Total No. of Questions: 6   *Total No. of Printed Pages:2*

Enrollment No......................................
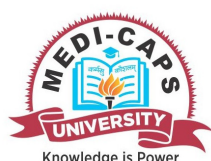
Faculty of Engineering / Science
End Sem Examination May-2024
EN3ES16 / BC3ES08 / SC3ES03
Basic Electronics Engineering

Programme: B.Tech. / B.Sc.   Branch/Specialisation: All

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.

Q.1 i. Wave shaping circuit is-   **1**
     (a) Rectifier   (b) Clipper
     (c) Clamper   (d) Both (b) and (c)

   ii. The value of barrier potential for Ge diode is-   **1**
     (a) 0.1 V   (b) 0.3 V   (c) 0.5 V   (d) 0.7 V

   iii. Which region of transistor is heavily doped-   **1**
     (a) Emitter   (b) Base
     (c) Collector   (d) All are equally doped

   iv. Transistor is used as an amplifier in-   **1**
     (a) Common base configuration in cut off mode
     (b) Common emitter configuration in cut off mode
     (c) Common base configuration in forward active mode
     (d) Common emitter configuration in forward active mode

   v. Transducer converts-   **1**
     (a) Sound to electrical energy
     (b) Electrical to sound energy
     (c) Mechanical to electrical energy
     (d) All of these

   vi. The necessary condition for modulation-   **1**
     (a) $F_c > F_m$ (b) $F_c < F_m$
     (c) $F_c = F_m$ (d) No Necessary Condition

   vii. Which is incorrect?   **1**
     (a) $(011101)_2$ (b) $(012578)_8$ (c) $(124560)_{10}$ (d) $(111111)_{16}$

   viii. Which BCD code is incorrect?   **1**
     (a) 0000   (b) 0001   (c) 0110   (d) 1010

   ix. Multi meter is used for measurement of _____.   **1**
     (a) Efficiency   (b) Ripple factor
     (c) Noise   (d) RMS value

   x. Which of the following device is used to measure current in A.C. circuits?   **1**
     (a) Wattmeter   (b) Voltmeter
     (c) Ohmmeter   (d) Ammeter

Q.2 i. Write diode current equation with notations' meaning.   **2**
   ii. Define ripple factor and derive it for half wave & full wave rectifier.   **3**
   iii. Explain LED with constructional diagram and working.   **5**
OR iv. Explain Zener diode as a voltage regulator with the help of characteristic.   **5**

Q.3 i. Define base width modulation.   **2**
   ii. Which MOSFET is known as Normally-OFF MOSFET and Why?   **3**
   iii. Describe difference between BJT and FET.   **5**
OR iv. Explain transistor as an amplifier and switch.   **5**

Q.4 i. Define communication modes.   **2**
   ii. State the sampling theorem and explain its significance.   **3**
   iii. Explain 'Need of Modulation'.   **5**
OR iv. Define modulation. Explain amplitude and frequency modulation with diagram.   **5**

Q.5 i. State the De Morgan's laws.   **2**
   ii. Implement NOT, NAND, OR gates using NOR gate.   **3**
   iii. Explain BCD Code and Gray Code. Convert $[10110]_2$ to Gray code.   **5**
OR iv. Design a full-adder using only basic gates.   **5**

Q.6 i. Define accuracy and precision.   **2**
   ii. Give any three differences between analog and digital multimeter.   **3**
   iii. Draw block diagram of CRO and explain each block.   **5**
OR iv. How voltage and frequency are measured using CRO? Explain with the help of diagram.   **5**

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Marking Scheme

BC3ES08 / SC3ES03/ EN3ES16 (T) Basic Electronics Engineering

Q.1	i)	D		1
	ii)	B		1
	iii)	A		1
	iv)	D		1
	v)	D		1
	vi)	A		1
	vii)	B		1
	viii)	D		1
	ix)	D		1
	x)	D		1

Q.2	i.	Equation – 1 Mark , Notations – 1 Mark	2
	ii.	Definition – 1 Mark , Halfwave & Fullwave Derivation – 1Mark each	3
	iii.	LED with constructional diagram – 2 Marks , Working – 3 Marks	5
OR	iv.	Zener diode characteristics – 2 Marks , Voltage regulator explanation – 3 Marks	5

Q.3	i.	Define Base Width Modulation – 2 Marks	2
	ii.	Which MOSFET is known as Normally-OFF MOSFET – 1 Mark , Why – 2 Marks	3
	iii.	At least 5 differences between BJT and FET – 1 Mark each	5
OR	iv.	Transistor as an amplifier – 3 Marks and switch – 2 Marks	5

Q.4	i.	Define communication modes – 2 Marks	2
	ii.	Sampling Theorem – 2 Marks , its significance - 1 Mark	3
	iii.	Need of Modulation – 5 Marks	5
OR	iv.	Define modulation – 1 Mark , Amplitude and Frequency modulation – 2 Marks each	5

Q.5	i.	State the De Morgan's laws – 1 Mark for each statement	2
	ii.	Implement NOT, NAND, OR gates using NOR gate – 1 Mark for each	3
	iii.	Explain BCD Code – 2 Marks and Gray Code – 2 Marks , Convert $[10110]_2$ to Gray code – 1 Mark	5

OR	iv.	full-adder using only basic gates – Definition – 1 Mark Design Process – 3 Marks Logic Diagram – 1 Mark	5

Q.6	i.	Define accuracy – 1 Mark , Precision – 1 Mark	2
	ii.	3 differences between analog and digital multimeter – 1 Mark each	3
	iii.	Block diagram of CRO – 2 Marks , explain each block – 3 Marks	5
OR	iv.	Voltage and frequency are measured using CRO – 3 Marks , Diagram – 2 Marks	5

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