**SIDDHARTH GROUP OF INSTITUTIONS :: PUTTUR**
Siddharth Nagar, Narayanavanam Road – 517583

**QUESTION BANK (DESCRIPTIVE)**

**Subject with Code :** EDC(15A04301) **Course & Branch**: B.Tech - EEE

**Year & Sem:** II-B.Tech & I-Sem **Regulation:** R15

# UNIT –I

## Junction Diode Characteristics & Special Semiconductor Diodes

1.a) Explain the forward and reverse bias characteristics of PN junction diode? 5M

b) Calculate the dynamic forward and reverse resistance of p-n junction diode when the applied voltage is 0.24V.Assume Germanium diode Io=2μA and T=300K. 5M

2. a) Write the diode equation and discuss the effect of temperature on diode current? 5M

b) The current flowing in a silicon PN diode at room temperature is 10 μA, when the large reverse bias is applied. Calculate the current flowing when 0.2v forward bias is applied? 5M

3. a) With the help of neat sketches explain the operation & characteristics of TRIAC? 5M

b) Calculate the factor by which the current will increase in silicon diode operating at a forward voltage of 0.4V when the temperature is raised from 25ºC to150ºC? 5M

4. Describe the principle of operation of and V-I characteristics of

a) Photo diode 5M

b) Unijunction transistor

5. a) Describe the V-I characteristics of SCR? 5M

b) Differentiate between tunnel diode and normal PN junction diode? 5M

6. a) Derive the expression for dynamic resistance of PN diode? 5M

b) With simple circuit explains how the zener diode acts as a voltage regulator? 5M

7. a)Write short notes on a)LED b)DIAC 5M

b) Sketch and explain the volt-ampere characteristics of a Tunnel diode. Indicate the negative Resistance portion? 5M

8.a) Draw band diagram of PN junction under open circuit conditions and explain? 5M

b) What are the general specifications of PN junction diode? 5M

9. a) With neat sketch explain principle and operation of Zener diode? 5M

b) List the features and applications of varactor diode? 5M

10.a) What are the basic applications of conventional diode and zener diode? 2M

b) Draw the symbols of UJT and Tunnel diode. 2M

c) Mention limitations of LCD. 2M

d) Define holding current? 2M

e) Draw the symbol and list characteristics of TRIAC? 2M

## UNIT II

## Rectifiers and Filters

1. Describe the operation of Half Wave Rectifier with and with out filters? 10M

2. a) Derive efficiency and Ripple Factor of half wave rectifier? 5M

b) With neat diagram explain Capacitor input filter and derive its ripple factor. 5M

3. a) Discuss working of Bridge rectifier & derive its Ripple factor and efficiency? 5M

b) Explain the operation of CLC filter and derive its ripple factor? 5M

4. Explain the operation of inductor input filter with Fullwave Rectifier? 5M

5. a) Describe the operation of center tapped full wave rectifier along with input and output waveforms? 5M

b) Compare Half Wave Rectifier, Full Wave Rectifier and Bridge rectifier? 5M

6. Explain working of π Section filter and derive the expression for ripple factor? 5M

7. a) A FWR voltage of 18vpeakis applied across a 500 μF filter capacitor. Calculate the ripple and dc voltages if the load takes a current of 100 mA? 5M

b) Describe about Multiple π-section filters? 5M

8. Explain Multiple L-section filter with neat sketch and derive its ripple factor? 10M

9. a) Draw the circuit diagram of FWR with inductor filter and explain its operation 5M

b) Compare various filter circuits in terms of its ripple factors. 5M

10. a) Define ripple factor. 2M

b) What is meant by Peak Inverse Voltage? 2M

c) Mention the necessity of Filter? 2M

d) What is the need for bleeder resistor? 2M

e) Define Surge current. 2M

## UNIT III

## Transistor Characteristics

1. With reference to a BJT, explain the following terms in detail?

a) Emitter Efficiency 4M

b) Base Transportation Factor 3M

c) Large signal current gain. 3M

2. a) Write the current components of PNP transistor and explain? 5M

b) For a transistor the leakage current is 0.1μA in CB configuration, while it is 19ma when it is connected in CE configuration. Calculate α & β of the same transistor? 5M

3. a) A transistor operating in CB configuration has IC = 2.98mA, IE = 3.00 mA and ICO =0.01 ma.What current will flow in the collector circuit of this transistor when Connected in CE configuration with a base current of 30μA? 5M

b) What is early effect? How does it modify the VI characteristics of a BJT? 5M

4. a) Describe the operation of a PNP BJT in common collector configuration? 5M

b) Draw the common collector transistor characteristics? 5M

5. a) With a neat diagram explain how a transistor acts as an amplifier? 5M

b) Explain the characteristics of CE configuration? 5M

6. Detail the construction of an n-channel MOSFET of depletion type. Draw and explain its Characteristics? 5M

7. Draw and explain construction and operation of Enhancement mode MOSFET with its Characteristics? 10M

8. a) Explain the construction and principle of operation of n-channel JFET. 5M

b) Define the JFET Volt-Ampere Characteristics. 5M

9. a) Derive Ebers-Moll Equations of BJT . 5M

b) Compare CB, CE and CC configurations of BJT. 5M

10. a) Why transistor is considered as current controlled device? 2M

b) For a transistor α is 0.99, what is β? 2M

c) What do you mean by Punch-Through or Reach-Through? 2M

d) Define rd, gm and μ of JFET. 2M

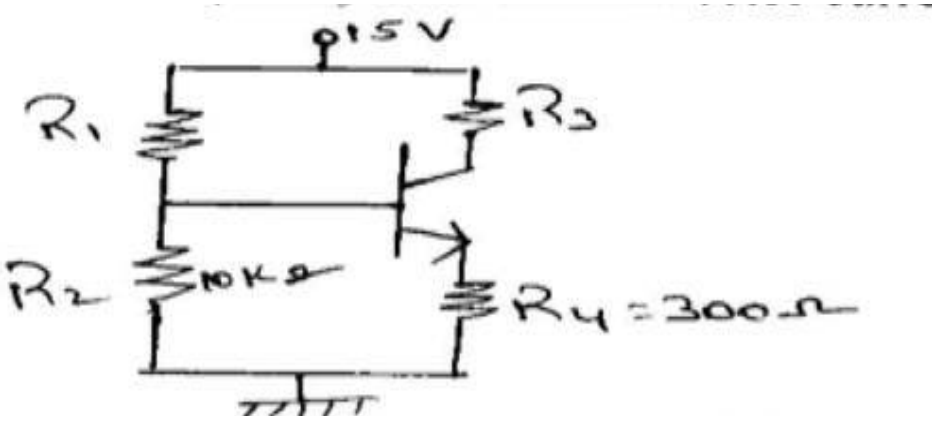
e) What do you mean by channel length modulation in MOSFET? 2M

## UNIT- IV

## Transistor Biasing and Thermal Stabilization

1. In the circuit show in figure transistor has β = 100 and VBE (active) = 0.6 V. 10M

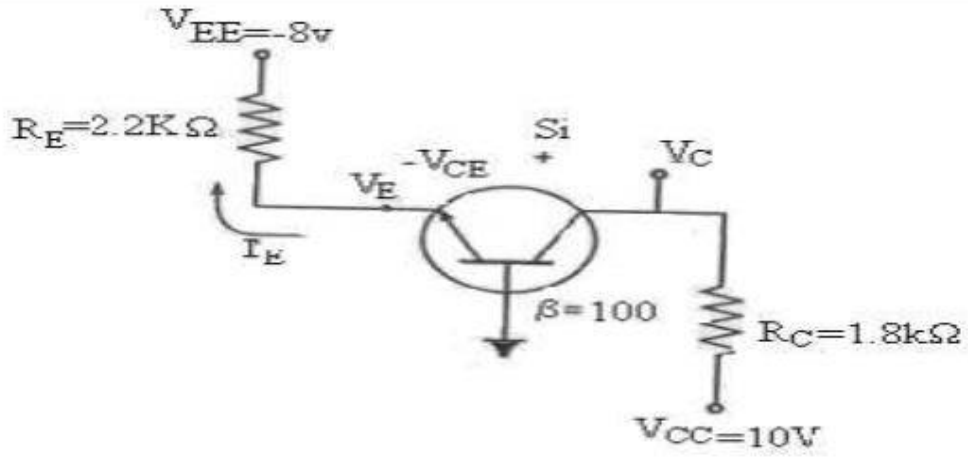
Calculate the values of R1 & R3 Such that collector current of 1 mA &VCE = 2.5 V.




