
Multiple Choice Questions**MODULE-III**

1. The α and β of a transistor are related to each other as []
a) $\alpha = \beta / (1 + \beta)$ b) $\beta = \alpha / (1 - \alpha)$ c) $\beta = \alpha / (1 + \alpha)$ d) $\alpha = \beta / (1 - \beta)$
2. The forward current gain $h_{FE} (\beta)$ is defined as []
a) I_C / I_B b) I_B / I_C c) I_C / I_E d) I_E / I_C
3. With increase in the Collector-Base reverse voltage []
a) effective base width decreases b) effective base width increases
c) effective collector width decreases d) effective collector width increases
4. The maximum current gain of a an amplifier is unity then it is a ___ configuration []
a) CB b) CE c) CC d) none
5. The common Emitter transistor circuit has []
a).High gain b).Low gain c).Negligible Gain d). Zero Gain
- 6.The maximum reverse collector to emitter breakdown voltage with base open is referred to as []
a). V_{CEO} b). V_C c). V_{CBO} d). V_{EBO}
7. The saturation value of V_{CE} is ____ []
a) 0.2A b) 0.7V c) 0.2V d) 1.3V
- 8.In power transistors, the heat developed at the collector junction may be removed with the use of []
a) heat sink b) transistor with high β c) transistor with low β d) none
9. The leakage current in CE configuration may be around []
a) few nano amperes b) few micro amperes c) few hundred micro amperes
d) few milli amperes

10. In cut-off the value of V_{CE} is []
a) 0V b) V_{CC} c) minimum d) $V_{BE}=0.6V$
11. Which of the following currents is nearly equal to each other? []
a) I_B and I_C b) I_E and I_C c) I_B and I_E d) I_B , I_C , and I_E
12. The saturation region is defined by V_{CE} _____ V_{CEsat} . []
a) > b) < c) \leq d) \geq
13. Which of the following is are) the application(s) of a transistor? []
a) Amplification of signal b) Switching and control
c) Computer logic circuitry d) All of the above
14. _____ should be considered in the analysis or design of any electronic amplifiers. []
a) dc b) ac c) dc and ac d) None of the above
15. The dc load line is determined solely by the _____. []
a) base-emitter loop b) collector-emitter loop c) base-collector loop d) None of the above
16. When transistors are used in digital circuits they usually operate in the: []
a) saturation and cutoff regions b) breakdown region c) active region d) linear region
17. What is the current gain for a common-base configuration where $I_E = 4.2$ mA and $I_C = 4.0$ mA? []
a) 16.80 b) 0.95 c) 1.05 d) 0.20
18. To operate properly, a transistor's base-emitter junction must be forward biased with reverse bias applied to which junction? []
a) collector-emitter b) emitter-base c) base-emitter d) collector-base
19. The C-B configuration is used to provide which type of gain? []
a) power b) voltage c) resistance d) current
20. In a transistor, collector current is controlled by: []
a) collector voltage b) base current c) collector resistance d) all
21. A transistor may be used as a switching device or as a: []
a) fixed resistor b) tuning device c) variable resistor d) rectifier
22. If a 2 mV signal produces a 2 V output, what is the voltage gain? []
a) 0.004 b) 100 c) 1000 d) 0.001
23. In a C-E configuration, an emitter resistor is used for: []
a) collector bias b) ac signal bypass c) higher gain d) stabilization
24. When a silicon diode is forward biased, what is V_{BE} for a C-E configuration? []
a) voltage-divider bias b) 0.4 V c) emitter voltage d) 0.7 V

25. Total emitter current is:

[]

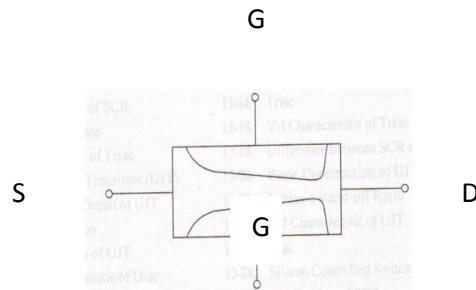
- a) $I_E + I_C$ b) $I_E - I_C$ c) $I_B - I_C$ d) $I_B + I_C$

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
b	a	a	a	a	a	c	a	b	b	b	c	b	c	b	a	b	d	b	b	c	c	d	d	d

