A   B

SECTION-D

Note: Long answer type questions. Attempt any two questions out of three questions.   (2x8=16)

Q.23 Define capacitance of a capacitor. Explain the factors affecting the capacitance of a capacitor. If C_x and C_y are the values of two capacitors, then write down their equivalent in each case when both are in series and parallel combinations respectively.

Q.24 Calculate the equivalent resistance and capacitance for the below circuits.

Q.25 Write a short note on each of the followings
  a) Superposition theorem
  b) Series resonance circuit
  c) Magneto-motive force
  d) KVL

2nd Sem. / Instrumentation & Control Engg.

Subject : Fundamentals of Electrical Engineering

Time : 3 Hrs.   M.M. : 60

SECTION-A

Note: Multiple choice questions. All questions are compulsory   (6x1=6)

Q.1 Which of the following statement is correct for an electric circuit?
  a) If the resistance of the circuit is high, then the current flowing through the circut is high
  b) If the voltage across the circuit is low, then the current flowing through the circuit is high
  c) For conductors, generally the voltage applied across it is inversely proportional to the current flowing through the conductor
  d) If the voltage across the circuit is 10 Volts and the resistance offered by the circuit is 10 Ohms, then the current flowing through the circuit is 1 Amp.

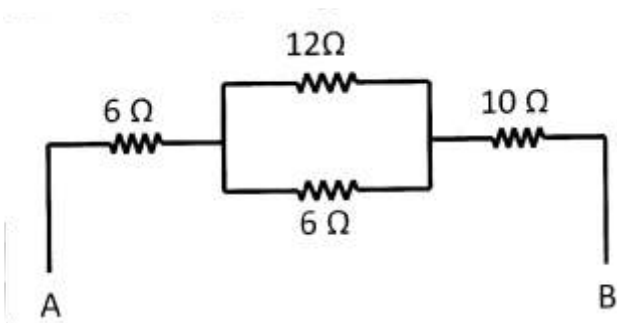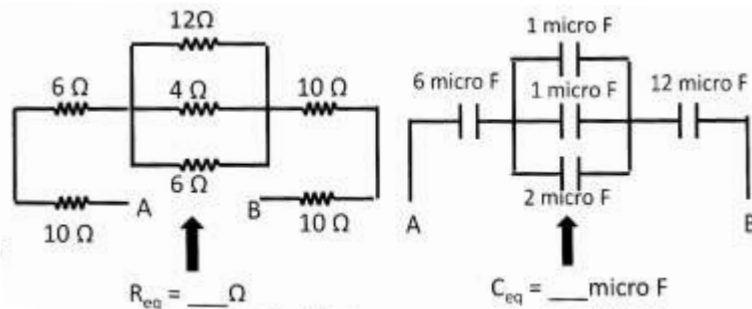Q.2 The power factor for a pure resistive circuit is
  a) 0   b) 1
  c) 0.5   d) 0.25

Q.3 If three batteries with emf 15 Volts each are connected in parallel then the equivalent emf across the parallel connection is
  a) 5 Volts   b) 45 Volts
  c) 12 Volts   d) 15 Volts

Q.4 The relation between conductivity and resistivity is
  a) Both are proportional to each other
  b) Both are same

c) Both are inversely proportional
d) Both increases with electron density

Q.5 Energy stored in an inductor (L) if the initial current flowing through it is I is given by
a) LI^2 b) IL^2
c) $0.5\,LI^2$ d) $0.25\,LI^2$

Q.6 In a pure capacitive circuit, which of the following option is most appropriate?
a) Current leads voltage by 90°
b) Current and voltage are in same phase
c) Voltage lags current
d) Current lags voltage by 90°

SECTION-B

Note: Objective/ Completion type questions. All questions are compulsory. (6x1=6)

Q.7 Expand KVL.

Q.8 KCL works on the principle of conservation of charge. (T/F)

Q.9 Five capacitors with the capacitance value of 50 micro Farad each are connected in parallel, then the equivalent value of capacitance is _____ micro Farad.

Q.10 Expand MMF.

Q.11 State the Ohm's law.

Q.12 If the amplitude of an AC signal is 141 Volts then the RMS value of the AC signal is _____ Volts.
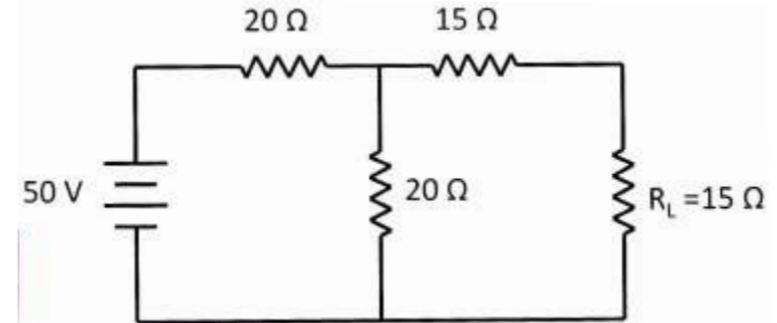
SECTION-C

Note: Short answer type questions. Attempt any eight questions out of ten questions. (8x4=32)

Q.13 State Thevenin's theorem. Also write the condition for a circuit to follow Thevenin's theorem.

Q.14 For an AC signal, f(t) = 10.sin(314t+30°) Volts, calculate the values of

a) Amplitude in volts
b) Frequency in Hz
c) Time period in seconds
d) Phase difference in degrees

Q.15 Write down the effect of temperature on resistance. Also define the term temperature coefficient of resistance.

Q.16 State the Faraday's law of electromagnetic induction. Also define self inductance.

Q.17 Draw the Norton's equivalent circuit for the below figure across R_L.

Q.18 Define electric power. Also write two different formulas of electric power (P) in terms of voltage (V), current (I) and resistance (R).

Q.19 Write any four differences between series and parallel resonance circuit.

Q.20 Define the term primary and secondary cells. Also define battery.

Q.21 Write a short note about star-delta connection.

Q.22 Calculate the equivalent resistance between the terminal A and B.