



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

	SUMMER-2023		
	Exam Seat No.:		
	Academic Year:2022-2023	Semester:II	
	Name of Programme: B.Tech	Pattern:2022	
	Name of Course: Fundamentals of Electronics Engineering	Course Code: FYE221007	
	Max. Marks:60	Duration:2.30 Hrs	

	<ol style="list-style-type: none">1. This question paper contains 3 pages.2. Answer to each new question is to be started on a new page.3. Assume suitable data wherever required, but justify it.4. Draw the neat labelled diagrams, wherever necessary.5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.	
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Question No. 1

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

Question No. 2

- 2 With the help of circuit diagram, explain how the BJT can be used as a switch? (6) CO3

Question No. 3

- 3.a)
1. Draw pin diagram of Op-Amp IC 741. (4) CO1
 2. Define and give typical values of the following op-amp parameters:
i) Slew Rate ii) Input offset voltage

OR

- 3.b)
1. Explain the concept of virtual ground and virtual short.
 2. Define and give typical values of the following op-amp parameters: (4) CO1
 - i) PSRR
 - ii) Input bias current
- 3.c) Draw and explain inverting summing amplifier using Op-Amp (6) CO3
- OR**
- 3.d) Draw and explain non-inverting comparator using Op-Amp. (6) CO3
- 3.e) For the inverting amplifier using Op-Amp, if $R_f = 22\text{ K}\Omega$, $R_1 = 2\text{ K}\Omega$, $V_{CC} = \pm 12\text{V}$, $V_{in} = 1\text{V}$ (6) CO3
- i) Calculate output voltage
 - ii) Is the result in part (i) practically possible? Justify.
- OR**
- 3.f) An op-amp is used in a non inverting mode with $R_1 = 2.2\text{ k}\Omega$, $R_f = 18\text{ k}\Omega$, $V_{CC} = \pm 12\text{V}$. Calculate Output voltage for i) $V_{in} = 150\text{mV}$ ii) $V_{in} = 2\text{V}$ and comment on the result. (6) CO3

Question No. 4

- 4.a)
1. Name the basic gates. Draw symbol and their truth table.
 2. i) Convert $(132.52)_{10}$ to binary. (4) CO2
 - ii) Convert $(110111010111.101101)_2$ to octal.
- OR**
- 4.b)
1. Why NAND and NOR gates are called as universal gates?
Draw truth table and symbol.
 2. i) Convert $(25)_{10}$ and $(12)_{10}$ into binary numbers and add binary numbers. (4) CO2
 - ii) Perform $(9)_{10} - (4)_{10}$ using 1's complement method.
- 4.c) State law of commutation, law of association and law of distribution. (6) CO2
- OR**
- 4.d) State and prove De Morgan's sum & product theorem with the help of truth table. (6) CO2

- 4.e) Design and implement full adder circuit. Write the expressions for sum and carry. (6) CO4

OR

- 4.f) What is flipflop? Draw & Explain the working D flip-flop. (6) CO4

Question No. 5

- 5.a) Explain modes of transmission. (4) CO2

OR

- 5.b) Write short note on Frequency modulation. (4) CO2

- 5.c) Write a short note on coaxial cable and optical fibre cable. (6) CO2

OR

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

- 5.e) Explain the elements of communication system with the help of block diagram. (6) CO2

OR

- 5.f) Explain GSM architecture (6) CO2