SRM VALLIAMMAI ENGINEERING COLLEGE

(An Autonomous Institution)

SRM Nagar, Kattankulathur – 603 203

DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION ENGINEERING
Common to
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
DEPARTMENT OF MEDICAL ELECTRONICS

QUESTION BANK

III SEMESTER

EI3361 - ELECTRONIC DEVICES AND CIRCUITS

Regulation – 2023

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SUBJECT : EI3361 –ELECTRONIC DEVICES AND CIRCUITS

SEM / YEAR: III / II

UNIT I - PN JUNCTION DEVICES

PN junction diode – Structure, Operation and V-I characteristics, Diffusion and Transition capacitance - Rectifiers – Half Wave and Full Wave Rectifier – Zener diode - Zener Reverse characteristics – Zener diode as voltage regulator - Display devices- LED, Laser diodes, Photo diode.

PART – A

Q.No	Questions	COs	BT Level	Competence
1.	What is transition capacitance and diffusion capacitance?	**CO1**	**BTL-1**	Remember
2.	What is rectifier and list its types?	**CO1**	**BTL-1**	Remember
3.	Summarize the two types of junction capacitances.	**CO1**	**BTL-2**	Understand
4.	Assess the term hole current in PN diode?	**CO1**	**BTL-2**	Understand
5.	Define depletion region.	**CO1**	**BTL-1**	Remember
6.	Examine the current components in a PN diode.	**CO1**	**BTL-2**	Understand
7.	Differentiate between avalanche breakdown & Zener breakdown.	**CO1**	**BTL-2**	Understand
8.	A 6.2V Zener diode has a resistance of 20 Ohms. Calculate the terminal voltage when the current is 20 mA?	**CO1**	**BTL-2**	Understand
9.	List out the factors on which barrier potential depends.	**CO1**	**BTL-1**	Remember
10.	Give the drawback of Zener Voltage Regulator.	**CO1**	**BTL-2**	Understand
11.	Discuss about the working principle of Laser diodes**.**	**CO1**	**BTL-2**	Understand
12.	Label the structure of PN Junction diode**.**	**CO1**	**BTL-1**	Remember
13.	Show the expressions of RMS current & ripple factor for bridge rectifier.	**CO1**	**BTL-2**	Understand
14.	Mention some of the applications of laser diode.	**CO1**	**BTL-1**	Remember
15.	Choose few applications of zener diode.	**CO1**	**BTL-1**	Remember
16.	A silicon diode has a saturation current 7.5µA at room temperature 300k.Find the saturation current at 400k.	**CO1**	**BTL-2**	Understand
17.	List out the applications of LEDs.	**CO1**	**BTL-1**	Remember

18.	Compare N-type impurity and P-type impurity in a semiconductor.	**CO1**	**BTL-2**	Understand
19.	Define the term transition capacitance C_T of a PN diode.	**CO1**	**BTL-1**	Remember
20.	Formulate on form factor and peak factor of rectifier circuits.	**CO1**	**BTL-1**	Remember
21.	Discuss the effect of temperature on semiconductor.	**CO1**	**BTL-2**	Understand
22.	Draw the VI characteristics of PN junction diode.	**CO1**	**BTL-2**	Understand
23.	List out the importance of peak inverse voltage?	**CO1**	**BTL-1**	Remember
24.	What are the advantages of bridge rectifier over centre tapped Counterpart?	**CO1**	**BTL-1**	Remember
	PART-B			
1.	**(i)** Draw the circuit diagram and explain the working principle of full wave rectifier**. (8)** **(ii)**Derive the expression for ripple factor, voltage, PIV, transformer Utilization Factor**. (8)**	**CO1**	**BTL-3**	Apply
2.	Derive the expression for diffusion capacitance of PN junction diode. **(16)**	**CO1**	**BTL4**	Analyze
3.	Derive the expression of the Space charge or transition capacitance of PN diode under reverse bias with a neat diagram. **(16)**	**CO1**	**BTL4**	Analyze
4.	Explain the working principle of a Half wave rectifier and its various parameters. **(16)**	**CO1**	**BTL4**	Analyze
5.	With neat sketch explain the construction, operation, and its characteristics of PN junction diode. **(16)**	**CO1**	**BTL-3**	Apply
6.	Explain the construction and working of full wave rectifier with neat diagram**. (16)**	**CO1**	**BTL4**	Analyze
7.	Describe the action of a full wave bridge rectifier using diodes and give waveforms of input and output voltages. **(16)**	**CO1**	**BTL-3**	Apply
8.	Briefly describe about the following **(i)** Laser Diode (**8)** **(ii)** LED. **(8)**	**CO1**	**BTL4**	Analyze
9.	Explain the working, advantages, and applications of Light Emitting Diodes. **(16)**	**CO1**	**BTL-3**	Apply
10.	**(i**) Examine the construction and working principle of Zener diode with a neat sketch. **(8)** **(ii)** Explain how Zener diode can be acts as a voltage regulator. **(8)**	**CO1**	**BTL4**	Analyze
11.	Make use of a diagram, explain the working of Zener diode and its Characteristics. **(16)**	**CO1**	**BTL-3**	Apply
12.	Derive the expression for a ripple factor in a half wave bridge rectifier with resistive load. **(16)**	**CO1**	**BTL-4**	Analyze
13.	Derive the expression for a ripple factor in a full wave bridge rectifier with resistive load. **(16)**	**CO1**	**BTL-4**	Analyze
14.	Explain the construction and working of different types of Display Devices with neat diagram**. (16)**	**CO1**	**BTL-3**	Apply

