(273)

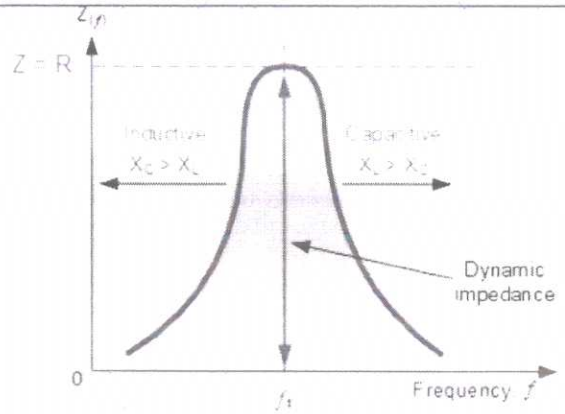
(9)

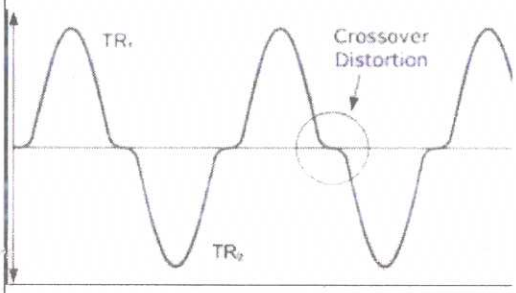
Scoring Indicators

ELECTRONIC CIRCUITS

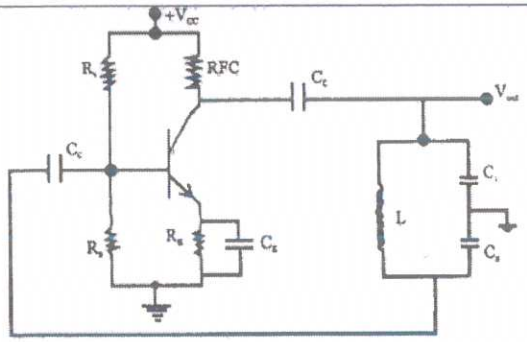
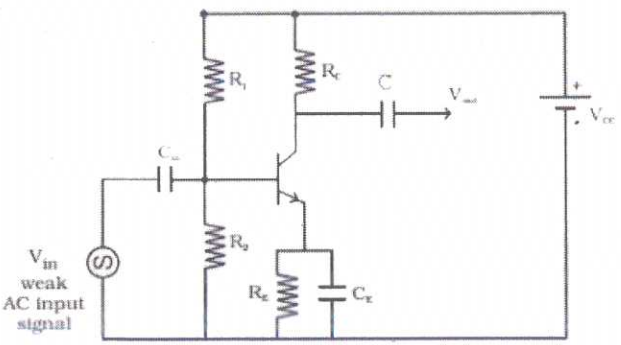
3043 (21)

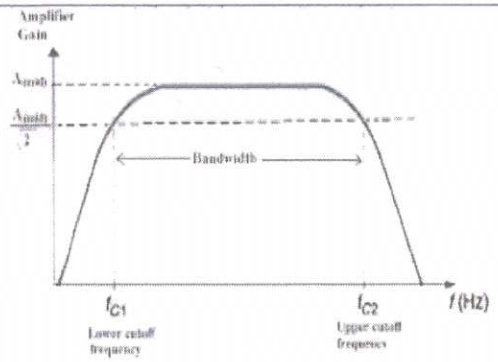
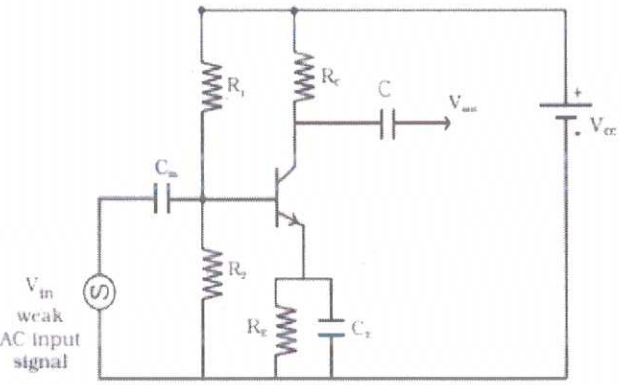
Q No	Scoring Indicators	Split score	Sub Total	Total score
	PART A			**9**
I. 1	Q point is the value of DC current and voltage when the transistor is under no signal condition.		1	
I. 2	It means the amplitude of the input signal is raised.		1	
I. 3	RF applications.		1	
I. 4	Middle of the load line or active region.		1	
I. 5	It is the fraction of the output that is fed back to the input.		1	
I. 6	Piezoelectric		1	
I. 7	RC phase shift,Wein Bridge		1	
I. 8	A duty cycle is the ratio of time a circuit is ON compared to the time it is OFF. D=Ton/(Ton+Toff)		1	
I. 9	η= RB1/(RB1+RB2)		1	
	PART B			24
II. 1	Transistor Biasing is the process of setting a transistors DC operating voltage or current conditions for perfect amplification.	1.5	3	
	Biasing is needed to fix the operating point in the required region for perfect amplification.	1.5		
II. 2	20dB=20 log 10(Vout/Vin) 1= log 10(Vout/Vin) (Vout/Vin)=10 Vout=10x1=10V	1*3	3	
II. 3		2	3	

