F. Y. B. Sc. ELECTRONICS

Paper I: - Electronic Components and Circuits.

Chapter I: Passive Components

Questions for 2 marks.

Q.1: What is an inductor?
Q.2: Define the unit of an inductor.
Q.3: State different types of inductors with circuit symbols.
Q.4: Define Q factor of an inductor.
Q.5: Enlist the applications of inductors.
Q.6: What is inductive reactance? State it's mathematical formula.
Q.7: Explain the effect of operating frequency on the inductive reactance of inductor.
Q.8: Inductor blocks AC and bypass DC, Comment.
Q.9: Why inductor is referred as a choke?
Q.10: Calculate the inductive reactance of 100 H inductor at 1 KHz frequency.
Q.11: Define the terms i] Inductance ii] Current carrying capacity of an inductor.
Q.12: What in significance of Q factor of inductor in tuned circuit?
Q.13: State the different core materials used in inductors with one application of each.
Q.14: Why ferrite core inductor is preferred in high frequency applications?
Q.15: State the operating principle of a transformer.
Q.16: Draw the circuit symbols of i] step up transformer ii] step down transformer.
Q.17: Draw the circuit symbols of i] isolation transformer ii] auto transformer.
Q.18: Define the terms in connection with transformer i] voltage ratio ii] current ratio.
Q.19: Define the terms in connection with transformer ii] turns ratio ii] efficiency.
Q.20: State the different types of losses in transformers.
Q.21: Explain the term efficiency of an ideal transformer.
Q.22: Enlist the different types of relays.
Q.23: Enlist the different specifications of relays.
Q.24: Draw neat-labeled circuit symbol of electromagnetic relay.
Q.25: What is resistor? Give its symbol.
Q.26: Name the various types of resistors in use.
Q.27: Distinguish between fixed and variable resistor.
Q.28: On which factors the resistance of resistor depends?
Q.29: Draw the labeled diagram of carbon composition resistor.
Q.30: Describe in brief metal film resistor.
Q.31: Define non-linear resistor. Give its examples.
Q.32: Explain the construction of wire wound resistor.
Q.33: Explain in short construction of metal film resistor.
Q.32: Explain the terms-tolerance and wattage.
Q.33: State the difference between potentiometer and rheostat.
Q.34: Describe in short the preset.
Q.35: Explain liner and non-linear resistor.
Q.36: State various types of fixed resistors. Draw the symbol of fixed resistor.
Q.37: Explain the term maximum operating temperature.
Q.38: How the resistance value 1 K is color coded?

Q.39: Calculate the value of resistance having co lour code sequence Red , Yellow, orange and gold?
Q.40: What is varistor? Give its application.
Q.41: What is LDR? Which materials are use to make LDR?
Q.42: Explain the meaning of NTC and PTC thermistor?
Q.42: What is thermistor? Draw its resistance temperature characteristics.
Q.43: Match the following.

i. Thermistor	-	Voltage sensing resistor
ii LDR	-	Three terminal variable resistor
iii Varistor	-	Temperature sensor
iv. Rheostat	-	Light sensor

Q.44: Semi conducting Materials can be use as temperature sensing materials comment.
Q.45: State the colors representing 0 to 9 digits of resistance color code.
Q.46: Indicate the colors of the bands for the resistance value 27 and tolerance 5%?
Q.47: How the resistor having resistance value 10 K with 10% tolerance is color-coded?
Q.48: Draw the color-coding diagram for 47 K resistor with 5% tolerance.
Q.49: Determine the resistance and tolerance rating for four-band color code resistor, having colors Red, Green, Black and Silver
Q.50: Determine the resistance and tolerance rating for five-band color code resistor with colors Blue, Red, Green, Silver and Gold.
Q.51: Give the applications at variable resistors.
Q.52: Which semi conducting materials are used in the fabrication of LDR?

Questions for 4 marks.

Q. 1: What is an inductor? State it's different types with circuit symbols.
Q. 2: Define Q factor of an inductor. Give it's significance in tuned circuit.
Q. 3: What is an inductor? State and define the unit of an inductor.
Q. 4: Calculate the value of an inductor that induces 40 V when current through it changes at the rate of 4 A / s.
Q. 5: Describe the air core inductor in details.
Q. 6: Explain constructional details of iron core inductor.
Q. 7: Write a note on ferrite core inductor.
Q. 8: What is a choke? Explain it's action as filter in power supply circuit.
Q. 9: Explain the frequency response of an inductor.
Q.10: State the different core materials used in inductors. Draw the circuit symbols of the inductors.
Q.11: Calculate the value of an inductance of an inductor having inductive reactance of 100 Ω operating at frequency 1000 Hz and 5000 Hz.
Q.12: Explain the term inductive reactance of an inductor. What is the value of inductive reactance of an inductor in DC circuit?
Q.13: Explain the following terms in connection with an inductor.
i] Inductance ii] Inductive reactance iii] Q factor iv] Current carrying capacity.
Q.14: Enlist the applications of inductors.
Q.15: Generally a choke is not used as a filter in power supply circuit, why?
Q.16: Calculate the effective inductance when two inductors $L_1 = 100$ mH and $L_2 = 50$ mH are connected in i] series ii] parallel.
Q.17: What is transformer? Explain the working principle of a transformer
Q.18: State different types of transformers. Draw their circuit symbol.

