BHARATHIDASAN ENGINEERING COLLEGE
FREQUENTLY ASKED QUESTIONS

YEAR/SEM : II / III
NAME OF THE SUBJECT : EC 3301 ELECTRON DEVICES AND CIRCUITS
NAME OF THE FACULTY : Ms. B.POONKUZHALI A.P/EEE

UNIT I

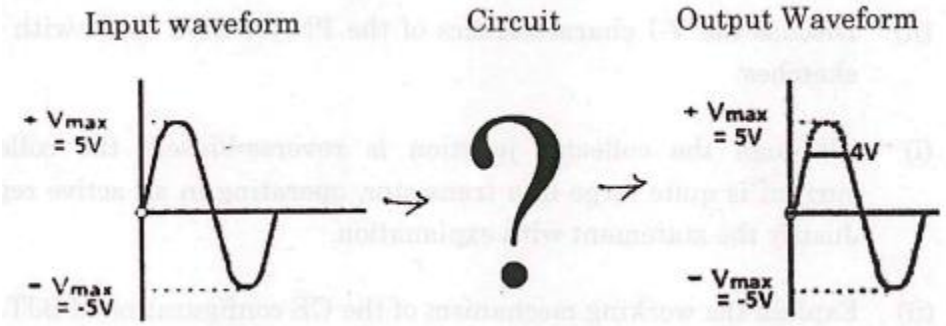
PN JUNCTION DEVICES

PN junction diode –structure, operation and V-I characteristics, diffusion and transition capacitance — Clipping & Clamping circuits - Rectifiers – Half Wave and Full Wave Rectifier– Display devices- LED, Laser diodes, Zener diode characteristics- Zener diode Reverse characteristics — Zener diode as regulator.

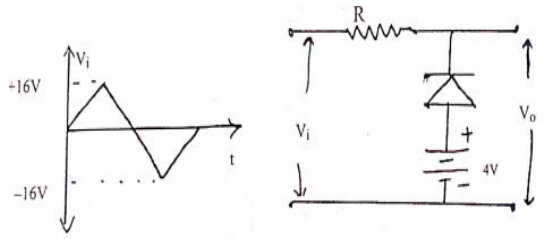
PART – A

1. What is meant by diffusion current in a semiconductor?
2. Define diffusion capacitance and transition capacitance **(NOV/DEC 20,21)**
3. Write the temperature dependence of reverse saturation current of PN junction diode.
4. Draw characteristics curve for LED **(NOV/DEC 2021)**
5. Compare between half wave and full wave rectifiers.
6. What is peak inverse voltage?
7. What are the applications of LED?
8. Mention any two advantages of LED. **(NOV/DEC 2022)**
9. What is LED? Draw its symbol.
10. What is LED? Which material is used for LED
11. Define diffusion capacitance and transition capacitance.
12. Mention the advantage of bridge rectifier over full wave rectifier
13. Why Si is preferred over Ge in the manufacture of semiconductor devices?
14. What are the static resistance and dynamic resistance of a diode.
15. What is the effect of junction temperature on cut-in voltage of a PN diode?
16. Differentiate between breakdown voltage and PIV of a PN diode.
17. Differentiate avalanche and zener breakdowns
18. List the necessity use of filters in rectifiers**.(APRIL/MAY 23)**
19. List some applications of zener diode. **(NOV/DEC 2022)**

20. Define LASER. Write Applications of laser diode. **(A/M 2019) (NOV/DEC 2020)**
21. Define Zener diode.
22. What is meant by depletion region?
23. List the necessity to use filter in conjunction with rectifiers. **(APRIL/MAY 2023)**
24. Differentiate LED and Laser.
25. Identify the diode circuit to get the following output wave form from the given input. **(APRIL/MAY 2023)**



26. Determine the peak output voltage of an half wave rectifier if the diode has VF=0.7V and AC input is 22V **(APRIL/MAY 2019)**
27. Determine the V_0 for the network shown. **(A/M 24)**