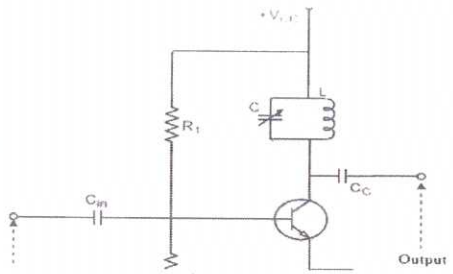
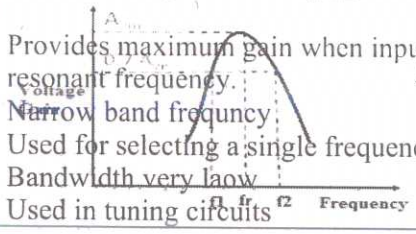
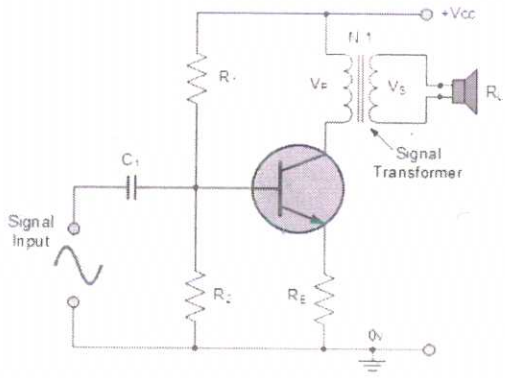
<table>
<tr><td></td><td> 

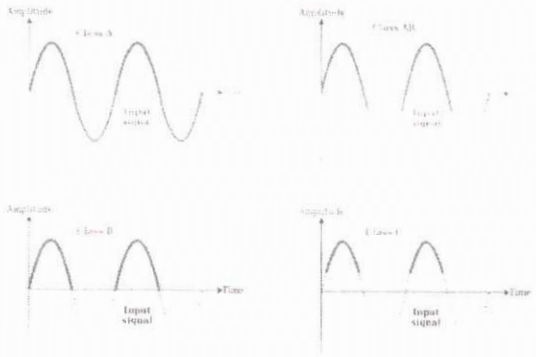
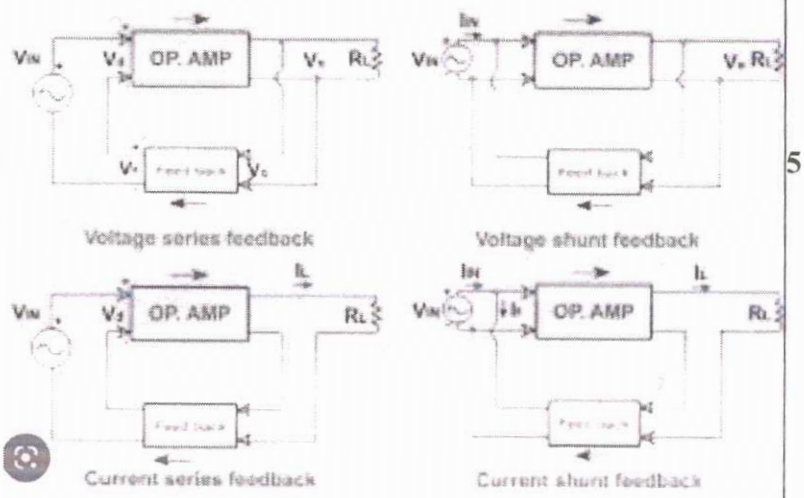
fr = 1/ (2 √LC)</td><td></td><td></td><td></td></tr>
<tr><td>II. 4</td><td>Crossover distortion is a type of distortion which is caused by switching between devices driving a load. It is most commonly seen in complementary, or "push-pull", Class-B amplifier stages.
 