15.	Write short notes on **(i)** Break down voltage **(8)** **(ii)** Knee voltage **(8)**	**CO1**	**BTL-3**	Apply
16.	Explain the term **(i)** static and dynamic resistance (**6)** **(ii)** junction resistance **(6)** **(iii)** reverse resistance of the diode **(4)**	**CO1**	**BTL-3**	Apply
17.	Explain the following term in a PN junction diode. **(i)** Maximum forward current (**5)** **(ii)** Peak inverse voltage **(6)** **(iii)** Maximum power rating. **(5)**	**CO1**	**BTL-3**	Apply

UNIT II - BJT AND SMALL SIGNAL AMPLIFIERS

BJT - structure, operation of NPN and PNP transistor, Input and output characteristics of CE, CB and CC configurations. Two port Devices and Hybrid Model of BJT for CE, CB and CC configurations - small signal model – Analysis of CE, CB, CC amplifiers.

PART – A

Q.No	Questions	COs	BT Level	Competence
1.	Define early effect.	**CO2**	**BTL-1**	Remember
2.	Determine the base current of CE transistor Circuit if I_c =80 mA and β=170.	**CO2**	**BTL-2**	Understand
3.	How does a transistor act as a switch?	**CO2**	**BTL-1**	Remember
4.	A transistor has a typical β of 100.If the collector current is 40 mA, calculate is the value of emitter current?	**CO2**	**BTL-2**	Understand
5.	What is meant by biasing?	**CO2**	**BTL-1**	Remember
6.	List the transistor parameters.	**CO2**	**BTL-2**	Understand
7.	Write the relationship between α and β.	**CO2**	**BTL-2**	Understand
8.	Express the operation of NPN and PNP Transistor.	**CO2**	**BTL-2**	Understand
9.	Give the input and output characteristics of a transistor in CB configuration.	**CO2**	**BTL-1**	Remember
10.	Draw the diode equivalent model of a transistor.	**CO2**	**BTL-2**	Understand
11.	What is Thermal runaway in transistors and mention how it can be	**CO2**	**BTL-2**	Understand
12.	Draw the Hybrid pi model for CE configuration.	**CO2**	**BTL-1**	Remember
13.	Mention the benefits of h parameters.	**CO2**	**BTL-2**	Understand
14.	Write the conversion formula of h parameter from CE to CB.	**CO2**	**BTL 2**	Understand
15.	Why BJT is called as current controlled device?	**CO2**	**BTL-2**	Understand
16.	A BJT has a base current of 200μA. Determine the collector current and β.	**CO2**	**BTL-1**	Remember
17.	Give the relationship between currents in NPN transistor.	**CO2**	**BTL-2**	Understand
18.	Find the value of β if a transistor has α = 0.97. Also find α if β=200.	**CO2**	**BTL-1**	Remember
19.	What is high level injection effect?	**CO2**	**BTL-1**	Remember
20.	Explain about multi emitter transistor.	**CO2**	**BTL-2**	Understand
21.	Name the three possible connections in transistors.	**CO2**	**BTL-1**	Remember
22.	Draw the symbol of PNP and NPN transistor.	**CO2**	**BTL-2**	Understand
23.	Define current amplification factor.	**CO2**	**BTL-2**	Understand
24.	What are the advantages of hybrid models?	**CO2**	**BTL-1**	Remember

