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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 necesary.*

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 R1=240Ω, ladj=100uA. **[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:

$V_{CC}= \pm12$ V, $R_{C1}=R_{C2}=3.7k\Omega$ and $R_E=4.2k\Omega$,

$\beta=100$ & $V_{BE}=0.7$ V. Calculate:

        i) Voltage Gain (Ad)

        ii) Input Resistance (Ri)

        iii) Output Resistance (Ro) **[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

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 differentail amplifier with RC=RE=65Kohm. Supply voltage used is ±15V, VBE=0.7V. **[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 ±5V. Draw input and output waveforms. Assume op-amp saturates at ±13.5V. **[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 2 KHz and capture range 100 Hz. Assume supply voltage of ± 10V. **[6]**

c) With neat circuit diagram explain I to V converter. **[5]**

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