

Unit-V

5. (a) Which types of circuits are used to select for transmission that part of an arbitrary waveform which lies above or below some reference level? [2]
- (b) Explain clamping circuit with diagram. [7]
- (c) Draw the circuit diagram of Wien bridge oscillator and explain its operation. [7]
- (d) Sketch and explain the circuit of a crystal-controlled oscillator. [7]

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325353(25)

BE (3rd Semester)

Examination, Nov.-Dec., 2017

(New Scheme)

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Basic Electronics

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) State mass-action law. [2]
- (b) Explain the difference between transition and diffusion capacitance of a P-N junction diode. csvtuonline.com
- The transition capacitance of an abrupt junction diode is 20 pF at 5V. Compute the decrease in capacitance for a 1V increase in bias. [7]

TC-125

(Turn Over)

(c) Explain the effect of temperature on $V-I$ characteristic of $P-N$ junction diode.

A silicon diode operates at a fixed forward bias of $0.4V$. Calculate the factor by which the current will get multiplied when the temperature is raised from $25^{\circ}C$ to $150^{\circ}C$. [7]

(d) Explain $V-I$ characteristic of a $P-N$ diode. [7]

Unit-II

2. (a) What do you mean by the term ripple factor? [2]

(b) Show that full-wave rectifier is twice as efficient as a half-wave rectifier. [7]

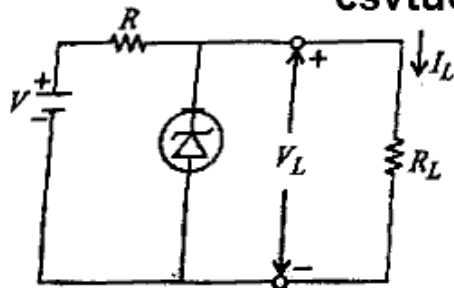
(c) Write notes on : [7]

(i) Bridge rectifier

(ii) π -filter

(d) The avalanche diode regulates at $50V$ over a range of diode currents from 5 to 40 mA. The supply voltage $V=200V$. Calculate R to allow voltage regulation from a load current $I_L=0$ up to I_{max} , the maximum possible value of I_L . What is I_{max} ? [7]

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Unit-III

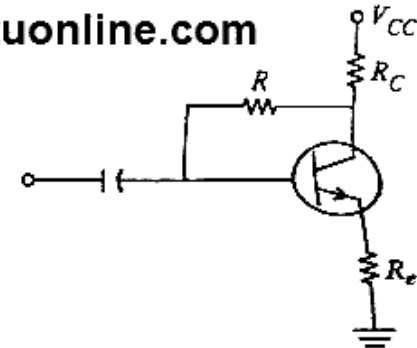
3. (a) What is the application of common collector (CC) configuration of a transistor? [2]

(b) Explain Ebers-Moll model for a transistor. [7]

(c) Explain base-width modulation (early effect). [7]

(d) In the circuit shown below, $V_{CC} = 24V$, $R_C = 10K$ and $R_e = 270\Omega$. If a silicon transistor is used with $\beta=45$ and if $V_{CE} = 5V$, find R . Neglect the reverse saturation current. [7]

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Unit-IV

4. (a) State the difference between BJT and FET. [2]

(b) Define transconductance g_m , drain resistance r_d and amplification factor of an FET. [7]

(c) Explain P-channel enhancement MOSFET with the help of its $(I_D - V_{DS})$ and $(I_D - V_{GS})$ characteristics. [7]

(d) Explain how an FET is used as a voltage-variable resistance. [7]