MODULE-IV

1. In JFET operating above pinch-off voltage, the []
 - (a) Drain current remains practically constant
 - (b) Drain current starts decreasing
 - (c) Drain current increases rapidly
 - (d) Depletion region becomes smaller
2. The JFET is often called square law device because its []
 - (a) Trans-conductance curve is parabolic
 - (b) AC resistance from drain-to-source varies inversely as square of the drain current
 - (c) Drain current varies as square of drain voltage for a fixed gate- to-source voltage
 - (d) Reverse gate leakage current varies as a square of the reverse gate voltage
3. For the operation of depletion-type MOSFET, the gate voltage has to be []
 - a) Low positive b) High positive c) High negative d) Zero
4. The N-channel MOSFET devices are preferred more than P-channel's because []
 - (a) N-channel devices are faster than P-channel devices
 - (b) N-channel devices consumes less power than P-channel devices
 - (c) N-channel devices have higher packing density than P-channel devices
 - (d) Both a) and c) above
5. As compared to N-channel MOS switch, the P-channel MOS switch has []
 - a) Same ON resistance b) Less ON resistance c) More ON resistance d) either a) or b)
6. Thermal runaway is not possible in FET because as the temperature of the FET increases []
 - a) the mobility decreases b) the trans-conductance increases
 - c) the drain current increases d) the mobility increases
7. The trans-conductance g_m of a JFET is equal to []
 - a) $\frac{-2I_{DSS}}{V_P}$ b) $\frac{2}{|V_P|} \sqrt{I_{DSS} I_D}$
 - c) $\frac{2I_{DSS}}{V_P} \left\{ 1 - \frac{V_{GS}}{V_P} \right\}$ d) $\frac{I_{DSS}}{V_P} \left\{ 1 - \frac{V_{GS}}{V_P} \right\}$
8. An FET is a better chopper than a BJT because it has []
 - a) lower offset voltage b) lower input current c) higher input impedance. d) both b and c

9. In a biased JFET, the shape of the channel is as shown in Fig below is due to []



- a. it is the property of the material used
 - b. the drain end is more reverse biased than source end
 - c. the drain end is more forward biased than source end
 - d. the impurity profile varies with the distance from the source.
10. Which of the following statement is not true in case of FET. []
- a) It has high input impedance
 - b) It is less noisy than bipolar transistor.
 - c) It has a large gain band width product
 - d) all of the above.
11. The JFET is a []
- a. current controlled device with high input resistance
 - b. voltage controlled device with high input resistance
 - c. voltage controlled device with low input resistance
 - d. current controlled device with low input resistance
12. FET is []
- a) current controlled device
 - b) voltage controlled device
 - c) resistance controlled device
 - d) reactance controlled device
13. In a FET, 10 volts reverse voltage is applied If gate current is $0.1\mu\text{A}$, the input resistance is []
- a) $1\text{ M}\Omega$
 - b) $10\text{ M}\Omega$
 - c) $100\text{ M}\Omega$
 - d) none of these
14. The best location for setting a Q-point on dc load line of an FET amplifier is at []
- a) saturation point
 - b) cut-off point
 - c) mid-point
 - d) none of these
15. Which of the following bias methods provides a solid Q-point in JFET, amplifiers? []
- a) Gate bias
 - b) Self-bias
 - c) Voltage divider bias
 - d) Current source bias

