KUMARAGURU
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Register Number:……..

B.E/B.TECH DEGREE EXAMINATIONS: DEC 2014

(Regulation 2009)

Third Semester

EEE251: BASICS OF ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to AERO/TXT)

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

Answer all the Questions

PART A (10 x 1 = 10 Marks)

1. An electric heater draws 3.5 A from a 110 V source. The resistance of the heating element is approximately

   a) 385 Ω b) 38.5 Ω

   c) 3.1 Ω d) 31 Ω

2. If the maximum value of a sinusoidal wave is 100V, the effective value of the voltage is

   a) 100V b) 70.7V

   c) 63.7V d) 141.4V

3. Mechanical characteristics of D.C motor can be drawn between

   a) Torque vs current b) Speed vs current

   c) Speed vs current d) Speed vs torque

4. The purpose of adding capacitor in a single phase induction motor is for _____

   a) Starting b) Braking

   c) Reversing d) Improving efficiency

5. When a diode is forward biased, it is equivalent to

   a) An OFF switch b) An ON switch

   c) A medium resistance d) A high resistance

6. In a photoconductive cell, the resistance of the semiconductor material varies ____ with the intensity of incident light.

   a) Directly b) Inversely

   c) Exponentially d) Logarithmically

7. What is the PIV of a diode in half wave bridge rectifier?

a) V_m b) $0.25V_m$

c) $2V_m$ d) $0.5V_m$

8. The feedback component of an integrator is _____.

a) Resistor b) Inductor

c) Capacitor d) Diode

9. The function of which of the following logic gate is similar to that of two switches in series?

a) AND b) OR

c) NAND d) NOR

10. A delay flip-flop is

a) JK flip flop b) RS flip flop

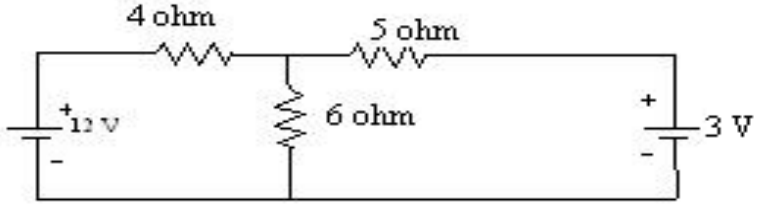
c) T flip flop d) D flip flop

PART B (10 x 2 = 20 Marks)

11. State Ohm's Law.
12. Draw the impedance diagram for series RL & series RC circuits.
13. Name the types of three phase induction motors.
14. Draw the speed torque characteristics of DC series motor.
15. Draw the input and output characteristics of common emitter configuration of transistor.
16. What are the applications of photo diode?
17. Define ripple factor.
18. Write the characteristics of ideal Op-amp.
19. Convert $(270)_{10}$ to octal number.
20. What are logic gates? Write the different types of logic gates.

PART C (5 x 14 = 70 Marks)

21. a) (i) In the circuit of fig. find current through each resistor using Kirchhoffs laws. (7)



(ii) Derive an expression for instantaneous power and average power in a series RLC circuit. (7)

(OR)

	b)	(i)	Write the voltage and current relationship in resistance, inductance and capacitance parameters.	(7)
		(ii)	An Inductor of 20mH and a resistor of 100 ohms are connected in series across 120V, 60Hz mains. Determine the average power expended in the circuit.	(7)
22.	a)		Explain the construction and operation of DC motor with neat diagram.	(14)
			(OR)	
	b)	(i)	Explain the selection procedure of motors for textile industry.	(7)
		(ii)	Draw and explain the speed torque characteristics of three phase induction motor.	(7)
23.	a)		Explain the construction of BJT transistor & its VI characteristic curve for CE configuration.	
			(OR)	
	b)		Explain the following (i) Photo transistor (ii) Light Emitting Diode	
24.	a)		With neat circuit diagram and waveforms, explain the working of full wave bridge rectifier.	
			(OR)	
	b)		Explain the operation of inverting and non-inverting amplifiers.	
25.	a)	(i)	What is half adder? Design a half adder circuit using NAND gates.	(7)
		(ii)	Convert the following decimal numbers a) $4658 = (\quad)_2$ b) $4357 = (\quad)_{16}$	(7)
			(OR)	
	b)		What is Flip Flop? Explain the S-R flip flop with truth table.	

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