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Question Paper Code : X 10354

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2020
Third Semester

Electrical and Electronics Engineering
EC8353 – ELECTRON DEVICES AND CIRCUITS

(Common to: Biomedical Engineering/Computer and Communication Engineering/
Electronics and Instrumentation Engineering/Instrumentation and Control
Engineering/Robotics and Automation)
(Regulations 2017)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions

PART – A

(10×2=20 Marks)

1. What is diffusion capacitance ?
2. Give the applications of LASER diode.
3. Mention the advantage of MOSFET.
4. A unijunction transistor has $r_{B1} = 4 \text{ K}\Omega$ and $r_{B2} = 2.5 \text{ K}\Omega$. Find the value of intrinsic stand-off ratio and the peak-point voltage, if $V_{BB} = 15 \text{ V}$ and the barrier potential is 0.7 V .
5. Draw the hybrid π model of CE configuration.
6. Mention the condition for proper amplification of a signal.
7. Enumerate the need for neutralization.
8. What is common mode rejection ratio ?
9. Give the condition for sustained oscillation.
10. Mention the types of feedback.

PART – B

(5×13=65 Marks)

11. a) i) Explain the characteristics of PN junction diode. (7)
ii) Explain the working of Zener diode as Regulator. (6)

(OR)

- b) Explain the working of full wave rectifier and derive the necessary equations to calculate the efficiency. (13)



12. a) Explain the input and output characteristics of BJT in common emitter configuration with neat sketches. **(13)**

(OR)

- b) Explain the structure and working of UJT with relevant diagrams. **(13)**

13. a) Derive the necessary equation to calculate the gain, input and output impedance of common emitter amplifier. **(13)**

(OR)

- b) Find the mid band gain A_M and the upper 3db frequency f_H of a CS (common source) amplifier fed with a signal source having an internal resistance $R_{sig} = 100 \text{ K}\Omega$. The amplifier has $R_G = 4.7 \text{ M}\Omega$, $R_D = R_L = 15 \text{ K}\Omega$, $g_m = 1 \text{ mA/V}$, $r_o = 150 \text{ K}\Omega$, $C_{gs} = 1 \text{ pF}$, $C_{gd} = 0.4 \text{ pF}$. **(13)**

14. a) Explain the working of differential amplifier and calculate its gain. **(13)**

(OR)

- b) i) Explain the working of single tuned amplifier. **(7)**

- ii) Discuss about BiMOS cascade amplifier. **(6)**

15. a) Explain the working of Hartley oscillator and derive its frequency of oscillation. **(13)**

(OR)

- b) Discuss about voltage series and current series feedback in detail. **(13)**

PART – C

(1×15=15 Marks)

16. a) With a neat diagram explain any two biasing techniques used for biasing a transistor. **(15)**

(OR)

- b) Discuss in detail, about the working of :

- i) LED. **(5)**

- ii) IGBT. **(10)**
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