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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  $0.7 \text{ V}$ .
5. Draw the hybrid  $\pi$  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)

**X 10354**



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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