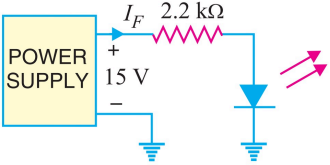


QP CODE: D2BPH2401	(Pages: 2)	Reg. No : .....
		Name : .....
SECOND SEMESTER FYUGP EXAMINATION, APRIL 2025		
MAJOR COURSE		
PHY2CJ101 : Electronics - I		
(Credits: 4)		
Time: 2 Hours	Maximum Marks: 70	
Section A		
Answer the following questions. Each carries 3 marks (Ceiling: 24 marks)		
1. Define breakdown voltage of a pn junction.	BL1	CO2
2. A pure semiconductor is doped with an element having atomic number 15. Discuss the possible conduction mechanism in this doped semiconductor.	BL5	CO1
3. Define the terms (i) valence band (ii) conduction band (i) band gap.	BL1	CO1
4. Determine the maximum applied voltage that will turn the the Zener diode into ON state in a voltage regulator circuit.	BL3	CO3
5. What are the advantages of using a full-wave rectifier over a half-wave rectifier?	BL2	CO3
6. Explain the working of choke input filter in rectifier circuit.	BL2	CO3
7. Find the $\alpha$ rating and hence $I_C$ of the transistor with $\beta = 50$ and $I_E = 12$ mA.	BL2	CO5
8. List out the different position values of the digits in the decimal number 345.	BL2	CO6
9. List the place values of digits in the binary number 11011.	BL2	CO6
10. Define digital circuit. Write its different states.	BL2	CO6
Section B		
Answer the following questions. Each carries 6 marks (Ceiling: 36 Marks)		
11. Differentiate between an unbiased, forward-biased and reverse biased pn junction in silicon, in terms of the barrier potential.	BL5	CO2
(PTO)		

12. What is current through the LED in the circuit shown in figure? Assume that voltage drop across the LED is 2 V.	BL2	CO2
		
13. What are voltage multipliers? With a neat circuit diagram, explain the working of a voltage doubler.	BL3	CO3
14. Evaluate the advantages and disadvantages of base resistor bias versus voltage divider bias in transistor amplifiers.	BL3	CO5
15. A transistor amplifier in CE configuration has load resistance 4 kΩ. If the supply voltage is 9V find the operating point, given zero signal base current = 5 μA and current gain $\beta = 200$ .	BL3	CO5
16. Describe the transistor action in detail with necessary diagrams.	BL2	CO4
17. Describe all the steps involved in converting a decimal number to BCD.	BL2	CO6
18. Using necessary steps find the hexadecimal equivalents of the numbers $(111101111011100)_2$ and $(11111000001101)_2$ .	BL3	CO6

### Section C

**Answer any one question. Each carries 10 marks (1 x 10 = 10 Marks)**

19. What is common-base configuration in transistors? Derive the expression for collector current in terms of current amplification factor, $\alpha$ . Discuss input and output characteristics of the system with the help of circuit diagram.	BL3	CO4
20. With a neat circuit diagram, explain the working of full wave bridge rectifier. Derive expressions for efficiency and ripple factor.	BL3	CO3

**CO : Course Outcome**

**BL : Bloom's Taxonomy Levels** (1 – Remember, 2 – Understand, 3 – Apply, 4 – Analyse, 5 – Evaluate, 6 – Create)