16. Which of the following technique is used for biasing the enhancement type MOSFET's? []
- a) Voltage divider bias b) Collector feedback bias
c) Current source bias d) Self-bias
17. The threshold voltage of an n-channel enhancement mode MOSFET is 0.5 V, when the device is biased at a gate voltage of 3V, pinch-off would occur at a drain voltage of []
- a) 1.5 V b) 2.5 V c) 3.5V d) 4.5V
18. The zero gate bias channel resistance of a junction field-effect transistor is 750 and the pinch-off voltage is 3V. For a gate bias of 1.5 V and very low drain voltage, the device would behave as a resistance of []
- a) 320Ω b) 816 Ω c) 1000 Ω d) 1270 Ω
19. If properly biased, JFET will act as a []
- a) current controlled current source b) voltage controlled voltage source
c) voltage controlled current source d) current controlled voltage source
20. How will electrons flow through a p-channel JFET? []
- a) from source to drain b) from source to gate c) from drain to source d) from drain to gate
21. Junction Field Effect Transistors (JFET) contain how many diodes? []
- a) 1 b)2 c)3 d)4
22. When applied input voltage varies the resistance of a channel, the result is called: []
- a) cutoff b) polarization c) saturation d) field effect
23. The input impedance of a JFET is in the range of
- a) above 2 MΩ b) 200 to 400 KΩ c) 20 to 40 KΩ d) below 2 KΩ
24. What three areas are the drain characteristics of a JFET ($V_{GS} = 0$) divided into? []
- a) ohmic, pinch-off, breakdown
b) pinch-off, constant-current, avalanche
c) ohmic, constant-voltage, breakdown
d) pinch-off, constant-voltage, avalanche
25. A “U” shaped, opposite-polarity material built near a JFET-channel center is called the:[]
- a) gate b) drain c) source d) heat sink
26. A MOSFET has how many terminals? []
- a) 1 b)2 c)3 or 4 d) 3
27. When an input signal reduces the channel size, the process is called: []
- a) enhancement b) substrate connection c) depletion d) gate charge

28. JFET terminal "legs" are connections to the drain, the gate, and the: []
a) source b) substrate c) channel d) cathode
29. I_{DSS} can be defined as: []
a) the maximum possible current with V_{GS} held at -4 V
b) the minimum possible drain current
c) the maximum possible current with V_{GS} held at 0 V
d) the maximum drain current with the source shorted
30. In the constant-current region, how will the I_{DS} change in an n-channel JFET? []
a) As V_{GS} increases I_D increases. b) As V_{GS} decreases I_D increases.
c) As V_{GS} decreases I_D remains constant.
d) As V_{GS} increases I_D remains constant.
31. Which JFET configuration would connect a high-resistance signal source to a low-resistance load? []
a) common-source b) source follower c) common-gate d) common-drain
32. When the JFET is no longer able to control the current, this point is called the: []
a) saturation point b) pinch-off region c) depletion region d) breakdown region
33. Which type of JFET bias requires a negative supply voltage? []
a) gate b) source c) feedback d) voltage divider
34. In the constant-current region, how will the I_{DS} change in an n-channel JFET? []
a) As V_{GS} decreases I_D decreases. b) As V_{GS} increases I_D increases.
c) As V_{GS} decreases I_D remains constant. d) As V_{GS} increases I_D remains constant.
35. A MOSFET has how many terminals? []
a) 2 or 3 b) 3 c) 4 d) 3 or 4
36. I_{DSS} can be defined as: []
A) the minimum possible drain current
B) the maximum possible current with V_{GS} held at -4 V
C) the maximum possible current with V_{GS} held at 0 V
D) the maximum drain current with the source shorted
37. What is the input impedance of a common-gate configured JFET? []
A) very low B) low C) high D) very high
38. JFET terminal "legs" are connections to the drain, the gate, and the: []
A) channel B) source C) substrate D) cathode

39. A very simple bias for a D-MOSFET is called: []
A) self biasing B) gate biasing C) zero biasing D) voltage-divider biasing
40. With the E-MOSFET, when gate input voltage is zero, drain current is: []
A) at saturation B) zero C) I_{DSS} D) widening the channel
41. With a 30-volt V_{DD} , and an 8-kilohm drain resistor, what is the E-MOSFET Q point voltage, with $I_D = 3$ mA? []
A) 6 V B) 10 V C) 24 V D) 30 V
42. When an input signal reduces the channel size, the process is called: []
A) Enhancement B) substrate connecting C) gate charge D) depletion
43. Which JFET configuration would connect a high-resistance signal source to a low-resistance load? []
A) source follower B) common-source C) common-drain D) common-gate
44. How will electrons flow through a p-channel JFET? []
A) from source to drain B) from source to gate C) from drain to gate D) from drain to source
45. When $V_{GS} = 0$ V, a JFET is: []
A) saturated B) an analog device C) an open switch D) cut off
46. When applied input voltage varies the resistance of a channel, the result is called: []
A) saturation B) polarization C) cutoff D) field effect
47. When is a vertical channel E-MOSFET used? []
A) for high frequencies B) for high voltages C) for high currents D) for high resistances
48. Junction Field Effect Transistors (JFET) contain how many diodes? []
A) 4 B) 3 C) 2 D) 1
49. When an input delta of 2 V produces a transconductance of 1.5 mS, what is the drain current delta? []
A) 666 mA B) 3 mA C) 0.75 mA D) 0.5 mA
50. When not in use, MOSFET pins are kept at the same potential through the use of: []
A) shipping foil B) nonconductive foam C) conductive foam D) a wrist strap