28. What is the condition for laser action **(A/M 24)**

PART-B

1. With a neat diagram explain the working of a PN junction diode in forward bias and reverse bias and show the effect of temperature on its V-I characteristics.**(A/M 2023,24) (N/D20, 2022)**
2. Briefly explain about the PN junction capacitances. **(A/M 24,5m)**
3. Explain the Operation and V-I characteristics of zener diode **(A/M 2019 &2010,24)**
4. Draw the circuit diagram and explain the working of full wave bridge rectifier and drive expression for average output current and rectification efficiency. **(A/M 2019 ,2010)**
5. Define full wave rectifier. With neat circuit diagrams and waveforms, Derive an

expression for a ripple factor in full wave rectifiers the load is resistive **(N/D 2022) (A/M 2023)**

6. Explain the operation of Zener diode as voltage regulator . **(NOV/DEC 2020, 2022) (A/M 2023,24)**
7. Explain the working of Bridge rectifier. Give the expressions for RMS current, PIV, ripple factor and efficiency.
8. Explain the drift and diffusion current for a semiconductor**. (NOV/DEC 2019, 2011)**
9. Discuss the working principle, characteristics and applications of LED in detail**.(N/D 2020&2019)**
10. Briefly discuss about the following : Laser diode and V-I characteristics **(Nov/Dec 2021)** (ii) switching characteristics of pn junction diode
11. Over what range of input voltage will the zener in a voltage regulator in circuit maintain 30V across 2000Ω load, assuming that series resistance R = 2000 Ω and zener current rating is 25 mA? **(NOV/DEC 2017)**
12. What value of series resistor is required to limit the current through a LED to 20 mA with a forward voltage drop of 1.6V when connected to a 10V supply? **(NOV/DEC 2017)**
13. Discuss briefly about following (i)LED **(NOV/DEC 2020**)
14. Determine the forward voltage and forward current for the PN junction diode shown in Figure (b) for both ideal model (by taking VF = 0V) and for practical model (by taking VF = 0.7V). Also determine the voltage across the limiting resistor in each case. Assume d r' = 10Ω at the determined value of forward current. **(NOV/DEC 2021)**
15. In a center taped full wave rectifier the load resistance R_L=1K Ω each diode as a forward bias dynamic resistance of 10 Ω find the voltage across of half the secondary winding is 220sin314t. find
    (i) The peak value of current
    (ii) The DC or average value of current
    (iii) The RMS value of current
    (iv) The ripple factor and
    (v) The rectification efficiency. **(NOV/DEC 2022)**
16. Elucidate the mechanism of avalanche and zener breakdown. **(APRIL/MAY 2023)**
17. Analyze biasing clipper and clamper circuits with neat sketch. **(APRIL/MAY 2023)**

UNIT II

TRANSISTORS AND THYRISTORS

BJT, JFET, MOSFET- structure, operation, characteristics and Biasing
UJT, Thyristors and IGBT - Structure and characteristics.

PART-A

1. Draw the input and output characteristics of a transistor in CE configuration and mark the cut off, saturation and active regions.**(APR/MAY 2010)**
2. Compare JFET & BJT, IGBT Vs MOSFET, JFET Vs MOSFET**(NOV/DEC 2022)**
3. Define α, ß and γ of the transistor and mention the relationship of the terms. **(A/M 24)**
4. Define early effect**. (NOV/DEC 2022)**
5. Define amplification factor of JFET
6. Calculate β of a transistor when α=0.98
7. Differentiate between Enhancement and Depletion MOSFET.**(A/M 24)**
8. Among CE, CB &CC configurations, which one is the most popular? Why?
9. Define pinch off voltage of a FET.
10. The transistor has IE 10 mA and α=0.98. Find the values of base and collector currents. **(NOV/DEC 2022)**
11. Recall the biasing arrangement for an NPN transistor to operate in the cut-off and saturation region. **(APRIL/MAY 2023)**
12. Define intrinsic standoff ratio of UJT.**(APRIL/MAY 2023)**
13. Define Base Width modulation.
14. Why collector region is larger than emitter region in BJT?
15. In a BJT, the emitter current is 12mA and the emitter current is 1.02times the collector current. Find the base current.
16. Determine the emitter current for the transistor circuit if Ic = 80mA and beta = 170.
17. Calculate the drain current for self-bias an N channel JFET with I_{Dss} = 40mA, Vp= -10v and V_{GS} = -5V.
18. Write the relationship between base current, emitter current and collector current in CB Configuration.
19. Mention the disadvantages of FET compared to BJT. **(NOV/DEC 2012)**
20. Define pinch off voltage of JFET. **(APR/MAY 2013)**