PART – B

1.	Explain the configurations and the principle of operation of BJT. **(16)**	**CO2**	**BTL-3**	Apply
2.	(i) Describe the input and output characteristics of a transistor in CC configuration. **(10)** (ii) Derive the relationship among α, β, γ. **(6)**	**CO2**	**BTL-4**	Analyze
3.	With neat diagram explain the input and output characteristics of a transistor in CE configuration. **(16)**	**CO2**	**BTL-4**	Analyze
4.	(i) The reverse leakage current of a transistor when connected in CB configuration is 0.2 μA and it is 18 μA when the same transistor is connected in CE configuration calculate α, β**. (9)** (ii) Describe early effect with relevant expressions and diagram. **(7)**	**CO2**	**BTL-2**	Understand
5.	Explain the construction and operation of CB configuration with neat sketch. **(16)**	**CO2**	**BTL-4**	Analyze
6.	Explain the construction and operation. **(i)** NPN transistor. **(8)** **(ii)** PNP transistor. **(8)**	**CO2**	**BTL-4**	Analyze
7.	Explain the following and determine the stability factor for each case. **(16)** **(i)** Fixed bias **(ii)** Collector to base bias **(iii)** Voltage divider bias.	**CO2**	**BTL-3**	Apply
8.	(i) Justify transistor as an amplifier. **(8)** (ii) Compare and contrast between CE, CB and CC configurations. **(8)**	**CO2**	**BTL-3**	Apply
9.	(i) The reverse leakage current of a transistor when connected in CB configuration is 0.2 μA and it is 18 μA when the same transistor is connected in CE configuration calculate α, β**. (8)** (ii) Describe early effect with relevant expressions and diagram. **(8)**	**CO2**	**BTL-4**	Analyze
10.	Describe hybrid parameters for all three configurations and relations between them. **(16)**	**CO2**	**BTL-3**	Apply
11.	Explain the construction and operation of CE configuration with neat sketch. **(16)**	**CO2**	**BTL-3**	Apply
12.	Explain the construction and operation of CB configuration with neat sketch. **(16)**	**CO2**	**BTL-4**	Analyze
13.	Design a voltage divider bias circuit for transistor to establish the quiescent point at V_{CE} =12V, I_C =1.5Ma, Stability factor S≤ 3, β =50, V_{BE}=0.7V, V_{CC} = 22.5V and R_C=5.6 KΩ. **(16)**	**CO2**	**BTL-3**	Apply
14.	Describe the input and output characteristics of a transistor in CE configuration. **(16)**	**CO2**	**BTL-4**	Analyze
15.	(i) Analyze the working mechanism of CB configuration of BJT. **(8)** (ii) Distinguish between h and π model. **(8)**	**CO2**	**BTL-4**	Analyze
16.	Asses the operation of various types of configurations of BJT with neat diagram. **(16)**	**CO2**	**BTL-3**	Apply
17.	Given an NPN transistor for which α=0.98, Ico =2 μA and I_{EO}=1.6 μA. A common emitter connection is used and Vcc=12V and R_L=40 kΩ.What is the minimum base current required in order that transistor enter in to saturation region. **(16)**	**CO2**	**BTL-4**	Analyze
UNIT III - FIELD EFFECT TRANSISTORS AND THYRISTORS				

JFET, MOSFET and IGBT - Structure, operation and characteristics - FET small signal model - Analysis of CS, CG and CD amplifier. Thyristor - SCR operation and characteristics, UJT - operation and characteristics.

