ESC201 - Basic Electronics Engineering

P. Pages : 2

Time : Three Hours

7648

GUG/W/23/14061

Max. Marks : 80

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Notes : 1.   All questions carry marks as indicated.
2.   Assume suitable data wherever necessary.
3.   Illustrate your answers wherever necessary with the help of neat sketches.

1. a) What is half wave rectifier? Derive the equation for following parameters of half wave rectifier. **8**
   i)   Average DC output voltage
   ii) Average DC output current
   iii) Ripple factor
   iv) Efficiency

   b) What is Ziner diode? Explain Ziner diode as a voltage regulator. **8**

OR

2. a) What is transistor? Explain the operation of NPN transistor. **8**

   b) Describe how BJT acts as a single stage common emitter amplifier. **8**

3. a) Define the following terms with respect to Op-Amp. **8**
   i)   Input offset voltage
   ii) CMRR
   iii) Slew Rate
   iv) Thermal drift

   b) What is virtual ground concept in Op-amp? List the ideal characteristics of Op-amp. **8**

OR

4. a) Explain Op-amp as inverting and non-inverting summing amplifier. **8**

   b) Explain ideal and practical differentiator? What are its limitation? Show the frequency response. **8**

5. a) Explain internal block diagram of IC 555 with neat diagram. **8**

   b) What is RC timing circuit? Explain the charging and discharging of RC circuit. **8**

OR

6. a) What is an Oscillator? State the Barkhausen criteria for sustained oscillator. **4**

   b) Draw the circuit for RC phase shift oscillator? Explain its working? Derive the equation of oscillating frequency. **12**

7. a) Obtain the following logic gate using NAND gate   **8**

     i)   NOT gate   iv)   NOR gate

     ii)   AND gate   v)   EXOR gate

     iii)   OR gate   vi)   EXNOR gate

   b) Simplify the following using k-map.   **8**

     i) $f(A,B,C,D) = \Sigma m(0,1,4,5,7,8,9,12,13,15)$

     ii) $f(A,B,C,D) = \Sigma m(0,1,3,4,5,7)$

OR

8. a) Explain the working of 4 – bit shift register with timing diagram.   **8**

   b) What is multiplexer? Explain 4 : 1 multiplexer? What is application of multiplexer.   **8**

9. a) Draw and explain block diagram of communication system.   **8**

   b) What is frequency modulation? Derive equation for frequency modulated signal.   **8**

OR

10. a) Write a note on IEEE Frequency Spectrum.   **8**

    b) Describe in detail about cellular concept and frequency reuse.   **8**

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