

D-180227**B. Tech. EXAMINATION, 2018**

Semester Common with I(CBS) & II(CBS)

FUNDAMENTALS OF ELECTRONICS

ENGINEERING (GP. B)

EC-101

Time : 3 Hours

Maximum Marks : 60

The candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt *Five* questions in all, selecting *one* question from each Section A, B, C and D. Section E is compulsory.

Section A

1. (a) Explain principle, working and characteristics of LED. 5

- (b) What do you mean by rectifier efficiency and ripple factor as applied to a rectifier ? Derive the expression for the same in case of Bridge rectifier. 5

2. (a) Explain the action of Zener diode as a voltage regulator. 5
- (b) Differentiate between Diffusion capacitances and Transition capacitances. 5

Section B

3. (a) Explain construction, working and characteristics of a transistor in CC configuration. 5
- (b) The emitter current of transistor is 10 mA. If $\alpha_{dc} = 0.99$ and $I_{CBO} = 10 \mu A$, calculate the value of I_C and I_B . 5
4. (a) Describe the construction, working and characteristic of P-Channel Enhancement MOSFET. 5
- (b) What are the advantages and disadvantages of FET over a conventional bipolar junction transistor ? 5

Section C

5. (a) Draw the circuit diagram of Hartley oscillator and explain its operation by deriving expression for frequency of oscillation. 5
- (b) What is an Oscillator ? Enumerate the different classes of oscillators. 5
6. (a) Draw the schematic diagram of difference amplifier. Derive the expression of the output voltage. 5
- (b) An Op-Amp has a slew rate of $0.5 \text{ V}/\mu\text{s}$. What is the largest sine wave output possible at a frequency of 1 MHz and what maximum output voltage of 1 V peak ? 5

Section D

7. (a) Solve the following expression using Boolean identity : 5
- $$ABC + A'B'C + A'BC + AB'C$$
- (b) Draw the block diagram of function generator. Explain each block in detail. 5

8. (a) How do you measure unknown frequency and phase using CRO ? Explain properly. 5
- (b) (i) Convert Decimal into Binary $(172.65)_{10}$. $1\frac{1}{2}$
- (ii) Subtract 1000100_2 from 1010100 using 2's Complement method. 2
- (iii) Convert $(FCB3A)_{16}$ to Octal equivalent. $1\frac{1}{2}$

Section E

9. (a) What do you mean by Dynamic Drain Resistance ? 2
- (b) Define α and β of a transistor and derive the relationship between them. 2
- (c) How does the diode voltage vary with temperature ? 2
- (d) What is BCD Code ? 2
- (e) Write the advantages of JFET over BJT. 2
- (f) What is Comparator ? 2
- (g) What is the difference between active and passive filter ? 2
- (h) Define Barkhausen Criterion. 2
- (i) What do you mean by majority and minority in P-N diode ? 2
- (j) What do you mean by Boolean Algebra ? 2