B. TECH. SEM –III (ELECTRICAL ENGG.) 2014 COURSE) (CBCS) : WINTER - 2017

SUBJECT : LINEAR & DIGITAL INTEGRATED CIRCUITS

Day : **Wednesday** Time : **10.00 AM TO 01.00 PM**

Date : **17/01/2018** **W-2017-2034** Max. Marks : 60

N.B.:

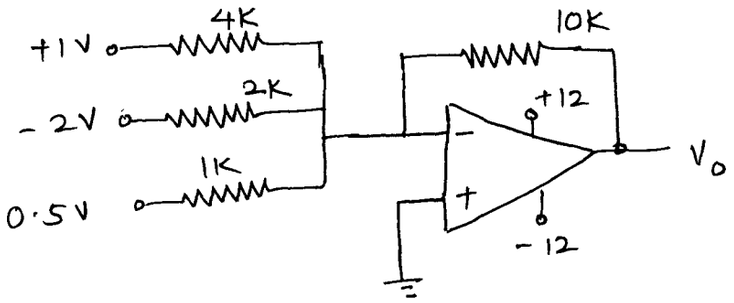
1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Use of non-programmable **CALCULATOR** is allowed.
4) Assume suitable data if necessary.

Q.1 **a)** Draw block diagram of an operational amplifier and describe function of each block. **[05]**

b) Draw circuit diagram of non-inverting V to I convertor and describe its operation. **[05]**

OR

a) What is the output of summing amplifier in the following figure: **[05]**



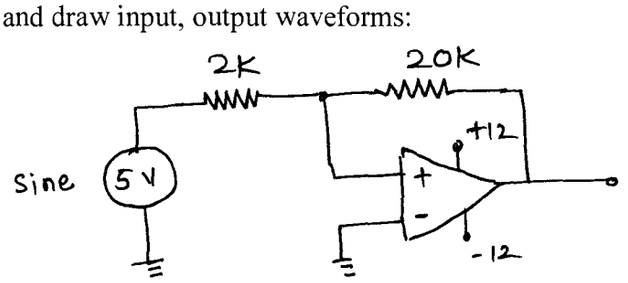
b) Define slew rate of op amp. What is the typical value of slew rate? What is its effect on output of an op amp when sine wave is applied? Show waveforms. **[05]**

Q.2 **a)** Draw circuit diagram of precision half wave rectifier and describe its operation with input and output waveforms. **[05]**

b) Draw circuit diagram of differentiator and explain its operation with input and output waveforms. **[05]**

OR

a) Determine Upper Threshold and Lower Threshold Points for the below circuit and draw input, output waveforms: **[06]**



b) Draw circuit diagram of triangular wave generator and sketch its input and output waveforms. **[04]**

P.T.O.

Q.3 Draw circuit diagram of IC 555 as astable multivibrator. Also draw internal diagram of IC 555. Describe its operation with waveforms. Write down formula for frequency of operation. **[10]**

OR

a) Draw diagram of three terminal voltage regulator and explain its operation. **[05]**

b) State specifications of IC 723 voltage regulator with its pin diagram. **[05]**

Q.4 Explain NAND and NOR logical functions with switches and bulb as i/p and o/p. Draw the correct truth table. **[10]**

OR

a) Convert the following expression in canonical or standard SOP form: **[06]**

i) $A\overline{B} + A\overline{B}C + \overline{A}C + AC$

ii) $ABCD + \overline{A}BC + A\overline{C}D + AD$

b) Draw a neat diagram of 1 b it comparator and analyze using k – map. **[04]**

Q.5 **a)** Draw a neat diagram of full subtractor using gates and explain working with its truth table. **[06]**

b) Explain Binary weighted resistor DAC with neat diagram. **[04]**

OR

a) Explain the function of demultiplexer with a neat block diagram and truth table. **[06]**

b) Explain the following terms: **[04]**
i) PLA **ii)** FPLA

Q.6 **a)** Draw a neat block diagram and truth table of : **[06]**
i) JK flip flop **ii)** D flip flop

b) Draw 2 bit synchronous counter. Explain with proper timing diagram. **[04]**

OR

Draw universal shift register with neat block diagram and explain its working. **[10]**

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