



	WINTER-2023		
	Exam Seat No.:		
	Academic Year:2023-2024	Semester:I	
	Name of Programme:B.Tech	Pattern:2023	
	Name of Course:Fundamentals of Electronics Engineering	Course Code:2300107A	
	Max. Marks:60	Duration:2.30	

	<p><b>Instructions:</b> Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.</p> <ol style="list-style-type: none"><li>1. This question paper contains 3 pages.</li><li>2. Answer to each new question is to be started on a new page.</li><li>3. Assume suitable data wherever required, but justify it.</li><li>4. Draw the neat labelled diagrams, wherever necessary.</li><li>5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.</li></ol>	
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**Question No. 1 Attempt following Question**

- 1 With the help of neat circuit diagram and waveforms, explain the working of bridge rectifier. (6) CO3

**Question No. 2 Attempt following Question**

- 2 How the BJT can be used as an amplifier? Explain. (6) CO3

**Question No. 3 Attempt following Question**

- 3.a) 1. Draw pin diagram of Op-Amp IC 741. (4) CO1  
2. Define input offset voltage and input offset current. Give their ideal and practical values for IC 741.

**OR**

- 3.b) 1. What is operational amplifier? Draw symbol with the terminals. (4) CO1  
2. Define CMRR and Slew Rate. Give their ideal and practical values for IC 741.

- 3.c) Draw and explain inverting amplifier using Op-Amp. (6) CO3

**OR**

- 3.d) Draw and explain inverting comparator using Op-Amp. (6) CO3

- 3.e) For inverting amplifier using Op-Amp, if  $R_f = 15\text{ k}\Omega$ ,  $R_1 = 1\text{ k}\Omega$ ,  $V_{CC} = \pm 15\text{V}$ ,  $V_i = 2\text{V dc}$ . (6) CO3

- i) Calculate output voltage
- ii) Is the result in part (i) practically possible? Justify.

**OR**

- 3.f) For a non - inverting amplifier using Op-Amp, if  $R_f = 2 \text{ k}\Omega$  and  $R_1 = 1 \text{ k}\Omega$ ,  $V_{cc} = \pm 15\text{V}$ . Calculate Output voltage for (6) CO3

$V_{in} = 3\text{V}$  dc and comment on the result.

**Question No. 4 Attempt following Question**

- 4.a) 1. Which are basic and derived gates? Draw their symbols. (4) CO2
2. i) Convert  $(38)_{10}$  to binary.
- ii) Convert  $(10101101.0111)_2$  to octal.

**OR**

- 4.b) 1. Which are basic and universal gates? Draw their symbols. (4) CO2
2. i) Convert  $(11111111.10001101)_2$  to hexadecimal.
- ii) Convert  $(362)_{10}$  to octal.

- 4.c) State and prove De' Morgan's sum & product theorems with the help of truth table. (6) CO2

**OR**

- 4.d) State associative law, commutative law and distributive law. (6) CO2
- 4.e) Design and implement full adder circuit. (6) CO4

**OR**

- 4.f) Draw & explain the working of SR flipflop. (6) CO4

**Question No. 5 Attempt following Question**

- 5.a) 1. Give the classification of transmission media. (4) CO2
2. What is full duplex system?

**OR**

- 5.b) 1. Give names of wired and wireless media. (4) CO2
2. What is half duplex system?

- 5.c) Distinguish between twisted pair cable and optical fiber cable. (6) CO2

**OR**

- 5.d) Draw and explain electromagnetic spectrum along with its applications. (6) CO2

5.e) Draw and explain the block diagram of communication system.

(6) CO2

**OR**

5.f) Explain GSM architecture.

(6) CO2