

G.R. No. _____

Paper Code - U127-104A(T2)

MARCH 2018 / IN - SEM (T2)

F. Y. B.TECH. (COMMON) (SEMESTER - II)

COURSE NAME: Basic Electronics Engineering

(2017 PATTERN)

Time: [1 Hour]

[Max. Marks: 30]

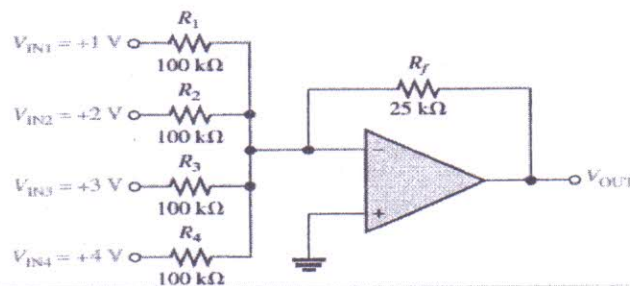
(*) Instructions to candidates:

- 1) Answer Q.1 OR Q.2, Q.3 OR Q.4
- 2) Figures to the right indicate full marks.
- 3) Use of scientific calculator is allowed
- 4) Use suitable data where ever required

- Q1 a) Draw the structure of N- channel Enhancement-MOSFET. Explain its working. Draw transfer characteristics of N and P channel E-MOSFET. [6]
- b) Draw the circuit diagram of full wave controlled rectifier. Explain its working along with input and output waveforms. Derive expression for average output voltage. [6]
- c) For P-channel Enhancement MOSFET $I_{D(on)} = 10\text{mA}$ at $V_{GS} = -12\text{V}$ and $V_{th} = -3\text{V}$. Find I_D when $V_{GS} = -6\text{V}$. [4]

OR

- Q2 a) Draw the circuit diagram for lamp/ fan regulator using TRIAC. Draw waveforms at input and across lamp/fan load. [6]
- b) Draw V-I characteristics of SCR. Define 1) Latching current 2) Holding current and 3) Forward break over voltage. [6]
- c) Draw and explain two transistor analogy of SCR. [4]
- Q3 a) What is the concept of virtual ground? Derive expression for the gain of inverting operation amplifier. [6]
- b) Draw the block schematic of OPAMP. Explain function of each block. [4]
- c) Identify the following circuit. Determine the output voltage for the same. [4]



OR

- Q4 a) What is comparator? Draw the circuit diagram inverting comparator and explain its operation with input and output waveforms. [6]
- b) Explain following parameters of op-amp [4]
a) CMRR
b) Input offset voltage.
- c) Non-inverting amplifier has $R_1 = 1\text{K}\Omega$, $R_F = 100\text{K}\Omega$. Find output voltage [4] if input is 1V_{pp} . Given: $V_{CC} = \pm 15\text{V}$.