VELALAR COLLEGE OF ENGINEERING AND TECHNOLOGY

(An Autonomous Institution, Affiliated to Anna University, Chennai)

Semester Examinations – April / May 2017   Regulations-2016

Programme: B.E/B.Tech   Semester: 1   Max. Marks: 100   Duration 3 Hrs

Course Code & Title: **16EET21   BASIC ELECTRICAL AND ELECTRONICS ENGINEERING**

Knowledge Levels (KL)	K1 - Remembering	K3 - Applying	K5 – Evaluating
	K2 - Understanding	K4 – Analyzing	K6 – Creating

Part A - Answer ALL Questions.   10 x 2 = 20 Marks

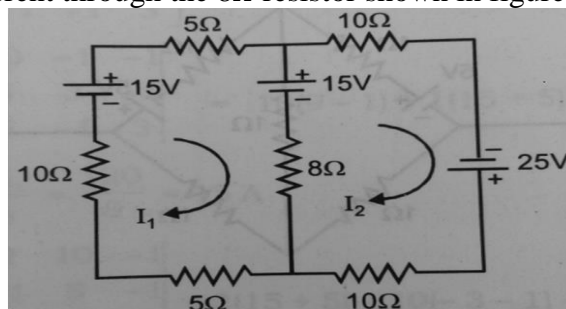| No.	Question	KL
1.	An electric heater draws 8A for 250V supply. Calculate the power rating.	K3
2.	State Kirchoff's voltage law.	K1
3.	Define form factor.	K1
4.	Define admittance.	K1
5.	State Fleming's left hand rule.	K1
6.	List the characteristics of DC shunt motor.	K1
7.	Define 'Avalanche breakdown'.	K1
8.	Mention the applications of a transistor.	K2
9.	Using 1's complement method, perform $(28)_{10}$ - $(15)_{10.}$	K3
10.	Which gates are called as universal gates?	K2

Part B - Answer ALL Questions.   5 x 16 = 80 Marks

No			Question	Marks	KL
11.	a	i.	Define the terms Voltage, Current,Power and Energy.	8	K1
		ii.	Three resistors A, B and C connected in parallel take a total current of 12A from the supply. $I_B = 2 I_A$ and $I_C = 3.5 I_B$. If the total power taken is 3 kW, calculate (i) the current taken by the loads (ii) the supply voltage.	8	K3

OR

| | b | i. | Find the current through the 8Ω resistor shown in figure | 6 | K3 |

| | | ii. | Explain the basic principle and construction of permanent magnet moving coil instruments with neat diagram | 10 | K4 |

12.	a	i.	Define RMS Value, Average Value and Peak Factor for sinusoidal waveform.	6	K1
		ii.	Derive the magnitude of voltage and current for R-L-C series circuit. Also derive the expression for power factor when $X_L > X_C$ and $X_C > X_L$. Explain through the phasor diagram.	10	K3

OR

	b	i.	With neat sketches, explain the principle and construction of moving iron instruments.	10	K4
		ii.	Derive voltage, current and power expression when three phase windings are connected in delta connections.	6	K3

13.	a		With neat diagram, explain the construction and working principle of DC generator.	16	K4

OR

	b		With neat diagram, explain the construction and working principle of DC motor.	16	K4

14.	a	i.	Explain the V-I characteristics of PN diode in both forward and reverse bias condition with neat diagram.	10	K4
		ii.	Draw the circuit diagram of full wave rectifier and explain its operations with the help of waveform.	6	K4

OR

	b		Explain the input and output characteristics of a transistor in CE configuration.	16	K4

15.	a	i.	Prove the following using Boolean algebra: 1. $(a + b)(\bar{a} + c)(b + c) = (a + b)(\bar{a} + c)$ 2. $(x + \bar{x}\bar{y})(\bar{x} + \bar{y}) + yz = \bar{y} + z$	10	K3
		ii.	State and prove DeMorgan's theorem.	6	K1

OR

	b	i.	Design and Implement half adder and full-adder using logic gates.	16	K6

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