

**Third Semester B.E. Degree Examination, Dec.2016/Jan.2017**

**Electronic Circuits**

Time: 3 hrs.

Max. Marks:100

**Note: Answer FIVE full questions, selecting at least TWO questions from each part.**

**PART - A**

- 1 a. Explain the phenomenon of thermal runaway. (06 Marks)  
 b. Explain the working of a transistor switch. (06 Marks)  
 c. Determine the operating point for a fixed bias circuit shown in Fig.Q1(c).

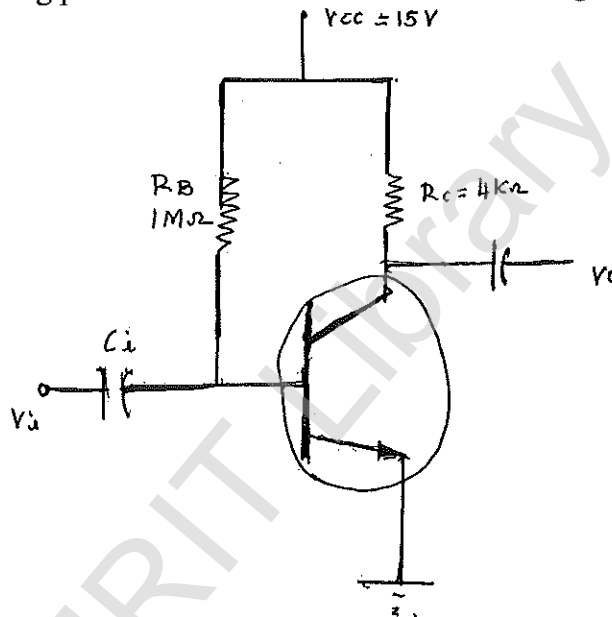


Fig.Q1(c)

(08 Marks)

- 2 a. Explain the construction and working of a n channel enhancement MOSFET. (10 Marks)  
 b. What are the differences between JFETs and MOSFETs? (05 Marks)  
 c. Write a note on handling of MOSFETs. (05 Marks)
- 3 a. A photodiode has a noise current of 1fA, responsivity of 0.5 A/W, active area of 1 mm<sup>2</sup> and rise time of 3.5 ns. Determine: i) NEP, ii) Detectivity, iii) D\*, iv) quantum efficiency. (04 Marks)  
 b. What is an opto coupler? Define forward opto coupling efficiency, isolation voltage and bandwidth. (08 Marks)  
 c. Explain the construction, characteristics and an application of a phototransistor with relevant diagrams. (08 Marks)
- 4 a. Derive expressions for Ai, Zi, Av and Yo for a transistor amplifier using h-parameter model. (12 Marks)  
 b. Explain the need for cascading amplifier. Explain a two stage cascaded amplifier with a neat block diagram. (08 Marks)

**PART – B**

- 5 a. Explain the different classes of large signal amplifiers with their characteristic specifications. (08 Marks)
- b. List the advantages of negative feedback. (06 Marks)
- c. For the OPAMP based non-inverting amplifier circuit shown in Fig.Q5(c), determine the voltage gain, input impedance in the presence of feedback given that open loop gain and input impedance of OPAMP are 80 dB and  $1\text{ M}\Omega$  respectively.

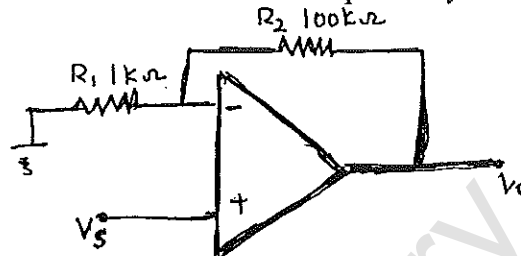


Fig.Q5(c)

(06 Marks)

- 6 a. What are voltage controlled oscillators? Explain the working of voltage controlled Hartley oscillator with a neat circuit diagram. (08 Marks)
- b. What is an RC high pass circuit? Explain how an RC high pass circuit can be used as a differentiator. (08 Marks)
- c. Explain the frequency stability criterion. (04 Marks)
- 7 a. Explain the working of a three terminal IC voltage regulator with a neat functional block diagram. (08 Marks)
- b. Define load regulation, line regulation, output, impedance, ripple rejection factor. (08 Marks)
- c. Differentiate between linear power supply and switched mode power supply. (04 Marks)
- 8 a. Determine the common mode gain for an OPAMP with differential voltage gain and CMRR of an OPAMP of 110 dB and 100 dB respectively. (04 Marks)
- b. Explain the working of an absolute value circuit with a neat circuit diagram. (08 Marks)
- c. Explain the working of an inverting comparator with hysteresis with a neat circuit diagram and suitable transfer characteristics. (08 Marks)

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