2. (a)For the improvement of stability of the operating point what suggestions you would like to give for self-bias. 5M

(b) Discuss with the help of stability factors**.** 5M

3. a) For the circuit shown below, determine IE, VC and VCE. Assume VBE = 0.7 V . 5M




b) Compare the advantages and disadvantages of biasing schemes? 5M

4. a) Define thermal instability, what are the factors affecting the stability factor? 5M

b) Draw the transistor biasing circuit using fixed bias arrangement and explain its principle with suitable analysis? 5M

5. a) Explain diode compensation circuit for variation in Ic for self-bias circuit? 5M

b) How self-bias circuit will eliminate the drawbacks in fixed bias circuit ? 5M

6. a) Discuss the criteria of fixed operating point? 5M

b) What is thermal runaway? What is the condition for thermal stability in CE configuration? 5M

7. a) ) Derive the stability factor S in fixed bias circuit? What are the drawbacks of transistor fixed bias circuit? 5M

b) Derive the expression for stability factor S in self bias circuit? 5M

8. a) Discuss the stabilization in a transistor against variations in Ico, VBE and β? 5M

b) Differentiate the bias stabilization and compensation techniques? 5M

9. a) Mention the merits and demerits of collector to base feedback bias. 5M

b) Differentiate between thermistor and sensistor compensation techniques? 5M

10. a) What do you understand by DC & AC load line? 2M

b) Define operating point Q of transistor. 2M

c) Define stability factor S, S', S''. 2M

d) What are the compensation techniques used for bias stability? 2M

e) What is thermal runaway and thermal stability? 2M

## UNIT- V
## Small Signal Low Frequency Transistor Amplifier Models

1. Explain with neat sketch about analysis of CE configuration using h-parameters and derive the expressions Ai, Av, Ri, Ro? 10M

2.For a CE amplifier circuit $R_s$ = 1kΩ, $R_1$ = 50kΩ, $R_2$ = 2kΩ, $R_c$ = 1kΩ, $R_L$ = 1.2kΩ. Construct small signal equivalent model and Calculate $A_v$, $A_I$, $R_I$ and $R_I$'. 10M

3. Explain with neat sketch, analysis of CB configuration using h-parameters? 10M

4. Draw the circuit diagram of CC amplifier using hybrid parameter and derive expressions for Ai, Av, Ri, Ro? 10M

5. a) State and explain Miller's theorem with the aid of a circuit diagram. 5M

b) Discuss about the dual of Miller's theorem? 5M

6. Derive the expression for voltage gain, input and output impedance of common source amplifier? 10M

7. a) Draw the basic circuit and small signal model of Common drain FET amplifier. 5M

b) Derive the expression for input and output impedance of common drain amplifier using FET? 5M

8. a) Explain the small signal equivalent circuit of Common Gate amplifier. 5M

b) In the CS amplifier, $R_D$ = 5 kΩ, $R_G$ = 10 MΩ, $r_d$ = 35 kΩ and μ = 50. Find the voltage

gain, input impedance and output impedance. 5M

9. a) Describe simplified hybrid model of BJT in CE configuration. 5M
   b) List out the typical values of h-parameters in the three BJT configurations (CE, CB and CC). 5M
10. a) What is meant by two port network? 2M
    b) List features of hybrid parameters . 2M
    c) Draw hybrid model for CE Configuration. 2M
    d) Compare various BJT amplifiers. 2M
    e) Draw small signal model of common source amplifier. 2M

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## UNIT I
## Junction Diode Characteristics & Special Semiconductor Diodes

1.A silicon PN junction is forward biased with a constant current at room temperature. When the temperature is increased by 10ºC, the forward bias voltage across the PN junction (GATE 2011) [ ]

(a)increases by 60mV (b)decreases by 60mV
(c) increases by 25mV (d) decreases by 25mV

2. A Zener diode, when used in voltage stabilization circuits, is biased in (GATE 2011) [ ]
(a) reverse bias region below the breakdown voltage
(b) reverse breakdown region
(c) forward bias region
(d) forward bias constant current mode

3. In a forward biased pn junction diode, the sequence of events that best describes the mechanism of current flow is (GATE 2013) [ ]
(a) injection, and subsequent diffusion and recombination of minority carriers
(b) injection, and subsequent drift and generation of minority carriers
(c) extraction, and subsequent diffusion and generation of minority carriers
(d) extraction, and subsequent drift and recombination of minority carriers

4. An electrical breakdown of a p-n junction occurs if (GATE 2015) [ ]
(a) forward voltage increases up to the rating
(b) reverse voltage increases beyond the rating
(c) forward voltage decreasing below the rating
(d) reverse voltage decreases below the rating

5. In a P-N junction diode under reverse bias, the magnitude of electric field is maximum at (GATE 2015) [ ]
(a) The edge of the depletion region on the P side
(b) The edge of the depletion region on the N side
(c) The centre of the depletion region on the N side
(d) The P-N junction

6. A silicon diode is preferred to a germanium diode because of its (GATE 2015) [ ]
(a) Higher reverse current
(b) Lower reverse current and higher reverse break down voltage
(c) Higher reverse current and lower reverse break down voltage
(d) None of the above

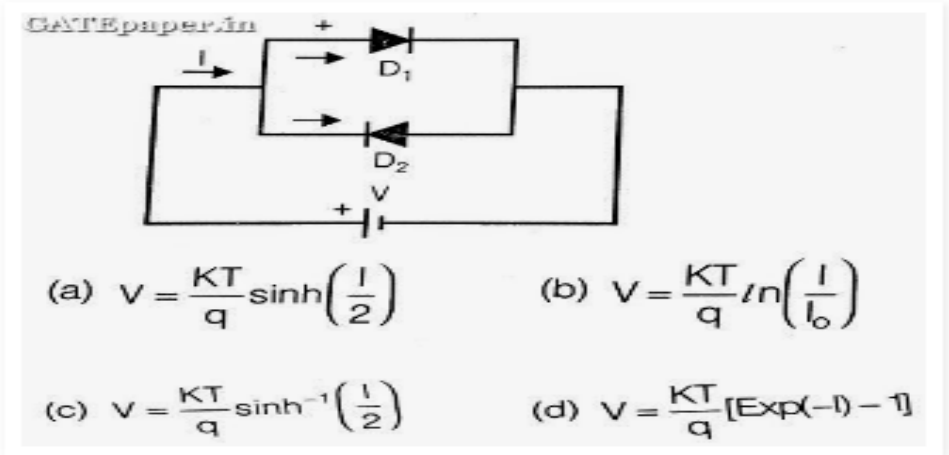
7. For forward biased diode (IES 2014) [ ]
(a) Transition capacitance is larger than diffusion capacitance
(b) Diffusion capacitance is larger than transition capacitance
(c) Both capacitances are having same value
(d) Cannot predict with certainty

8. Which of the following does not cause damage of an SCR? (IES 2014) [ ]
(a) High current (b) High rate of rise of current
(c) High temperature (d) High rate of rise of voltage

9. For the V-I characteristics of an SCR, which of the following statements are correct? (IES 2014) [ ]
1. It will trigger when the applied voltage is more than the forward break over voltage 2. Holding current is greater than latching current 3. When reverse biased, a small value of leakage current will flow 4. It can be triggered without gate current
(a) 1, 2 and 3 (b) 1, 3 and 4 (c) 1, 2 and 4 (d) 2, 3 and 4

10. The diffusion capacitance of a PN junction (GATE 1987) [ ]
(a) Decreases with increasing current and increasing temperature
(b) Decreases with decreasing current and increasing temperature
(c)Increases with increasing current and increasing temperature
(d)Does not depend on current and temperature

11. In the circuit shown below, the current voltage relationship when $D_1$ and $D_2$ are identical is given by (assume Germanium diodes) (GATE 1988) [ ]




(a) $V = \frac{KT}{q}\sinh\left(\frac{I}{2}\right)$ (b) $V = \frac{KT}{q}ln\left(\frac{I}{I_o}\right)$

(c) $V = \frac{KT}{q}\sinh^{-1}\left(\frac{I}{2}\right)$ (d) $V = \frac{KT}{q}[Exp(-I) - 1]$

12. In a Zener diode, (GATE 1989) [ ]
(a) only P-region is heavily doped
(b) only N-region is heavily doped
(c) both P and N-regions are heavily doped
(d) both P and N-regions are lightly doped

13. In a forward biased photo diode, with increase in incident light intensity, the diode current (GATE 1990) [ ]
(a) increases
(b) remains constant
(c) decreases
(d) remains constant, but the voltage drop across the diode increases.