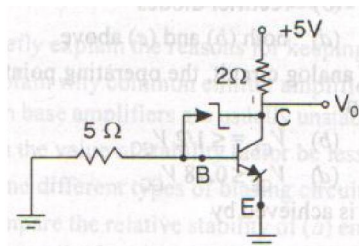
ANSWERS

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
a	a	a	c	d	c	c	a	c	a	c	b	a	b	c	c	d	b	c	b	b
22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42
c	a	d	A	c	c	a	c	b	b	d	a	a	d	c	a	b	c	b	a	d
43	44	45	46	47	48	49	50													
a	d	a	d	c	d	b	c													

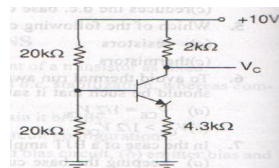
MODULE-V

1. The dc load line of a transistor circuit []
 - a) Is a graph between I_C and V_{CE}
 - b) is a graph between I_C and I_B
 - c) does not contain the locating point
 - d) is a curved line
2. The positive part of the output signal in a transistor circuit starts clipping, if Q-point of the circuit moves []
 - a) towards the saturation point
 - b) towards the cut-off point
 - c) towards the center of the load line
 - d) none of the above
3. The negative part of the output signal in a transistor circuit starts clipping, if Q-point of the circuit moves []
 - a) towards the saturation point
 - b) towards the cut-off point
 - c) towards the center of the load line
 - d) none of the above
4. The voltage divider biasing circuit is used in amplifiers quite often because it []
 - a) limits the ac signal going to the base
 - b) makes the operating point almost independent of β
 - c) reduces the dc base current
 - d) reduces the cost of the circuit
5. Which of the following components are used for bias compensation in transistor circuits? []
 - a) resistors
 - b) rectifier diodes
 - c) thermistors
 - d) both b) and c) above
6. To avoid thermal run away in the design of analog circuit, the operating point of the BJT should be such that it satisfies the condition []
 - a) $V_{CE} = \frac{1}{2}V_{CC}$
 - b) $V_{CE} > \frac{1}{2}V_{CC}$
 - c) $V_{CE} \leq \frac{1}{2}V_{CC}$
 - d) $V_{CE} = 0.78V_{CC}$
7. In the case of a BJT amplifier, bias stability is achieved by []
 - (a) keeping the base current constant
 - (b) changing the base current in order to keep the I_C and V_{CB} constant
 - (c) keeping the temperature constant
 - (d) keeping the temperature and the base current constant.
8. For a transistor amplifier with self-biasing network, the following components are used: $R_1 = 4\text{ k}$, $R_2 = 4\text{ k}$ and $R_E = 1\text{ k}$, the approximate value of the stability factor 'S' will be []
 - a) 4
 - b) 3
 - c) 2
 - d) 1.5

9. A transistor circuit employing base bias with collector feedback has greater stability than the one without feedback because []
- a) I_C decrease in magnitude b) V_{BE} is decreased
 c) of negative feedback effect d) I_C becomes independent of β
10. Improper biasing of a transistor circuit leads to []
- (a) excessive heat production at collector terminal
 (b) distortion in output signal
 (c) faulty location of load line
 (d) heavy loading of emitter terminal
11. The negative output swing in a transistor circuit starts clipping first when Q-point []
- a) Has optimum value b) is near saturation point
 c) Is near cut-off point d) is in the active region of the load line.
12. When a BJT is employed as an amplifier, it operates []
- a) in cut-off b) in saturation c) well into saturation d) over the active region.
13. Which of the following method used for biasing a BJT in integrated circuits is considered independent of transistor beta? []
- a) Fixed biasing b) voltage divider bias
 c) Collector feedback bias d) base bias with collector feedback.
14. The voltage V_0 of the circuit shown in Fig. below is []

