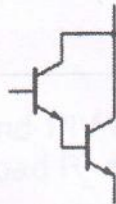




- vi) The number of free electrons is less than the number of holes in
 a) Intrinsic semiconductor b) P-type Semiconductor
 c) N-type Semiconductor d) All of the above
- vii) The knee voltage of an ideal diode is
 a) 0.3V b) 0.7V c) 0V d) 1V
- viii) In a full wave rectifier the ideal value of, the ripple factor is
 a) 1.21 b) 0.482 c) 0 d) None of the above
- ix) The gate source junction of a JFET should be
 a) always forward biased b) always reverse biased
 c) no biasing d) none of the above
- x) In a bipolar junction transistor base region is
 a) thin and heavily doped b) thin and lightly doped
 c) thin and moderately doped d) none of the above
- xi) When the transistor is operating in the saturation region then
 a) $V_{CE} = 0V$ b) $V_{CE} = 0.2V$
 c) $V_{CE} = V_{CC}$ d) None of the above
- xii) Identify the symbol.



- a) Darlington pair transistor b) JFET
 c) BJT d) None of the above
- xiii) The value of radix in decimal number system is
 a) 2 b) 8 c) 10 d) 1
- xiv) Invalid number in Excess-3 code is
 a) 1001 b) 0110 c) 0010 d) 1100
- xv) The largest decimal number that can be represented by a four bit binary number is
 a) 3 b) 7 c) 15 d) 31



PART - B

Answer **any five** questions.

(5×7=35)

2. a) Explain the inter conversion of voltage source and current sources.
b) Explain with the circuit diagram the growth of current in a series RL circuit. Show it graphically and define time constant. (3+4)
3. a) Plot a curve showing the variations of circuit current and impedance with frequency in series resonance circuit.
b) State and explain the steps to apply Maximum Power Transfer theorem. (2+5)
4. Draw the circuit diagram of a centre tapped full wave rectifier. Draw the i/p and o/p waveform. Mention its advantages over half wave rectifier. 7
5. a) What is a filter ? Draw the circuit diagram of a capacitor filter applied to half wave rectifier.
b) With circuit diagram explain the working of a zener diode voltage regulator. (4+3)
6. a) Define α and β of a transistor.
b) With a relevant circuit diagram explain the working of a NPN transistor. (2+5)
7. With the necessary diagrams explain the working of n-channel JFET and define parameters r_d , g_m and μ . 7
8. a) Explain with examples the method to convert a decimal number into binary equivalent. Consider the integer and fractional part of a binary number.
b) Write a short note on Gray code. (5+2)
9. Explain the steps involved in binary subtraction using 2's complement method with an example. 7

PART - C

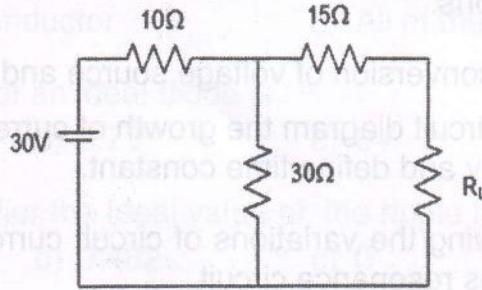
Answer **any four** questions.

(4×5=20)

10. A series resonant circuit has the following constants, $L = 220 \mu\text{H}$, $C = 470\text{pF}$, $R = 20 \Omega$. The supply voltage is 10V. Calculate
 - a) Resonant Frequency
 - b) Impedance at resonance
 - c) Current at resonance
 - d) Voltage at resonance

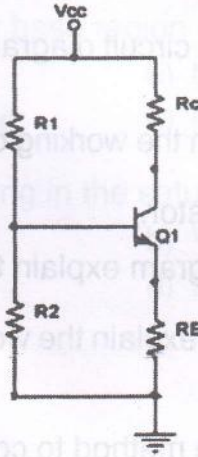


11. Determine the value of R_L for maximum power transfer in the given circuit. Also calculate the maximum power transferred to the load.



12. Calculate the Q-point values for the voltage divider biasing circuit.

$R_1 = 33k\Omega, R_2 = 3.3k\Omega, R_C = 10k\Omega, R_E = 560\Omega, \beta = 200, V_{CC} = 15V; V_{BE} = 0.7V$



13. Calculate the efficiency and PIV of a halfwave rectifier circuit with an input voltage of 220 Vrms and load R_L of 100 Ω . Given $r_s = 5 \Omega$ and turns ratio of a transformer is 5 : 1.

14. Convert the following :

a) $EF_{(16)} = ?_{(2)} = ?_{(10)}$

b) $456_{(10)} = ?_{(2)} = ?_{(16)}$

(2+3)

15. a) Convert the following gray code to binary code

i) 1110

ii) 10101

- b) Convert the binary code 1110 to gray code.

(4+1)
