

2002 SCHEME

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EC32

Third Semester B.E. Degree Examination, June/July 2018 Electronics Circuits

Time: 3 hrs.

Max. Marks:100

Note: 1. Answer any FIVE full questions.

2. Missing data may be suitably assumed.

- 1 a. For the sketch shown in fig.Q1(a) below V_i varies from 0 to 150V. Sketch the output voltage V_o to the same time scale as the input voltage. Assume diodes to be ideal.

(08 Marks)

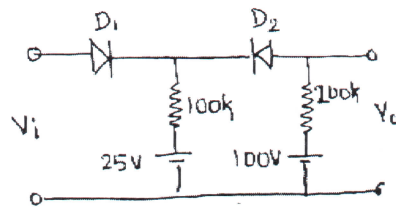


Fig.Q1(a)

- b. Explain the operation of full wave voltage doubler circuit. (07 Marks)
- c. A full wave rectifier circuit is fed from a secondary center tapped transformer. The rms voltage from either end of secondary to center tap is 30V if diode resistance $R_f = 2\Omega$, half secondary resistance $R_s = 8\Omega$ and load $R_L = 1k\Omega$, calculate efficiency of rectification. (05 Marks)
- 2 a. Draw and explain a double diode clipper circuit, which limits the output at two independent levels. (06 Marks)
- b. Explain how a diode can be used in a transistor to compensate for changes in I_{CO} . (06 Marks)
- c. For the circuit shown in the Fig.Q2(c) determine I_C , V_{CE} , R_1 , V_B .

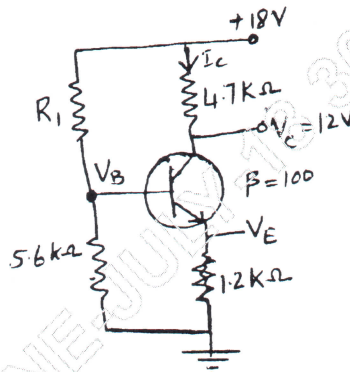


Fig.Q2(c)

(08 Marks)

- 3 a. Explain the working of single stage R-C coupled amplifier using BJT. (12 Marks)
- b. A three stage amplifier has these power gains $G_1 = 10$, $G_2 = 100$ and $G_3 = 1000$. What is the total power gain? What is the Bel power gain of each stage? What is the bel power gain of the 3 stage amplifier? (08 Marks)
- 4 a. Draw the hybrid - π model of a transistor and explain the significance of each component in the model. (06 Marks)
- b. Derive expressions for transistor transconductance g_m and input conductance $g_{b'e}$. (10 Marks)
- c. Explain the various types of distortions encountered in amplifiers. (04 Marks)

- 5 a. What are power amplifiers and how do they differ from small signal voltage amplifier. (04 Marks)
- b. Explain the working of a push-pull amplifier and derive expression for its efficiency. (12 Marks)
- c. Define class A and Class B type of amplification. (04 Marks)
- 6 a. Derive an expression for the maximum conversion efficiency of a class B push – pull amplifier. (10 Marks)
- b. Calculate the input power, output power and efficiency of the amplifier in the fig.Q6(b) shown for an input voltage in a base current of 10mA peak. Also calculate the power dissipated by the transistor. (10 Marks)

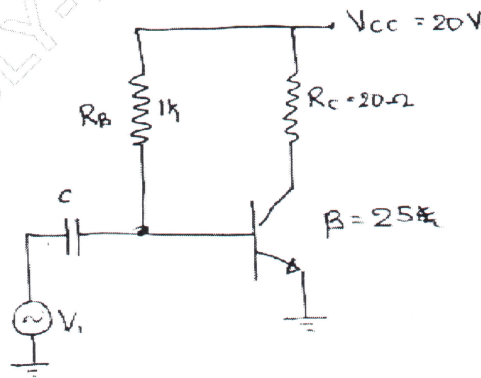


Fig.Q6(b)

- 7 a. Explain the working of a 3-bit DAC using R-2R ladder network. (08 Marks)
- b. What are the specifications of a DAC? (04 Marks)
- c. Sketch the output V_o of the following comparator circuits. [Refer Fig. Q7(c)] (08 Marks)

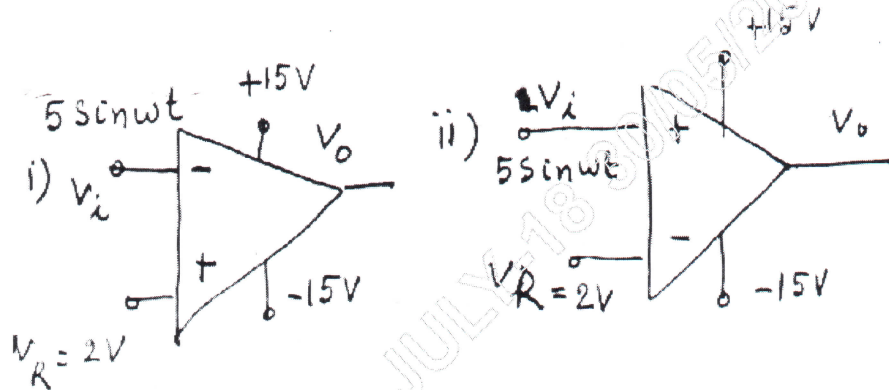


Fig. Q7(c)

- 8 a. Draw and explain the working of positive clamper. (06 Marks)
- b. Explain the working of D/A converter [Binary weighted resistors] with neat sketch. (06 Marks)
- c. Give the circuit schematic off 555 timer connected as an astable multivibrator. Describe its operation. (08 Marks)
