

F 3160

(Pages : 4)

Reg. No.....

Name.....



B.TECH. DEGREE EXAMINATION, NOVEMBER 2014

Third Semester

Branch : Computer Science and Engineering

CS 010 306—ELECTRONIC DEVICES AND CIRCUITS (CS)

(New Scheme—2010 Admission onwards)

[Regular/Improvement/Supplementary]

Time : Three Hours

Maximum : 100 Marks

Part A

Answer all question briefly.

Each question carries 3 marks.

1. Write the values of maximum efficiency of rectification in the *three* rectifier circuit.
2. Draw the *h*-parameter model of CE transistor.
3. Draw the circuit of voltage follower using op-amp.
4. Which type of oscillator is preferred when high stability of frequency is required ? Why ?
5. What are the differences between astable and monostable multivibrators ? Explain.

(5 × 3 = 15 marks)

Part B

Answer all questions.

Each question carries 5 marks.

6. Using 7809, draw a voltage regulator circuit. Specify the range of input that can be applied ?
7. Sketch the input and output characteristics of an *n*pn transistor of CE configuration.
8. Draw the block diagram of the internal blocks in an operational amplifier and explain the functions of each block.
9. State and explain any *five* advantages of negative feedback in amplifiers.
10. Plot the step response of low pass RC circuit for : (i) Very low (ii) Medium (iii) High time constants.

(5 × 5 = 25 marks)

Turn over

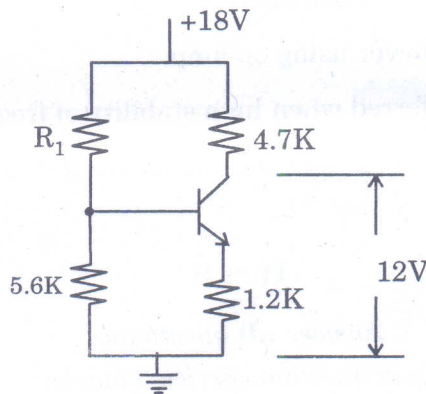
Part C

Answer all questions.
Each full question carries 12 marks.

11. Draw the complete circuit diagram of a centre-tapped rectifier using LC filter and explain its working with necessary waveforms.

Or

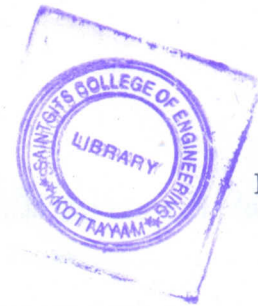
12. With a circuit diagram, explain how a series voltage regulator provides regulation against (a) line voltage variations ; (b) load current changes.
13. For the circuit shown in fig. 1 below using silicon transistor with $V_{BE} = 0.7$ volt, find (a) collector current ; (b) Emitter and base voltages with respect to ground ; (c) value of R_1 ; and (d) Plot the d.c. load line and mark the Q-point.



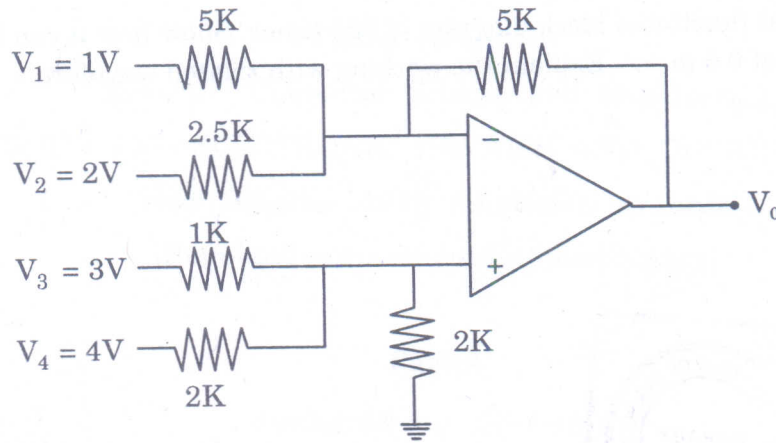
Or

14. In a fixed bias circuit, the coordinates of the Q point which is located at the centre of the d.c. load line are $V_{CE} = 5$ Volt and $I_C = 2$ mA. calculate V_{CC} , R_C and R_B . Assume a silicon transistor with $\beta = 100$.





15. (a) For the op-amp circuit shown below, find the output voltage V_0 .



(7 marks)

(b) Draw and explain ideal voltage transfer curve of an op-amp.

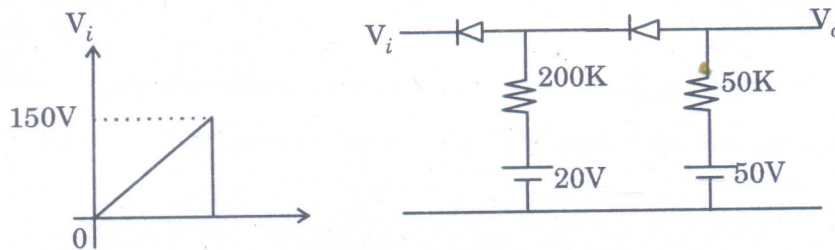
(5 marks)

Or

16. Give the circuit of a difference amplifier in which the gain can be varied by a single potentiometer control. Hence derive the expression for its gain.
17. Draw a circuit of BJT amplifier having negative current series feedback. Analyse the circuit to derive its gain, input resistance and output resistance with feedback.

Or

18. With a neat circuit diagram, explain the working of RC phase shift oscillator using op-amp. Derive the expression for the oscillator frequency.
19. (a) Find the output V_0 for the circuit shown below Assume silicon diode having $V_r = 0.7$ volt.



(7 marks)

Turn over

(b) Explain the working of the high pass filter as a differentiator.

(5 marks)

Or

20. Draw the internal functional block diagram of 555 timer. Show how it can be used to generate a time delay pulse of 0.6 m sec. Explain the working with related waveforms.

(5 × 12 = 60 marks)