14. A PN junction with a 100 Ω resistor is forward biased so that a current of 100 mA flows. If the voltage across this combination is instantaneously reversed to 10 volts at t = 0, the reverse current that flows through the diode at t = 0 is approximately given by (GATE 1992) [ ]
(a) 0 mA (b) 100 mA (c) 200 mA (d) 50 mA

15. An infrared LED is usually fabricated from (GATE 1992) [ ]
(a) Ge (b) Si (c) GaAs (d) GaAsP

16. The units of (q/KT) are (GATE 1998) [ ]
(a) V (b) $V^{-1}$ (c) J (d) J/K

17. For small signal ac operation, a practical forward biased diode can be modeled as (GATE 1998) [ ]
(a) Resistance and capacitance in series
(b) Ideal diode and resistance in parallel
(c) Resistance and ideal diode in series
(d) Resistance

18. N – Type silicon is obtained by doping silicon with (GATE 2003) [ ]
(a) Germanium (b) Aluminum (c) Boron (d) Phosphorous

19. The band gap of silicon at $300^0$K is (GATE 2003) [ ]
(a) 1.36 eV (b) 1.10 eV (c) 0.80 eV (d) 0.67 eV

19. The primary reason for the widespread use of silicon in semiconductor device technology is (GATE 2005) [ ]
(a) Abundance of silicon on the surface of the earth
(b) Larger band gap of silicon in comparison to germanium
(c) Favorable properties of silicon – dioxide ($S_iO_2$)
(d) Lower melting point

20. Which of the following is NOT associated with a PN junction? (GATE 2008) [ ]

(a) Junction capacitance (b) Charge storage capacitance
(c) Depletion capacitance (d) Channel length modulation

21. A Zener diode when used in voltage stabilization circuits, is biased in (GATE 2011) [ ]
(a) Reverse bias region below the breakdown voltage
(b) Reverse breakdown region
(c) Forward bias region
(d) Forward bias constant current mode

22. The value of volt equivalent of temperature at $27^0$C is [ ]
(a) 26mv (b) 36mv (c) 46mv (d) 20mv

23. The value of cut in voltage for Ge is [ ]
(a) 0.7 (b) 0.6 (c) 0.3 (d) 0.8

24. The main reason why electrons can tunnel through a PN junction is that [ ]
(a) They have high energy (b) barrier potential is very low
(c) depletion layer is extremely thin (d) impurity level is low

25. Avalanche breakdown is primarily dependent on the phenomenon of [ ]
(a) Collision (b) Doping (c) ionization (d) recombination

26. Write the incorrect statement. A varactor diode [ ]
(a) has variable capacitance
(b) utilizes transition capacitance of a junction
(c) has always a uniform doping profile
(d) is often used in an automatic frequency control

27. Which one of the following statement is correct? A photo diode works on the Principle of [ ]
(a)photovoltaic effect (b)photoconductive effect
(c) photoelectric effect (d)photothermal effect

28. LEDs are fabricated from [ ]
(a)silicon (b)germanium (c) Si or Ge (d) gallium arsenide

29. LCD displays are preferred over LED displays because they [ ]
(a) are more reliable (b) consume less power
(c) respond quickly (d) are cheaper

30. An SCR is [ ]
(a) three layer three terminal device
(b) three layer four terminal device
(c) four layer three terminal device
(d) four layer four terminal device

31. A TRIAC is a [ ]

(a) 2 terminal switch (b) 2 terminal bilateral switch
(c) 3 terminal unilateral switch (d) 3 terminal bidirectional switch

32. The TRIAC is equivalent to [ ]
(a) two SCRs connected in parallel
(b) two SCRs connected in antiparallel
(c) one SCR, one diode connected in parallel
(d) one SCR, one diode connected in antiparallel

33. UJT is known as [ ]
(a) voltage controlled device (b) current controlled device
(c) relaxation oscillator (d) none of the above

34. The forward dynamic resistance of a junction diode varies ……as the forward current. (GATE 1994) [ ]
(a)Inversely (b) directly (c) equally (d) none

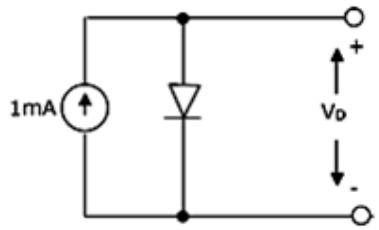
35. The depletion capacitance, $C_J$, of an abrupt PN junction with constant doping on either side varies with reverse bias, $V_R$ as (GATE 1995) [ ]

(a) $C_j \propto V_R$ (b) $C_j \propto V_R^{-1}$ (c) $C_j \propto V_R^{\frac{-1}{2}}$ (d) $C_j \propto V_R^{\frac{-1}{3}}$

36. The electron and hole concentrations in a intrinsic semiconductor are $n_i$ and $p_i$ respectively. When doped with a P-type material, these changes to n and p respectively. Then (GATE 1998) [ ]

(a)$n + P = n_i + P_i$ (b) $n + n_i = p + p_i$
(c) $np_i = n_ip$ (d) $np = n_ip_i$

37. In the figure shown, a silicon diode is carrying a constant current of 1 mA. When the temperature of the diode is 20°C, diode voltage is found to be 700 mV. If the temperature rises to 40°C, diode voltage becomes approximately equal to (GATE 2002) [ ]





(a)740 mV (b) 660 mV (c)680 mV (d)700 mV

38. Match items in Group 1 with items in Group 2, most suitably, (GATE 2003) [ ]

| Group 1 | | Group 2 | |
|---|---|---|---|
| P | LED | 1 | Heavy doping |
| Q | Avalanche photodiode | 2 | Coherent radiation |
| R | Tunnel diode | 3 | Spontaneous emission |
| S | LASER | 4 | Current gain |

(a) P – 1 Q – 2 R – 4 S - 3 (b) P – 2 Q – 3 R – 1 S - 4

(c) P – 3 Q – 4 R – 1 S - 2 (d) P – 2 Q – 1 R – 4 S - 3



39. You need a very efficient thyristor to control the speed of an AC fan motor.
A good device to use would be [ ]

(a)4-layer diode (b)Diode
(c)TRIAC (d)BJT

40. The _____ can conduct current in either direction and is turned on when a breakover voltage is exceeded. (BSNL(TTA) 2015) [ ]
(a)SCR (b)DIAC (c)TRIAC (d)BJT

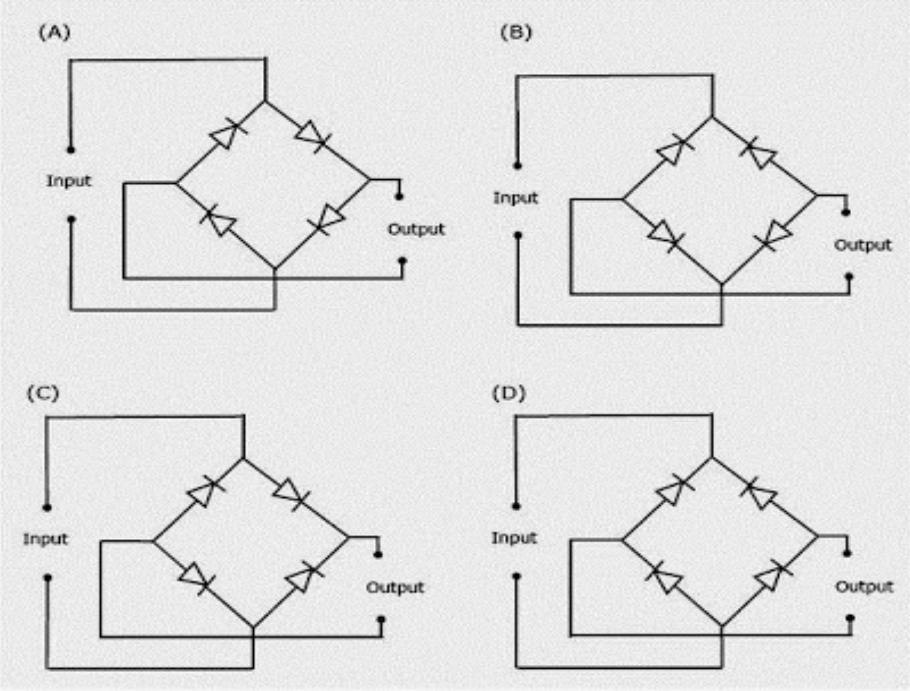
## UNIT II
## Rectifiers and Filters

1.A half wave rectifier uses a diode with a forward resistance $R_f$. The voltage is $V_m \sin\omega t$ and the load resistance is $R_L$. The DC current is given by (GATE 1997) [ ]

