



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

SUMMER-2024	
Exam Seat No.:	
Academic Year:2023-2024	Semester:I/II
Class:FY	Program:B.Tech
Branch Code:FYE	Pattern:2022
Name of Course:Fundamentals of Electronics Engineering	Course Code:FYE221007
Max. Marks:60	Duration:2.30 Hrs.

Instructions: 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.

1. This question paper contains _____page(s).
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.

Question No. 1 Attempt following Question

- 1a) With the help of neat circuit diagram and waveform, explain the working of full wave rectifier with centre tap transformer. (6) CO3

Question No. 2 Attempt following Question

- 2a) Explain Common Emitter amplifier in detail (6) CO3

Question No. 3 Attempt following Question

- 3a) 1. Draw pin diagram of Op-Amp IC 741. (5) CO1
2. Define and give typical values of the following op-amp parameters: i) CMRR ii) PSRR

OR

- 3b) 1. Explain the concept of virtual ground and virtual short. (5) CO1
2. Define and give typical values of the following op-amp parameters: i) Slew Rate
ii) Input bias current

- 3c) Draw and explain inverting summing amplifier using Op-Amp (5) CO3

OR

- 3d) Draw and explain inverting comparator using Op-Amp (5) CO3

- 3e) For the inverting amplifier using Op-Amp, if $R_f = 47\text{ K}\Omega$, (6) CO3

$R_1 = 4.7 \text{ K}\Omega$, $V_{CC} = \pm 10\text{V}$, $V_i = 0.5\text{Vdc}$

Calculate output voltage

OR

- 3f) 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 $V_{in} = 1\text{Vdc}$. (6) CO3

Question No. 4 Attempt following Question

- 4a) 1. Name the derived gates. Draw their symbol and truth table. (4) CO2
2. i) Convert $(19)_{10}$ to binary.
ii) Convert $(1101110101100.00101101)_2$ to hexadecimal

OR

- 4b) 1. Why NAND and NOR gates are called as universal gates? (4) CO2
Draw their symbol and truth table
2. i) Convert $(1010)_2$ to decimal.
ii) Convert $(80)_{10}$ to octal

- 4c) State law of association and law of Distribution (4) CO2

OR

- 4d) State De' Morgan's sum & product theorem (4) CO2
- 4e) Design and implement full adder circuit. Write the expressions for sum and carry. (8) CO4
Add following two numbers
 $A = 0110$ and $B = 0101$.

OR

- 4f) What is flip flop? Draw & Explain the working SR flip-flop. (8) CO4

Question No. 5 Attempt following Question

- 5a) Write short note on Amplitude modulation (5) CO2

OR

- 5b) Write short note on Frequency modulation (5) CO2
- 5c) Explain different types of cables used in communication system with neat diagrams. (5) CO2

OR

- 5d) What is the need of modulation? Explain (5) CO2
- 5e) Explain the elements of communication system with the help of block diagram (6) CO2

OR

5f) Explain GSM architecture

(6) CO2

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