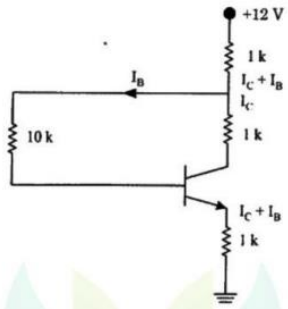
21. Define Transistor. Why transistor called a current controlled device?
22. If the base current in a transistor is 30μA and the emitter current is 7.2mA.What are the values of α, β and Ic?
23. What are the important features of FET? **(NOV/DEC 2009)**
24. A unijunction transistor has rB1 = 4 KΩ and rB2 = 2.5 KΩ. Find the value of intrinsic stand-off ratio and the peak-point voltage, if VBB = 15 V and the barrier potential is 0.7 V**(N/D 2019)**
25. What is MOSFET? What are the types of MOSFET?
26. Mention application of UJT**.(APR/MAY 2012)**
27. What are thyristors? Mention two of them.
28. What is meant by negative resistance region of UJT? **(N/D2021)**
29. What are the requirements for biasing circuits? **(NOV/DEC2021)**
30. Give some advantages of MOSFET. **(NOV/DEC2020)**

PART-B

1. Describe the static input and output characteristics of a CB transistor with neat circuit diagram. (13) **(NOV/DEC 2010,2020)**
2. Explain the structure, operation and VI characteristics of BJT**.(A/M 24)**
3. With a neat diagram explain any two biasing techniques used for biasing a transistor. **(NOV/DEC 2022,2022)**
4. Explain the construction and operation of N channel JFET with neat sketches and characteristics curve. Also explain the three distinct regions of the output characteristics.
5. Derive the expression for current gain, input impedance and voltage gain of a CE Transistor Amplifier. **(NOV/DEC 2010,2020) (APRIL/MAY 2023)**
6. Explain and derive the voltage and current gain expressions for CB configuration using hybrid models. **(A/M 24)**
7. Although the collector junction is reverse-biased the collector current is quite large in transistor, operating in an active region. Justify the statement with explanation. **(APRIL/MAY 2023)**
8. Explain the negative resistance characteristics of the uni junction transistor with neat sketches. **(APRIL/MAY 2023)**
9. Explain how the trans conductance of a JFET varies with drain current and gate voltage

characteristics and transfer characteristics **(APRIL/MAY 2023)**

10. Explain the working of n channel enhancement type MOSFET. Sketch its typical characteristics**. (APR/MAY 2015, 2010) (NOV/DEC 2009,2011 2022)**
11. Draw the small signal equivalent circuit of MOSFET common drain amplifier and derive the expression for voltage gain, input impedance and output impedances.**(A/M 24)**
12. Describe the operation of UJT and its emitter characteristics. **(A/M 2010,24N/D 2011)**
13. Explain various biasing methods used in FET & BJT.
14. Describe the construction operation and V-I characteristic of SCR with neat diagram(N/D 2012) **(NOV/DEC 2022)**
15. Describe construction details about IGBT. **(NOV/DEC2019,A/M 24)** .
16. Compare IGBT & BJT.
17. Compare CE, CB and CC configuration of BJT(5) **(MAY JUNE 2014)**
18. (i) Draw the hybrid π model of BJT and obtain expression for various parameters(13)
    (ii) Compare BJT and power transistor **(MAY JUNE 2014)**
19. Construction and working of opto couplers **(APRIL/MAY 2015)**
20. Brief about the transistor switching characteristics **(APRIL/MAY 2015)**
21. Describe the construction & working of UJT with its equivalent circuit & VI characteristics (NOV/DEC2020) (APRIL/MAY 2015) **(NOV/DEC 2022)**
22. In an transistor amplifier using voltage divider bias, the operating point is chosen such that Ic = 2mA, V_{CE} = 3V. If Rc = 2.2 kΩ, Vcc = 9V and β=50. Find the values of bias resistors and Re. Assume Vbe = 0.3V and current through the bias resistors is 10 I_B. **(NOV / DEC 2017)**
23. A transistor having α=0.99 and VBE=0.7V, is given in the circuit, find the value of the collector current. **(NOV/DEC 2022)**



UNIT III

AMPLIFIERS

9

BJT small signal model – Analysis of CE, CB, CC amplifiers- Gain and frequency response –MOSFET small signal model– Analysis of CS and Source follower — Gain and frequency response- High frequency analysis.

