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Code No. : 14446

VASAVI COLLEGE OF ENGINEERING (AUTONOMOUS), HYDERABAD*Accredited by NAAC with A++ Grade***B.E. (E.C.E.) IV-Semester Main & Backlog Examinations, July-2022****Electronic Circuits**

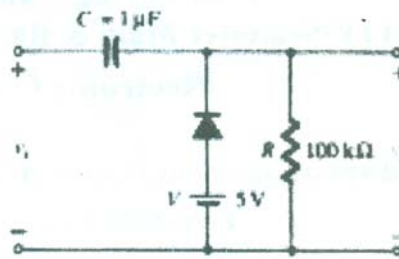
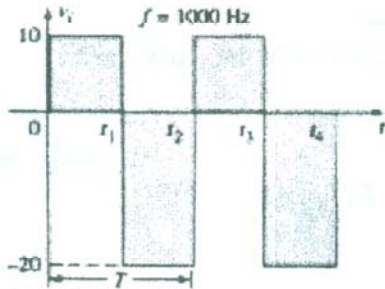
Time: 3 hours

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.	State Clamping theorem	2	1	1	1
2.	Draw the circuit diagram for compensated attenuator and write conditions for Under, over and perfect compensation.	2	1	1	1
3.	Sketch the darlington pair amplifier circuit? Write its any two applications.	2	2	2	1
4.	Define Common Mode Rejection Ratio (CMRR)? How to improve CMRR in differential amplifier?	2	3	2	2
5.	What are the advantages of negative feed back in amplifiers?	2	1	3	1
6.	The distortion in the amplifier is found to be 3%, when the feedback ratio of negative feedback amplifier is 0.04. When the feedback is removed, the distortion becomes 15%. Find the open loop gain of an amplifier.	2	3	3	2
7.	What is meant by Piezo electric effect? List out any two examples which comes under Piezo electric crystals.	2	2	4	1
8.	For a RC phase shift oscillator, the feed back network uses $R=4k\Omega$ and $C=1500pF$. The transistor amplifier used, has a collector resistance R_C of $10k\Omega$. Calculate the frequency of oscillations in the oscillator.	2	2	4	1
9.	What is power amplifier? How it different from voltage amplifier?	2	2	5	1
10.	The load of 4Ω is connected to the secondary winding of transformer having primary winding turns 200 and secondary winding turns 20. Calculate impedance seen at primary winding of the transformer.	2	1	5	1
Part-B (5×8 = 40 Marks)					
11. a)	An RC differentiator circuit is driven from a symmetrical square wave of peak to peak V volts with period T. Sketch the output wave forms for i) $RC \ll T$ ii) $RC = T$ iii) $RC \gg T$	4	2	1	2

b)



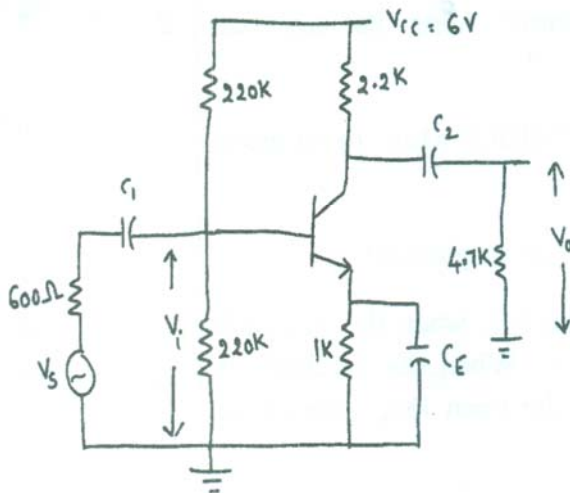
4 3 1 2

When the given input wave form is applied to the above circuit, determine the steady state output waveform.

12. a) Explain in detail about the frequency response of a Common emitter amplifier?

4 2 2 1

b)



Given data

$$g_m = 40 \text{ mS}$$

$$r_{\pi} = r_{b'e} = h_{ie} = 2.5 \text{ k}\Omega$$

$$r_x, r_{bb'} = 100 \Omega$$

$$r_{\mu}, r_{b'c} \rightarrow \infty$$

$$r_o = r_{ce} = 139 \text{ k}\Omega$$

4 4 2 2

Find the Q-point, A_v, R_i, R_o, A_{vs} for the given circuit by assuming the amplifier operating in midband frequency.

13. a) Identify feedback topology in the emitter follower circuit. Calculate expressions for input, output impedance and voltage gain with feedback.

4 3 3 1,2

b) An amplifier with negative feedback has a voltage gain of 120. It is found that without feedback an input signal of 60mV is required to produce a particular output, whereas with feedback the input signal must be 0.5V to get same output. Find A_v and β of the amplifier.

4 3 3 1

14. a) Derive the expression for frequency of oscillations in a Hartley Oscillator?

4 1 4 1,2

b) In a Hartley Oscillator $L_1=15\text{mH}$, $C=50\text{pF}$ and frequency of oscillations is 168kHz. Calculate the value of L_2

4 3 4 2

i) If the mutual inductance between L_1 and L_2 is $5\mu\text{H}$.

ii) If the mutual inductance between L_1 and L_2 is zero.

15. a)	Explain with neat circuit diagram, the working of a Class-A power amplifier with resistive load.	4	2	5	1,2
b)	Prove that in a transformer coupled Class-A Power amplifier the maximum efficiency is 50%	4	2	5	1,2
16. a)	<p>The diagram shows a clipper circuit. The input terminal is on the left, with an upward arrow labeled V_i. The circuit starts with a diode D_1 pointing towards the right, followed by a $10k\Omega$ resistor. After this resistor, the circuit splits into two parallel branches. The first branch contains a $10k\Omega$ resistor. The second branch contains a diode D_2 pointing towards the left, in series with a $10V$ DC source (positive terminal up). Both branches recombine at the output terminal on the right, which has a downward arrow labeled V_o.</p>	4	3	1	2
<p>For the given clipper circuit shown in above if the input voltage $V_i(t) = 50\sin\omega t$ is applied. Calculate and plot</p>					
<p>i) Transfer characteristics ii) Input and output waveforms on the same time scale.</p>					
b)	Draw the equivalent small signal model for BJT in CE configurations at low and high frequency. Also write significance of each parameter.	4	3	2	1,2
17.	Answer any <i>two</i> of the following:				
a)	Draw a feedback amplifier in block diagram form. Identify each block, and state its function.	4	1	3	1
b)	Explain the operation of Wien bridge Oscillator? Mention its advantages over RC Phase shift oscillator?	4	2	4	1,2
c)	Explain how to eliminate Cross over distortion in audio power amplifier?	4	2	5	1,2

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%