PART – A

Q.No	Questions	COs	BT Level	Competence
1.	Compare BJT and FET.	**CO2**	**BTL-2**	Understand
2.	Measure the value of ideal voltage gain for a certain JFET has a	**CO2**	**BTL-2**	Understand
3.	Evaluate the value of Transconductance. When VGS of a FET	**CO2**	**BTL-2**	Understand
4.	Define the term pinch off voltage of MOSFET.	**CO2**	**BTL-1**	Remember
5.	Demonstrate the concept of operating point with suitable graph.	**CO2**	**BTL-2**	Understand
6.	What are the different types of power MOSFET?	**CO2**	**BTL-2**	Understand
7.	Design a basic circuit for an operation of enhancement type MOSFET.	**CO2**	**BTL-1**	Remember
8.	Differentiate the between the IGBT and MOSFET.	**CO2**	**BTL-2**	Understand
9.	Show how an SCR can be triggered on by the application of a pulse to gate terminal.	**CO2**	**BTL 2**	Understand
10.	Give the VI characteristics of SCR.	**CO2**	**BTL-2**	Understand
11.	Draw the symbol of IGBT.	**CO2**	**BTL-1**	Remember
12.	Draw the two-transistor equivalent circuit of SCR.	**CO2**	**BTL-2**	Understand
13.	What is break over voltage of SCR?	**CO2**	**BTL-1**	Remember
14.	List few applications for thyristors.	**CO2**	**BTL-1**	Remember
15.	Distinguish the latching current & holding current.	**CO2**	**BTL-2**	Understand
16.	Compare the merits and demerits of IGBT.	**CO2**	**BTL-1**	Remember
17.	Write down the applications of IGBT?	**CO2**	**BTL-2**	Understand
18.	Illustrate the need of snubber circuit.	**CO2**	**BTL-2**	Understand
19.	Name the three possible connections in transistors.	**CO2**	**BTL-1**	Remember
20.	Draw the symbol of P- channel and N- channel MOSFET.	**CO3**	**BTL 2**	Understand
21.	Define negative resistance region in UJT.	**CO3**	**BTL 1**	Remember
22.	What are the advantages of UJT?	**CO3**	**BTL 2**	Understand
23.	Draw the structure of UJT.	**CO3**	**BTL 2**	Understand
24.	Write about the intrinsic standoff ratio of a UJT.	**CO3**	**BTL 1**	Remember

PART – B

1.	Show the construction and operation of MOSFET with neat diagram. **(16)**	**CO2**	**BTL-3**	Apply
2.	Explain the construction and working of **(i)** N-channel JFET. **(8)** **(ii)** P-channel JFET. **(8)**	**CO2**	**BTL-4**	Analyze
3.	**(i)** Explain the construction and working of Depletion mode MOSFET. **(8)** (ii) Enhancement mode MOSFET. **(8)**	**CO2**	**BTL-4**	Analyze
4.	Describe with circuit IGBT static I-V, transfer and turn–on and turn–off characteristics. .**(16)**	**CO2**	**BTL-2**	Understand

5.	Discuss the operation of thyristor with the help of its static V-I characteristics. **(16)**	**CO2**	**BTL-4**	Analyze
6.	Compare and contrast the performance characteristics of SCR and MOSFET. **(16)**	**CO2**	**BTL-4**	Analyze
7.	Explain the basic construction and equivalent circuit of a UJT and briefly explain the device operation. **(16)**	**CO2**	**BTL-3**	Apply
8.	Show the four-layer construction of SCR and two transistor equivalent circuit and explain the device operation. **(16)**	**CO2**	**BTL-3**	Apply
9.	Describe the working principle of SCR and its VI characteristics. **(16)**	**CO2**	**BTL-4**	Analyze
10.	With neat sketch explain the turn on and turn off characteristic of SCR. **(16)**	**CO2**	**BTL-3**	Apply
11.	Explain the construction and working of IGBT with neat diagram. **(16)**	**CO2**	**BTL-3**	Apply
12.	Describe the construction and working principle of DIAC with neat sketches. **(16)**	**CO2**	**BTL-4**	Analyze
13.	Take part in discussion about the working of thyristor and two transistor analogy of a thyristor in detail. **(16)**	**CO2**	**BTL-3**	Apply
14.	Describe the construction and working principle of UJT with neat sketches. **(16)**	**CO2**	**BTL-4**	Analyze
15.	Describe the UJT triggering circuit with neat sketch. **(16)**	**CO2**	**BTL-4**	Analyze
16.	**(i)** Describe the operation of UJT as a relaxation oscillator. **(8)** **(ii)** Derive its frequency of oscillation. **(8)**	**CO2**	**BTL-3**	Apply
17.	Draw and explain the steady state and switching characteristics of SCR. **(16)**	**CO2**	**BTL-4**	Analyze

