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Code No. : 14424

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD**B.E. (E.C.E. : CBCS) IV-Semester Main Examinations, January-2021****Electronic Circuits**

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.	State the significance of lower and upper 3dB frequencies in high pass and low pass RC circuits respectively	2	1	1	2
2.	Distinguish between the comparator and clipping circuit	2	2	1	2
3.	Draw the circuit diagram of emitter coupled BJT differential amplifier	2	1	2	1
4.	List the applications of emitter follower	2	1	2	1
5.	What is the significance of sampling circuit in negative feedback amplifiers?	2	1	3	2
6.	Compute the overall input and output resistances of negative feedback amplifier with $Z_i = 1K$; $Z_o = 10K$; $A_v = 100$; and $\beta = 0.5$ for a voltage series feedback amplifier circuit?	2	3	3	2
7.	State and explain the Barkhausen's conditions	2	2	4	1
8.	Write the condition for sustained oscillations of Hartley oscillator and write the expression for frequency of oscillations in the circuit?	2	2	4	1
9.	Justify, why Non-linear distortion is called harmonic distortion?	2	2	5	2
10.	What is meant by cross over distortion?	2	2	5	2
11.	Draw the response of high-pass RC Circuit to the step input	2	2	1	1
12.	Give detailed classification of amplifiers	2	2	2	1

Part-B (3 × 14 = 42 Marks)

13. a)	For a High-pass RC circuit, develop the expressions for the %tilt for a square wave input?	10	4	1	2
b)	A Pulse generator with an output resistance of $R = 500$ ohms is connected to an oscilloscope with an input capacitance of $C = 30$ pF. Determine the time constant and rise time of the circuit?	4	4	1	2
14. a)	Derive the expressions voltage gain, current gain, input impedance and output admittance for a BJT using h-parameters for a CB configuration	7	3	2	3
b)	Draw the circuit diagram and explain the salient features of Darlington amplifier	7	3	2	2

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15. a)	Explain the effect of negative feedback on Input impedance, Output Impedance, and Voltage gain for the Current shunt negative feedback amplifiers with necessary diagrams	7	2	3	2
b)	Negative feedback effects the bandwidth of amplifiers. Justify the statement	7	4	3	2
16. a)	Explain the principle of operation of RC Phase shift oscillator with necessary circuit diagram	7	2	4	2
b)	Analyse the advantages and limitations of crystal oscillators	7	2	4	2
17. a)	Draw the circuit diagram of a Class-B push pull amplifier and explain its working with the help of necessary waveforms	7	2	5	2
b)	Describe the characteristics of tuned amplifiers. Also give the applications of tuned amplifiers	7	1	5	1
18. a)	Design a circuit to clamp the positive peaks of a sine waveform with 5V peak to -2V level and also draw the necessary waveforms	7	3	1	3
b)	Analyse and compute the current gain A_I , the input impedance R_I , Voltage gain A_V , and output resistance R_o using h-parameter exact analysis for the given circuit. The CE h-parameters are $h_{ie} = 1200\text{ohms}$, $h_{re} = 2 \times 10^{-4}$, $h_{fe} = 60$ and $h_{oe} = 25\mu\text{A/V}$.	7	4	2	3
19.	Answer any <i>two</i> of the following:				
a)	Analyse and compare the performance parameters of current series and voltage series feedback amplifiers	7	2	3	2
b)	Explain the operation of Colpitts Oscillator with necessary diagram	7	2	4	2
c)	Draw the circuit diagram of class – A transformer coupled Power amplifier and explain its operation	7	2	5	2

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)	60.5%
2	Knowledge on application and analysis (Level-3 & 4)	39.5%
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	0%