

Total No. of Questions : 8]

SEAT No. :

P620

[Total No. of Pages : 2

[5869]-242

S.E. (Electronics & Telecommunication)

ELECTRONIC CIRCUITS

(2019 Pattern) (Semester - III)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.
- 2) Figures to the right indicate full marks.
- 3) Neat diagrams must be drawn whenever necessary.
- 4) Make suitable assumptions whenever necessary.

- Q1)** a) Draw the block diagram of a regulated dc power supply and explain the function of each block in it. [6]
b) With the help of a block diagram explain the concept of SMPS. [6]
c) Design an adjustable voltage regulator using LM317 for output voltage 1.25V to 15V and draw necessary connection diagrams. Assume $R_1=240\Omega$, $I_{adj}=100\mu A$. [6]

OR

- Q2)** a) With the help of a neat diagram explain the operation of an adjustable voltage regulator using IC LM 317. [6]
b) Compare linear and switch mode power supply [6]
c) Explain the concept of current boosting with necessary diagram. [6]

- Q3)** a) An emitter biased Dual input balanced output differential amplifier has the following specifications:

$V_{CC} = \pm 12\text{ V}$, $R_{C1} = R_{C2} = 3.7\text{ k}\Omega$ and $R_E = 4.2\text{ k}\Omega$,
 $\beta = 100$ & $V_{BE} = 0.7\text{ V}$. Calculate:

- i) Voltage Gain (A_d)
 - ii) Input Resistance (R_i)
 - iii) Output Resistance (R_o) [6]
- b) Define the following characteristics of OP-AMP
- i) input bias current
 - ii) Slew rate
 - iii) CMRR [6]
- c) Explain Current mirror circuit with neat diagram. [5]

OR

P.T.O.

- Q4)** a) Draw a block diagram of the op-amp and explain in detail. [6]
 b) Find the Q point for a Dual input Balanced output differential amplifier with $R_C=R_E=65\text{Kohm}$. Supply voltage used is $\pm 15\text{V}$, $V_{BE}=0.7\text{V}$. [6]
 c) Compare ideal & practical parameters of an Op-amp. [5]

- Q5)** a) Draw and inverting summing amplifier with three inputs and derive expression for its output voltage $V_o = -(V_a + V_b + V_c)$. [6]
 b) Draw a circuit diagram of three op-amp Instrumentation amplifiers and write its output equation. [6]
 c) Design and inverting Schmitt Trigger circuit whose V_{UT} and V_{LT} are $\pm 5\text{V}$. Draw input and output waveforms. Assume op-amp saturates at $\pm 13.5\text{V}$. [6]

OR

- Q6)** a) Design a practical integrator with input signal of 2Vpp and cut off frequency of 2.5KHz for DC voltage gain of 10. [6]
 b) Explain in detail the working of square wave generators with a neat circuit diagram. draw waveform of output voltage and capacitor voltage. [6]
 c) Explain the operation of a precision full wave rectifier with necessary waveforms. [6]

- Q7)** a) Draw block diagram and explain any one application of IC PLL 565 in detail. [6]
 b) Draw circuit diagram and explain D/A converter with binary weighted resistors and give output voltage equation $V_o = ?$ [6]
 c) With neat circuit diagram explain V to I converter. [5]

OR

- Q8)** a) For PLL IC 565 define and give expression of free running frequency, lock range and capture range. [6]
 b) Design a PLL circuit using 565 IC to get free running frequency 4.5KHz , lock range 2KHz and capture range 100Hz . Assume supply voltage of $\pm 10\text{V}$. [6]
 c) With neat circuit diagram explain I to V converter. [5]

