

AR-2529

Faculty of Engineering & Technology

M.Sc. (Applied Electronics) Semester-I (C.B.S. – New) Examination

ELECTRONIC DEVICES & CIRCUITS

(15002)

Paper—1 AE 2

Time : Three Hours]

[Maximum Marks : 80

INSTRUCTIONS TO CANDIDATES

- (1) All questions carry marks as indicated.
 - (2) Due credit will be given to neatness and adequate dimensions.
 - (3) Assume suitable data wherever necessary.
 - (4) Illustrate your answers wherever necessary with the help of neat sketches.
1. (a) Draw and explain forward and reverse biased diode characteristic. 6
 - (b) Explain diode as a clipper. How is it used as wave shaping circuit ? 7
- OR**
2. (a) Explain capacitor filter. Derive expression for ripple factor.
For the capacitor filter is full wave rectified input of 30 V dc is supplied with load resistance of 1 k Ω , determine value of capacitor for a ripple factor of 0.01. 7
 - (b) Compare Half wave, Full wave and Bridge rectifier. 6
3. (a) What is Q point ? Explain the stability of the circuit. Derive expression of stability factor. 7
 - (b) For a base bias circuit determine V_{CE} , I_C .
 $V_{CC} = 20$ V, $\beta = 100$, $R_B = 400$ k Ω , $R_C = 2$ k Ω . 7

OR

4. (a) Determine stability factor of voltage divider bias circuit and Q point coordinates.
 $R_1 = 10 \text{ k}\Omega$, $R_2 = 5 \text{ k}\Omega$, $R_C = 1 \text{ k}\Omega$, $R_E = 500 \text{ }\Omega$, $V_{CC} = 10 \text{ V}$. 7
- (b) Define and derive hybrid parameter for CE amplifier. 7
5. (a) For a given JFET $I_{DSS} = 15 \text{ mA}$, $V_{gs(off)} = -5 \text{ V}$. Determine the drain current if $V_{GS} = -1 \text{ V}$.
 Draw and explain transfer characteristic of JFET. 7
- (b) Compare BJT and FET. 6

OR

6. (a) Draw and explain drain and transfer characteristics of MOSFET. 7
- (b) Explain CMOS. 6
7. (a) Explain transformer coupled amplifier. State the advantages. Explain freq. response plot. 7
- (b) Explain direct coupled amplifier. Derive the input, output resistance and gain expression. 7

OR

8. (a) Explain Bootstrap Emitter follower. 7
- (b) Explain common source FET amplifier. 7
9. (a) Prove that power efficiency of class B amplifier is 78.5%. 6
- (b) Explain complementary symmetry push pull power amplifier. 7

OR

10. (a) Explain Colpitt's oscillator in a transistor Colpitt's oscillator $C_1 = .001 \text{ }\mu\text{F}$, $C_2 = 0.01 \text{ }\mu\text{F}$ and $L = 5 \text{ }\mu\text{H}$. Determine frequency and gain for oscillation. 7
- (b) Explain Wein bridge oscillator. 6
11. (a) Explain how Schottky diode is a fast switching diode. State uses. 6
- (b) Explain tunneling effect. Explain tunnel diode and its applications. 7

OR

12. (a) Explain working principle, construction of PIN diode. State its uses. 7
- (b) Explain photo-transistor with its characteristics. 6