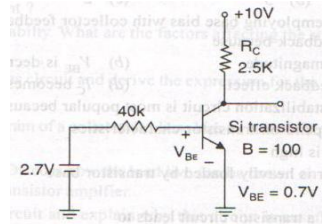


- a) 5.1 V b) 3.1 V c) 2.5 V d) zero
15. The collector voltage V_C of the circuit shown in figure below is []



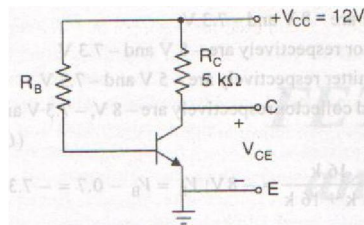
- a) 2V b) 4.6V c) 8V d) 8.6V

16. In the circuit shown in Fig. below. The transistor is biased at []



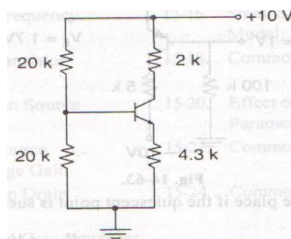
- a) 0 mA b) 5 mA c) 3.9mA d) ∞

17. Assume $V_{BE} = 0.7\text{ V}$ and $\beta = 50$ for the transistor shown in Fig. below. For $V_{CE} = 2\text{ V}$, the value of R_B is []



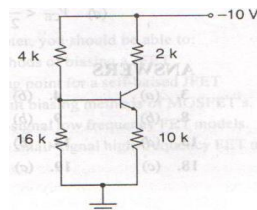
- a) 200 KΩ b) 242 KΩ c) 283 KΩ d) 300 KΩ

18. The collector voltage V_C of the circuit shown in Fig. below is approximately []



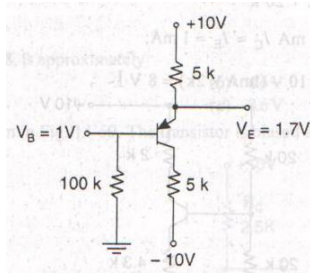
- a) 2V b) 4.6V c) 8V d) 8.6V

19. In the circuit shown in Fig. below, the approximate voltages at the transistor []



- (a) base and emitter are -8 V and -7.3 V
 (b) base and collector respectively are -8 V and -7.3 V
 (c) collector and emitter respectively are -5 V and -7.3 V
 (d) base, emitter and collector respectively are -8 V, -7.3 V and -5 V.

20. A circuit using BJT is shown in Fig. below. The value of β is []



- a) 120 b) 150 c) 165 d) 186
21. Thermal runaway will be avoided if the quiescent point is such that []
a) $V_{CE} > \frac{1}{2}V_{CC}$ b) $V_{CE} < V_{CC}$ c) $V_{CE} < 2V_{CC}$ d) $V_{CE} < \frac{1}{2}V_{CC}$
22. The dc load line of transistor circuit []
a) is a graph between I_C and V_{CE} b) is a graph between I_C and I_B
c) does not contain the Q Point d) is a curved line
23. The ac load line of a transistor circuit is steeper than its dc line because []
a) ac signal sees less load resistance b) I_C is higher
c) input signal varies in magnitude d) none of the above
24. The maximum peak to peak output voltage swing is obtained when Q point of a circuit is located []
a) near saturation point b) near cutoff point c) at the center of the load line
d) atleast on the load line
25. The positive part of the output signal in a transistor circuit starts clipping, if Q point of the circuit moves []
a) toward the saturation point b) toward the cutoff point
c) toward the center of the load line d) none of the above
26. The negative part of the output signal in a transistor circuit starts clipping if the Q point of the circuit moves []
a) toward the saturation point b) toward the cutoff point
c) toward the center of the load line d) none of the above
27. The Q-point in a voltage amplifier is selected in the middle of the active region because []
a) it gives better stability b) the circuit needs a small
c) the biasing circuit then need less number of resistors
d) it gives distortions less output

