

**B. E. First Semester (ALL) / SoE – 18-19 – Rev – FY-201 Examination**

**Course Code : EE 2101**

**Course Name : Basic Electronics**

Time : 2 Hours]

[ Max. Marks : 40

**Instructions to Candidates :—**

- (1) Attempt any **Four** questions out of **Six**.
- (2) All questions carry **Ten** marks.
- (3) Assume suitable data wherever necessary.
- (4) Illustrate your answers wherever necessary with the help of neat sketches.

1. (A) Solve any **One** :—

(A1) The equation  $5x^2 - 14x - 226 = 0$  has the root 9, -6. Find the base of the system. 4(CO1,2)

(A2) Convert Gray code into its equivalent octal and decimal numbers  $(1011010101101011)_{\text{gray}}$ . 4(CO1,2)

(B) Solve any **One** :—

(B1) Perform using Binary Arithmetic

(i)  $(7AC.F9)_{16} - (543.17)_8 = (?)_{10}$

(ii)  $(8FE2.1C)_{16} + (271.56)_8 = (?)_{16}$  6(CO1,2)

(B2) Perform using 2's complement method

(i) Subtract  $(11)_2$  from  $(110010)_2$

(ii) Subtract  $(1100010)_2$  from  $(101)_2$  6(CO1,2)

2. (A) Solve any **One** :—

(A1) State and prove Demorgans Theorems. 4(CO1,2)

(A2) Find out the Minterms for given Expression  
 $F(A, B, C) = A + BC + AC$ . 4(CO1,2)

- (B) Solve any **One** :—
- (B1) Design full adder circuit with gate level implementation. 6(CO1,2)
- (B2) Design S – R Flip Flop and Explain with Truth Table. 6(CO1,2)
3. (A) Solve any **One** :—
- (A1) Explain Intrinsic and Extrinsic Semiconductor with crystal structure. 4(CO3)
- (A2) Explain the working of NPN transistor. 4(CO3)
- (B) Solve any **One** :—
- (B1) What is Rectifier ? Explain Bridge Rectifier with Input Output Waveform and derive the equation for  $I_{dc}$ ,  $V_{dc}$  and Efficiency. 6(CO3)
- (B2) Explain working of Common emitter configuration with its input and output characteristics. 6(CO3)
4. (A) Solve any **One** :—
- (A1) List all ideal characteristics of OP – AMP. 6(CO3)
- (A2) Draw and explain summing Amplifier using OP – AMP. 6(CO3)
- (B) Solve any **One** :—
- (B1) Draw and explain Integrator using OP–amp. Also derive the expression for output voltage. 4(CO3)
- (B2) Draw and explain differentiator using Op–amp. Also derive the expression for output voltage. 4(CO3)
5. (A) Solve any **One** :—
- (A1) Define Accuracy, Reproducibility, Precision, Sensitivity, Resolution and Drift with respect to measurement. 5(CO4)
- (A2) Derive the balance condition equation for Maxwell's inductance bridge. 5(CO4)

- (B) Solve any **One** :—
- (B1) Draw and explain TRUE – RMS voltmeter. 5(CO4)
- (B2) Draw and explain Digital Multimeter. 5(CO4)
6. (A) Solve any **One** :—
- (A1) How are transducers classified ? Give examples. 5(CO4)
- (A2) Explain the Proximity Sensors with neat diagram. 5(CO4)
- (B) Solve any **One** :—
- (B1) Explain the working of LVDT in detail. 5(CO4)
- (B2) Explain Thermocouple with neat diagram. 5(CO4)

