Roll No. | | | | | | | | | | | | | Total No. of Pages : 03

Total No. of Questions : 18

B.Tech. (Electrical & Electronics Engg. / Electronics & Electrical)
(2018 Batch) (Sem.–3)

ELECTRICAL CIRCUIT ANALYSIS

Subject Code : BTEEE-301-18
M.Code : 76463

Time : 3 Hrs. Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

Write briefly :

Q1 State Reciprocity Theorem and its application.

Q2 What is coefficient of coupling?

Q3 Write various applications of filters?

Q4 What are open circuit parameters? Give the equivalent circuit.

Q5 State advantages of 3-phase machines over 1-phase machines.

Q6 The coupled coil with L_1 = 3H, L_2 = 1mH and K = 0.5 are connected in series additive arrangement. Calculate the equivalent inductance.

Q7 What do you mean by duality network?

Q8 What is the difference between network synthesis and network analysis?

Q9 Give the condition for selecting the resonant frequency in m-derived high pass and low-pass filters.

Q10 What do you mean by immittance?

SECTION-B

Q11 For the given two port network calculate the short circuit parameters of Fig. 1.

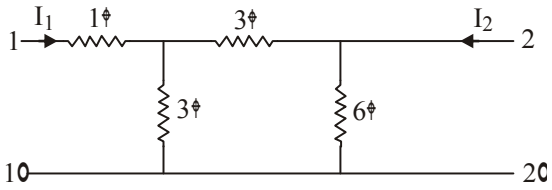

FIG.1

Q12 Find current in 5Ω resistance in the magnetically coupled circuit of Fig. 2.

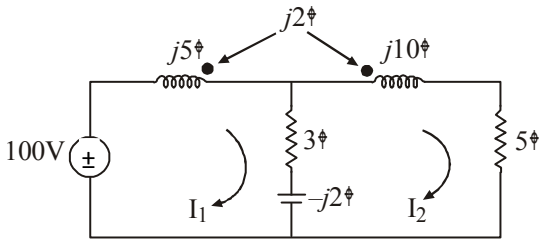

FIG.2

Q13 Determine the current delivered by 54V source for the circuit shown using nodal analysis of Fig. 3.

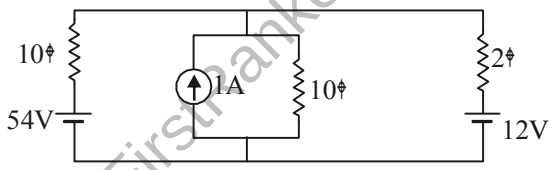

FIG.3

Q14 Find $i_1(t)$ in Fig. 4 if switch is closed at t = 0 and the inductors are unenergized initially.

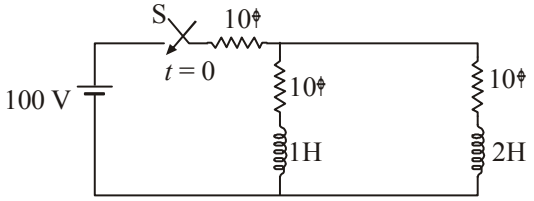

FIG. 4

Q15 Test for positive realness $F(s) = \dfrac{2s^2 + 2s + 1}{s^3 + 2s^2 + s + 2}$.

SECTION-C

Q16 The driving point impedance is given by :

$$Z(s) = 8\frac{(s^2 + 4)(s^2 + 25)}{s(s^2 + 16)}$$

Obtain the Foster-I and Foster-II networks.

Q17 Design a m-derived T and π-network low pass filter with nominal characteristic impedance R0 = 600Ω, having cut-off frequency of 1.8KHz and infinite attenuation f∞ = 2KHz.

Q18 Describe the following :

a) Represent sine function as rotating phasor.

b) Derive all characteristics of constant K High Pass and Band Pass filter.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.