Name _____

Jaypee Institute of Information Technology, Noida

End Term Examination, 2017

B.Tech ECE/CSE/IT 2nd Semester

Course Title: Electrical Science -2/BEDC/ECA **Maximum Time: 2 hrs**

Course Code: 15B11EC211/10B11EC211/10B11EC111 **Maximum Marks: 35**

Note: Attempt all questions.

Q.1 Find $v(t)$ for $t > 0$, for the circuit shown in Fig. 1. Assume steady state at $t = 0^-$. [5]

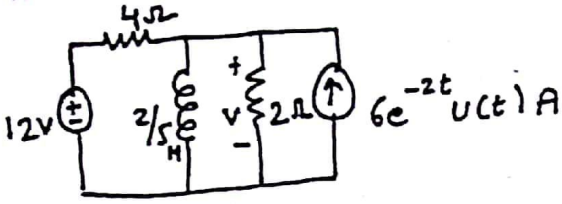

fig 1

Q.2 (a) Use 2's complement to solve the following decimal numbers using 8-bit representation: (i) -128 + 65 (ii) 13 - 5

(b) Simplify using K-map: $F(A,B,C,D) = \Pi M (0,1,4,5,8,9,13,15)$ [2+3]

Q.3 Determine the five properties which hold/not hold for the following system. [5]

$$y(t) = x(t).\cos(t + 1).$$

Q.4 (a) Determine whether the following signal is periodic. If periodic, then determine fundamental period. Also, determine whether it is energy or power signal.

$$x(t) = \exp(-2t).u(t)$$

(b) Sketch the following signals:

(i) $x_1(t) = u(t) + 5u(t-1) - 2u(t-2)$ (ii) $x_2(t) = \delta(\cos t)$ (iii) $x_3(t) = -6r(0.2t)$ [2+3]

Q.5 (a) Describe different types of digital modulation techniques with the help of suitable waveforms.

(b) Describe the steps involved to convert an analog signal to digital signal with relevant figures. [2+3]

Q.6 (a) Describe regulation of a practical transformer. Also, write condition for maximum efficiency.

(b) A 11 kV/400 V distribution transformer takes a no load primary current of 1 A at a power factor of 0.24 lagging. Find (i) Core loss current (ii) Magnetizing current (iii) Core/Iron loss. Also, draw the equivalent circuit. [2+3]

Q.7 (a) A four-pole, wave connected armature in a dc generator has 51 slots with 12 conductors per slot. It is driven at 900 rpm. If the useful flux per pole is 25 mWb, calculate the value of generated emf.

(b) Write short notes on any TWO of the following: (i) Ideal Transformer (ii) Causal/Anti-Causal/Non-Causal signal (iii) Analogous electrical and mechanical quantities [2+3]