Code No. : 13364 N/O

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD
Accredited by NAAC with A++ Grade
B.E. (E.E.E.) III-Semester Main & Backlog Examinations, Jan./Feb.-2024
Electronics Engineering-I

Time: **3 hours**   Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10 × 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO	PSO
1.	Define the following terms related to Rectifiers: a) Peak Inverse Voltage b) % Efficiency	2	1	2	1	2
2.	A Silicon diode has a reverse saturation current of 10.5 µA at room temperature of 27°C. Determine reverse saturation current at 60°C.	2	3	1	2	2
3.	Define α, β and γ of a transistor. find the relation between them.	2	1	1	1	2
4.	What is early effect and briefly explain the same.	2	1	1	1	2
5.	State Miller's theorem and mention it's importance in the analysis of amplifier.	2	1	4	1	2
6.	Draw the Common Base Hybrid model, indicate each component and write it's importance.	2	1	4	1	2
7.	What is threshold voltage in Metal Oxide Semiconductor Field Effect Transistor and write it's importance.	2	1	1	1	2
8.	An N channel JFET has I_{DSS}=10mA and V_p=-6V. Deteremine the I_D for V_{gs}=-2V in the pinch-off region.	2	3	1	2	2
9.	Mention the procedure how amplitude can be measured using a CRO.	2	1	3	1	2
10.	Write the working principle of Light Emitting Diode and write the applications of LED.	2	1	3	1	2

Part-B (5 × 8 = 40 Marks)

Q. No.	Stem of the question	M	L	CO	PO	PSO
11. a)	Explain the working of PN junction diode under forward bias and Reverse bias conditions with the necessary diagrams.	4	2	1	1	2
b)	A full-wave rectifier uses two diodes, the internal resistance of each diode may be assumed constant at 20 Ω. The transformer r.m.s secondary voltage from centre tap to each end of secondary is 50 V and load resistance is 980 Ω. Find i) Max a.c voltage, V_m ii) Max. load current, I_m iii) Average load current, V_{dc} iv) the r.m.s value of load current.	4	3	2	2	2
12. a)	Explain the input and output characteristics of Common Emitter Configuration with relavant diagrams.	4	2	1	1	2
b)	Draw the Collector to base bias circuit and find the expression for stability factor.	4	3	1	2	2
13. a)	Derive the generalized expression for the following of amplifier constructed using Bipolar junction transistor i) Current Gain ii) Voltage gain.	5	3	4	2	2

			M	L	CO	PO	
	b)	When simplified h-model will be used for analyzing BJT amplifier and how it is derived from exact model.	3	3	4	2	2
14.	a)	Explain the operation of N-Channel E-MOSFET and obtain it's VI-Characteristics.	4	2	1	2	2
	b)	Obtain the Voltage gain and input impedance of the JFET constructed as Common Source amplifier.	4	3	5	2	2
15.	a)	Draw the block diagram of CRO and explain the functionality of each block.	5	2	3	1	2
	b)	Explain the operation of Photo Diode with neat sketches.	3	2	3	1	2
16.	a)	Explain the operation of Zener as voltage regulator with required diagrams.	4	2	1	1	2
	b)	In a Silicon transistor circuit with a fixed bias, V_{CC}=9V, R_C=3KΩ, R_B=8KΩ, β = 50, V_{BE}=0.7V. Find the operating point and Stability factor.	4	3	1	2	2
17.		Answer any *two* of the following:					
	a)	A Common collector as shown below. The h-parameter are h_{ie}=1.1kΩ, h_{re}=4x10^{-4}, h_{fe}=86 and h_{oe}=2μA/V. Compute the Current gain A_I, the Input impedance Z_i.	4	4	4	2	2
	b)	With a neat constructional diagram, explain the working of N-channel JFET.	4	2	1	1	2
	c)	Explain the operation of UJT and show the negative resistance region.	4	2	3	2	2

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

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	40%
iii)	Blooms Taxonomy Level – 3 & 4	40%

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