Register Number:……..

KUMARAGURU
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B.E/B.TECH DEGREE EXAMINATIONS: JUNE 2017

(Regulation 2015)

Second Semester

U15EET211: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to AE / ME / AUE / BIO)

COURSE OUTCOMES:

CO1: Acquire the basic knowledge of fundamental laws of circuit elements. (K2)

CO2: Define various magnetic field concepts. (K2)

CO3: Understand relationships among current, voltage and power in AC circuits. (K2)

CO4: Understand the characteristics of various electrical machines. (K2)

CO5: Understand the characteristics of basic electronic devices and their applications. (K2)

CO6: Verify the truth table of digital logic gates. (K2)

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-

PART A (10 x 1 = 10 Marks)

1. Match the following CO1 [K_2]

List I	List II
A. Conductance	i. farad
B. Energy	ii. watts
C. Capacitance	iii. mho
D. Power	iv. joules

	A	B	C	D
a)	iv	iii	ii	i
b)	iii	iv	i	ii
c)	ii	i	iii	iv
d)	i	iv	iii	ii

2. Electrical appliances are connected in parallel because it CO1 [K_2]

a) is a simple circuit
b) draws less current
c) results in reduced power loss
d) makes the operation of appliances independent of each other

3. Permeability in a magnetic circuit corresponds to _____ in an electric circuit. CO2 [K_2]

a) Conductivity b) Resistivity

c) Conductance d) Resistance

4. The direction of the induced emf in a coil may be found with the help of CO2 [K_2]

a) Faraday's law b) Lenz's law

c) Fleming's left hand rule d) Steinmetz law

5. The period of a wave is CO3 [K_2]

i) Same as frequency

ii) Reciprocal of frequency

iii) Time required to complete one cycle

iv) Same as angular frequency

a) i is correct b) i, ii, iii are correct

c) i and iv are correct d) ii and iii are correct

6. The voltage of domestic supply is 220V. This value represents CO3 [K_2]

a) Mean value b) Peak value

c) Average value d) RMS value

7. Assertion (A): DC shunt motor is used in Milling machines. CO4 [K_2]
Reason (R): Speed of the DC shunt motor is constant.

a) A is true but R is false b) Both A and R are individually true, R is the correct explanation of A

c) Both A and R are individually true but R is not the correct explanation of A d) A is false but R is true

8. A 50 Hz, 4 pole single phase induction motor will have a synchronous speed (N_s) of CO4 [K_2]

a) 1440 rpm b) 1500 rpm

c) 1000 rpm d) 1540 rpm

9. Arrange the working sequence of PN junction diode for forward biasing CO5 [K_2]

1. PN Junction is formed
2. Space charge region is formed around the PN junction
3. Diffusion process
4. Conduction of current after applying above the knee voltage

a) 2 3 4 1 b) 4 3 1 2

c) 1 3 2 4 d) 3 4 1 2

10. A logic gate is an electronic circuit which CO6 [K_2]

a) Makes logic decisions b) Allows electron flow only in one direction

c) Works on binary algebra d) Alternates between 0 and 1

PART B (10 x 2 = 20 Marks)

(Answer not more than 40 words)

11.	State Ohm's law.	CO1	[K_2]
12.	List out the properties of series electric circuits.	CO1	[K_2]
13.	A bar magnet whose length and width are 4m and 2m respectively. Its magnetic flux density is 0.12T. Find the magnetic flux produced.	CO2	[K_2]
14.	Compare magnetic circuit with electric circuit.	CO2	[K_2]
15.	Define RMS value.	CO3	[K_2]
16.	An alternating current is given as i(t) = 300sin (157t+π/3). Find the maximum current and time period.	CO3	[K_2]
17.	What is back emf?	CO4	[K_2]
18.	Why transformers are rated in KVA?	CO4	[K2]
19.	Mention the applications of diodes.	CO5	[K_2]
20.	Draw the logic diagram of EX-OR gate with its truth table.	CO6	[K_2]

Answer any FIVE Questions:-

PART C (5 x 14 = 70 Marks)

(Answer not more than 300 words)

Q.No. 21 is Compulsory

21.	Derive the capacitance of the parallel plates separated by (i) Dielectric medium. (ii) Dielectric medium with partly air.	(6) (8)	CO1	[K_2]
22.	(i) State and explain the laws of Electromagnetic induction. (ii) Discuss magnetic hysteresis with necessary diagram.	(7) (7)	CO2	[K_2]
23.	Prove that Form factor of pure ac sinusoidal wave is 1.11.		CO3	[K_2]
24.	i) Explain the construction and working principle of DC motor. ii) Compare squirrel cage and slip ring induction motor.	(10) (4)	CO4	[K_2]

25.	(i) Explain the operation of PN junction diode with its V-I characteristics.	(7)	CO5	[K_2]
	(ii) Discuss the characteristics of BJT in CE configuration.	(7)		
26.	A 230V, 50Hz AC supply is applied to a series circuit having 2.5Ω resistance, 0.06H inductance and 6.8μF capacitance. Find (i) Impedance (ii) Current (iii) Phase angle (iv) Power factor (v) Power consumed.		CO3	[K_2]
27.	Illustrate and explain the working principle of Half wave and Full wave rectifier.		CO5	[K_2]

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