B.E. Mechanical Engineering (Model Curriculum) Semester - IV

ESC201 - Basic Electronics Engineering

P. Pages : 2 **GUG/S/23/14061**

Time : Three Hours * 2 7 9 8 * Max. Marks : 80

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) Draw block diagram of basic DC power supply? Explain each block in detail. **8**

b) Derive the following factor for full wave bridge rectifier? **8**

i) Vdc, Idc

ii) Ripple factor

iii) Efficiency

iv) Peak Inverse Voltage

OR

2. a) Explain input and output characteristic of BJT in common base mode. **8**

b) Explain regulated power supply IC 78XX and 79XX series. **8**

3. a) What is Op-amp? Explain the internal block diagram of an Op-amp with a neat diagram. **8**

b) Illustrate the pin diagram of IC 741 Op-amp and explain function of each pin. **8**

OR

4. a) Derive the following parameters for inverting amplifier. **8**
i) Output voltage
ii) Gain
iii) Input resistance with feedback
iv) Output resistance

b) Write short note on. **8**
i) Voltage shunt feedback amplifier.
ii) Voltage series feedback amplifier.

5. a) What is Astable multivibrator? Explain its circuit operation. **8**

b) Draw the pin diagram of IC 555 timer and explain function of each pin. **8**

OR

6. a) Design RC phase shift oscillator having oscillating frequency 200 Hz. **8**

b) Design a Wein bridge oscillator for frequency 965 Hz. **8**

7. a) Minimize the following expression using Boolean algebra **8**

i) $X = ABC + \bar{A}B + AB\bar{C}$

ii) $X = \bar{A}B\bar{C} + A\bar{B}\bar{C} + \bar{A}\bar{B}\bar{C}$

iii) $X = AB + \bar{A}C + BC$

b) Simplify using K-map **8**

i) $f(A, B, C, D) = \Sigma m(1,5,6,7,11,12,13,15)$

ii) $f(A, B, C, D) = \Sigma m(0,1,2,4,8,9,11,12)$

OR

8. a) What is Half Adder? How full adder can be implemented using Half Adder. **8**

b) Explain **8**

i) JK Flip Flop

ii) D-Flip Flop

9. a) Define amplitude modulation? Derive equation for amplitude modulated wave. **8**

b) What is noise? What are the various sources and form of noise. **8**

OR

10. a) Draw the block diagram of GSM communication. Explain each block? State the advantage and disadvantages. **12**

b) List out the advantages & disadvantages of unguided transmission media. **4**

****