Q.19: What is transformer? Explain on which principle it works.
Q.20: State different types of transformers. Explain in details isolation transformer.
Q.21: What type of core material is used in power transformer? Explain it's importance.
Q.22: Draw the circuit symbols of. i] step up transformer ii] step down transformer iii] isolation transformer iv] auto transformer.
Q.23: Explain the different types of losses in transformers.
Q.23: Define the following terms in connection with transformer
i] voltage ratio ii] current ratio iii] turns ratio iv] efficiency.
Q.24: Turn ratio of a transformer decides a type of transformer. Comment.
Q.24: What is transformer? When 100 V DC is applied to the primary of transformer having turns ratio 5: 1, what is it's secondary voltage? Comment on the result.
Q.26: What is the function of step up and step down transformer? Explain how step up and step down is achieved in a transformer.
Q.27: Explain in details isolation transformer. Where it is used?
Q.28: Explain in details about autotransformer. State it's application.
Q.29: A transformer is connected to 120 V ac line has turns ratio 1: 2 Calculate the step up voltage at it's secondary.
Q.30: A transformer has 500 primary and 50 secondary turns. If 1230 V ac is applied to it's primary, the full load primary current is 0.1 A. Calculate secondary voltage and secondary current.
Q.31: Write a note on dry read relay.
Q.32: State the specifications of general-purpose electromagnetic relay.
Q.33: State the applications of general-purpose electromagnetic relay.
Q.34: What is resistor? Name the various types at fixed and variable resistors.
Q.35: With neat diagram explain the construction at carbon composition resistor.
Q.36: Describe carbon film resistors. What are its features?
Q.37: Explain the construction at metal film resistor. Draw neat diagram and give its applications.
Q.38: Write a short note on wire wound resistor.
Q.39: Explain the method of determining resistance value using four-band color code system.
Q.40: State various types of fixed resistors. Explain any one of them.
Q.41: Explain the specifications of resistors.
Q.42: Explain the terms. i] tolerance ii] maximum operating temperature iii] maximum operating voltage iv] wattage.
Q.43: State the different types of variable resistors. Explain any one of them.
Q.44: Write note on linear and non-linear resistor
Q.45: What is potentiometer? Explain its construction and draw its symbol.
Q.46: With neat diagram explain the construction and specifications of rheostat.
Q.47: Write a note on preset.
Q.48: Explain the construction and applications of themistor.
Q.49: What is varistors? Describe its construction.
Q.50: Write a note on LDR Draw its symbol.
Q.51: What are the different types of nonlinear resistors? Explain any one in brief.
Q.52: State the different types and applications of nonlinear resistors?
Q.53: Indicate the color of the bands for each of the following resistors. i] 27 kΩ, 10 % ii] 100 Ω, 5 %
Q.54: Determine the resistance and tolerance rating for following four band color codes. i] Brown, Black, Red and Gold. ii] Orange, Violet, Yellow and Silver.

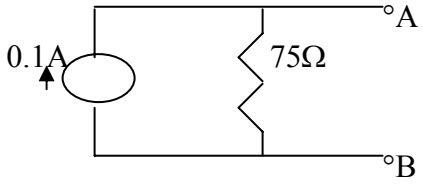
Questions for 6 marks.

Q.1: Explain the constructional details of step down transformer.
Q.2: Deduce the basic relationship for voltage ratio, current ratio, turns ratio of ideal transformer.
Q.3: Explain in details autotransformer and isolation transformer.
Q.4: Explain the following terms in connection with an inductor. i] Inductance ii] Inductive reactance iii] Q factor.
Q.5: Write a note on air core and ferrite core inductor.
Q.6: Explain the constructional details of general-purpose electromagnetic relay.
Q.7: Explain the action of general-purpose electromagnetic relay as a switch.
Q.8: Explain in details dry read relay.
Q.9: A transformer has 500 primary and 100 secondary turns. If 1230 V ac is applied to it's primary, the full load primary current is 0.2 A . Calculate secondary voltage, secondary current and efficiency of a transformer.
Q.10: Name the different types of fixed resistors and variable resistors. Explain any one of each grape.
Q.11: Explain the construction at rheostat and potentiometer. State the difference between them.
Q.12: Explain the method at determining resistance value using four-band color code. Hence indicate the color bands for the resistance value
Q.13: Write short notes on i] film resistor ii] preset
Q.14: With neat diagram explain the construction at wire wound resistor and rheostat. State their applications.
Q.15: State the different resistors specification. Explain each specification in brief.
Q.16: Write a note on linear and logarithmic potentiometer. State the different types of non-linear resistors.
Q.17: What is thermistor? Explain its construction. With resistance temperature characteristics explain NTC and PTC thermistor.
Q.18: Write note on i] varistors ii] light dependent resistors.
Q.19: Give the classification of capacitor into different types; explain any one fixed capacitor in detail.
Q.20: Describe Aluminium and Tantalum electrolyte capacitor.
Q.21: Write a note on i] Paper capacitor ii] Ceramic capacitor.
Q.22: With neat diagram explain paper capacitor and polystyrene capacitor.
Q.23: Describe construction and specifications of paper capacitor and polystyrene capacitor.
Q.24: Explain construction and applications of ceramic capacitor and polystyrene capacitor.
Q.25: What is a capacitor? What materials are used as dielectric in a capacitor? Describe briefly trimmer capacitor.
Q.26: Explain construction and applications of gang condenser and trimmer capacitor.
Q.27: Describe any four specifications of capacitor. Draw the symbol of fixed and variable capacitor.
Q.28: Give any four uses of capacitor. Explain charging and discharging of capacitor.
Q.29: Distinguish between electrolytic and non- electrolytic capacitor. Explain the terms i] voltage rating ii] tolerance.

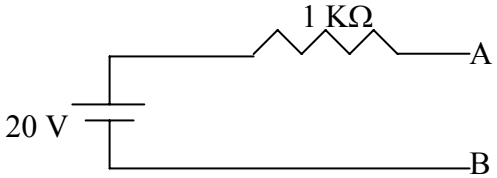
Chapter II: Circuit Laws and Network Theorems

Questions for 2 marks.