UNIT IV- DIFFERENTIAL AMPLIFIER AND POWER AMPLIFIERS

Differential amplifier – Common mode and Difference mode analysis – FET input stages – Single tuned amplifiers – Gain and frequency response –Power amplifiers Types: - Class A, B, AB and C Power amplifiers- Push-Pull amplifiers (Qualitative analysis only).

PART – A

Q.No	Questions	COs	BT Level	Competence
1.	Define a common mode rejection ratio for a differential amplifier. What is the value of CMRR for ideal cases?	**CO4**	**BTL 1**	Remember
2.	CMRR of an amplifier is 100 dB, estimate common mode gain, if the differential gain is 1000.	**CO4**	**BTL 2**	Understand
3.	A multistage amplifier employs 5 stages each of which has a power gain of 30.What is the total gain of the amplifier in dB?	**CO4**	**BTL 1**	Remember
4.	Model the ideal tuned circuit and write the expression for its resonant frequency.	**CO4**	**BTL 2**	Understand
5.	Discuss the need for cascading the amplifiers.	**CO4**	**BTL 1**	Remember
6.	Why neutralization is important? And give its types.	**CO4**	**BTL 1**	Remember
7.	Define differential mode signals of a differential amplifier.	**CO4**	**BTL 1**	Remember
8.	Construct a Differential amplifier and what is the ideal value of CMRR?	**CO4**	**BTL 2**	Understand
9.	Outline the need for constant current source for difference amplifier.	**CO4**	**BTL 2**	Understand

10.	Compare the performance of various power amplifier types.	**CO4**		
11.	Classify amplifiers according to the input.	**CO4**	**BTL 2**	Understand
12.	Summarize the advantages and performance of class-c amplifier.	**CO4**	**BTL 2**	Understand
13.	Define conversion efficiency of power amplifier.	**CO4**	**BTL 1**	Remember
14.	Distinguish common mode and difference mode.	**CO4**	**BTL 2**	Understand
15.	Take part in discussing the term cross over distortion.	**CO4**	**BTL 1**	Remember
16.	Compare gain and frequency.	**CO4**	**BTL 1**	Remember
17.	Assess the frequency response of double tuned amplifier for coupling coefficient=1,k>1,k<1.	**CO4**	**BTL 2**	Understand
18.	Discuss the need for complementary symmetry amplifier.	**CO4**	**BTL 1**	Remember
19.	Write the advantages of push pull amplifier.	**CO4**	**BTL 2**	Understand
20.	A single tuned amplifier is tuned to receive the single at 650 kHz with bandwidth of 10 kHz. Design the loaded quality factor of the tuned amplifier.	**CO4**	**BTL 2**	Understand
21.	What is meant by differential amplifier?	**CO4**	**BTL 1**	Remember
22.	List out the importance of CMRR?	**CO4**	**BTL 2**	Understand
23.	Define output offset voltage.	**CO4**	**BTL 1**	Remember
24.	Define input offset current.	**CO4**	**BTL 1**	Remember
	PART – B			
1.	Design the circuit diagram of a single tuned amplifier and explain it working in detail. **(16)**	**CO4**	**BTL 4**	Analyze
2.	Draw a differential amplifier and its equivalent circuit. Derive for A_d and A_c. **(16)**	**CO4**	**BTL 3**	Apply
3.	**(i)** Explain the working of class-C power amplifier with diagrams. **(8)** **(ii)** Derive the expression for efficiency of the class-C power amplifier. **(8)**	**CO4**	**BTL 4**	Analyze
4.	Describe the complementary symmetry (class B) push pull amplifier in detail. **(16)**	**CO4**	**BTL 4**	Analyze
5.	What is neutralization? Explain any two methods in brief. **(16)**	**CO4**	**BTL 4**	Analyze
6.	With neat diagram, explain the emitter coupled BJT differential amplifier, and express differential gain, common mode gain and CMRR. **(16)**	**CO4**	**BTL 4**	Analyze
7.	With neat sketch explain two stage cascaded amplifier and analyze its overall A_v, A_t, R_t *and* R_o. **(16)**	**CO4**	**BTL 3**	Apply
8.	**(i)**Explain the working of transformer coupled class-A power amplifier with diagrams. **(8)** **(ii)**Derive the expression for efficiency of the class-A power amplifier. **(8)**	**CO4**	**BTL 4**	Analyze
9.	**(i)**Classify the power amplifiers and calculate the efficiency for various types of power amplifiers. **(10)** **(ii)** List the characteristics of power amplifiers. **(6)**	**CO4**	**BTL 4**	Analyze
10.	Describe the working principle of single tuned amplifier with neat circuit diagram. **(16)**	**CO4**	**BTL 3**	Apply
11.	Describe the common mode and differential mode analysis of differential amplifier using FET and determine its CMRR**. (16)**	**CO4**	**BTL 4**	Analyze