</td><td>1.5

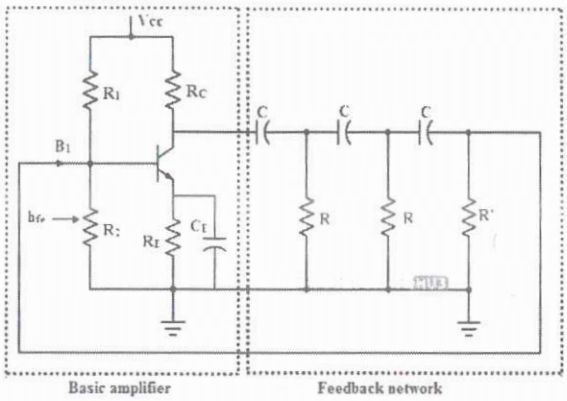
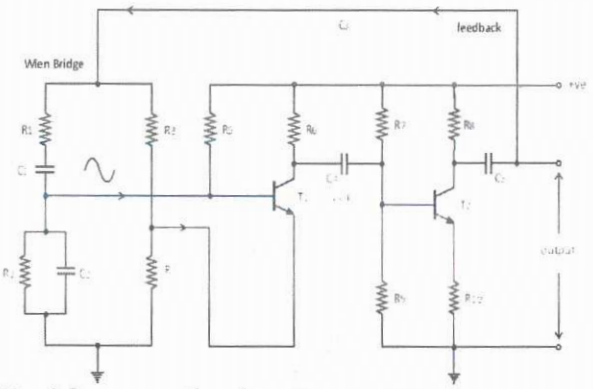
1.5</td><td>3</td><td></td></tr>
<tr><td>II. 5</td><td><table>
<tr><td>Voltage amplifier</td><td>Tuned amplifier</td></tr>
<tr><td>Used to increase the voltage level of the input circuits</td><td>Used to increase the voltage level of the input circuits at a single frequency</td></tr>
<tr><td>Bandwidth is high</td><td>Narrow bandwidth</td></tr>
<tr><td>Used for a wide range of frequencies</td><td>Used for selecting a single frequency</td></tr>
<tr><td></td><td></td></tr>
</table>.</td><td>1*3</td><td>3</td><td></td></tr>
<tr><td>II. 6</td><td>The negative feedback in amplifiers causes:
Reduced the gain and increases the stability.
Increases the bandwidth to maintain constant gain-bandwidth product.
Reduces the distortion and noise in the amplifier</td><td>3</td><td>3</td><td></td></tr>
<tr><td>II. 7</td><td></td><td>3</td><td>3</td><td></td></tr>
</table>

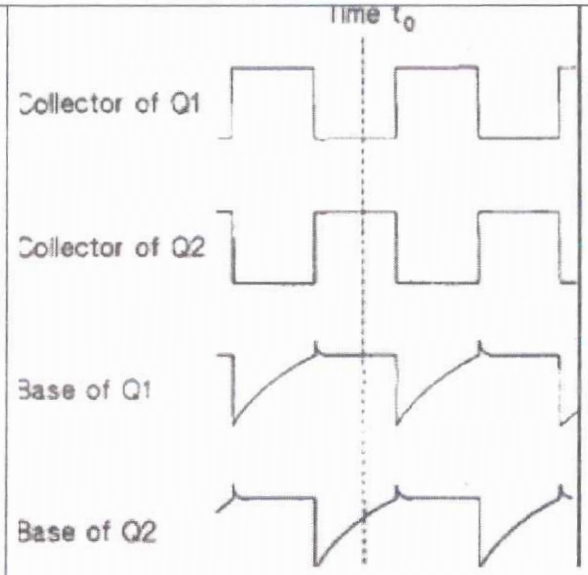
				
II. 8	To generate square waves. Used in timing circuits. In flashlights Analog circuits.	1*3	3	
II.9	T=1.38RC TON=TOFF TON=0.69RC =1.38*100*10^{-6}*33*10^{3}=4555*10^{6} F=1/T=2.19*10^{3}Hz	3	3	
II.10	UTP stands for upper triggering poi LTP stands for upper triggering point when the input is higher than a certain chosen threshold (UTP), the output is low. When the input is below a threshold (LTP), the output is high; when the input is between the two, the output retains its current value.		1.5 1.5	3
	PART C			42
1		3 3	3	7