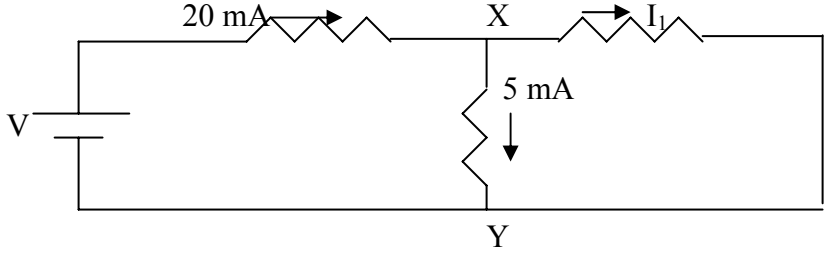
Q.1: What is the essential difference between direct current and alternating current?
Q.2: Define briefly an ideal current source and an ideal voltage source.
Q.3: State the three versions of Ohms laws relating to voltage, current and resistance.
Q.4: State and explain Kirchhoff's current law.
Q.5: State and explain Kirchhoff's voltage law.
Q.6: Explain the method of calculating In and Rn for Nortons equivalent circuit.
Q.7: Explain the method of calculating V^{th} and R^{th} for Therenin's equirvalent circuit.
Q.8: When maximum power will be delivered to the load, explain briefly.
Q.9: Give the advantage of Milliman's theorem.
Q.10: Explain the need of Thevenin's theorem.
Q.11: Explain the need of Norton's theorem.
Q.12: Give the steps for applying Superposition theorem to a circuit.
Q.13: Explain in brief, a concept of electrical network.
Q.14: Give the steps involving in Thevenin's theorem.
Q.15: Give the steps involving in Norton's theorem.
Q.16: Give the Statement of Ohms law.
Q.17: Find the Thevenin's equivalent of following circuit,



Q.18: Find Norton's equivalent of following circuit.



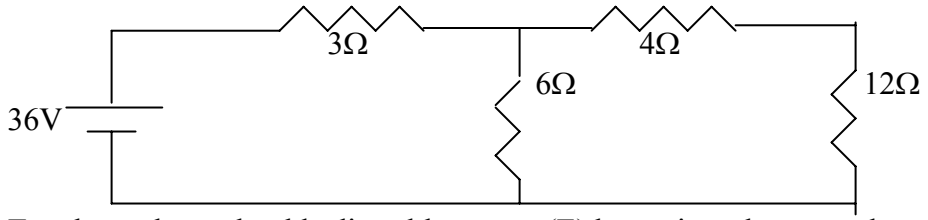
Q.19: A battery has e.m.f. 28 volts supplies a current of 4 A. What is the resistance of the circuit?
Q.20: An electrical device has resistance of 1.5 KΩ when operated from a 230 V Power line, how much current does it take from the power line?
Q.21: An soldering has resistance of 1500Ω and a current 0.15 A. flows through it. What is the voltage across it?
Q.22: A voltage 230 V, applied across a conductor and a current of 0.15 A. flows through it. What is the value of resistance of a conductor?
Q.23: Find the value of the current (I_1) in the following circuit.



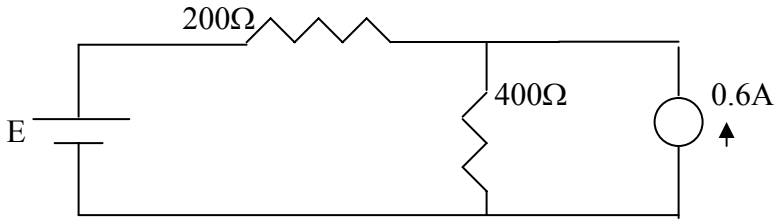
24. An antenna has a Thevenin's voltage of 20 V and a Thevenin's resistance of 300Ω. When the receiver is matched to the antenna, what is the power transferred to the receiver?

Questions for 4 marks.

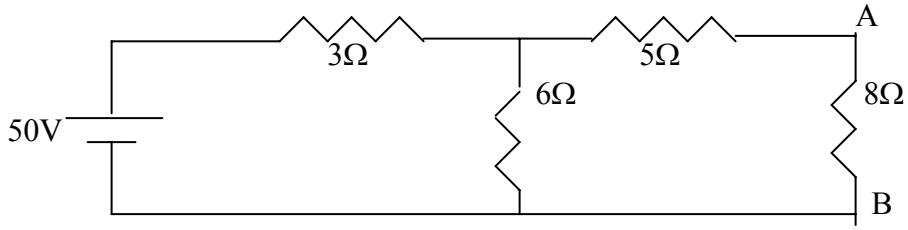
Q.1: State Thevenin's theorem. Prove it in case of two terminal networks.
Q.2: State Norton's theorem. Prove it in case of two terminal networks.
Q.3: How voltage source is converted into current source and vice versa?
Q.4: State and explain Ohm's law relating to (V), (I) and (R).
Q.5: State superposition theorem. Prove this theorem in case of general network.
Q.6: Apply Thevenin's theorem to find current through the 12Ω resistor of the following circuit.



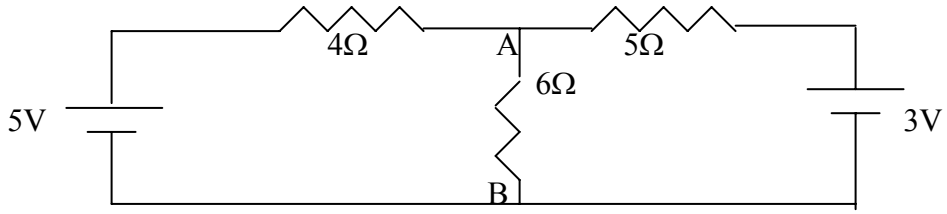
Q.7: To what voltage should adjustable source (E) be set in order to produce a current of 0.3 A in the 400Ω resistor shown in following figure.



