

Total No. of Questions: 6

Total No. of Printed Pages:3

Enrollment No.....



Faculty of Engineering / Science

End Sem Examination Dec 2024

EN3ES16 / BC3ES08 / SC3ES03

Basic Electronics Engineering

Programme: B.Tech./B.Sc.

Branch/Specialisation: All/
Computer Science

Duration: 3 Hrs.

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d. Assume suitable data if necessary. Notations and symbols have their usual meaning.

		Marks	BL	PO	CO	PSO
Q.1	i. Forward barrier voltage of silicon diode is-	1	1	1	1	
	(a) 0.1 V (b) 0.3 V					
	(c) 0.7 V (d) 1.11 V					
	ii. Example of pentavalent impurity is-	1	1	1	1	
	(a) Boron (b) Aluminium					
	(c) Silicon (d) Phosphorus					
	iii. Which terminal is not associated with BJT?	1	1	1	1	
	(a) Gate (b) Emitter					
	(c) Collector (d) Base					
	iv. Q-Point is also known as-	1	1	1	1	
	(a) Saturation point (b) Operating point					
	(c) Pinch-off point (d) Quality point					
	v. If 5 kHz is bandwidth of message signal then	1	2	1,2	3	
	bandwidth of amplitude modulated signal is-					
	(a) 10 kHz (b) 5 kHz					
	(c) 2.5 kHz (d) 25 kHz					
	vi. Which is an example of transducer?	1	1	1,2	3	
	(a) Microphone (b) Modulator					
	(c) Filter (d) Amplifier					
	vii. In Boolean algebra $x + x$ is equivalent to-	1	2	1,2,3	4	
	(a) $2x$ (b) x^2 (c) x (d) x'					
	viii. Example of universal gate is-	1	1	1,2,3	4	
	(a) AND (b) NAND					

P.T.O.

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	(c) OR	(d) XOR				
ix.	By connecting a shunt resistance, a PMMC meter can be converted in-		1	1	1	1
	(a) Ammeter	(b) Voltmeter				
	(c) Ohmmeter	(d) CRO				
x.	Lissajous patterns are used to measure _____ of two signals.		1	1	1	1
	(a) Ripple factor	(b) Power				
	(c) Current	(d) Phase				
Q.2	i. Write diode current equation by defining each term used.		2	2	1	1
	ii. Discuss classification of semiconductors in detail.		3	2	1	1
	iii. What do you mean by rectifier? Give its types with circuit diagram. Define ripple factor of rectifier.		5	2	1	1
OR	iv. Discuss construction and working of- (a) Zener diode (b) LED		5	2	1	1
Q.3	i. Explain the Structure of BJT on the basis of size and doping level of various regions.		2	2	1	1
	ii. Discuss common base configuration of BJT with the help of circuit diagram and input, output VI characteristic graphs.		8	2	1	1
OR	iii. Explain the structure and operation of Enhancement type n-Channel MOSFET with circuit diagram and graphs.		8	2	1	1
Q.4	i. Discuss at-least three needs of modulation in communication system.		3	2	1, 2	3
	ii. Explain amplitude modulation with the help of mathematical expressions and appropriate waveforms.		7	2	1, 2	3
OR	iii. Draw block diagram and explain each component of communication system in detail.		7	2	1, 2	3

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Q.5	i. Perform following conversions-	4	3	1, 2, 3	2
	(a) $(1011)_2 = (?)_{10}$				
	(b) $(2B)_{16} = (?)_{10}$				
	(c) $(25)_{10} = (?)_2$				
	(d) $(1000)_2 = \text{Gray code?}$				
	ii. Derive minimal expression for following function using K-map-	6	3	1, 2, 3	2
	$F(w,x,y,z) = \sum_m (0,1,2,3,5,7,11,15)$				
OR	iii. Discuss half adder and full adder circuits in detail.	6	3	1, 2, 3	2
Q.6	Attempt any two:				
	i. Explain the construction and working of Cathode Ray Tube.	5	2	1	1
	ii. Draw block diagram and explain the working of each component of CRO.	5	2	1	1
	iii. Define following terms with example-	5	2	1	1
	(a) Accuracy				
	(b) Precision				
	(c) Sensitivity				
	(d) Hysteresis				

Marking Scheme
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Q.1	i)	(c) 0.7 V	1
	ii)	(d) Phosphorus	1
	iii)	(a) Gate	1
	iv)	(b) Operating point	1
	v)	(a) 10 kHz	1
	vi)	(a) Microphone	1
	vii)	(c) x	1
	viii)	(b) NAND	1
	ix)	(a) Ammeter	1
	x)	(d) Phase	1
Q.2	i.	Equation 1 mark, defining terms 1 mark	2
	ii.	1.5 mark for each type	3
	iii.	Definition 1 mark, 2 mark for each type, ripple factor 2 mark	5
OR	iv.	Zener diode 2.5 marks, LED 2.5 marks,	5
Q.3	i.	Size 1 mark, doping 1 mark	2
	ii.	Circuit 2 marks, theory 2 marks, input characteristics 2 marks, output characteristics 2 marks.	8
OR	iii.	Structure 2.5 marks, circuit 1 marks, operation 2.5 marks, graph 2 marks	8
Q.4	i.	1 mark for each need	3

	ii.	Definition 3 marks, maths 2 marks, waveforms 2 marks	7
OR	iii.	Diagram 2 marks, explanation: 1 mark for each component	7
Q.5	i.	1 mark for each operation	4
	ii.	k-map 2 marks, grouping 2 marks, minimal expression 2 marks	6
OR	iii.	Half adder: table 1 mark, circuit 1 mark, expression 1 mark Full adder: table 1 mark, circuit 1 mark, expression 1 mark	6
Q.6			
	i.	Diagram 2 marks, working 3 marks	5
	ii.	Block diagram 2 marks, theory 3 marks	5
	iii.	2 marks for accuracy 1 mark for precision 1 mark for sensitivity 1 mark for hysteresis	5
