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14ELN15

First Semester B.E. Degree Examination, Dec.2014/Jan.2015 Basic Electronics

Time: 3 hrs.

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Max. Marks:100

Note: Answer FIVE full questions, selecting atleast ONE question from each part.

PART 1

1 a. Draw and explain the V-I characteristics of a silicon P-N junction Diode.. (05 Marks)

- b. A single phase full wave rectifier supplies power to a 1 K.Q load. The AC voltage applied to the diode is 300 0 300 V. If diode resistance is 251) and that of the transformer secondary negligible. Determine average load current, average load voltage and rectification efficiency.
- c. Draw and explain the series negative clipper circuit with a suitable waveform. (04 Marks)
- d. Derive an equation for the collector current of a P -N-P transistor in terms of base current and _{adc} and also obtain the relationship between adc and Nc. (05 Marks)
- 2 a. With a neat circuit diagram and waveform, explain the working of a half wave rectifier and show that its ripple factor is 1.21. (07 Marks)
 - b. Draw the common emitter circuit and sketch the input and output characteristics. Also explain operating regions by indicating them on the characteristic curve. (07 Marks)
 - c. Explain the performance of Zener -. Diode in terms of source and load effects. (06 Marks)

PART - 2

3 a. Explain the operation of a fixed - bias circuit, with a suitable circuit diagram. (07 Marks)

- b. What are the ideal characteristics of a operational amplifier? (05 Marks)
- c. A voltage divider bias circuit has Vcc = 15 V, R_c 2.7 KO and RE = 2.2 KC), R_1 = 22 K.Q
- R2 = 12 Kn, life = 50. Calculate VE, Vc, lc and VcE and also draw DC load line and mark the

Q — point. Assume VBE = 0.7 V.

4 a. Derive the expression of output voltage of a differentiator circuit using an opamp. (05 Marks)b. Write expression for output voltage at points A, B, C, D and E as shown in Fig. 4(b).

(10 Marks)

(08 Marks)





c. With a neat circuit diagram and waveform, explain how opamp can be used as a non - inverting amplifier. (05 Marks)



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PART-3

_	a State De Mangan's theorem for 4 warishing and move them by the method	d of monfoot	
3	a. State De Morgan's theorem for 4 – variables and prove them by the method of perfer		
	Induction.	(UO Marks)	
	b. Design fun – auder ch cut using three – variables and implement it using two in	all – auuel.	
	c Explain the construction of an OR – gate using diodes	(00 Marks)	
	d Realize basic gates from NAND gate	(04 Marks)	
	u. Realize basic gates from NAND gate.	(04 Marks)	
6	a. Design a logic circuit, symbol, and truth – table of exclusive – OR gate. b. Convert	(04 Marks)	
	i) (294.6875)14 –) _s		
	ii) $(356.15)s - (-(-)_{10})$	(05 Marks)	
	c. Simplify and Realize using basic gates :		
	i) $ABC + ABC + ABC + ABC$	4	
	ii) $(A + B) (A + e) (T \cdot + C)$.	(06 Marks)	
	d. Subtract (111)2 from (1010)2 using I's and 2's complement method.	(05 Marks)	
	PART-1 ₆ . V'',		
7	a. Explain the working of clocked R S flip – flop with a suitable logic diag	ram and a	
	truth-table.	(06 Marks)	
	b. Explain the logic pinout and signals of 8085 microprocessor.	(08 Marks)	
	c. Explain the construction and working of a linear variable differential transducer	[LVDT].	
		(06 Marks)	
8	a. With a neat block diagram, explain the architecture of 8051 microcontroller.	(09 Marks)	
	b. What is a transducer?. Distinguish between active and passive transducer.	(06 Marks)	
	c. What is Thermister? Explain its advantages and limitations.	(05 Marks)	
	PART-5		
0	m^2 Define amplitude modulation and prove that $P_1 - P_2 1$	(05 Morks)	
,	a. Define amplitude modulation and prove that $\Gamma_1 = \Gamma C \Gamma + \frac{1}{2}$	(05 Mai KS)	
	b. What are commonly used frequency ranges in communication system? M	lention the	
	application of each range.	(05 Marks)	
	c. The total power content of an AM signal is 1000 W. Determine the power being	transmitted	
	at carrier frequency and at each of the side bands when percentage modulation is	100%.	
		(05 Marks)	
	d. Explain the differences between Amplitude and Frequency modulation.	(05 Marks)	
10	a. Explain the block diagram of ISDN.	(06 Marke)	
	b. What are the advantages of ontical fiber communication?	(05 Marks)	
	c Explain the basic principle of operation of mobile phones.	(05 Marks)	
	d. What is modulation? Explain need of modulation.	(04 Marks)	
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