(a) $\frac{V_m}{\sqrt{2}\,R_L}$ (b) $\frac{V_m}{\pi\left(R_f + R_L\right)}$

(c) $\frac{2Vm}{\sqrt{\pi}}$ (d) $\frac{V_m}{R_L}$

2. The correct full wave rectifier circuit is : (GATE 2007) [ ]




3. In the full wave rectifier using two ideal diodes, $V_{dc}$ and $V_m$ are the dc and peak values of the voltage respectively across a resistive load. If PIV is the peak inverse voltage of the diode, then the appropriate relationships for this rectifier are
(GATE 2004) [ ]

(a) $V_{dc} = \frac{V_m}{\pi}, PIV = 2V_m$

(b) $V_{dc} = 2\frac{V_m}{\pi}, PIV = 2V_m$

(c) $V_{dc} = 2\frac{V_m}{\pi}, PIV = V_m$

(d) $V_{dc} = \frac{V_m}{\pi}, PIV = V_m$



4.For a Full wave rectifier, with sinusoidal input and inductor as filter, ripple factor for maximum load current and minimum load current conditions are respectively [ ]

(a) 0.1 and 1 (b) 0.1 and 0.47
(c)0 and 0.47 (d) 0 and 0.

5. In a half wave rectifier, the load current flows for what part of the cycle. [ ]

a. $0^0$
b. $90^0$
c. $180^0$
d. $360^0$

6. In a full wave rectifier, the current in each diode flows for [ ]

(a) whole cycle of the input signal
(b) half cycle of the input signal
(c) more than half cycle of the input signal
(d) none of these

7. The maximum efficiency of full wave rectification is [ ]
(a) 40.6% (b) 100% (c) 81.2% (d)85.6%

8. The ripple factor of a bridge rectifier is [ ]
(a) 0.482 (b) 0.812 (c)1.11 (d)1.21

9.In a rectifier, larger the value of shunt capacitor filter [ ]
(a)larger the peak-to-peak value of ripple voltage
(b) larger the peak current in the rectifying diode
(c)longer the time that current pulse flows through the diode
(d) smaller the dc voltage across the load

10.The dc output polarity from a half-wave rectifier can be reversed by Reversing [ ]
(a)the diode (b)transformer primary
(c)transformer secondary (d) both (b) and (c)

11.The average value of a half wave rectified voltage with a peak to peak value of 200V is (AMIE 2005-2006) [ ]
(a) 63.7V, (b) 127.3 V, (c) 141 V, (d) 200 V

12. The DC power output for HWR is [ ]
(a) $(I_m^2/\pi^2)R_L$ (b) $I_m/2$ (c) $(I_m/2)\,R_L$ (d) $I_m.R_L$

13. The TUF for Bridge Rectifier is ___ [ ]
(a) 0.287 (b) 0.693 (c) 0.812 (d). 0.963

14. The main reason why a bleeder resistor is used in DC power supply is that it [ ]
a. keeps the supply ON b. improves filtering action
c. improves voltage regulation d. both b and c

15. The Ripple factor for HWR is [ ]
a. 1.211 b. 0.86 c. 0.46 d.0.911

16. What is the $I_{RMS}$ value for Halfwave Rectifier [ ]
a.$I_m/2$ b.$I_m$ c.$I_m/4$ d.none

17. In a rectifier, larger the value of shunt capacitor filter (**GATE 2011)** [ ]
a.larger the peak-to-peak value of ripple voltage
b. larger the peak current in the rectifying diode

c. longer the time that current pulse flows through the diode
d. smaller the dc voltage across the load

18. In a LC filter, the ripple factor, (**GATE 1999)** [ ]
a.Increases with the load current
b. increases with the load resistance
c. remains constant with the load current
d. has the lowest value

19.The basic reason why a full wave rectifier has a twice the efficiency of a half wave rectifier is that :(**GATE 1997)** [ ]

a. it makes use of transformer
b. its ripple factor is much less
c. it utilizes both half-cycle of the input
d. its output frequency is double the line frequency

20.A half wave rectifier is equivalent to (**GATE 2006)** [ ]

a. clamper circuit
b. clipper circuit
c. clamper circuit with negative bias
d. clamper circuit with positive bias

21.The basic purpose of filter is to : [ ]

a. minimize variations in ac input signal
b. suppress harmonics in rectified output
c. remove ripples from the rectified output
d. stabilize dc output voltage

22. The use of a capacitor filter in a rectifier circuit gives satisfactory performance only when the load [ ]

a. current is high
b. current is low
c. voltage is high
d. voltage is low

23.If the line frequency is 50 Hz, the output frequency of bridge rectifier is [ ]

a. 25 Hz b. 50 Hz c. 100 Hz d. 200 Hz

24. The amount of ac content in the output can be mathematically expressed

by a factor called as [ ]

a.TUF b.Ripple factor c.PIV d. PRV

25. The bridge rectifier is preferred to an ordinary two diode full wave rectifier because (**GATE 2001)** [ ]

a. it needs much smaller transformer for the same output
b. no center tap required
c. less PIV rating per diode
d. all the above

26. In a bridge type full wave rectifier, if $V_m$ is the peak voltage across the secondary of the transformer, the maximum voltage coming across each reverse biased diode is [ ]

a. $V_m$ b. $2V_m$ c. $V_m/2$ d. $V_m/\sqrt{2}$

27. The PIV rating of Diodes for FWR is [ ]

a. Vsm b. $2\ V_{sm}$ c. $V_{sm/2}$ d.$V_{sm/\sqrt{2}}$

28. To get a peak load voltage of 40V out of a bridge rectifier. What is the approximate rms value of secondary voltage? **GATE 2014** [ ]

a. 0 V b. 14.4 V c. 28.3 V d. 56.6 V

29. In a center tap full wave rectifier, if Vm is the peak voltage between center tap and one end of the secondary, the maximum voltage coming across the reverse bias diode is [ ]

a. $V_m$ b. $2V_m$ c. $V_m/2$ d. $V_m/\sqrt{2}$

30. Which rectifier requires four diodes? (**GATE 1998)** [ ]

a. half-wave voltage doubler b. full-wave voltage doubler
c. full-wave bridge circuit d. voltage quadrupler

31. A half wave rectifier uses a diode with a forward resistance $R_f$. The voltage is $V_m \sin\omega t$ and the load resistance is $R_L$. The DC current is given by [ ]

a.$V_m/\sqrt{2}R_L$ b.$V_m/\pi(R_L+R_f)$ c.$V_m/R_L$ d.$2V_m/\sqrt{\pi}$

32. If the input and output terminals are reversed in bridge rectifier are reversed without any changes in the diode, then the output will be [ ]

a.$V_m$ b.$2V_m$ c. zero d.none

33. Ripple factor for Fullwave rectifier with capacitor input filter is: [ ]

a. $1/4\sqrt{3}fCR_L$ b.$1/2\sqrt{3}fCR_L$ c.$1/6\sqrt{3}fCR_L$ d.$1/\sqrt{3}fCR_L$

34.Which filter is suitable for variable loads with better regulation [ ]

a. capacitor filter b.LC filter
c.Choke filter d.both b and c

35. For a single π-section filter, the halfwave ripple is …… times that for a fullwave circuit [ ]

a. 2 b.3 c.6 d.8

36. The value of bleeder resistance $R_B$ to be connected in Multiple L-section filter is given by [ ]

a. $R_B>3\omega L$ b. $R_B\leq 3\omega L$ c. $R_B< 6\omega L$ d.$R_B>6\omega L$

37. As the inductance acts as a short circuit for DC, it is always to be connected in ------- to the load [ ]

a. shunt b.series c.both d.none

38. In capacitor input filter, initially there is a heavy inrush of current through the forward biased diode.This is called as…….. current. [ ]

a. source current b.sink current c.surge current d.none

39. The TUF for HWR is ____ (**BSNL(TTA) 2015)** [ ]

a. 1.211 b. 0.86 c. 0.287 d.0.911

40. The output frequency of half wave Rectifier is ---- [ ]

a. $2f_{in}$ b. $f_{in}$ c.$f_{in}/2$ d.$f_{in}^2$

## UNIT III
## TRANSISTOR CHARACTERISTICS

1. When a PNP transistor is properly biased, the holes from the emitter (GATE 2015) [ ]
   (a)Diffuse through the base into the collector region
   (b) Recombine with the electrons in the base region
   (c) Recombine with the electrons in the emitter region
   (d) Diffuse through the emitter to collector

