

Q. P. Code: 39715

Duration: 03 Hours

Total Marks assigned to paper: 80 Marks

Instruction to candidate:-

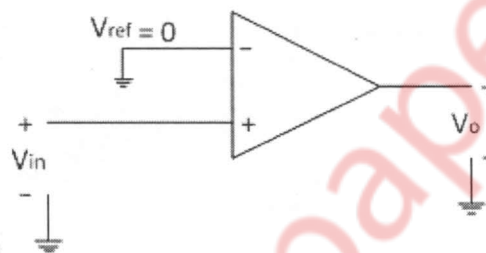
1. Question 1 is compulsory.
2. Attempt any three from remaining five questions.
3. All questions carry equal marks.
4. Assume suitable data wherever necessary.

Q1. Attempt all

[20 Marks]

Q1.a Determine the common mode output voltage for an OpAmp circuit with CMRR= 65db, $A_d = 10$ and $V_{cm} = 5$ mV

Q1.b Explain operation of following comparator circuit. Consider input as sine wave of 10 V.



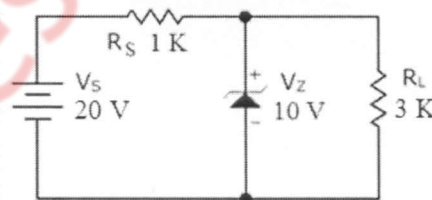
Q1.c Explain centre tapped full wave rectifier.

Q1.d With an example explain operation of transistor as a switch.

Q1.e Explain crossover distortion in class B power amplifier. How it is overcome.

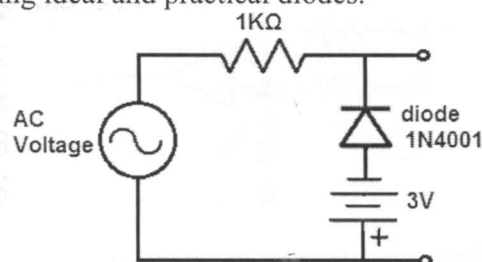
Q2.a For the Zener diode network, determine V_L , V_R , I_Z , and P_Z .

[8 Marks]



Q2.b Determine output voltage. Assume, input to be sine wave of 5 V peak. Draw waveform considering ideal and practical diodes.

[8 Marks]

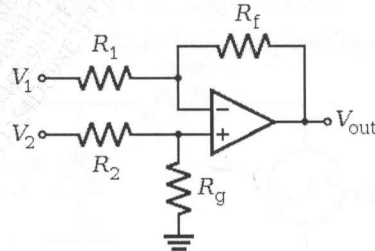


Q2.c Compare BJT and FET.

[4 Marks]

- Q3.a Determine operating point and V_{DS} for an FET self biasing circuit with $V_{DD} = 12\text{ V}$, $R_D = 2.2\text{ K}$, $R_S = 1.6\text{ K}$, $R_G = 1\text{ M}$, $I_{DSS} = 6\text{ mA}$ and $V_P = -6\text{ V}$ [8 Marks]
- Q3.b BJT transistor with voltage divider bias circuit has following values, $V_{CC} = 20\text{ V}$, $R_1 = 68\text{ K}$, $R_2 = 10\text{ K}$, $R_C = 6.2\text{ K}$, $R_E = 1.1\text{ K}$, $\beta = 50$. Determine operating point and V_{BC} . [8 Marks]
- Q3.c Explain working of D-MOSFET [4 Marks]
- Q4.a Explain working of Schmitt trigger. [8 Marks]
- Q4.b Explain Weinbridge oscillator. [8 Marks]
- Q4.c Give typical values for OpAmp IC 741. [4 Marks]
1. Open loop gain
 2. Input impedance
 3. Slew rate
 4. Offset voltage
- Q5.a Derive the expression of stability factor for emitter stabilized biasing circuit. [8 Marks]
- Q5.b Draw and explain series voltage regulator. [8 Marks]
- Q5.c Compare class A, class B and class C power amplifier based on, [4 Marks]
- a) Output waveform for collector current
 - b) Linearity
 - c) Distortion
 - d) Efficiency

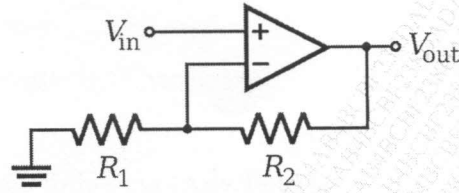
- Q6.a Derive the expression for output and hence determine the output voltage. Consider, $R_1 = R_2 = R_f = R_g = 10\text{ K}$ and $V_1 = V_2 = 2\text{ V}$. [5 Marks]



- Q6.b Explain weighted summation amplifier using OpAmp. [5 Marks]

Q6.c Identify the circuit diagram. Derive the expression for output voltage. Consider, $R_2 = 30\text{ K}$, $V_{IN} = 100\text{ mV}$, $V_O = 3.1\text{ V}$. What value of input resistance is needed in the given circuit to produce the given output voltage?

[5 Marks]



Q6.d Identify the circuit diagram. Derive the expression for output voltage. [5 Marks]