PART-A

1. What is the function of bypass capacitor in an amplifier circuit?
2. What is emitter follower ? The transistor has IE 10 mA and α=0.98. find the values of base and collector currents. **(NOV/DEC 2022)**
3. Why bypass and coupling capacitors are used in amplifier circuits? **(A/M 24)**
4. Why harmonic distortion occurs in amplifier and how it reduced. **(A/M 24)**
5. Define the four H-parameters and its limitations. (NOV /DEC2014)
6. Write down the characteristics of CE&CC amplifier. (APR/ MAY 2011)
7. What is meant by latching SCR (NOV/DEC 2019)
8. what is emitter follower. **(NOV/DEC 2022)**
9. What is the significance of small signal amplifier? .**(APRIL/MAY 2023,**2010, 2015)
10. Based on the transistor configuration how amplifiers are classified. (NOV/DEC 2013)
11. Write the Hybrid parameters equation for transistor amplifier? (NOV/DEC 2013)
12. Draw a CE amplifier & its hybrid equivalent circuit.
13. Which amplifier is called as voltage follower? Why?
14. What are the salient features of hybrid parameters?
15. Define the frequency response of Amplifier?
16. Write a note on effects of coupling capacitor on the bandwidth of the amplifier .**(APRIL/MAY 2023)**
17. Draw the drain characteristics of FET and mark operating region Compare BJT and FET
18. .For an amplifier, mid band gain= 100 and lower cut off frequency is 1kHz. Find the gain of an amplifier A_r frequency of 20 Hz
19. Draw the small signal equivalent circuit of CE amplifier. **(N/D 2021**)
20. Why NPN transistor has a better high frequency response than the PNP transistor? *(*NOV /DEC 21)
21. NPN common emitter amplifier circuit has the following parameter hfe=50 hie=1Ω and

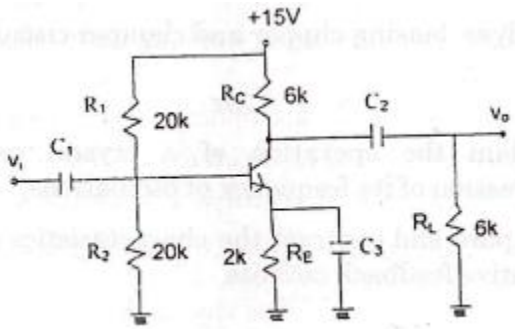
rc=3.3kΩ find the voltage gain of the amplifier**.(N/D 2019)**

22. Draw the hybrid π model of CE configuration **(NOV /DEC 2020)**
23. Mention the condition for proper amplification of a signal. **NOV /DEC 2020**

PART-B

1. Derive the expressions for the following of a small signal transistor amplifier in terms of the h-parameters
    a. current gain
    b. voltage gain
    c. input impedance
    d. output admittance
2. Compare CB, CE and CC amplifiers
3. Explain how the transconductance of a JFET varies with drain current and gate voltage characteristics and transfer characteristics. A JFET has the following parameters IDDS = -32mA,VGS(off) = - 8V , VGS = - 4.5V . Find the values of drain current. (APR/ MAY 2010, 2011)
4. Explain the working of n channel MOSFET, thus obtain the VI characteristics and what is the significance of pinch off voltage. **(APR/MAY 2015, 2010,2011,NOV/ DEC 2010)**
5. Define the *h*-parameters of a Transistor in a small signal Amplifier? What are the benefits of *h*-parameters? **(APR/ MAY 2013,NOV/DEC 2011)**
6. In a single-stage CE Transistor Amplifier, R_S = 1 kΩ and R_L = 1.2 kΩ, using h_{fe} = 50, h_{oe} = 25 × 10^{-6}A/V, h_{re} = 2.5 × 10^{-4}, h_{ie} = 1100 Ω, find A_I, A_V, Z_i and Z_o.
7. In a single-stage CE Transistor Amplifier R_S = 1 kΩ, R_1 = 50 kΩ, R_2 = 2 kΩ, R_C = 1 kΩ, R_L = 1.2 kΩ, h_{fe} = 50 and h_{ie} = 1.1 kΩ. Find A_I, R_i, R_o and voltage gain.
8. Draw the circuit of CE Transistor Amplifier and its equivalent circuit. Discuss its characteristics**. (MAY/JUNE 2013) (NOV/DEC 2022,21)**
9. Draw the circuit diagram of Emitter follower and its equivalent circuit and derive the expression for voltage gain.
10. Draw the circuit of CB Transistor Amplifier and its *h*-parameter equivalent circuit. Discuss the characteristics of CB Amplifier**. (NOV/DEC 2013)**
11. Compare the CC and CE configurations with respect to R_i, R_o, A_V and A_I.

