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10CS32

Third Semester B.E. Degree Examination, December 2011
Electronic Circuits

Time: 3 hrs. Max. Marks:100

Note: ***1. Answer any FIVE full questions, selecting at least TWO questions from each part.***
2. Any missing data may be assumed suitably.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

PART – A

1 a. Discuss with neat sketches, the relation of operating point of transistor for following cases : i) Neat saturation region ; ii) Neat cut – off region ; iii) At the centre of active region. **(08 Marks)**

b. For the circuit shown in Fig.Q.1(b), calculate I_B, I_C, V_{CE}, V_C, V_E, V_B and V_{BC}. Assume B = 100. **(08 Marks)**

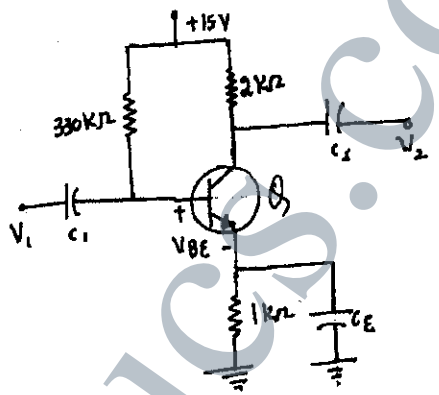

Fig.Q.1(b)

c. Explain the basic methods of triggering of SCR. **(04 Marks)**

2 a. Explain with neat sketches, the operation, characteristics and parameters of n – channel depletion type MOSFET. **(08 Marks)**

b. Explain with neat sketches, the operation of JFET along with its characteristic curves. **(08 Marks)**

c. Discuss merits, demerits and applications of IGBTs. **(04 Marks)**

3 a. Discuss the classification of optoelectronic devices, in detail. **(06 Marks)**

b. Explain with neat diagrams, the principle of operation, characteristics, advantages, disadvantages and applications of a photodiode. **(08 Marks)**

c. Briefly discuss with necessary diagrams, the basic operation and construction of LED. **(06 Marks)**

4 a. Obtain the expression for current gain, input impedence voltage gain, output impedance power gain of a transistor amplifier using complete h – parameter model. **(08 Marks)**

b. In the common collector shown in Fig.Q.4(b), the transistor parameters are h_{ic} = 1.2 k , h_{fc} = -101 , h_{rc} = 1 and h_{oc} = 25 μA/v. Calculate R_i, A_i, A_v and R_o for the circuit. **(08 Marks)**

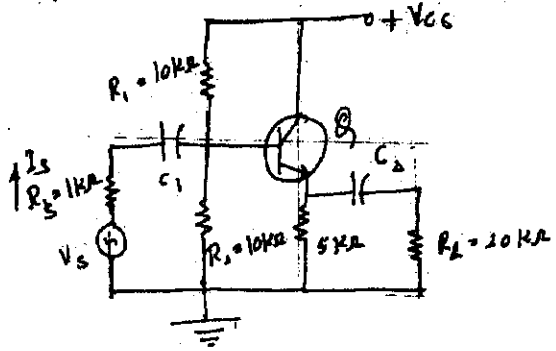

Fig.Q.4(b)

c. Explain common emitter, common collector amplifier along with its a.c. equivalent circuit. **(04 Marks)**

PART – B

5 a. Explain the classification of large signal amplifiers as class A, class B, class C and class AB amplifiers. **(06 Marks)**

b. An amplifier with openloop voltage gain of 1000, delivers 10W of power output at 10% second harmonic distortion when i/p is 10 mV. A 40 dB negative feedback is applied and output paver is to remain at 10W. Determine required input signal V_s and second harmonic distortion with feedback. **(08 Marks)**

c. Explain the advantages and disadvantages of negative feedback. **(06 Marks)**

6 a. Explain with a neat diagram Hartley oscillater and calpits oscillate as LC oscillator. **(06 Marks)**

b. Explain the various types of multivibrators. Also mention the applications. **(06 Marks)**

c. Obtain the expression for time period T at the base of transistor, in case of wave shaping circuits. **(08 Marks)**

7 a. Explain with a functional block diagram, a typical three terminal IC voltage regulator. **(06 Marks)**

b. Discuss the limitations of linear voltage regulators. **(06 Marks)**

c. Briefly discuss power converters in series and parallel connection along with neat diagrams. **(08 Marks)**

8 a. Discuss the requirements of a good instrumentation amplifier. **(06 Marks)**

b. Fig.Q.8(b) shows dual input, balanced output and differential amplifier configuration. Assuming silica transistor with h_{ie} = 2.8 KΩ, calculate : i) Operating point valves ; ii) Differential gain ; iii) Common mode gain ; iv) CMRR ; v) Output if V_{S_1} = 70 mV peak to peak at 1 kHz ; vi) V_{S_2} = 40 mV peak to peak at 1 kHz. **(10 Marks)**

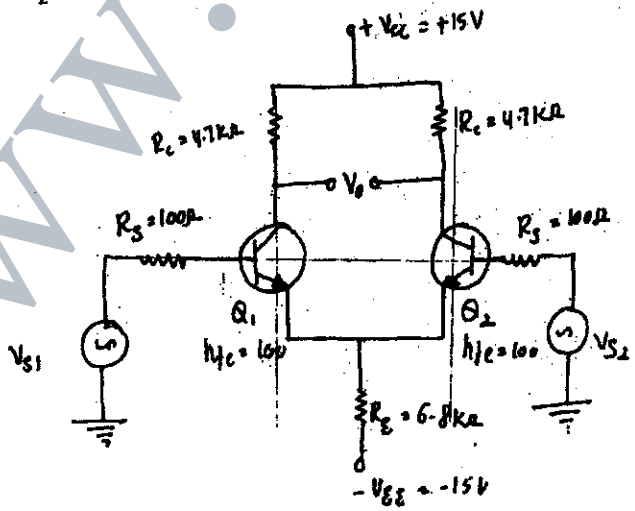

Fig.Q.8(b)

c. Explain the various electrical characteristics of an ap-amp which are generally in the data sheet. **(04 Marks)**

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