**20EC303**

**Hall Ticket Number:**

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| **II/IV B.Tech (Regular/Supplementary) DEGREE EXAMINATION** | | | |
| **January, 2024** | **Electronics and Communication Engineering** | | |
| **Third Semester** | **Electronic Devices and circuits** | | |
| **Time:** Three Hours | | **Maximum:** 70 Marks | |
| ***Answer question 1 compulsory.*** | | | **(14X1 = 14Marks)** |
| ***Answer one question from each unit.*** | | | **(4X14=56 Marks)** |
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|  |  | Answer all questions. | CO | BL | M |
| 1 | a) | Draw Zener Diode Characteristics. | CO1 | L1 | 1M |
|  | b) | Differentiate drift and diffusion currents? | CO1 | L1 | 1M |
|  | c) | What is the operating principle of LED? | CO1 | L1 | 1M |
|  | d) | Define ripple factor | CO2 | L1 | 1M |
|  | e) | Define Transformer Utilization factor | CO2 | L1 | 1M |
|  | f) | List out different filters used in association with rectifiers. | CO2 | L1 | 1M |
|  | g) | What is the difference between transistor compensation & stabilization? | CO3 | L2 | 1M |
|  | h) | What is the need of biasing? | CO3 | L1 | 1M |
|  | i) | Compare BJT and FET. | CO4 | L2 | 1M |
|  | j) | Define pinch-off voltage. | CO4 | L1 | 1M |
|  | k) | Which colour of light is emitted by GaAs, Gp, GaAsp? | CO1 | L1 | 1M |
|  | l) | List the applications of zener diode. | CO1 | L1 | 1M |
|  | m) | Draw the symbol of TRIAC. | CO1 | L1 | 1M |
|  | n) | What is rectifier? | CO2 | L1 | 1M |
| **Unit-I** | | | | | |
| 2 | a) | Explain temperature dependence of V-I characteristics in PN junction diode. | CO1 | L2 | 7M |
|  | b) | Draw and explain the construction and operation of LED | CO1 | L2 | 7M |
|  |  | **(OR)** |  |  |  |
| 3 | a) | Discuss about V-I characteristics of tunnel diode with help of Fermi level diagram. | CO1 | L2 | 7M |
|  | b) | Explain the Avalanche and Zener Breakdowns in PN junction diode. | CO1 | L2 | 7M |
| **Unit-II** | | | | | |
| 4 | a) | Derive the expression for Ripple factor for Full Wave Rectifier with L-section filter. | CO2 | L3 | 7M |
|  | b) | Derive the expressions for ripple factor and maximum efficiency of HWR. | CO2 | L3 | 7M |
| **(OR)** | | | | | |
| 5 | a) | Compare FWR and Bridge rectifier. | CO2 | L3 | 7M |
|  | b) | Draw the full wave rectifier with π-section filter & explain its operation along with derivation for ripple factor. | CO2 | L2 | 7M |
| **Unit-III** | | | | | |
| 6 | a) | Explain input and output characteristics of transistor in CB configuration with neat diagram. | CO3 | L2 | 7M |
|  | b) | What are the techniques of bias compensation in BJT? And explain at least 2 techniques. | CO3 | L2 | 7M |
| **(OR)** | | | | | |
| 7 | a) | Discuss the base width modulation. | CO3 | L2 | 7M |
|  | b) | Discuss about collector to base bias circuit and derive expression for stability factor. | CO3 | L3 | 7M |
| **Unit-IV** | | | | | |
| 8 | a) | Explain the construction & operation of UJT. | CO4 | L2 | 7M |
|  | b) | Explain the construction and operation of n-channel JFET. | CO4 | L2 | 7M |
| **(OR)** | | | | | |
| 9 | a) | Describe the construction and working principle of Enhancement mode and depletion mode MOSFET and draw its characteristics. | CO4 | L2 | 7M |
|  | b) | With neat sketch explain the characteristics of SCR | CO4 | L2 | 7M |