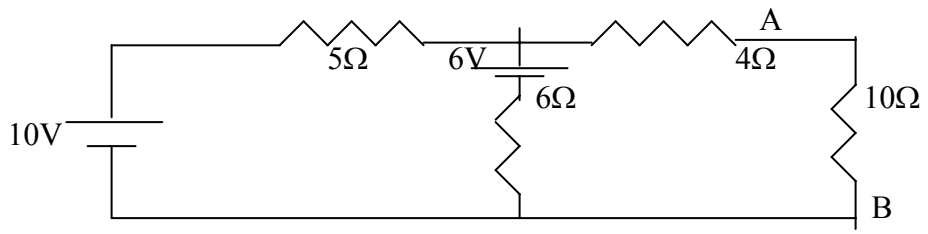
Q.8: Using Thevenin's theorem, find current in 8Ω resistor in the following figure. Given that battery has internal resistance of 1Ω



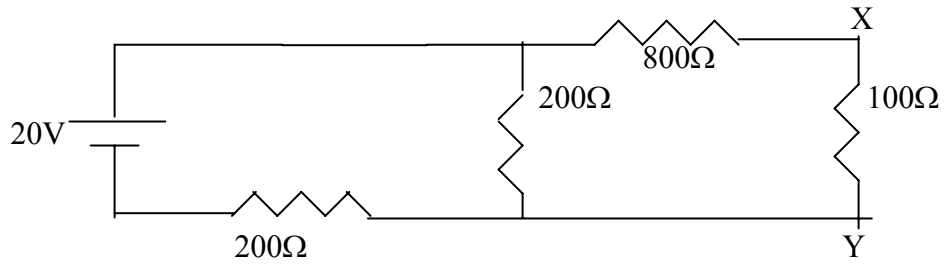
Q.9: Using Thevenin's theorem, find the current in 6Ω resistor in the following figure.



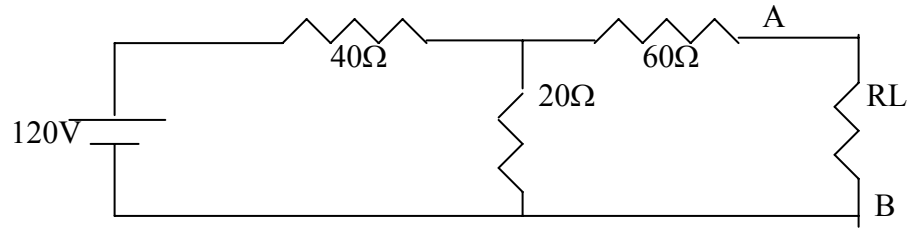
Q.10: Using Thevenin's theorem, find potential difference across terminals (A) and (B) in following figure.



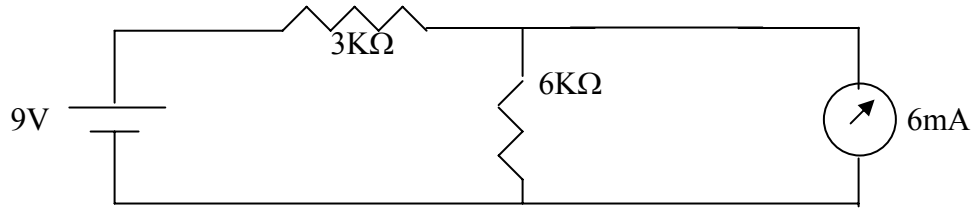
Q.11: Find the voltage across 100 resistors by constructing Norton equivalent circuit in the following figure to the left of terminals X and Y.



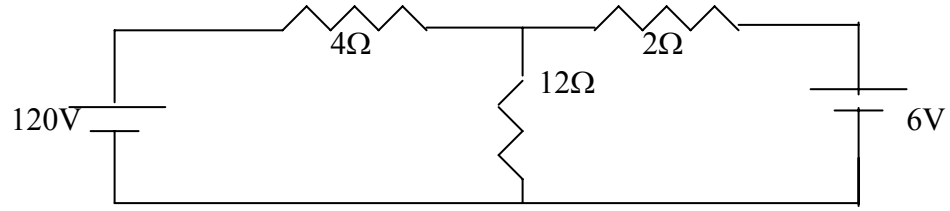
Q.12: Find the value of load resistance (RL) in following figure for transfer of maximum power. Determine also the maximum power.



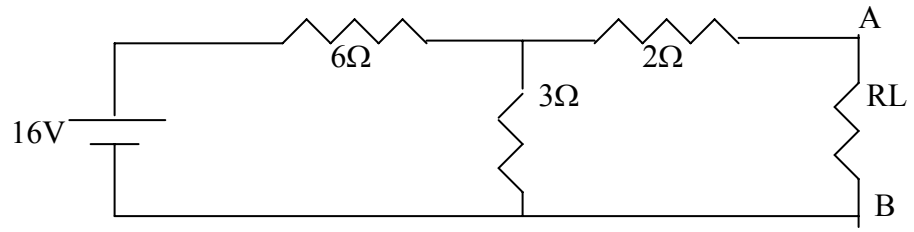
Q.13: For the following circuit, find Norton's equivalent and hence find circuit through the 6 KΩ resistor.



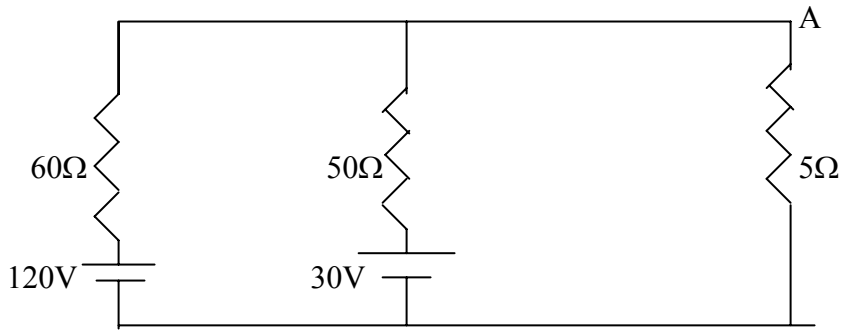
Q.14: What is the Norton's equivalent for the circuit shown in following figure, use it to find current through 12Ω resistor.



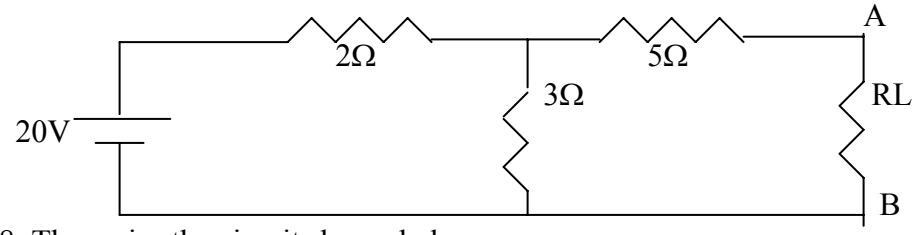
Q.15: According to Maximum power transfer theorem, what should be the value of load resistance (RL) to abstract maximum power from the 16 V battery shown in following fig. Calculate the value of power.



