Registration No:

Total Number of Pages : 02   **B.TECH**

B.TECH 1ST SEMESTER REGULAR EXAMINATIONS, DECEMBER 2017
BASICS OF ELECTRONICS
Subject Code:BBSES1041
Time: 3 Hours
Max Marks : 100
The figures in the right hand margin indicate marks.

PART-A   (10X1 = 10 MARKS)

Answer all questions.
   a. The Ripple facor value of Full wave rectifier is ……………… ?
   b. The expression of β interms of α is…………………..?
   c. The expression I_{RMS} for HWR is ………………….?
   d. BJT acts as a switch in -------------------region of operation.
   e. When $V_{DS}=V_{GS}-V_T$, Enhancement Mosfet is working in ------------------------ mode.
   f. Lissajous pattern is mostly used for measuring--------------------.
   g. The binary number 10101 is equivalent to decimal number …………..
   h. For display of signal pattern ………… voltage is applied to the horizontal plates of a CRO
   i. The form factor value of full wave rectifier is ……………………?
   j. To design Ex-OR gate, minimum ……………no.of NAND gates are required ?

PART-B   (15 x 2 = 30 MARKS)

Answer any fifteen questions from the following.
   1. Write down the difference of Si, Ge, and GaAs
   2. Explain in neat sketch the energy band diagram of p-n junction.
   3. Explain the characteristics and equivalent model representation ideal diode
   4. What are the applications of diode and in neat sketch diagram explain the concept of si
      diode clipping of input of 5v peak to peak to at positive 2v.
   5. Derive the ripple factor of half wave rectifier.
   6. Explain the output characteristics of CE configuration with neat sketch.
   7. Derive the relationship between α , β ,γ?
   8. Define modulation and mention the basic types of modulation?
   9. Why BJT is called so current controlled device ?
   10. State and explain about zener diode ?
   11. Sketch the symbol of P-channel D-MOSFET ?
   12. What is the difference between analog and digital signal?
   13. Find out the 1's and 2's complement of the binary number $(1011101101)_2$?
   14. Simplify the given Boolean expression ?
       Y =(A'B +A'B'C')'
   15. Bring the differences between BJT and FET ?
   16. A Lissajous pattern on a CRO has 5horizontal tangencies & 2 vertical tangencies.The
       frequency of horizontal input is 1Khz.What is the frequency of vertical input?
   17. Write down the differences between clipper and clamper circuit .

18. Write down the expressions for depletion width in forward biasing and Reverse biasing od PN junction diode .
19. What is Shockley's equation ?
20. Draw the circuit diagram for Sweep generator .

<div align="center"><u>**PART-C**</u></div>   **(6 x 5 = 30 MARKS)**

<u>**Section-i**</u>   <u>**Answer any Six questions**</u>

1. Derive the output current and output voltage expressions of FWR ?
2. Explain with suitable diagram the working operation of transistor act as an amplifier ?
3. Explain the PN junction under biasing.
4. Explain the construction of n-channel D-MOSFET ?
5. Find out the maxterms from the function below?
   $F(W,X,Y,Z) = (X'+Z')(W+Y)$
6. Write the short notes on trasistor act as a switch ?
7. Convert the following expressions to POS form:
   $A + AB + \overline{AC}$ ii) $AB + B\overline{C} + \overline{A}C$
8. Describe the operation of any one of Full wave rectifier with the current flow direction .

<u>**Section-ii**</u>   <u>**Answer any Two questions**</u>   **(2 x 15 = 30 MARKS)**

1.What is the need of adder circuit and Explain the Half adder and Full adder circuit with minimum number of logic gates?

2.A bridge type FWR uses four diodes with internal resistance of each diode is(R_f) of 100 ohms if input AC signal is 220v RMS and load resistance of 1kilo ohms and the turn ratio is 9:1 .Determine
   (i) I_M , I_{DC} ,I_{RMS} (ii) PIV   (iii)V_{DC}, V_{AC}
   (iv) Form factor,   (v)P_{OUT}, P_{IN} (vi)Efficiency

3.Determine the output voltage for the following diagrams:i)
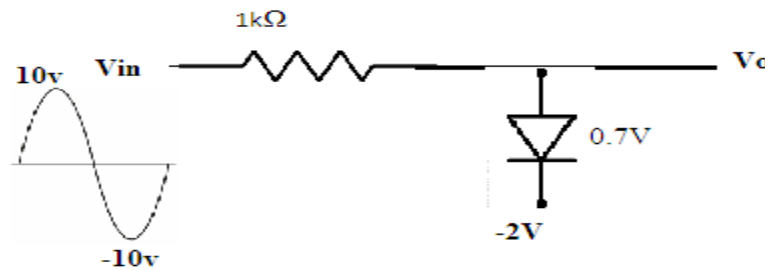
And   ii)
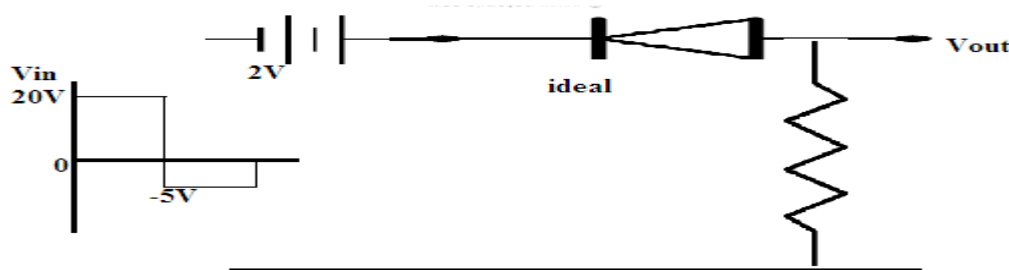
4. What is standard form of Boolean expression? If the Boolean expression is represented as F $(P,Q,R,S) = P'QR + RS + Q'R'$,Find out the standard POS form of the expression?

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