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Code No. : 14523

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**B.E. (Mech. Engg. : CBCS) IV-Semester Main Examinations, January-2021****Basic Electronics Engineering**

Time: 2 hours

Max. Marks: 60

*Note: Answer any NINE questions from Part-A and any THREE from Part-B***Part-A (9 × 2 = 18 Marks)**

Q. No.	Stem of the question	M	L	CO	PO
1.	What is P-N Junction diode? How is it formed?	2	1	1	1
2.	Define Mobility and diffusion.	2	2	1	1
3.	Distinguish between Zener breakdown and avalanche breakdown mechanism in reverse biased P-N junctions	2	2	1	2
4.	Differentiate between BJT and FET.	2	2	2	2
5.	Define the terms Emitter efficiency (γ), transport factor (β^*) and Large signal current gain (α) of a transistor.	2	2	2	1
6.	Define Transconductance (g_m) and amplification factor (μ).	2	2	2	1
7.	What is meant by feedback? Explain why is it necessary?	2	2	2	2
8.	State Barkhausen Criteria.	2	1	2	1
9.	List the advantages of a negative feedback.	2	1	2	1
10.	Write the basic principle involved in a strain gauge.	2	2	4	2
11.	Draw the symbol and output characteristics of SCR.	2	1	3	1
12.	Write the applications of CRO.	2	2	4	1
Part-B (3 × 14 = 42 Marks)					
13. a)	Draw and explain the circuit diagram of a Half Wave Rectifier. Find Ripple factor and efficiency.	7	3	1	2
b)	Explain how a Zener diode can be used as a Voltage regulator.	7	2	1	2
14. a)	Explain the operation of JFET with V-I Characteristics.	6	2	2	2
b)	What are the three basic BJT amplifier configurations? Compare the Voltage gains and current gains of these three configurations.	8	3	2	2
15. a)	Draw the block diagram of a negative feedback amplifier and explain each block in detail. Also draw all the four types of feedback topologies.	10	2	2	1
b)	Prove that Negative feedback increases the bandwidth and stability of an amplifier with the help of expressions.	4	3	2	2

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16. a)	Explain the working principle of UJT using the V-I characteristics.	6	2	3	2
b)	What is a Transducer? Explain how thermocouple is used for temperature measurement.	8	3	4	2
17. a)	Explain the working of a center-tapped full wave rectifier with a neat circuit diagram and also derive its dc load current, RMS output current and Ripple factor.	8	4	1	3
b)	Write the relationships between α , β and γ . Calculate the current gain of a BJT CE configuration if α is 0.98 and also compute the collector current if base current is $40\mu\text{A}$.	6	4	2	3
18. a)	What are the LC type of oscillators? Explain the principle of operation of any of those with a neat diagram.	7	3	2	2
b)	With a neat diagram explain the operation of LVDT.	7	2	4	2
19.	Answer any <i>two</i> of the following:				
a)	With a neat sketch explain about V-I characteristics of a PN diode.	7	2	1	1
b)	Explain about the Depletion and Enhancement modes of MOSFET.	7	2	2	2
c)	Describe the advantages of a Crystal Oscillators compare to conventional oscillators.	7	2	2	1

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	63%
2	Knowledge on application and analysis (Level-3 & 4)	37%
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	0
