Reg. No. | | | | | | | | | |

MANIPAL ACADEMY OF HIGHER EDUCATION
(Deemed University)

III Sem I & C Engineering, Make up Examination

ELECTRICAL CIRCUIT ANALYSIS – ICE 201
(05-01-2007)

Time: 3 Hrs]. [Max. Marks: 100

.Note:

- Answer any FIVE full questions.
- All questions carry equal marks.

1A. Find the current Ix using mesh current analysis. Refer the circuit shown in Fig Q1A.
1B For the network shown in Fig Q1B, find the currents through resistors R1, R2 using nodal technique. (10+10)

2A. State and explain i) Thevinin's theorem ii) Superposition theorem.
2B. Find the resonant frequency for the given parallel circuit shown in Fig Q2B. Also derive the formula used.
2C. Explain i) Time constant ii) Reciprocity theorem. (10+05+05)

3A.In the given network shown in fig Q3A the switch S is opened at t=0.Solve for the values of V, $\frac{dv}{dt}$ and $\frac{d^2v}{dt^2}$ at t=0+.
3B. Find all the branch currents for the circuit shown in Fig Q3B.
3C. Define the terms i) Q factor ii) Band width iii) resonance.
. (10+05+05)

4A. Find the trigonometric Fourier series for the waveform shown in Fig Q4A.
4B. Find the Laplace Inverse of the following functions:

a) $F(s) = \frac{1}{s(s^2 - a^2)}$ b) $F(s) = \frac{2s+3}{(s+1)(s+2)}$.(10+10)

5A. An RLC Series circuitconsists of R=10 Ohms, L=15.8H and C=0.1 microfarad and the applied voltage is 10V.
Calculate : a) resonant frequency b) q factor. c) Current at resonance d) Voltage across inductor e)Voltage across capacitor.

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5B. Find the exponential Fourier series for the waveform shown in fig Q5B. Also obtain the coefficients of the trigonometric Fourier series from the exponential coefficients and compare the two series. . (10+10)

6A. State the initial and Final value theorems .What is their significance? Verify the initial and final value theorem for the function

$$f(t) = 3u(t) + 2e^{-t}.$$

6B. Derive the relationship between the resonant frequency and half power frequencies. (10+10)

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