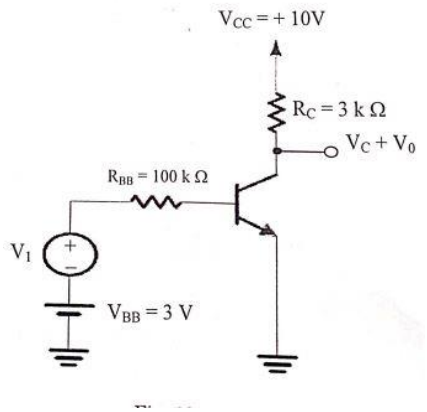
12. Describe the operation of common drain FET amplifier and derive the equation for voltage gain. (12) **(NOV/DEC 2013)**
13. In the common drain FET amplifier. Evaluate the voltage gain (4) (NOV/DEC 2013) **(NOV/DEC 2022)**
14. Using the low frequency hybrid model, obtain the expression for voltage gain, current gain, input impedance, and output impedance for CE configuration. **(APRIL/MAY 2023)**
15. The transistor in the amplifier circuit shown has h-parameters hie=2k Ω and hfe=80. The value of hoe and hre are negligible. Calculate the voltage gain and input impedance of Z_i(amp) of the amplifier. Capacitors C_1, C_2 and C_3 may be assumed short at signal frequency due to small impednces. **(APRIL/MAY 2023)**



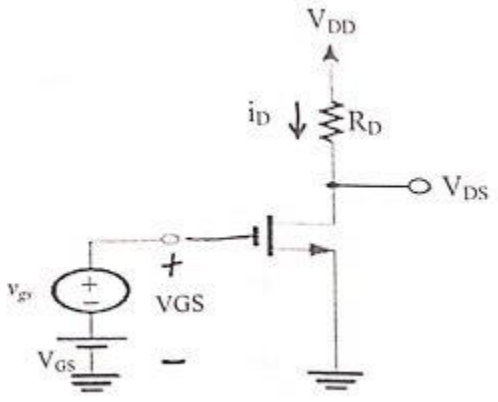
16. Explain the high frequency analysis of the CS amplifier. **(APRIL/MAY 2023)**
17. Compare CS, CD and CG amplifiers. **(APRIL/MAY 2023)**
18. Derive the expression for the voltage gain of
    i. Common source amplifier **NOV / DEC 2019**
    ii. Common drain amplifier configurations, under small signal low frequency condition
19. Prove that Darlington amplifier offers very high input impedance and its significance. **(A/M 2015)**
20. For CS amplifier, the operating point is defined by V_{gsq}=-2.5V, V_p=-6V and I_{dq}=2.5mA with I_{dss}=8mA. Also R_g=1MΩ,R_s=1KΩ,R_d=2.2KΩ and V_{dd}= 15V, calculate g_m,r_d,Z_i,Z_o and A_v . (NOV / DEC 2014)
21. What is the significance of Darlington pair connections(6)
22. Cascade amplifier have high bandwidth. Validate this statement suitably**.(MAY/JUNE 2014)**
23. Draw the small signal equivalent circuit of Common Source Amplifier operated at high

frequency and explain. Derive the expression for the voltage gain of the CS amplifier. **(NOV / DEC 2021)**

24. Draw the small signal equivalent model for Common collector amplifier constructed using BJT and derive the expression for current gain, voltage gain, input resistance and output resistance. **(NOV / DEC 2021)**
25. Find the mid band gain AM and the upper 3db frequency fH of a CS (common source) amplifier fed with a signal source having an internal resistance Rsig = 100 KΩ. The amplifier has RG 4.7 MΩ, RD = RL = 15 KΩ, gm = 1 mA/V, ro = 150 KΩ, Cgs = 1 pF, Cgd = 0.4 pF**. (NOV / DEC 2020)**
26. Analyze and determine I_C, I_B and dc voltage at the collector of transistor amplifier circuit shown.



