



SB-0613

First Year B. Sc. Examination

March / April – 2011

Electronics : Paper - II

(Network Lines & Field)

Time : 3 Hours]

[Total Marks : 70

Instructions :

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી. Fillup strictly the details of signs on your answer book.		Seat No. :	
Name of the Examination :		<input type="text"/>	
F. Y. B. Sc.		<input type="text"/>	
Name of the Subject :		<input type="text"/>	
Electronics - 2		<input type="text"/>	
Subject Code No. :		Section No. (1, 2,.....) :	
0 6 1 3		Nil	
		Student's Signature	

- (2) Figures on the **right** indicate marks.
- (3) All symbols and abbreviations have their usual meaning.
- (4) Non-programmable calculators is allowed.
- (5) Q. 1 is **compulsory**.
- (6) Assume data if **necessary**.

1 Answer in short : **7×2=14**

- (a) What is a Fourier Series?
- (b) Explain following term and give their units. Bandwidth, Q-factor, Resonance frequency.
- (c) Give units of Resistance, Reactance, Impedance and Admittance
- (d) What is Time constant? Give time constant of R-L circuit.
- (e) What is Power factor?
- (f) Define cut-off frequency in filter.
- (g) In a circuit using three impedances how many circuit arrangement is possible.

2 (a) State and prove Thevenine theorem **8**
(b) State and explain Ohm's Law, Kirchoff's voltage Law and Kirchoff's current Law. **6**

OR

- 2 (a) Deduce Laplace transform of n^{th} order integral. Deduce. 8
 (b) Find the Laplace transform of : 6
 (1) $F(t) = \text{Exp}(\alpha t)$
 (2) $F(t) = \cos(\omega t)$.

- 3 (a) Reduction of complicated network using 14
 $Z_{1oc}, Z_{1sc}, Z_{2oc}, Z_{2sc}$. Derive equation for star and delta network.

OR

- 3 (a) State and prove maximum power transfer theorem 7
 using suitable example.
 (b) What is an ideal current source? State and prove 7
 Norton's Theorem.

- 4 (a) Find the Mutual inductance (M) and co-efficient of 10
 coupling (k) of two magnetically coupled coils. If the coil
 has self inductance of $250 \mu H$ each. If series aiding
 inductance (L_a) of $550 \mu H$ and series opposing
 inductance (L_o) of $450 \mu H$.

- (b) In a parallel resonance circuit $R = 100 \Omega$, $L = 2.5 H$ 4
 and $C = 0.1$ micro farad, then calculate impedance and
 anti-resonance of the circuit.

OR

- 4 (a) An R-L-C circuit containing capacitor of reactance 10 10
 12Ω a coil having a resistance 60Ω and inductive
 reactance of 180Ω . The combination is connected across
 a supply of $200V, 50 \text{ Hz}$. Compute (1) Current, (2) Power
 factor and (3) Power taken by the circuit.

- (b) In the below given circuit using Thevenine's theorem 4
 find the current through 12Ω .

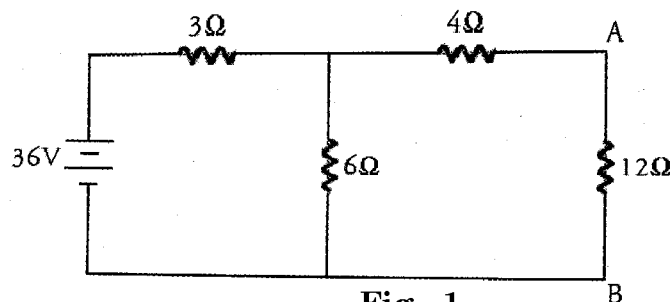


Fig. 1

- 5 Write short note on any two : 7×2=14
 (a) Evaluation of Fourier constant
 (b) Types of Filter
 (c) Resonance and Anti-resonance
 (d) Reciprocity Theorem.