2. In a MOSFET operating in the saturation region, the channel length modulation effect causes (GATE 2013) [ ]

(a) an increase in the gate-source capacitance (b) a decrease in the Transconductance
(c) a decrease in the unity-gain cutoff frequency (d) a decrease in the output resistance

3. An increase in the base recombination of a BJT will increase (GATE 2013) [ ]

(a) the common emitter dc current gain β
(b) the breakdown voltage BVCEO
(c) the unity-gain cut-off frequency fT
(d) the transconductance gm

4. Which is the important factor in the steady-state characteristics of a MOSFET? (GATE 2015) [ ]

(a)Current gain (b) Transconductance
(c) Output resistance (d) Drain-source voltage

5. When the drain voltage in an n-MOSFET is negative, it is operating in [ ]

(GATE 2015)
(a) Active region (b) Inactive region
(c)Ohmic region (d) Reactive region

6. When a transistor is connected in common emitter mode it will have (IES 2014) [ ]

(a)Negligible input resistance and high output resistance
(b) High input resistance and low output resistance
(c) Medium input resistance and high output resistance
(d) Low input resistance as well as output resistance

7. Which of the following is the fastest switching device? (IES 2014) [ ]

(a)JFET (b) BJT (c) MOSFET (d) Triode

8. Which of the following transistors is symmetrical in the sense that emitter and Collector or source and drain terminals can be interchanged? (IES 2014) [ ]

(a)JFET (b) MOSFET (c) NPN transistor (d) PNP transistor

9. The pinch off voltage for an n-channel JFET is 4 volts, then pinch off occurs for $V_{DS}$ when $V_{GS}$ = -1 volts is (GATE 1987) [ ]

(a) 3 volts (b) 5 volts (c) 4 volts (d) 1 volts

10. An N-channel JFET, $V_{GS}$ is held constant. $V_{DS}$ is less than the breakdown voltage. As $V_{DS}$ is increased…(Assume 'S' as conducting cross sectional area of the channel and 'J' as channel current density) (GATE 1988) [ ]

(a) 'S' increases and 'J' increases (b) 'S' decreases and 'J' decreases
(c) 'S' decreases and 'J' increases (d) 'S' increases and 'J' decreases

11. In MOSFET devices, the N-channel type is better than the P-channel type in which of the following respect (GATE 1988) [ ]

(a) It has better noise immunity (b) It is faster
(c) It is TTL compatible (d) It has better drive capability

12. The quiescent collector current $I_C$, of a transistor is increased by changing resistances. As a result (GATE 1988) [ ]

(a) $g_m$ will not be effected (b) $g_m$ will decrease
(c)$g_m$ will increase (d)$g_m$ will increase or decrease depending upon bias stability

13. In a MOSFET, the polarity of the inversion layer is the same as that of the (GATE 1989) [ ]

(a) Charge on the gate electrode (b)Minority carriers in the drain
(c) Majority carriers in the substrate (d)Majority carriers in the source

14. The pinch off voltage of a JFET is 5.0 volts. Its cutoff voltage is (GATE 1990) [ ]

(a) 5V (b) 0V (c)2.5V (d)0.7V

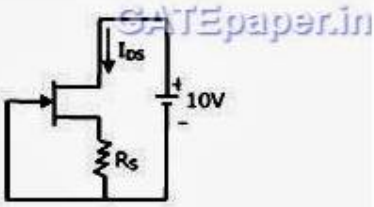
15. Which of the following statements are correct for biasing transistor amplifier Configurations? (GATE 1990) [ ]

(a)CB amplifier has low input impedance and a low current gain
(b)CC amplifier has low output impedance and a low current gain
(c)CE amplifier has very poor voltage gain but has very high input impedance
(d)The current gain of CB amplifier is higher than the current gain of CC amplifier

16. In a transistor having finite β, the forward bias across the base emitter junction is kept constant and the reverse bias across the collector base junction is increased. Neglecting the leakage across the collector base junction and the depletion region generating current, the base current will…….. (GATE 1992) [ ]

(a)Increase (b)Decrease
(c)Remains constant (d)Exponentially Increase

17. The JFET in the circuit shown has an $I_{DSS}$ = 10 mA and $V_P$ = 5 volts. The value of the resistance $R_S$ for a drain current $I_{DS}$ of 6.4 mA is …….. (Select the nearest value). (GATE 1992) [ ]




(a) 150 ohms (b) 470 ohms

(c) 560 ohms (d) 1 kilo ohm

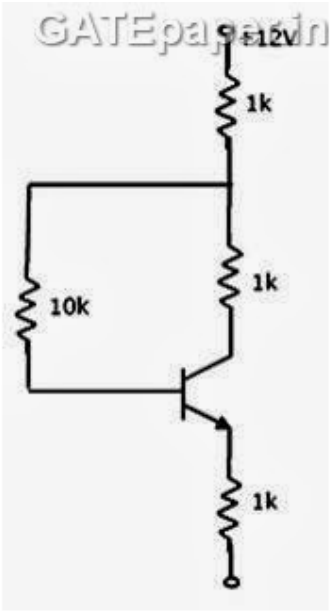
18. α – cutoff frequency of a bipolar junction transistor (GATE 1993) [ ]
(a) increases with the increase in base width
(b)increases with the increase in emitter width
(c)increase with increase in the collector width
(d)increase with decrease in the base width

19. The threshold voltage of an n-channel MOSFET can be increased by (GATE 1994) [ ]
(a)Increasing the channel dopant concentration
(b)Reducing the channel dopant concentration
(c)Reducing the gate oxide thickness
(d)Reducing the channel length

20. A BJT is said to be operating in the saturation region, if (GATE 1995) [ ]
(a)Both the junctions are reverse biased
(b)Base emitter junction is in reverse biased, and base collector junction is forward biased
(c)Base emitter junction is in forward biased, and base collector junction is reverse biased
(d)Both the junctions are forward biased

21. The Ebers – Moll model is applicable to (GATE 1995) [ ]
(a)Bipolar junction transistors
(b)nMOS transistors
(c)Unipolar Junction transistors
(d)Junction field effect transistors

22. A transistor having α = 0.99 and VBE = 0.7 volts, in the circuit shown, then the value of the collector current will be…… (GATE 1995) [ ]




(a)3.725mA (b) 5mA (c) 1mA (d) 2.3mA

23. If a transistor is operating with both of its junctions forward biased, but with the Collector base forward bias greater than the emitter base forward bias, then it is Operating in the (GATE 1996) [ ]
(a)Forward active mode
(b)Reverse active mode
(c)Reverse saturation mode
(d)Forward saturation mode

24. The common emitter short circuit current gain β of a transistor (GATE 1996) [ ]
(a)Is a monotonically increasing function of the collector current $I_C$
(b)Is a monotonically decreasing function of $I_C$
(c)Increases with $I_C$, for low $I_C$, reaches maximum and then decreases with further increase in $I_C$.
(d)Is not a function of $I_C$.

