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.

Name of the Examination :

👉 **F. Y. B. Sc.**

Name of the Subject :

👉 **Electronics - 2**

👉Subject Code No. : | **0** | **6** | **1** | **3** | 👉Section No. (1, 2,.....) : | **Nil**

Seat No. :

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-factoOr, 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

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2 (a) Deduce Laplace transform of nth order integral.Deduce.   8
   (b) Find the Laplace transform of :   6
        (1) $F(t) = Exp(\alpha t)$
        (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 μH each. If series aiding
        inductance (La) of 550 μH and series opposing
        inductance (Lo) of 450 μH.
   (b) In a parallel resonance circuit R = 100 Ω, 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
        12 Ω a coil having a resistance 60 Ω and inductive
        reactance of 180 Ω. The combination is connected across
        a supply of 200V, 50 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
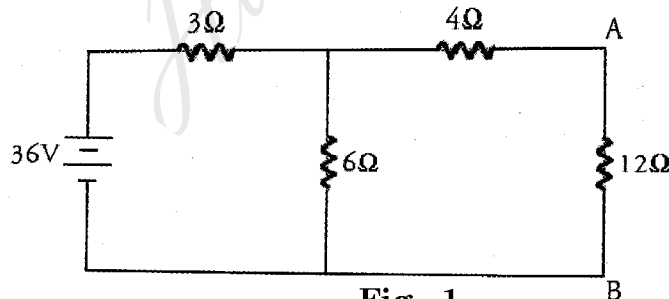   find the current through 12 Ω.

Fig. 1

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

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