the types of capacitor and give one application of each.

d) Define flux and flux density.

e) State the applications of electromagnet.

f) Define coefficient of self inductance.

g) State Lenz's law.

Q.2) Attempt any THREE of the following. **12 Marks**

a) State the various types of resistors and give their applications.

b) Compare resistance in series and resistances in parallel.

c) Explain charging and discharging of capacitor.

d) State the difference between 'self-induced EMF' and 'mutual induced EMF'. Also state the expression for 'coefficient of coupling' and 'equivalent inductance' when two inductors are connected in series.

Q.3) Attempt any THREE of the following. 12 Marks

a) State the various effects of electric current and explain any one of them.

b) The field coil of a generator has 14.1 Ω at 25^0C and 18.2 Ω at 32^0 C. Find the temperature coefficient of resistance at 0^0C and resistance at 0^0C.

c) Define the following terms as related to electric circuits:

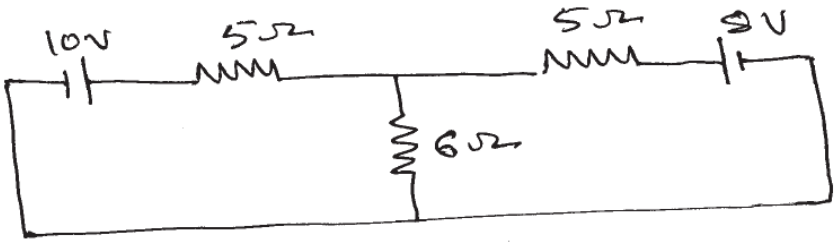
(i) Node (ii) Branch (iii) Loop and (iv) Mesh

d) Derive the expression for energy stored in capacitor with the help of neat diagram.

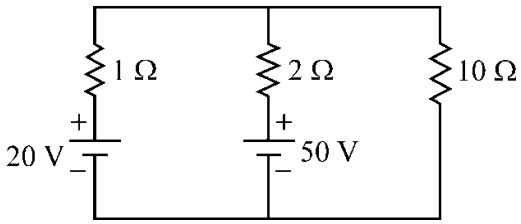
Q.4) Attempt any THREE of the following. 12 Marks

a) Describe the effect of temperature on resistance.

b) Determine the current through 6 Ω resistor shown in figure using KVL.



c) Using Kirchhoff's laws calculate the current flowing through 10 Ω.



d) Explain any one constant voltage charging method.

e) Three capacitors A, B, C have capacitances 10, 50 and 25 F respectively. Calculate (a) charge on each when connected in parallel to a 250 V supply (b) total capacitance.

Q.5) Attempt any TWO of the following. 12 Marks

a) A mild steel ring having a cross-sectional area of 5 cm^2 and a mean circumference of 40 cm has a coil of 200 turns wound in firmly around it. Calculate: (i) Reluctance of the ring (ii) Current required to produce a flux of 800 Wb in the ring. Assume relative permeability of mild steel as 380.

b) Compare electric circuit and magnetic circuit on any six points.

c) A coil consisting of 120 turns is placed in the magnetic field of 0.8 mWb. Calculate the average emf induced in the coil when it is moved in 0.08 seconds from the given field of 0.3 mWb. If the resistance of coil is 200 Ω, find the induced current in the coil.

Q.6) Attempt any TWO of the following. 12 Marks

a) Explain Hysteresis loop of magnetic material with neat labeled diagram.

b) (i) A magnetic flux of 0.4 mWb passing through a coil of 1200 turns is reversed in 0.1 second. Determine the average value of self-induced emf

(ii) Compare statically induced EMF with dynamically induced EMF on any two points.

c) (i) State the various types of inductor.

(ii) Derive an expression for energy stored in magnetic field.

Scheme - I

Sample Test Paper - I

Program Name : **Electrical Engineering Program Group**

Program Code : **EE/EP/EU**

22212

Semester : **Second**

Course Title : **Fundamentals of Electrical Engineering**

Marks : **20** **Time: 1 Hour**

Instructions: All questions are compulsory

1. Illustrate your answers with neat sketches wherever necessary
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3. Assume suitable data if necessary
4. Preferably, write the answers in sequential order

Q.1 Attempt any FOUR. **08 Marks**

a) Differentiate between Direct current and Alternating current. (any two points)

b) Define emf and resistance

c) State the different types of resistors.

d) State Ohm's Law.

e) State the concept of internal voltage drop.

f) Define: (i) Linear Network and (ii) Non-linear Network

Q.2 Attempt any THREE. **12 Marks**

a) Define ideal voltage source and practical voltage source. Draw it's symbol and characteristics.

b) The rating of electric geyser is 250 V, 3 kW. How much current does it take and what is its hot resistance? Also calculate the energy consumed by it in one hour.

c) State the following effects of currents: (i) Heating effect (ii) Magnetic effect.

d) Write the expression for 'equivalent resistance' and 'voltage division' when 3 resistance are connected in series.

e) Compare unilateral and bi-lateral circuit

f) State Kirchhoff's laws & explain sign convention adopted for it.

Scheme - I

Sample Test Paper - II

Program Name : **Electrical Engineering Program Group**
Program Code : **EE/EP/EU**
Semester : **Second**
Course Title : **Fundamentals of Electrical Engineering**
Marks : **20** **Time: 1 Hour**

22212

Instructions: All questions are compulsory

1. Illustrate your answers with neat sketches wherever necessary
2. Figures to the right indicate full marks
3. Assume suitable data if necessary
4. Preferably, write the answers in sequential order

Q.1 Attempt any FOUR. **08 Marks**

a) Define Capacitor.

b) State the term Di-electric strength

c) Draw B-H curve for magnetic curve.

d) State the applications of electromagnet.

e) State Lenz's law.

f) State the different types of inductors

Q.2 Attempt any THREE. **12Marks**

a) Derive the expression for energy stored in capacitor with the help of neat diagram.

b) Three capacitors having capacitance of 4 μF, 6 μF and 8 μF respectively. Find the equivalent capacitance when they are connected in (i) series and (ii) Parallel.

c) Explain Hysteresis loop of magnetic material with neat diagram.

d) Give any two similarities and dissimilarities between electric and magnetic circuits.

e) State Faraday's first law and second law of Electromagnetic Induction.

f) An iron ring with mean circumference of 80 cm and cross sectional area of 10 cm^2 is uniformly wound with 500 turns of wire. Determine the current required to set up a flux density of 1.2 Tesla in the ring. Assume $\mu_r = 1000$ for iron.