12.	Examine the common mode and differential mode analysis of differential amplifier and determine its CMRR. **(16)**	**CO4**	**BTL 3**	Apply
13.	With neat diagram, describe the working of a differential amplifier using FET. **(16)**	**CO4**	**BTL 3**	Apply
14.	Discuss the operation of class AB amplifier to avoid cross over distortion with neat diagram. **(16)**	**CO4**	**BTL 3**	Apply
15.	Discuss about the AC analysis of differential amplifier. **(16)**	**CO4**	**BTL 3**	Apply
16.	Describe about the different coupling schemes in amplifiers. **(16)**	**CO4**	**BTL 4**	Analyze
17.	Explain in detailed about the RC coupled amplifiers. **(16)**	**CO4**	**BTL 4**	Analyze

UNIT V - FEEDBACK AMPLIFIERS AND OSCILLATORS

Advantages of Negative feedback – voltage / current, Series, Shunt feedback –Positive feedback – Condition for oscillations, RC Phase shift, Wien bridge, Hartley, Colpitts and Crystal oscillators.

PART –A

Q.No	Questions	COs	BT Level	Competence
1.	The overall gain of a multistage amplifier is 140.When negative voltage feedback is applied the gain is reduced to 17.5. Find the fraction of the output that is feedback to the input.	**CO5**	**BTL 1**	Remember
2.	Assess the two Barkhausen conditions required for sinusoidal oscillation to be sustained.	**CO5**	**BTL 2**	Understand
3.	A tuned circuit has a resonant frequency of 1600 kHz and a bandwidth of 10 kHz. What is the value of its Q factor?	**CO5**	**BTL 1**	Remember
4.	List the disadvantages of negative feedback in amplifiers and how it can be overcome?	**CO5**	**BTL 1**	Remember
5.	Show the expression for the frequency of oscillations of a in RC phase shift oscillator.	**CO5**	**BTL 2**	Understand
6.	An amplifier has a current gain of 240 and input impedance of 15KΩ without feedback. If negative current feedback (current attenuation = 0.015) is applied, what will be the input impedance of the amplifier?	**CO5**	**BTL 1**	Remember
7.	What is the advantage of a Colpitts oscillator compared to a phase shift oscillator?	**CO5**	**BTL 2**	Understand
8.	Which is the most used feedback arrangement in cascaded amplifier and why?	**CO5**	**BTL 1**	Remember
9.	Which type of feedback circuit increases gain of an amplifier?	**CO5**	**BTL 1**	Remember
10.	Outline the advantages of crystal oscillator.	**CO5**	**BTL 2**	Understand
11.	Discuss about Nyquist's stability criteria for feedback amplifiers.	**CO5**	**BTL 2**	Understand
12.	Develop the oscillator model which uses both positive and negative feedback? Why?	**CO5**	**BTL 1**	Remember
13.	Determine the operating frequency of transistor Hartley oscillator if L1=50μH, L2=1mH, and mutual inductance between the coils M=10 μH and C=10pF.	**CO5**	**BTL 2**	Understand
14.	Point out the five characteristics of an amplifier which are modified by negative feedback.	**CO5**	**BTL 1**	Remember
15.	List out the advantages of RC phase shift oscillator.	**CO5**	**BTL 1**	Remember