25. The early effect in a bipolar junction transistor is caused by (GATE 1999) [ ]
(a)Fast turn ON
(b)Fast turn OFF
(c)Large Collector – Base reverse bias
(d)Large Emitter – Base forward bias

26. An n-channel JFET has $I_{DSS}$ = 2 mA and $V_p$ = -4 volts. Its Transconductance $g_m$ in mS for an applied gate to source voltage of -2 volts is (GATE 1999) [ ]

(a)0.25 (b)0.50 (c) 0.75 (d)1.0

27. MOSFET can be used as a (GATE 2001) [ ]
(a)Current controlled capacitor (b)Voltage controlled capacitor
(c)Current controlled inductor (d)Voltage controlled inductor

28. The effective channel length of a MOSFET in saturation decreases with increase in (GATE 2001) [ ]
(a)Gate voltage (b)Drain voltage
(c)Source voltage\ (d)Body voltage

29. The action of a JFET in its equivalent circuit can best be represented as a (GATE 2003) [ ]
(a)Current controlled current source
(b)Current controlled voltage source
(c)Voltage controlled current source
(d)Voltage controlled voltage source

30. Choose the correct match of input resistance of various amplifier configurations shown below: (GATE 2003) [ ]

| **Configuration** | **Input resistance** |
|---|---|
| CB : Common Base | LO : Low |
| CC : Common Collector | MO : Moderate |
| CE : Common Emitter | HI : High |

a. CB – LO, CC – MO, CE – HI
b. CB – LO, CC – HI, CE – MO
c. CB – MO, CC – HI, CE – LO
d. CB – HI, CC – LO, CE – MO

31. The impurity commonly used for realizing the base region of a silicon NPN transistor is (GATE 2004) [ ]
(a)Gallium (b)Indium (c)Boron (d)Phosphorous

32. Consider the following statements $S_1$ and $S_2$.
$S_1$: the β of a BJT reduces if the base width is increased
$S_2$: the β of a BJT increases if the doping concentration in the base is increased
Which of the following is correct? (GATE 2004) [ ]
(a)$S_1$ is FALSE and $S_2$ is TRUE
(b)Both $S_1$ and $S_2$ are TRUE
(c)Both $S_1$ and $S_2$ are FALSE
(d)$S_1$ is TRUE and $S_2$ is FALSE

33. Consider the following statements $S_1$ and $S_2$.
$S_1$: the threshold voltage ($V_T$) of a MOS capacitor decreases with increase in gate oxide thickness
$S_2$: the threshold voltage ($V_T$) of a MOS capacitor decreases with increase in substrate doping concentration.
Which of the following is correct? (GATE 2004) [ ]
(a)$S_1$ is FALSE and $S_2$ is TRUE
(b)Both $S_1$ and $S_2$ are TRUE
(c)$S_1$ is TRUE and $S_2$ is FALSE
(d)Both $S_1$ and $S_2$ are FALSE

34. The phenomenon known as "early effect" in a BJT refers to a reduction of the effective base width caused by (GATE 2006) [ ]
(a)Electron – hole recombination at the base
(b)The reverse biasing of the base collector junction
(c)The forward biasing of emitter base junction
(d)The early removal of stored base charge during saturation to cutoff switching

35. For a BJT, the common base current gain $\alpha = 0.98$ and the collector base junction reverse bias saturation current, $I_{CO} = 0.6$ μA. This BJT is connected in the common emitter mode and operated in the active region with a base current ($I_B$) of 20 μA. The collector current $I_C$ for this mode of operation is (GATE 2011) [ ]
(a)0.98 mA (b)0.99 mA (c)1.0 mA (d)1.01 mA

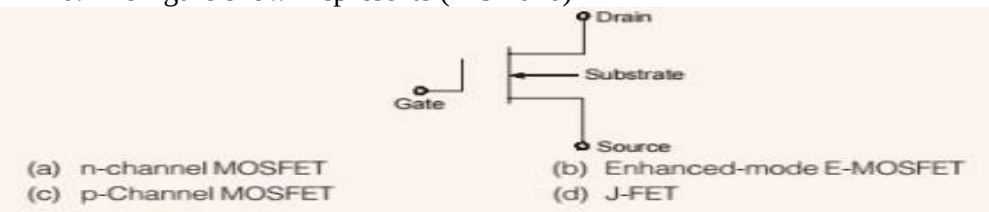
36. In MOSFET operating in saturation region, the channel length modulation effect causes (GATE 2013) [ ]
(a)An increase in gate source capacitance
(b)A decrease in Transconductance
(c)A decrease in unity gain bandwidth product
(d)A decrease in output resistance

37. If the fixed positive charges are present in the gate oxide of an N channel enhancement type MOSFET, it will lead to (GATE 2014) [ ]
(a)a decrease in the threshold voltage
(b)channel length modulation
(c)an increase in substrate leakage current
(d)an increase in accumulation capacitance

38. An increase in the base recombination of a BJT will increase (GATE 2014) [ ]
(a)the common emitter DC current gain, β
(b)the breakdown voltage $BV_{CEO}$
(c)the unity gain cutoff frequency, $f_\tau$
(d)the Transconductance gm

39. The leakage current in an NPN transistor is due to the flow of (IES 2016) [ ]
(a)Holes from base to emitter
(b)Electrons from collector to base
(c)Holes from collector to base
(d)Minority carriers from emitter to collector

40. The figure shown represents (IES 2016) [ ]

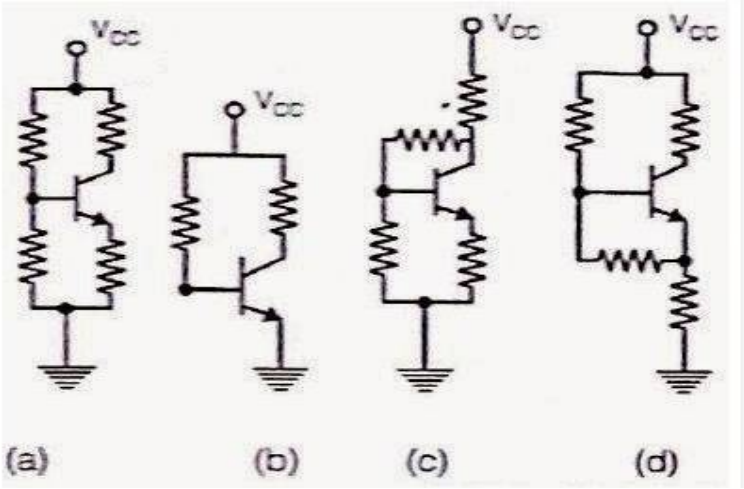


**UNIT- IV**
**Transistor Biasing and Thermal Stabilization**

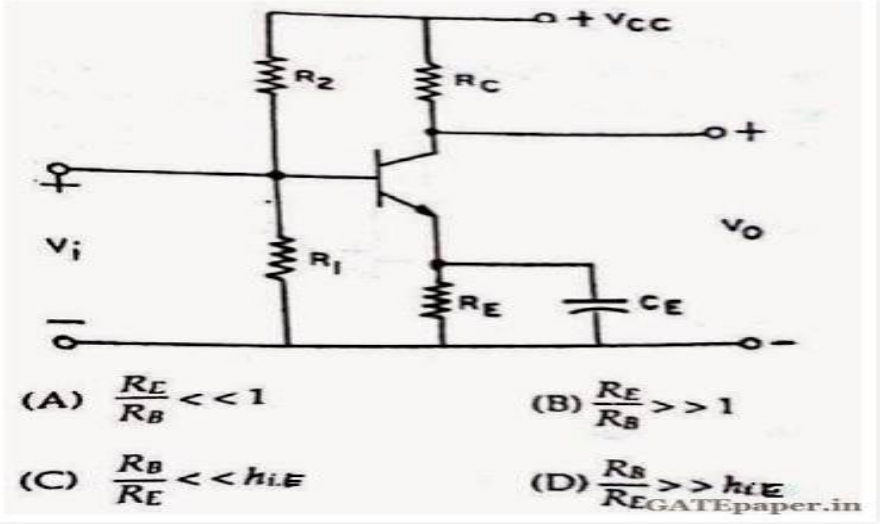
1.Variation in β in a BJT can cause a fixed bias circuit to so [GATE 2015] [ ]
(a)Into active mode of operation from saturation mode (b) Out of active mode
(c) Out of saturation (d) Into cutoff mode from active mode of operation

2 The increase in value of β of transistor can cause the fixed bias circuit to
[IES 2014] [ ]
a)Shift from saturation region to active region
(b) Shift the operation from active mode to saturation mode
(c) Shift the operation from saturation mode to cutoff mode
(d) Shift the operation from cutoff mode to active mode

3.Of the four biasing circuits shown in figure, for a BJT, indicate the one which can have maximum bias stability [GATE 1989] [ ]



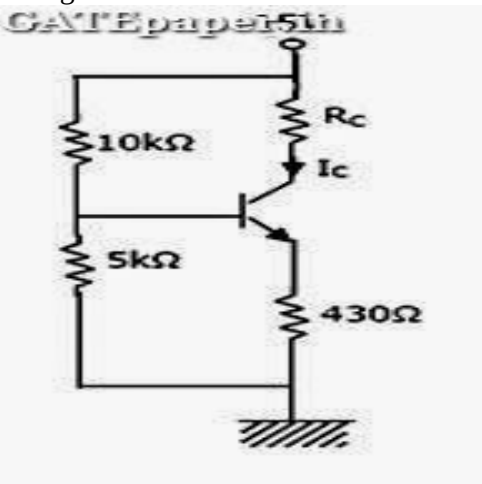

4. For good stabilized biasing of the transistor of the CE amplifier of the figure shown, the condition is
[GATE 1990] [ ]