	 $BW=f_{c2}-f_{c1}$	1		
2	 At low frequencies coupling capacitors offer high impedance and reduce gain. At high frequencies coupling capacitors offer low impedance and reduce gain.	4 3	3	7

3	  Provides maximum gain when input frequency is equal to resonant frequency. Narrow band frequncy. Used for selecting a single frequency Bandwidth very laow Used in tuning circuits	3 1 3	7	7
4	 The maximum power will be transferred to the load by the power amplifier if its impedance will be same as the impedance of the loud speaker.For maximum power transfer impedance of the amplifier must match the impedance of the amplifier.	3 4	7	7

5	 Class A Operating point in the middle of load line Currrent flows for complete input cycle Class B Operating point in the cut off region of load line Currrent flows for 180⁰ of input cycle Class C Operating point in the deep cot off region of load line Currrent flows for less than 180⁰ of input cycle	4 3*1	7 3	7 7
6	Types of negative feedback exist: Voltage series, Voltage shunt, Current series and Current shunt.  	2 5	7	7

7	 F=1/2πR sqrt6*C=2KHz Let C=0.01μF R=1/(2π*2*1000*0.01*10^{6} *sqrt6) =1.3*10^{9} ohm	3 4	7	7
8	 Used for generating low frequencies. Two amplifiers required The output of the second stage goes to the feedback section.the voltage across the parallel section given to the input of the first stage.The net phase shift is 0 F=1/(1/2πR sqrt($_{R1C1R2C2}$)	4 3	4	7
9		4 3	7	7



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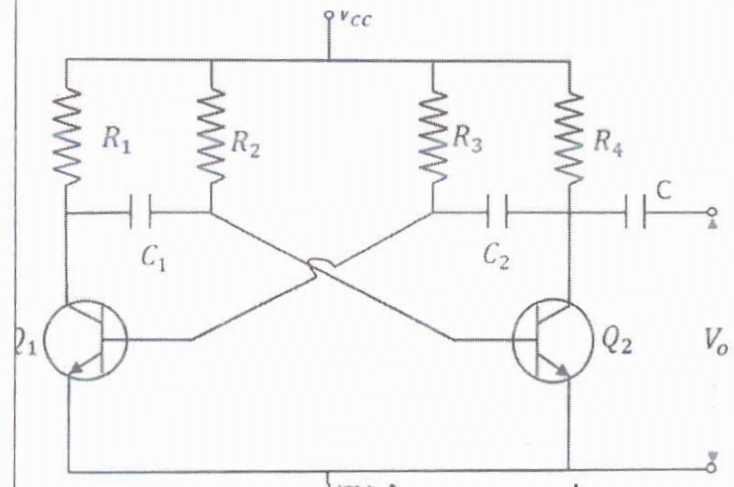

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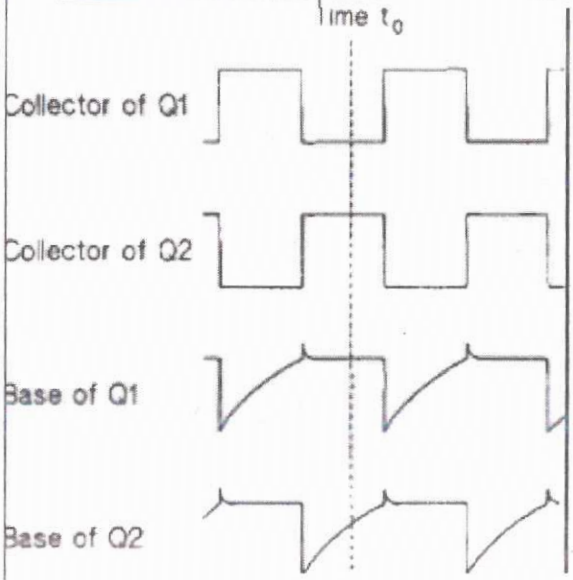
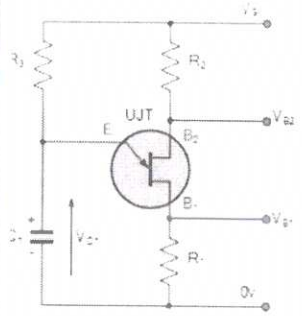


1.5

1.5

7

7

12	 T=RCln(1/(1-η) η =0.6 Let C=0.1μF T=1msec= RCln(1/(1-η)) R=10.9K	3 4	7	7