16.	Analyze the effects on bandwidth and output impedance due to various types of feedback.	**CO5**	**BTL 2**	Understand
17.	Illustrate the expression for frequency of oscillation of a Wein bridge oscillator.	**CO5**	**BTL 1**	Remember
18.	Distinguish between negative and positive feedback.	**CO5**	**BTL 2**	Understand
19.	Discuss the limitations of LC and RC oscillators.	**CO5**	**BTL 2**	Understand
20.	A Wein bridge oscillator is used for operating at f_0 =10KHz. If the value of R is 100Ω. Design the value of capacitor.	**CO5**	**BTL 1**	Remember
21.	What is the effect of lower cut off frequency with negative feedback?	**CO5**	**BTL 1**	Remember
22.	What are the essential for oscillator?	**CO5**	**BTL 2**	Understand
23.	What are the draw backs of phase shift oscillators?	**CO5**	**BTL 2**	Understand
24.	Mention any two high frequency LC oscillator.	**CO5**	**BTL 2**	Understand
	PART – B			
1.	With neat block diagram, explain the operation of following feedback amplifiers. **(i)** Voltage series feedback amplifier. **(8)** **(ii)** Current shunt feedback amplifier. **(8)**	**CO5**	**BTL 4**	Analyze
2.	**(i)**Explain with neat circuit diagram, the working of Hartley oscillator using transistor. **(8)** **(ii)**Derive an expression for frequency of oscillation. **(8)**	**CO5**	**BTL 4**	Analyze
3.	**(i)** With neat diagram explain Wien – Bridge oscillator. **(8)** **(ii)** Derive an expression for frequency of oscillation. **(8)**	**CO5**	**BTL 3**	Apply
4.	Illustrate the CE amplifier with voltage shunt- feedback with neat diagram. **(16)**	**CO5**	**BTL 3**	Apply
5.	Illustrate the circuit of CE amplifier with current series feedback and obtain the expression for feedback ratio, voltage gain, input resistances and output resistances. **(16)**	**CO5**	**BTL 3**	Apply
6.	(**i)** Explain the operation of Colpitts Oscillator with neat diagram. **(8)** **(ii)** Derive the expressions for the frequency of oscillation and the condition for maintenance of oscillation. **(8)**	**CO5**	**BTL 4**	Analyze
7.	Explain the construction and working of crystal oscillator with neat diagram. **(16)**	**CO5**	**BTL 4**	Analyze
8.	Explain the construction and working of Hartley oscillator with neat diagram. .**(16)**	**CO5**	**BTL 4**	Analyze
9.	Design a Colpitts oscillator with C_1 = 100pf and C_2 = 7500pf. The inductance is variable. Determine the range of inductance values, if the frequency of oscillation is to vary between 950 KHz and 2050 KHz. **(16)**	**CO5**	**BTL 3**	Apply
10.	Sketch a circuit diagram of a two-stage capacitor coupled BJT amplifier that uses series voltage negative feedback. .**(16)**	**CO5**	**BTL 4**	Analyze
11.	Explain the working of a phase shift oscillator. Discuss its advantages and Disadvantages. .**(16)**	**CO5**	**BTL 3**	Apply

12.	Explain the operation of current series feedback amplifier and derive its expression for **(i)**Input resistance **(5)** **(ii)**Output resistance **(6)** **(iii)**Voltage gain **(3)** **(iv)**Feedback ratio **(2)**	**CO5**	**BTL 4**	Analyze
13.	Describe about the basic concept of feedback and explain about the positive feedback. **(16)**	**CO5**	**BTL 3**	Apply
14.	Discuss the advantages of negative current feedback on the Performance of amplifiers. **(16)**	**CO5**	**BTL 4**	Analyze
15.	State and briefly explain barkhausen criteria for oscillation. **(16)**	**CO5**	**BTL 4**	Analyze
16.	Explain the operation of tank circuit with neat diagram. **(16)**	**CO5**	**BTL 4**	Analyze
17.	Differentiate oscillator with the amplifiers. **(16)**	**CO5**	**BTL 3**	Apply