5.Which of the following statements are correct for biasing transistor amplifier configurations? [GATE 1990] [ ]

a). CB amplifier has low input impedance and a low current gain
b). CC amplifier has low output impedance and a low current gain
c). CE amplifier has very poor voltage gain but has very high input impedance
d). The current gain of CB amplifier is higher than the current gain of CC amplifier

8.I n circuit shown, assume that the transistor is in active region. It has a large β and its base emitter voltage is 0.7 volts. The value of IC is [GATE 2000] [ ]

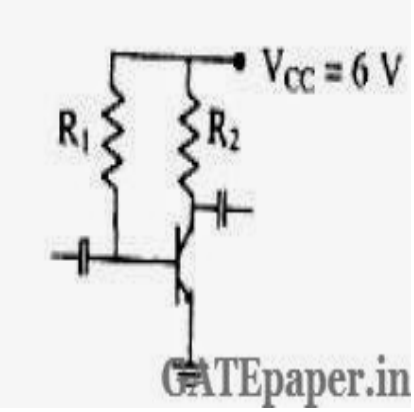



a) Indeterminate since RC is not given b). 1 ma
c). 5 mA d). 10 ma

10. Introducing a resistor in the emitter of a CE amplifier stabilizes the dc operating point against variations in [GATE 2000] [ ]

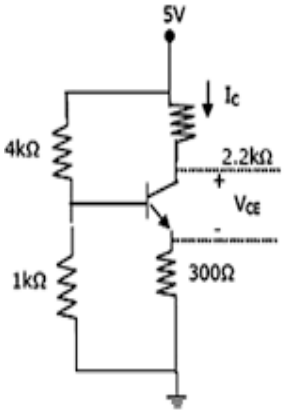
a). Only the temperature b)Only the β of the transistor c)Both temperature and β
d). None of the above

11 In the amplifier circuit shown in the figure, the values of R1 and R2 are such that the transistor is operating at VCE = 3 volts and IC = 1.5 mA, when its β is 150.for a transistor with β of 200, the operating point (VCE, IC) is [GATE 2003] [ ]




a). (2 volts, 2 mA) b). (3 volts, 2 mA) c). (4 volts, 2 mA) d) .(4 volts, 1 mA)

12.Assuming that the β of the transistor is extremely large and VBE = 0.7 volts, IC and VCE in the circuit shown are [GATE 2004] [ ]




(a) $I_C = 1mA, \quad V_{CE} = 4.7V$

(b) $I_C = 0.5mA, \quad V_{CE} = 3.75V$

(c) $I_C = 1mA, \quad V_{CE} = 2.5V$

(d) $I_C = 0.5mA, \quad V_{CE} = 3.9V$



13.The Stability factor in a bipolar junction transistor is [IES 2016] [ ]

(a) $\dfrac{1+\beta}{1-\beta\left(\dfrac{dI_B}{dI_C}\right)}$

(b) $\left(\dfrac{1+\beta}{1-\beta}\right)\left[1-\left(\dfrac{dI_B}{dI_C}\right)\right]$

(c) $(1+\beta)\left[1-\beta\left(\dfrac{dI_B}{dI_C}\right)\right]$

(d) $\dfrac{\beta-1}{\left[1-\beta\left(\dfrac{dI_B}{dI_C}\right)\right]}$

14. Transistor biasing is done to keep …… in the circuit [ ]
a).Proper direct current b)Proper alternating current
c).The base current small d)Collector current small

15. Operating point represents …….. [ ]
a)Values of IC and VCE when signal is applied b)The magnitude of signal
c) Zero signal values of IC and VCE d)none of the above

16. If biasing is not done in an amplifier circuit, it results in …… [ ]
a) Decrease in the base current b)Unfaithful amplification
c) Excessive collector bias d)None of the above

17. Transistor biasing is generally provided by a ……. [ ]
a)Biasing circuit b)Bias battery c)Diode d)None of the above

18. For faithful amplification by a transistor circuit, the value of VBE should ……. for a silicon transistor [ ]
a)Be zero b)Be 0.01 V c)Not fall below 0.7 V d)Be between 0 V and 0.1 V

19. For proper operation of the transistor, its collector should have …… [ ]
a)Proper forward bias b)Proper reverse bias c)Very small size d)None of the above

20. For faithful amplification by a transistor circuit, the value of VCE should ……..
for silicon transistor [ ]
a)Not fall below 1 V b)Be zero c)Be 0.2 V d)None of the above

21.The circuit that provides the best stabilization of operating point is …… [ ]
a)Base resistor bias b) Collector feedback bias c)Potential divider bias d)None of the above

22. The point of intersection of d.c. and a.c. load lines represents …….. [ ]
a)Operating point b)Current gain c)Voltage gain d)None of the above

23. An ideal value of stability factor is ……. [ ]
a)100 b)200 c)More than 200 d)1

24 The zero signal IC is generally …… mA in the initial stages of a transistor
amplifier [ ]
a)4 b)1 c)3 d)More than 10

25. If the maximum collector current due to signal alone is 3 mA, then zero signal collector current
should be at least equal to …….. [ ]
a)6 mA b)2mA c)3 mA d) 1 mA

26. The disadvantage of base resistor method of transistor biasing is that it …… [ ]
a)Is complicated b)Is sensitive to changes in ß c)Provides high stability d)none

27 The biasing circuit has a stability factor of 50. If due to temperature change, ICBO changes by 1
µA, then IC will change by …… [ ]
a)100 µA b)2.25 µA c)20 µA d)50 µA

28. The leakage current in a silicon transistor is about …… the leakage current in a germanium
transistor [ ]
a)One hundredth b)One tenth c)One thousandth d)One millionth

29. The operating point is also called the ……. [ ]
a)Cut off point b)Quiescent point c)Saturation point d)None of the above

30. For proper amplification by a transistor circuit, the operating point should be located at the
…….. of the d.c. load line [ ]
a)The end point b)Middle c) The maximum current point d)None of the above

31. The operating point …… on the a.c. load line [ ]
a)Also lie b)Does not lie c)May or may not lie d)Data insufficient

32. The disadvantage of voltage divider bias is that it has ……. [ ]
a)High stability factor b)Low base current c)Many resistors d)None of the above

33. Thermal runaway occurs when ……. [ ]
a)Collector is reverse biased b)Transistor is not biased
c)Emitter is forward biased d)Junction capacitance is high

34. The purpose of resistance in the emitter circuit of a transistor amplifier is to [ ]
a)Limit the maximum emitter current b)Provide base-emitter bias
c)Limit the change in emitter current d)None of the above

35. The base resistor method is generally used in …… [ ]
a)Amplifier circuits b)Switching circuits c) Rectifier circuits d)None of the above

36. The stability factor of a collector feedback bias circuit is …….. that of base resistor bias.[ ]
a)The same as b) More than c)Less than d)None of the above

37. If the value of collector current IC increases, then the value of VCE …… [ ]
a) Remains the same b) Decreases c)Increases d) None of the above

38. If the temperature increases, the value of VCE …… [ ]
a) Remains the same b) Is increased c)Is decreased d)None of the above

39. The stabilisation of operating point in potential divider method is provided by [ ]
a) RE consideration b) RC consideration c)VCC consideration d) None of the above

40. When the temperature changes, the operating point is shifted due to ……. [ ]
a) Change in ICBO b) Change in VCC C)Change in the values of circuit resistance
d)None of the above

## UNIT- V
## Small Signal Low Frequency Transistor Amplifier Models

1.Which of the following statements are correct for biasing transistor amplifier configurations? (GATE 1990) [ ]
a. CB amplifier has low input impedance and a low current gain
b. CC amplifier has low output impedance and a low current gain
c. CE amplifier has very poor voltage gain but has very high input impedance
d. The current gain of CB amplifier is higher than the current gain of CC amplifier

2. Match the following: (GATE 1995) [ ]

| | |
|---|---|
| a) CC amplifier | 1) provides voltage gain but no current gain |
| b) CE amplifier | 2) provides current gain but no voltage gain |
| c) CB amplifier | 3) provides neither voltage nor power gain |
| | 4) provides neither current nor power gain |
| | 5) provides both voltage and current gain |

a) a-2, b-3, c-1 b) a-3,b-2,c-1 c) a-1,b-3,c-2 d) a-5,b-4,c-1

3. _____ Amplifier gives $180^0$ Phase shift. [ ]