27. Consider the amplifier circuit shown, The FET is specified to have V_1=0.4 V, k_n'=0.4mA/V^2, W/L=10, and λ=0 . Also, let V_{DD}=1.8V , R_D=17.5kΩ and V_{GS}=0.6V. Find I_D and V_{DS}.



UNIT IV

MULTISTAGE AMPLIFIERS AND DIFFERENTIAL AMPLIFIER

BIMOS cascade amplifier, Differential amplifier – Common mode and Difference mode analysis – FET input stages – Single tuned amplifiers – Gain and frequency response – Neutralization methods, power amplifiers –Types (Qualitative analysis).

PART-A

1. Name the types of feedback amplifiers.
2. State two advantages and two disadvantages of single tuned amplifiers.**(A/M 24)**
3. What are the coupling schemes used in multistage amplifiers. **(A/M 24)**
4. State piezo-electric effect. **(MAY/JUNE-2013)**
5. Mention the types of feedback amplifier connections. **(NOV/DEC2013)**
6. Define CMRR of a differential amplifier**(MAY/JUN 2014) (NOV/DEC 2022)**
7. List the factors that affects the stability of amplifiers**(NOV/ DEC 2014**)
8. Write down the need of cascading the amplifiers**. (NOV/ DEC 2014)**
9. Compare voltage amplifier with power amplifier. .**(APRIL/MAY 2023)**
10. What is CMMR list the various methods of improving CMRR.(**NOV/ DEC 2014)**
11. Define CMRR and write its significance in the differential amplifiers. **(APR/MAY 2010)**
12. Write the role of Darlington pair. **(NOV/DEC 2022)**
13. An amplifier has a current gain of 240 and input impedance of 15 kΩ without feedback. If negative current feedback (Current attenuation = 0.015) is applied, what will be the input impedance of the amplifier? **(NOV/DEC 2017)**
14. Determine the input impedance of a differential amplifier(emitter coupled) with RB=3.9kΩ and ZB=2.4kΩ **(APR/MAY 2019)**
15. Why negative feedback is employed in high gain amplifiers?
16. What are the cascaded amplifiers? **(APR/MAY 2015)**
17. Mention the need for a coupling capacitor in amplifier circuits**. (NOV/DEC 2021)**
18. What is meant by neutralization? **(NOV/DEC 2021)**
19. Enumerate the need for neutralization**. (NOV/DEC 2020)**
20. What is common mode rejection ratio**? (NOV/DEC 2020)**
21. A single tuned amplifier provides a bandwidth of 10kHz at a frequency of 1MHz. find the circuit**. (APR/MAY 2019)**

PART-B

1. Draw the circuit diagram of an emitter coupled BJT differential amplifier and derive the expressions for differential gain, common mode gain, CMRR, input impedance and output impedance. (**APR/MAY 2019,24) (NOV/DEC 2022)**
2. Explain the basic principle of tuned amplifiers using MOSFET and derive the expression for its centre frequency gain. Also discuss their characteristics and losses.**(A/M 24)**
3. Explain the general characteristics of negative feedback amplifier in Voltage series, Voltage shunt, Current series, Current shunt feedback connections diagrammatically.(16) **(NOV/DEC 2013)**
4. Derive expressions for differential gain, common mode gain, CMRR, input impedance and output impedance for a differential amplifier. (MAY/JUNE 2013).
5. A Harley oscillator is designed with L1 = 2mH, L2 = 20µH and a variable capacitance. Determine the range of capacitance value if the frequency of oscillation is varied between 950 to 2050 KHZ.(15)
6. Deduce expression for emitter current in a differential amplifier under large signal operation**. APR/MAY 2019**
7. Illustrate the behaviour of MOSFET based amplifier circuit with tuned load also deduce expression for voltage gain at center frequency Q and bandwidth. **APR/MAY 2019**
8. With neat circuit diagram and relevant equations, explain the working of a differential amplifier. Also derive the expression for single ended AC voltage gain of the circuit. **(NOV/DEC 2021)**
9. With neat diagrams, elucidate the construction, operation and frequency response characteristics of a single tuned amplifier. Also mention why potential instability occur in tuned amplifiers? (NOV/DEC 2021) **(APRIL/MAY 2023)**
10. Explain the working of differential amplifier and calculate its gain. **(NOV/DEC 2020)**
11. Discuss about BiMOS cascade amplifier. Draw the circuit diagram of an emitter coupled BJT differential amplifier and derive the expressions for differential gain, common mode gain, CMRR, input impedance and output impedance. APR/MAY 2019 (MAY/JUNE 2013) **(NOV/DEC 2022)**
12. Explain the general characteristics of negative feedback amplifier in Voltage series, Voltage shunt, Current series, Current shunt feedback connections diagrammatically.**(**