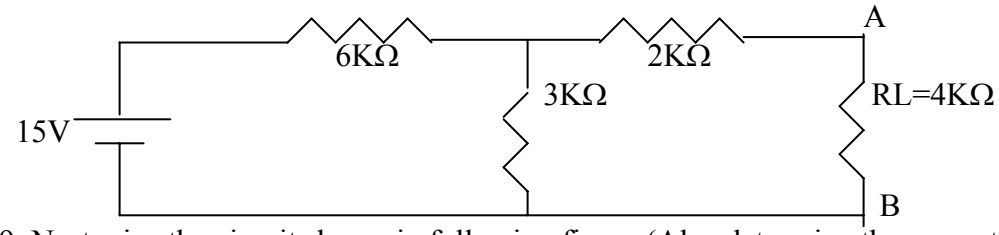
Q.16: By constructing a Milliman equivalent voltage source at terminals A and B find the voltage across (RL=5Ω) in the following circuit.



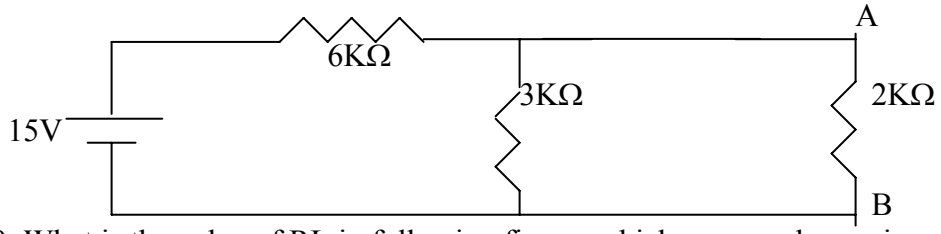
Q.17: For the circuit shown in following figure, find the value of (RL) for maximum power transfer.



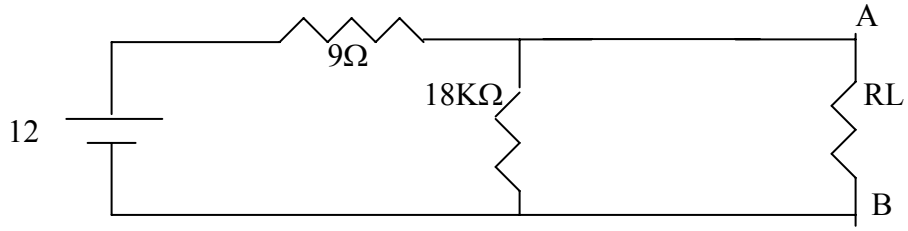
Q.18: Thevenise the circuit shown below.



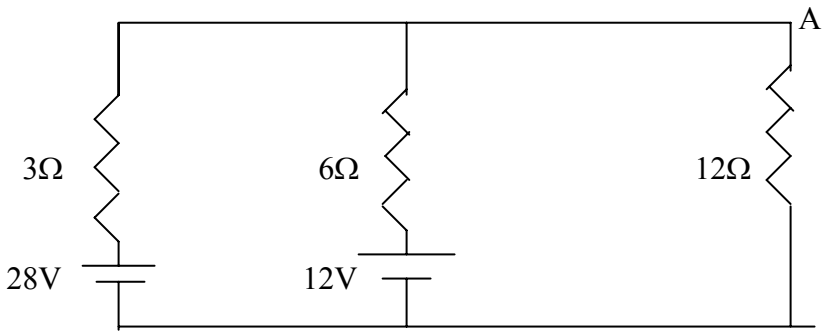
Q.19: Nortonize the circuit shown in following figure (Also determine the current through RL)



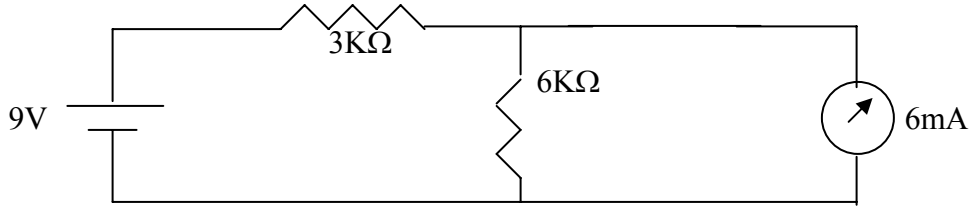
Q.19: What is the value of RL in following figure, which can supply maximum power to the load? What is the value of load power?



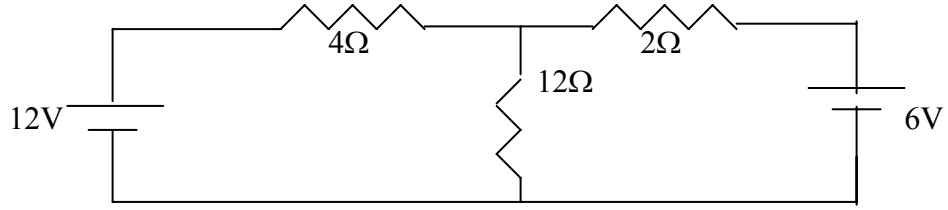
Q.19: Use superposition principle to find current through 12Ω resistor of following figure.



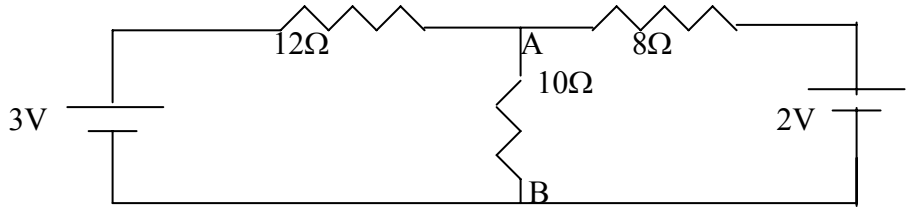
Q.20: Using superposition theorem, calculate the current following through 6 resistor of the following circuit.



