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Code No. : 13346 S

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (E.E.E.) III-Semester Supplementary Examinations, August-2022

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
1.	When a reverse bias is applied through Ge PN diode the reverse saturation current at room temperature is $0.3\mu\text{A}$. Determine current flowing in the diode when 0.15 V forward bias is applied at room temperature?	2	3	1	2
2.	Define Ripple factor and Regulation of the rectifier.	2	1	2	1
3.	What is meant by operating point of the Bipolar Junction Transistor?	2	1	1	2
4.	A transistor has $\beta=100$. If the collector current is 40mA, find the value of emitter current.	2	2	1	3
5.	Why hybrid parameters are called so? Define them.	2	2	4	1
6.	Draw the simplified CE hybrid model.	2	2	4	2
7.	Compare the features of Bipolar junction transistor and Field Effect Transistor.	2	2	1	2
8.	Write the applications of JFET.	2	1	5	3
9.	Draw the electrical equivalent circuit of UJT.	2	3	3	4
10.	Write the operating principle of Light Emitting Diode.	2	1	3	3
Part-B (5 × 8 = 40 Marks)					
11. a)	Explain the working of PN junction diode under forward bias and Reverse bias conditions.	4	1	1	1
b)	Two identical Ge diodes are connected as per below diagram. Find V_1 and V_2 .	4	4	1	3
<p>The diagram shows two diodes, D₁ and D₂, connected in series. A 10V DC source is connected across the series combination. Diode D₁ is forward biased (anode to the left, cathode to the right), and diode D₂ is reverse biased (anode to the right, cathode to the left). The voltage across D₁ is labeled V₁ and the voltage across D₂ is labeled V₂.</p>					
12. a)	Explain the Common Emitter configuration of npn transistor with the help of input and output VI-characteristics.	4	1	1	2
b)	Draw the circuit of Self-bias and obtain it's operating point and stability factor.	4	3	4	1

Contd... 2

13. a)	Under which condition simplified h-model will be used for analyzing BJT amplifier? And how it is derived from exact model.	4	3	4	3
b)	Write the guidelines for linear analysis of transistor circuits and find the A_I and Z_I of the following circuit.	4	4	4	2
14. a)	Explain the working of an Enhancement type MOSFET with a neat construction diagram and its characteristics.	4	2	1	1
b)	Assuming that the saturation drain current I_{DS} is given by	4	4	1	2
$I_{DS} = I_{DSS} \left(1 - \frac{V_{gs}}{V_p} \right)^2$					
Prove the transconductance is					
$g_m = g_{m0} \left(1 - \frac{V_{gs}}{V_p} \right) = \frac{-2}{V_p} \sqrt{I_{DS} I_{DSS}}$					
15. a)	Explain the working principle of UJT with its V-I characteristics.	4	2	3	1
b)	Describe the working of Cathode Ray Oscilloscope with the help of neat block diagram.	4	2	3	1
16. a)	Obtain the expression for ripple factor of center-tapped full wave rectifier.	4	4	2	3
b)	Explain Common Base configuration of npn transistor with help of input and output VI-characteristics.	4	2	1	1
17.	Answer any <i>two</i> of the following:				
a)	Compare Common Base and Common Emitter configurations using h-parameter models.	4	3	1	2
b)	Draw the N-channel JFET diagram and explain its Drain characteristics.	4	2	1	1
c)	Explain the operating principle of Photo diode.	4	2	3	1

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%