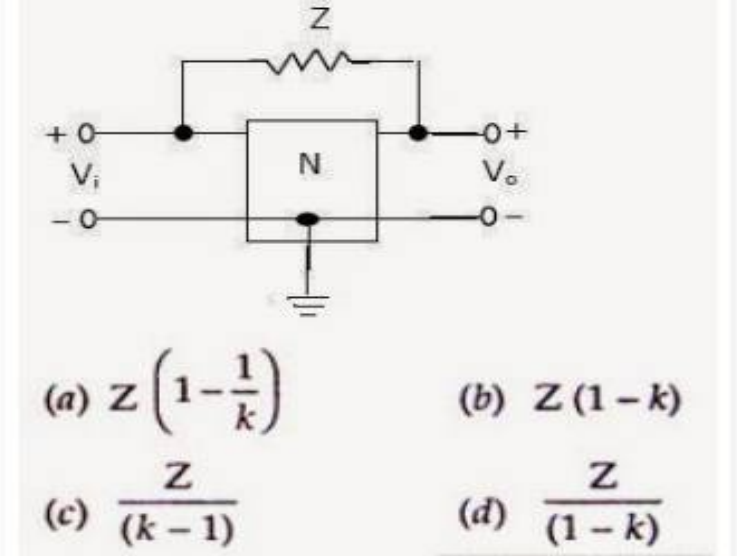
a) CC b)CE c)CB d) All the above

4. Which of the following is referred to as the reverse transfer voltage ratio? [ ]
a) $h_i$ b) $h_r$ c) $h_f$ d) $h_o$

5.The voltage gain of emitter follower is [ ]

a) 1 b) <=1 c)>=1 d) 0

6.In the circuit shown, 'N' is a finite gain amplifier with a gain of K, large input impedance and very low output admittance. The input impedance of the feedback amplifier with the feedback impedance Z connected as shown will be _____ [ ]
(GATE 1996)




(a) $Z\left(1-\frac{1}{k}\right)$ (b) $Z(1-k)$

(c) $\frac{Z}{(k-1)}$ (d) $\frac{Z}{(1-k)}$

7. The current gain of generalized amplifier is [ ]
a) Ai= -hf/(1+hoRL) B) Ai=1-hf/hoRL C)Ai=ho-hf/(1+RL) D) Ai=-hf/RL

8. The role of coupling capacitors in amplifier circuits [ ]
a) Allow dc components b) block dc components
c)both A& B d) coupling capacitors are not used in amplifier circuits

9. In simplified hybrid model, Ai is _____ [ ]
a) Ai=hoRL b) hoRL>>1 c)Ai=-hf d) Ai=RL

10. You have a need to apply an amplifier with a very high power gain. Which of the following would you choose? [ ]
a) CC b) CB c) CE d)emitter follower

11.To analyze the circuit which has feedback resistance connected between input& output , ____ theorem is used [ ]
a) Thevenin's theorem b) norton's theorem c)miller's theorem d) none

12. If RL=12KΩ, hoe=25μA/V, hfe=50 &hie=1.1KΩ, then the value of Ai is [ ]
a) 49.85 b) -49.85 c)50 d) 50

13.The parameter hoe has dimensions of _____ [ ]
a) Ω b) V c)A d) none

14. What is the range of the input impedance of a common-base configuration? [ ]

a) A few ohms to a maximum of 50 Ω b)1 kΩ to 5 kΩ
c) 100 kΩ to 500 kΩ d) 1 MΩ to 2 MΩ15.

15. Which one of the following configuration is frequently used for impedance matching [ ]
a)fixed bias b)voltage divider bias
c)emitter follower d)collector feedback

16.Relation between $A_{vs}$ and $A_{IS}$ is_____ [ ]
a) AVS=AIS*RL/RS b) AVS=AIS*RS/RL
c)AVS=AISRLRS d) AIS=AVSRLRS

17.The parameter h11 has dimension of _____ [ ]
a) Ω b) V c)A d) dimensionless

18.The cc configuration also known as _____ [ ]
a) Source follower b) base follower c)emitter follower d) collector follower

19.The current gain of a CB amplifier is [ ]
a) Less than 1 b) greater than 1 c) approximately equal 1 d) None

20. When the bypass capacitor is removed from a common-emitter amplifier, the voltage gain [ ]
a) increases b) decreases
c) has very little effect d) exponentially increases

21. To analyze the common-emitter amplifier, what must be done to determine the dc equivalent circuit? [ ]
a) leave circuit unchanged
b) replace coupling and bypass capacitors with opens
c) replace coupling and bypass capacitors with shorts
d) replace $V_{CC}$ with ground

22. For the common-emitter amplifier ac equivalent circuit, all capacitors are [ ]
a) effectively shorts
b) effectively open circuits
c) not connected to ground
d) connected to ground

23. Which of the following should be done to obtain the ac equivalent of a network? [ ]
a) Set all dc sources to zero
b) Replace all capacitors by a short circuit equivalent
c) Remove all elements bypassed by the short-circuit equivalent.
d) All of the above

24. For a common-emitter amplifier, the purpose of the emitter bypass capacitor is [ ]
a) no purpose, since it is shorted out by $R_E$.
b) to reduce noise
c) to despike the supply voltage
d) to maximize amplifier gain

25. What is the controlling current in a common-base configuration? [ ]
a) $I_e$ b) $I_c$ c) $I_b$ d) None of the above

26. A common-gate amplifier is similar in configuration to which BJT amplifier? [ ]
a) CE b) CC c) CB d) emitter follower

27. A common-source amplifier is similar in configuration to which BJT amplifier? [ ]
a) CB b) CC c) CE d) emitter follower

28. What is the function of the coupling capacitors $C_1$ and $C_2$ in a FET circuit? [ ]
a) to create an open circuit for dc analysis
b) to isolate the dc biasing arrangement from the applied signal and load
c) to create a short-circuit equivalent for ac analysis
d) All of the above

29. The h-parameters are valid over a_____ frequency range [ ]
a) R.F b) For DC only c)Audio frequency range d) upto 1 MHz

30. Which FET amplifier has a phase inversion between input and output signals? [ ]
a)common gate b) common drain
c) common source d)all of the above

31. FET amplifiers provide _____ [ ]
a) excellent voltage gain b) high input impedance
c) low power consumption d) All of the above

32. The current gain of a BJT is (GATE 2001) [ ]
a. $g_m r_o$
b. $g_m / r_o$
c. $g_m r_\pi$
d. $g_m / r_\pi$

33. A common emitter transistor amplifier has a collector current of 1.0 mA when its base current is 25 µA at room temperature. Its input resistance is approximately equal to _____ (GATE1994) [ ]
a) 1kΩ b) 2kΩ c) 3kΩ d) 5kΩ

34. Introducing a resistor in the emitter of a CE amplifier stabilizes the dc operating Point against variations in (GATE2000) [ ]
a) Only the temperature b) Only the β of the transistor
c) Both temperature and β d) None of the above

35. For an operation of BJT amplifier, a transistor's base-emitter junction must be forward biased with reverse bias applied to which junction? [ ]
a) collector-emitter b) base-collector
c) base-emitter d) collector-base

36. The symbol $h_{fe}$ is the same as: [ ]
a) $\beta_{DC}$ b) $\alpha_{DC}$ c) $\beta_{ac}$ d) none of the above

37. If the emitter resistance in a common emitter voltage amplifier is not bypassed, it will (GATE 2014) [ ]
a) Reduce both the voltage gain and the input impedance
b) Reduce the voltage gain and increase the input impedance
c) Increase the voltage gain and reduce the input impedance
d) Increase both the voltage gain and the input impedance

38. Often a common-collector will be the last stage before the load; the main Function of this stage is to: [ ]
a) provide voltage gain
b) provide phase inversion
c) provide a high-frequency path to improve the frequency response
d) buffer the voltage amplifiers from the low-resistance load and provide impedance matching for maximum power transfer

39. For h-parameters _____ are independent variables. [ ]
a) i1 b) v2 c)both (a)&(b) d) i2

40. h-parameters are also known as_____ [ ]
a) Impedance parameters b)Admittance parameters
c)Hybrid parameters d) none of the above

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