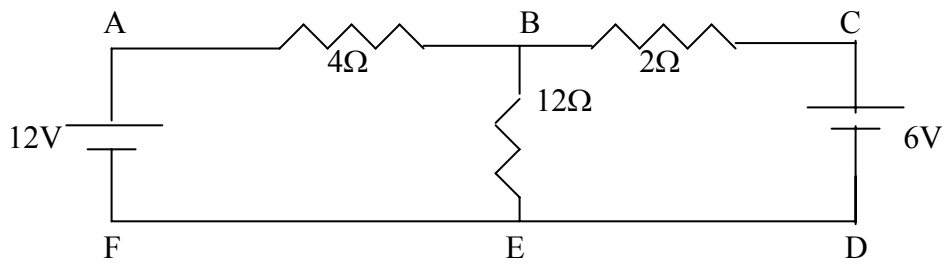
Q.21: What is the Norton's equivalent circuit for the circuit shown below.



Q.22: Use Kirchhoff' laws to find the magnitude and direction of current flow through10Ω resistor of following figure.



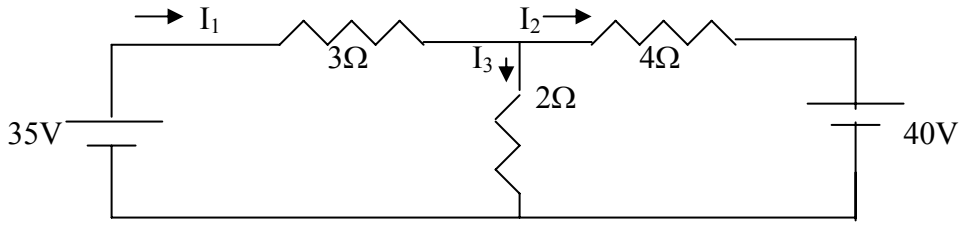
Q.23: Using Kirchhoffs laws, calculate the magnitude of the branch current through AB in the network shown in following figure.



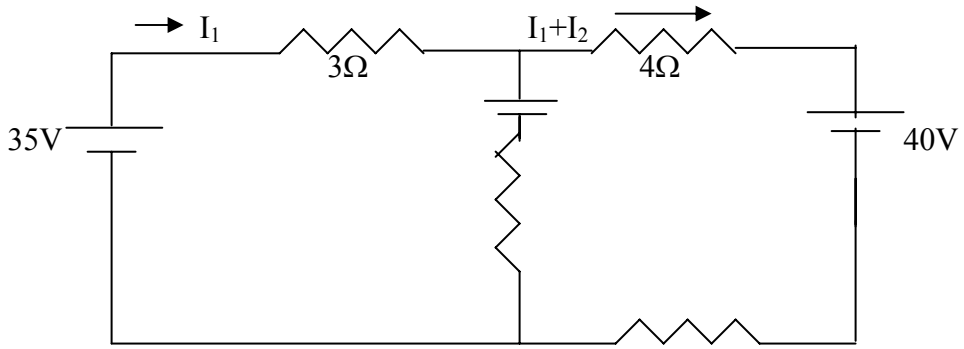
Q.24: Obtain the equation to find maximum power in case of maximum power transfer theorem.
Q.25: State Kirchhoffs voltage law; and explain the procedure for applying this law.
Q.26: Give the statements of Kirchhhoffs current law and Kirchhoffs voltage law.

Questions for 6 marks.

Q.1: Explain how a given Thevenin's circuit can be converted into Norton's equivalent circuit and vice versa.
Q.2: State and explain Milliman's theorem.
Q.3: Give the statement of Norton's theorem. Prove that the interchange of voltage and current sources with the help of Thevinin's and Norton's theorems, give method of circuit analysis.
Q.4: State and explain Superposition theorem.
Q.5: What is the Maximum power transfer theorem? Show that the power lost in the internal generator is equal to the power delivered to the load and the power efficiency is 50%.
Q.6: A certain network including a generator has open voltage of 125V and on short circuit produces a current of 5.59A. When a 100Ω resistor is connected, the current is 4.41A. By Thevinin's theorem, find an equivalent voltage source circuit for the network.
Q.7: In the circuit shown in following figure, find the different branch currents by Superposition theorem.



Q.8: For the circuit shown in following figure, find the currents flowing in all branches of a given circuit. As there are two unknowns I1 and I2 two closed loops will be considered.



Q.9: State and explain i] Thevenin's theorem and ii] Norton's theorem.

Chapter III: P-N Junction

Questions for 2 marks.

Q.1: Write short note on insulator.
Q.2: Write short note on conductor.
Q.3: Explain in short semiconductors.
Q.4: What is doping and dopant?
Q.5: Explain in brief, process of dopping.
Q.6: What is impurities? Why it is used?
Q.7: Explain pentavalent impurities with example.
Q.8: Explain trivalent impurities with example.
Q.9: Explain in brief, intrinsic semiconductor.
Q.10: Discuss intrinsicsemiconductor are pure semiconductors.
Q.11: Explain in brief, knee voltage of diode.
Q.12: Explain in brief, breakdown voltage of diode.
Q.13: Draw circuit symbol of diode, zener diode, photo diode and LED, label it
Q.14: Draw the symbol of LED and give its two uses.
Q.15: Draw the neat-labelled I-V characteristics of zener diode.
Q.16: Write short note on extrinsic semiconductor.
Q.17: Which impurity play important role in formation of P type semiconductor?
Q.18: What is threshold voltage?
Q.19: Explain in brief potential barrier.
Q.20: What is barrier potential? How it forms?
Q.21: Write short note on conduction band.
Q.22: Write short note on valence band.
Q.23: What is energy gap? How it measures?
Q.24: Which process is used to convert the material into extrinsic?
Q.25: Explain energy band diagram.
Q.26: Draw labelled band diagram of conductor, semiconductor and insulator.
Q.27: Pentavallent impurity is called as donor impurity, comment.
Q.28: Trivallent impurity is called as donor impurity, comment.
Q.29: Distinguish with diagram, then solid material on the basis of band diagram.
Q.30: Give the circuit symbol and one application each 1) LED 2) Zener diode.