NOV/DEC 2013)

13. Derive expressions for differential gain, common mode gain, CMRR, input impedance and output impedance for a differential amplifier. **(MAY/JUNE 2013).**
14. A Harley oscillator is designed with L1 = 2mH, L2 = 20μH and a variable capacitance. Determine the range of capacitance value if the frequency of oscillation is varied between 950 to 2050 KHZ.(15)
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18. With neat diagrams, elucidate the construction, operation and frequency response characteristics of a single tuned amplifier. Also mention why potential instability occur in tuned amplifiers? **(NOV/DEC 2021) (APRIL/MAY 2023)**
19. Explain the working of differential amplifier and calculate its gain. **(NOV/DEC 2020)**
20. Discuss about BiMOS cascade amplifier**. (NOV/DEC 2020)**
21. What is differential amplifiers? Explain its working. **(APRIL/MAY 2023)**
22. Describe the working of class A and class B power amplifier in detailed with relevant diagram. **(NOV/DEC 2022)**
23. Analyse the effect of connecting a CB transistor to the CE amplifier on its input impedance and frequency response. **(APRIL/MAY 2023)**
24. Draw the block diagram of an ‘n’ stage cascaded amplifier and the expression for overall voltage gain. Also, determine the expression for bandwidth of a ‘n’ stage cascaded amplifier. **(APRIL/MAY 2023)**
25. Summarize the importance of a single tuned amplifier and explain its actual response.
26. (i) Write notes on frequency stability of an oscillator. (ii) A negative feedback of $\beta = 0.01$ is applied to an amplifier of gain 500. Calculate the change in overall gain of the feedback amplifier if the internal amplifier is subjected to a gain reduction of 10 %.
27. What is differential amplifiers? Explain its working. **(APRIL/MAY 2023)**
28. Describe the working of class A and class B power amplifier in detailed with relevant

diagram. **(NOV/DEC 2022)**

29. Analyse the effect of connecting a CB transistor to the CE amplifier on its input impedance and frequency response. **(APRIL/MAY 2023)**
30. Draw the block diagram of an ‘n’ stage cascaded amplifier and the expression for overall voltage gain. Also, determine the expression for bandwidth of a ‘n’ stage cascaded amplifier. **(APRIL/MAY 2023)**
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32. Write notes on frequency stability of an oscillator. (ii) A negative feedback of $\beta = 0.01$ is applied to an amplifier of gain 500. Calculate the change in overall gain of the feedback amplifier if the internal amplifier is subjected to a gain reduction of 10 %.

UNIT V

FEEDBACK AMPLIFIERS AND OSCILLATORS

Advantages of negative feedback – voltage / current, series, Shunt feedback –positive feedback – Condition for oscillations, phase shift – Wien bridge, Hartley, Colpitts and Crystal oscillators.

PART-A

1. How is a Schmitt trigger different from multi vibrator **(MAY/JUNE 2013)**
2. Define "intrinsic standoff ratio" **(NOV/DEC2013)**
3. What is meant by hysteresis in schmitt trigger? **(MAY/JUN 2014)**
4. List the applications of astable multivibrators **(NOV/ DEC 2014)**
5. Mention the effects on bandwidth and output impedance due to various types of feedback. **(NOV/DEC 2022)**
6. What is the effect of voltage series feedback on input resistance?
7. What are the advantages of negative feedback?
8. An Amplifier has a gain of 300. When negative feedback is applied, the gain is reduced to 240. Find the feedback ratio. .**(APRIL/MAY 2023)**
9. What is an oscillator?
10. In a weinbridge oscillator, if the value of resistance, R=100KΩ and the frequency of oscillation is10K Hz, find the value of capacitor. **(APRIL/MAY 2023)**
11. What is the difference between an oscillator and amplifier?
12. What is damped oscillation?
13. What is sustained oscillation?
14. Give the condition of oscillation for Hartley oscillator **(NOV/DEC 2020)**
15. Write the expression for input and output resistances of voltage series feedback amplifier? **(NOV/DEC 21)**
16. Draw the equivalent circuit of crystal oscillator. **(NOV/DEC 2021)**
17. What are the advantages of crystal oscillator? **(NOV/DEC 2012)**
18. Mention the types of feedback amplifiers. **(NOV/DEC2013,NOV/DEC 2020)**
19. List the elements used in linear and nonlinear wave shaping circuits**.(APR/MAY 2015)**
20. What is the expression for the frequency of oscillation of a wein bridge oscillator?
21. Write the drawbacks of negative feedback in amplifiers and how it can be overcome.

