

324554(24)

BE (5th Semester)
Examination, Nov.-Dec., 2018
(New Scheme)

Integrated Circuits

Time Allowed : 3 hours

Maximum Marks : 80
Minimum Pass Marks : 28

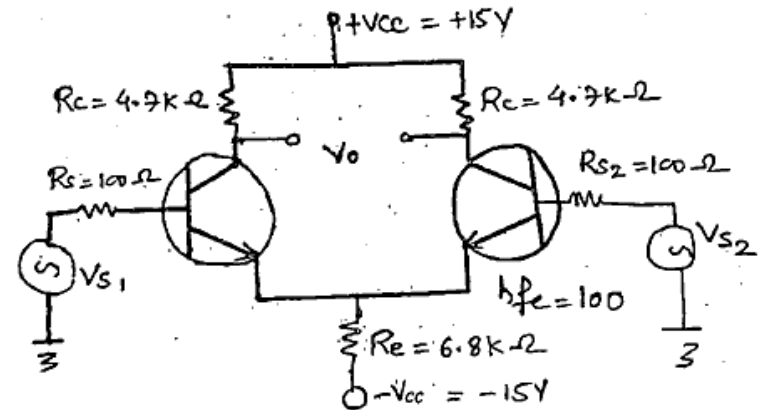
- Note : (i) Part (a) of each question is compulsory. Attempt any two parts from (b), (c) and (d) of each question.
(ii) The figures in the right-hand margin indicate marks.

Unit-I

1. (a) Draw IC pin diagram of 741. [2]
- (b) State and explain the characteristics of an ideal op-amp. Also explain its V-I characteristics. [7]
- (c) Explain block diagram of op-amp. [7]

(Turn Over)

- (d) Figure shows a dual input balanced output differential amplifier configuration. Assuming Si transistor with $h_{ie} = 2.8 \text{ k}\Omega$, calculate : [7]
 - (i) Operating point values
 - (ii) Differential gain
 - (iii) CMRR
 - (iv) Common mode gain
 - (v) Output if $V_{s1} = 70 \text{ mV}$ peak to peak at 1 kHz and $V_{s2} = 40 \text{ mV}$ peak to peak at 1 kHz



Unit-II

2. (a) Define the following : [2]
 - (i) CMRR
 - (ii) Input offset voltage
- (b) Design an op-amp to generate the following output : [7]

$$V_o = 2V_1 + 3V_2 + 4V_3 - 5V_4$$

(Continued)

[3]

- (c) Explain and draw the output waveform of an ideal integrator circuit when input is —
- (i) step input ;
 - (ii) sine input ;
 - (iii) square input. [7]
- (d) Explain the following applications of a voltage comparator : [7]
- (i) Window detector
 - (ii) Zero-crossing detector

Unit-III

3. (a) Define active filters and give its types. [2]
- (b) Explain Schmitt trigger circuit with its waveforms. <http://www.csvtuonline.com> [7]
- (c) Explain successive approximation A/D converter technique with the help of block diagram. [7]
- (d) Design a low-pass active filter at cut-off frequency of 15.9 kHz with passband gain of 1.5. [7]

Unit-IV

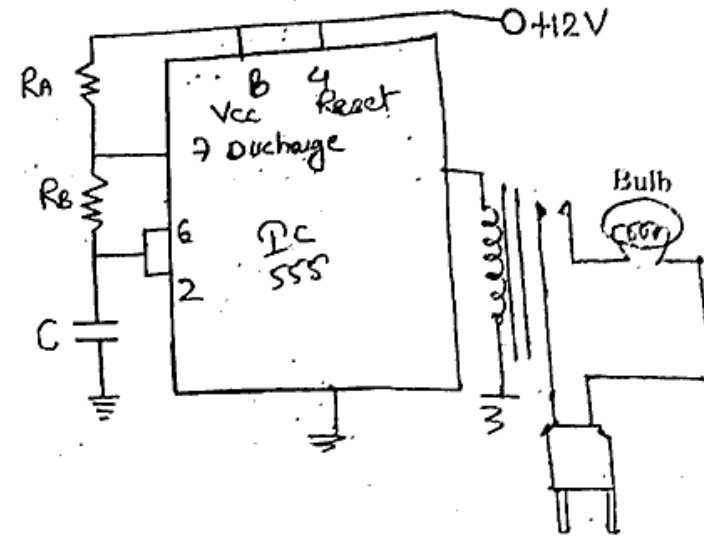
4. (a) Draw IC pin diagram of IC555 timer circuit. [2]
- (b) Derive the expression for pulse width of a monostable multivibrator using IC555. [7]

TC-166

(Turn Over)

[4]

- (c) Design an astable multivibrator which will flash the electric bulb such that its ON time will be 3 seconds and OFF time will be 1 second. [7]



- (d) Draw and explain voltage controlled oscillator IC566. [7]

Unit-V

5. (a) Define multiplier. [2]
- (b) Explain the operation of basic series and shunt regulator circuits. [7]
- (c) Explain the operation of IC723. [7]
- (d) Explain three-terminal regulator IC LM78XX and LM79XX. [7]

»-»-»

TC-166