28. The biasing circuit that gives best stability to Q point is []
 a) base resistance biasing b) feedback resistor biasing
 c) potential divider biasing d) emitter resistor biasing
29. The potential divider biasing is used in amplifiers to []
 a) limit the input ac signal going to the base
 b) reduce dc base current
 c) reduce the cost of the circuit by limiting the number of resistors
 d) make the operating point almost independent of β
30. The ideal value of stability factor of a biasing circuit is []
 a) 1 b) 5 c) 10 d) 100
31. The universal bias stabilization circuit is the most popular because []
 a) IC does not depend on transistor characteristic
 b) its β sensitivity is low
 c) voltage divider is heavily loaded by transistor base
 d) IC equals to IE
32. Improper biasing of the transistor circuit leads to []
 a) excessive heat production at collector terminal
 b) distortion in output signal
 c) faulty location of load line
 d) heavy loading of emitter terminal
33. The voltage divider biasing circuit is used in amplifiers quite often because it []
 a) limits the ac signal going to base b) makes the operating point almost independent of β
 c) reduces the dc base current d) reduces the cost of the circuit
34. For a transistor amplifier with self- biasing network, the following components are used: []
 $R_1 = 4K\Omega$, $R_2 = 4K\Omega$ and $R_E = 1K\Omega$, the approximate value of stability factor will be
 a) 4 b) 3 c) 2 d) 1.5
35. Which of the following components are used for bias compensation in transistor circuit []
 a) resistors b) rectifier diodes c) thermistors d) both b) and c) above
36. For good stabilized biasing of the transistor of the CE amplifier of figure. We should have: []
 a) $R_E/R_B \ll 1$ b) $R_E/R_B \gg 1$ c) $R_E/R_B \ll h_{rb}$ d) $R_E/R_B \gg h_{rb}$

37. In the BJT amplifier, the transistor is biased in the forward active region putting a capacitor across R_E will: []
- Decrease the voltage gain and decrease the input impedance
 - Increase the voltage gain and decrease the input impedance
 - Decrease the voltage gain and increase the input impedance
 - Increase the voltage gain and increase the input impedance
38. Introducing a resistor in the emitter of a common emitter amplifier stabilizes the dc operating point Against variations in: []
- Only the temperature
 - Only the β of the transistor
 - Both temperature and β
 - None of the above
39. Voltage-divider bias provides: []
- A stable Q point
 - an unstable Q point
 - A Q point that easily varies with changes in the transistor's current gain
 - A Q point that is stable and easily varies with changes in the transistor's current gain
40. Three different Q points are shown on a dc load line. The upper Q point represents the: []
- Intermediate current gain
 - maximum current gain
 - minimum current gain
 - cutoff point
41. The ends of a load line drawn on a family of curves determine: []
- saturation and cut-off
 - the power curve
 - the operating point
 - the amplification factor
42. The Q point on a load line may be used to determine: []
- I_C
 - V_B
 - V_C
 - V_{CC}
43. If a transistor operates at the middle of the dc load line, a decrease in the current gain will move the Q point: []
- off the load line
 - up
 - nowhere
 - down
44. In a transistor, collector current is controlled by: []
- collector voltage
 - base current
 - collector resistance
 - all of the above
45. Total emitter current is: []
- $I_E - I_C$
 - $I_C + I_E$
 - $I_B + I_C$
 - $I_B - I_C$
46. The Q point on a load line may be used to determine: []
- V_C
 - V_{CC}
 - V_B
 - I_C
47. Which of the following technique is used for biasing the enhancement type MOSFET []
- Voltage divider bias
 - Collector feedback bias
 - Current source bias
 - Self-bias

48. Which of the following has a negative temperature coefficient []
 a) Thermistor b).Sensistor c).Resistor d). Inductor
- 49.The operating point variation is due to []
 a). I_{CBO} b). V_{BE} c). β d). All the above
50. The stability factor of a fixed bias is []
 a) $1+\beta$ b) $1-\beta$ c) $(1+\beta)/ 1-\beta$ d) $(1-\beta)/ (1+\beta)$

Answers

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
a	b	a	b	d	c	a	b	b	b	b	d	b	d	a	b	c	c	a	d	d
22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40		
a	a	c	a	a	d	c	d	a	b	b	b	b	d	b	b	c	a	b		
41	42	43	44	45	46	47	48	49	50											
a	a	d	b	c	c	b	a	d	a											

Signature of subject co-ordinator

Signature of Head of Department, ECE