Hall Ticket Number:

Code No. : 12627 AS N/O

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (I.T.) II-Semester Advanced Supplementary Examinations, September-2023

Basic Electronics

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.	Define the ripple factor and conversion efficiency of a rectifier?	2	1	1	1
2.	What are the applications of varactor diode?	2	1	1	1
3.	What is the value of 'α' for a BJT that has a 'β' of 90? Find the base and emitter current if the collector current is 4 mA?	2	2	2	2
4.	Why are junction transistors called bipolar devices?	2	1	2	1
5.	What is the significance of the term "Field-Effect" in the name FET? Provide the circuit symbol for P-channel JFET?	2	1	3	1
6.	What are the universal gates and why they are called universal gates?	2	1	3	1
7.	An amplifier has a voltage gain of 200. This gain is reduced to 50 when negative feedback is applied. Determine the feedback factor?	2	2	4	2
8.	What is meant by cross over distortion?	2	1	4	1
9.	What is meant by virtual ground?	2	1	5	1
10.	A non-inverting amplifier has an input voltage of 1V. The input resistance R_i = 1KΩ and feedback resistance is 5 KΩ. Find the output voltage?	2	1	5	2
	Part-B (5 × 8 = 40 Marks)				
11. a)	Explain the V-I Characteristics of P-N Junction Diode?	4	2	1	1
b)	Explain the operation of center tapped transformer Full Wave Rectifier circuit?	4	2	1	1
12. a)	Draw the circuit diagram of a transistor operating in CB mode and explain the input and output characteristics?	4	2	2	1
b)	The value of 'α' increases with the increasing reverses-bias voltage of the collector junction why?	4	3	2	1

Contd... 2

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13. a)	Describe the operation of CMOS inverter circuit?	4	3	3	1
b)	Explain the different types of integrated circuit technologies?	4	2	3	1
14. a)	Explain the working principle of a Hartley Oscillator and derive the requency of oscillation?	4	3	4	1
b)	Find the operating frequency of the transistor of a Colpitts oscillator if C_1=0.001μF, C_2=0.01μF and L=15μH?	4	3	4	2
15. a)	Explain how a triangular wave can be generated by using op-amp?	4	3	5	1
b)	Design an inverting operational amplifier with R_1=50KΩ, R_f= 500 KΩ, and V_i=20.4V and find V_o=?	4	3	5	3
16. a)	With a neat circuit diagram explain the working of a Zener diode shunt Voltage Regulator	4	2	1	1
b)	Draw and label the circuit diagram of a h-parameter equivalent circuit of CE Mode transistor and derive expression for input impedance and current gain?	4	3	2	2
17.	Answer any ***two*** of the following:				
a)	What are the advantages of negative feedback?	4	2	3	1
b)	With a neat block diagram explain how oscillations can be generated. Also state the Barrkhausen's criteria of oscillations.	4	2	4	1
c)	With a neat circuit diagram explain the operation of a differentiator circuit using an OpAmp.	4	3	5	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%

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