Questions for 4 marks

Q.1: Explain LED with symbol and state its uses.
Q.2: Explain the operation of P-N Junction diode when forword and reverse bias.
Q.3: Write note on phoptodiode.
Q.4: What is junction barrier? Explain it.
Q.5: What is dopping? Explain n type semiconductor.
Q.6: What is zener diode? Explain its I-V characteristics.
Q.7: Write note on LED.
Q.8: What is dopping? Explain P Type semiconductor.
Q.9: Explain the formation of depletion region in P-N Junction.
Q.10: Explain P type semiconductor.
Q.11: Explain Zener diode as voltage regulator.

Q.12: How the barrier potential is developed across the P-N Junction, what are the approximate values this potential for Germenium and Silicon?
Q.13: Draw and explain I-V characterisitics of P-N Junction.
Q.14: Draw energy band diagram for i) conductor ii) insulator iii) p type semiconductor iv) n type semiconductor
Q.15: Explain Light Emmiting Diode. Give its Symbol.
Q.16: What is dopping? State the elements used to obtain p type semiconductor and n type semiconductor.
Q.17: Explain the characteristics of junction diode in forword and reverse bias configuration.
Q.18: Explain the diagram for forword and reverse characteristics of P-N Junction diode.
Q.19: Zener diode can be used as voltage regulator. Comment.
Q.20: What is Semiconductor? State any two distinguishing properties of semiconductors.
Q.21: Explain why semiconductors have negative temperature oc coefficient of resistance?
Q.22: On the basis of band theory Distinguish between Conductor, Insulator and Semiconductor.
Q.23: What is dopping? Which elements are normally used for dopping ? State the nature of semiconductor on the basis of doppents.
Q.24: Explain the depletion region in P-N junction semicxonductor.
Q.25: Why germenium have negative temperature of coefficient of resistance? Explain Intrinsic and Extrinsic semiconductors.
Q.26: Explain in detail conductor and semiconductor.
Q.27: Distinguish in brief, solid material on the basis of band diagram.
Q.28: Explain in detail mechanism of conduction in p type semiconductor
Q.29: Explain in detail mechanism of conduction in n type semiconductor
Q.30: Explain I-Vcharacteristics of diode.
Q.31: Explain in detail Forword biasing of P-N junction diode.
Q.32: Explain in detail reverse biasing of P-N junction diode.
Q.33: Define the terms 1) breakdowm voltage 2) knee voltage 3) barrier potential
Q.34: Explain in detail formation of P-N Junction.
Q.35: Explain in detail formation of p type material.
Q.36: Explain in detail formation of n type material.
Q.37: Explain in detail extrinsic semiconductor.
Q.38: What is photodiode? Give its circuit symbol and state its working.
Q.39: Enlist the applications of i) diode ii) zener diode iii) photodiode iv) LED
Q.40: What is optocoupler? Where it is used?
Q.41: Discuss the improtance of optocoupler.

Questions for 6 marks

Q.1: What is zener diode? How it can be used for voltage regulation in power supply?
Q.2: What is P-N Junction? Explain potential barrier and depletion region.
Q.3: What is extrinsic semiconductor? Explainntype semiconductor.
Q.4: What is depletion layer? How it is formed?
Q.5: Explain the operation of P-N junction during forward and reverse bias?
Q.6: What is zener diode? Draw I-V characteristics of zener diode and explain how it is used for voltage regulation.
Q.7: What is intrinsic semiconductor? How are n type and p type semiconductors obtained?
Q.8: What is the purpose of dopping a semiconductor? Distinguish between p type and n type semiconductor.

Q.9: Distinguish between metal, semiconductor and insulator. Give examples of each.
Q.10: Draw the circuit diagram of zener regulator. Obtain necessary for calculating the values of series dropping resistance.
Q.11: Draw the band structure of insulator, semiconductor and conductor. Hence distinguish them.
Q.11: Draw the circuit diagram of zener regulator. Explain the working of circuit.
Q.12: What is P-N junction? Draw and explain characteristics of P-N junction?
Q.13: What is semiconductor? state distinguishing properties of semiconductor. Explain why semiconductor have negative temperature coefficient of resistance?
Q.14: What are different types of semiconductors? On the basis of band theory , distinguish between conductor , semiconductor and insulator
Q.15: What is Zener diode? Explain working of zener regulator with neat diagram.
Q.16: How the barrier potential is developed across the P-N Junction? What are the approximate values of these potentials in Ge and Si?
Q.17: What is meant by dopping? Explain how p and n type semiconductors are obtained.
Q.18: What is P-N Junction? Explain the formation od P-N Junction.
Q.19: Explain in detait extrinsic and intrinsic semiconductors with suitable example.
Q.20: Explain with crystal structure i) p type material ii) n type material.
Q.21: Explain in detail I-V characteristics of P-N Junction diode? and forword resistance of the diode.
Q.22: Write the importance, scope and application with working of optocoupler in detail.
Q.23: Explain in detail with neat diagram formation of depletion region.
Q.24: Explain in detail, working principle of LED. Draw its symbol and state its applications
Q.25: Explain in detail with appropriate diagram i) Forword biasing ii) Reverse biasing
Q.26: What is intrinsic material? Why and how it is converted in to extrinsic material?
Q.27: Explain in detail formation of P-N Junction.
Q.28: Explain in detail mechanism of conduction in i) t material ii) n type material.
Q.27: Write short note on i) LED ii) photodiode.

Chapter 4: Rectifier Circuit

Question for 2 marks.