(APR/MAY 2019)

22. State the Barkhausen criterion for an oscillator. What will happen to the oscillation, if the magnitude of the loop is greater than unity?**(NOV/DEC 2022)(APRIL/MAY 2023,24)**
23. What is meant by positive feedback and and negatives feedback? **(A/M 24)**

PART-B

1. Draw and describe the four types of topology for feedback of an amplifier. Derive the expression for gain with feedback. Mention the advantages of negative feedback amplifier. **APR/MAY 2019**

2. With the neat diagram explain voltage series and current series amplifier. Derive the expression for transresistance gain, i/p resistance, o/p resistance and the voltage gain.**(A/M 24)**

3. Draw the circuit diagram of RC phase shift oscillator and briefly explain its working principle. Also derive for its gain.**(A/M 24)**

4. Design a shift oscillator, to oscillate at $1KH_z$**(**5m,**A/M 24)**

5. Explain the working of UJT based saw tooth oscillators. Also derive the expression for frequency of oscillation.(16) **(APR/MAY 2015,MAY/JUNE 2013,NOV/DEC 2014)**

6. With a neat diagram explain about Hartley oscillator & derive the expression for frequency of oscillation and condition of oscillation. **(NOV/DEC 2022) (APRIL/MAY 2023)**

7. With neat circuit diagram explain the operation of an RC phase shift oscillator and derive the condition for oscillation and resonant frequency with BJT. **(NOV/DEC 2012)**

8. Explain the operation of crystal oscillator with neat diagram and write the expression for its frequency of oscillation.(16) (MAY/JUNE 2012) **(APRIL/MAY 2023)**

9. Draw the circuit diagram of Schmitt trigger circuit and explain its operation with waveforms**. (NOV/ DEC 2013)**

10. With a neat circuit diagram, describe the working of a Wien bridge oscillator. Derive an expression for the resonant frequency. How output amplitude is stabilized? **(APRIL/MAY 2023)**

11. Voltage series negative feedback amplifier has a voltage gain without feedback of A = 500, input resistances (Ri) = 3KΩ, output resistance Ro = 20KΩ, and feedback ratio of β = 0.01. Calculate the voltage gain A_V, input resistance (R_{if}) and output resistance (R_{of})

of amplifier with feedback.

12. A Hartley oscillator is designed with L1 = 2mH, L2 = 20μH and a variable capacitance. Determine the range of capacitance value if the frequency of oscillation is varied between 950 to 2050 KHZ.(16)

13. Discuss the operation of Astable and one shot multi vibrator with relevant waveforms. **(APR/MAY 2015)**

14. Draw the circuit of a Colpitt's oscillator, explain its working and also derive the condition for the frequency of oscillation. . **(NOV/DEC 2021) (NOV/DEC 2022)**

15. Calculate the voltage gain, input and output impedance of a voltage series feedback amplifier with A=500, β=0.01, R_i=3KΩ, R_0=20KΩ and hfe=-0.5 impedance. **(APRIL/MAY 2023)**

16. With appropriate derivations, discuss the effects of negative feedback on gain, bandwidth, input, and output impedances. **(APRIL/MAY 2023)**

17. Compare the contrast the characteristics of positive feedback with negative feedback circuits. **(APRIL/MAY 2023)**

18. Design a phase shift oscillator using FET having gm = 5000μ S, rd = 40KΩ and feedback circuit value of R = 10KΩ. Determine the value of C, RL and RD to have the frequency of operation as 1 KHz and A>29. **(NOV/DEC 2021)**

19. Discuss about voltage series and current shunt feedback in detail. **(NOV/DEC 2020) (NOV/DEC 2022)**