Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **17EC2072** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ELECTRON DEVICES AND CIRCUITS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Discuss the behaviour of a PN junction diode under forward and reverse biasing. Summarize its V-I characteristics on both the bias. Write short notes on:  (i) Knee voltage (ii) Breakdown voltage  (iii) Limitations in the operating conditions. | CO1 | 12 |
| b. | Explain the salient features of Bohr’s atomic model. Construct the structure of silicon atom. | CO1 | 8 |
| **(OR)** | | | | |
| 2. | a. | Illustrate the principle of hall effect. | CO1 | 8 |
| b. | Express the mechanism of drift and diffusion in semiconductors. | CO1 | 8 |
| c. | Compare and contrast intrinsic and extrinsic semiconductors. | CO1 | 4 |
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| 3. | a. | Establish the following relations   1. IC=[1/(1- α)]\* IB+ [1/(1- α)]\* ICBO 2. Γ= 1/(1- α) 3. IE=(β+1)IB+(β+1)ICBO | CO1 | 13 |
| b. | Demostrate the action of a transistor as an amplifier. | CO1 | 7 |
| **(OR)** | | | | |
| 4. | a. | With a neat diagram, explain the input and output characteristics of a BJT under common emitter configuration and derive its input and output impedances. | CO1 | 10 |
| b. | An ac voltage of peak value 20V is connected in series with a silicon diode and load resistance of 500 Ω. If the forward resistance of diode is 10 Ω. Find  (i) Peak current through the diode  (ii) Peak output voltage  Assume the diode is ideal and find (i) & (ii) | CO1 | 10 |
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| 5. | a. | Formulate a pn junction device that exhibits negative resistance between peak point and valley point voltage. | CO2 | 12 |
| b. | Name the device associated with voltage regulator and justify the reason for using it as voltage regulator. | CO2 | 8 |
| **(OR)** | | | | |
| 6. | a. | Explain the construction and working principle of DIAC with the transistor equivalent circuit. Discuss the application and limitations of the device. | CO2 | 10 |
| b. | Discuss the working of varacter diode. | CO2 | 10 |
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| 7. | a. | Analyze the operation of Hartley and Colpitts oscillator in brief. | CO5 | 10 |
| b. | Draw the block diagram of practical power amplifier. | CO4 | 10 |
| **(OR)** | | | | |
| 8. | a. | Summarize the working of a RC phase shift oscillator. Discuss its merits and demerits. | CO6 | 10 |
| b. | Derive the expression for ripple factor, voltage, current, efficiency and peak inverse voltage of a full wave rectifier circuit. | CO3 | 10 |
|  | | **Compulsory**: |  |  |
| 9. |  | There is an application which needs the output voltage to be regulated. Choose an appropriate diode/device, that would ensure this operation with appropriate circuit and describe how it regulates voltage. Consider a specific example, design the circuit with appropriate values of components involved. State the important constraints that need to be considered. | CO3 | 20 |