Q.1: What is a ripple factor? What is its value for half wave rectiffer?
Q.2: What do you mean by rectiffer?
Q.3: Define the term rectification and efficieny
Q.4: Distinguish between half wave and full wave rectifier
Q.5: What is he function of filter?
Q.6: Distingusih between ac and dc voltages.
Q.7: Why do we use transformer in rectifier circuit?
Q.8: Calculate the % ripple factior, if the dc output voltage 20 V and ac voltage 2V.
Q.9: Full wave rectiffer is superior to half wave rectifier. Comment.
Q.10: A full-wave rectifier is..... efficient than a half wave rectifier (less, more not).
Q.11: The bridge rectifier is not used for .....voltage application (low, high very high)
Q.12: The output of a rectifier contains..... and .....
Q.13: Ripple factor of a full wave rectifier is (0.58, 0.48, 0.28)
Q.14: In full-wave rectification, if the i/p frequencyis 50 Hz then output frequency is.....(50 Hz, 100 Hz, 200 Hz)
Q.15: The maximum efficiency of a full-wave rectifier is ..... (40%,81.2%,90%)
Q.16: In half-wave rectification if the input frequency is 50 Hz, then O/P frequency is .....(50 Hz, 100 Hz, 200 Hz)
Q.17: A filter circuit is used to remove the..... and allows only the ..... to reach the load.
Q.18: In a half wave rectifier, the load current flows for.....
i) the complete cycle of the input signal.
ii) Only for the positive half-cycle of the input signal.
iii) lessthan half cycle of the i/p signal.
iv) more than half cycle but less than the complete cycle of the input signal.

Question for 4 marks.

Q.1: Derive an expression for the efficiency of a half wave rectifier.
Q.2: Derive an expression for the efficiency of a centre tap full wave rectifier.
Q.3: With a neat circuit diagram explain the working of a half wave rectifier.
Q.4: Explain the working of the choke input filter
Q.5: Explain the working of the capacitor filter.
Q.6: Explain the working of the II –filter.
Q.7: The applied input AC power to the half wave rectifier is 100 watts. The DC output power obtained is 40 Watts. Calculate the rectification efficiency.
Q.8: Show that efficiency of a full wave rectifier is 81.2

Question for 6 marks.

Q.1: Describe the action of the capacitor filter and II filter.
Q.2: Describe the action of the choke input filter and II filter.
Q.3: With a neat circuit diagram, explain the working of full wave rectifier.
Q.4: With a neat circuit diagram, explain the working of bridge rectifier.
Q.5: Draw the output voltage waveform of a full wave rectifier and thenshow the effect of this waveform of connecting a capacitor across the load.

Q.6: Show that the maximum rectification efficiency of a half wave recifier is 40.6%.
Q.7: Draw the circuit of a half wave rectifier with a capacitor input filter and describe the operation of the circuit.

Chapter 5: Bipolar junction transistor

Question for 2 marks.

Q.1: Find the Value of β if $\alpha = 0.99$.
Q.2: Why the common emitter configuration is most commonly used?
Q.3: Why the ordinary junction transistor is called bipolar?
Q.4: In a common base configuration, current amplificiation factor is 9. If the emitter current is 1 mA determine the value of base current.
Q.5: Draw the symbol of NPN and PNP transistor and specify the leads.
Q.6: What are the three possible transistor configurations?
Q.7: Define the term current amplification factor.
Q.8: List advantag of the CE configuration
Q.9: Explain the terms cutoff and saturation w.r.to transistor.
Q.10: What is a transistor? Why is it so called ?
Q.11: In a ltransistor, base is very.....i] thin ii] thick iii] narrow
Q.12: A transistor has .....PN junctions i] One ii] two iii] three
Q.13: The emitter is .....doped i] heavily ii] lightly iii] moderately
Q.14: The value of α is than i] 4.2 ii] 1 iii] 3
Q.15: Common collector arrangement is generally used for.....i] impedance matching ii] amplification iii] None
Q.16: The most commonly used transistor circuit arrangement is..... circuit. (CB, CE, CC)
Q.17: The collector is..... than emitter (Larger, Smalller)
Q.18: The i/p resistance of a transistor is much ..... than its output resistance (Less, more)
Q.19: The function of a transistor is to do..... (rectification, amplification)
Q.20: Transistors would be classified as..... electronic devices. (active, passive)
Q.21: The very thin, lightly doped control terminal on a bipolar transistor is the.....(base, emitter, collector)
Q.22: The emitter- base junction of a bipolar transistor is always.....(forward biased, reverse biased).

Question for 4 marks.

Q.1: Explain the function of emitter, base abd collector in the operation of a BJT.
Q.2: Explain the construction of BJT.
Q.3: Derive the relation between α and β
Q.4: Draw the O/p characteristics of BJT and explain if brief.
Q.5: With the help of neat diagram, explain operation of PNP transistor.
Q.6: Describe the transistor action in detail.
Q.7: Distingusish between CE and CC configuration.
Q.8: What is done in the base region of a transistor to improve its operation.
Q.9: The current gain of transistor in CE configuration is 200. Calculate its CB current gain. Find the IB when Ie is 3 mA.
Q.10: What is BJT? Explain its construction.

Questions for 6 marks.

Q.1: Explain the construction and working of BJT
Q.2: Derive the relation between α and β and explain the I-V characteristics of BJT/
Q.3: Explain input and output characteristics of BJT.
Q.4: Explain transistor configuration of CE and CB.
Q.5: Explain the construction and working of PNP transistor.
Q.6: Explain the construction and working of NPN transistor.

Chapter VI:Transistor biasing methods

Questions for 2 marks.

Q.1: In order to achieve a faithful application minimum base emitter voltage V_{BE} required for Silicon transistor is ------.
Q.2: In order to achieve a faithful application minimum base emitter voltage V_{BE} required for Germanium transistor is ------.
Q.3: For proper operation of transistor Base-Emitter junction should be ------.
Q.4: For proper operation of transistor Base-Collector junction should be ------.
Q.5: The interaction of d.c.load line with given base current curve in transistor operation is -----.
Q.6: The superior and best method of transistor biasing is -------.
Q.7: The zero signal collector current I.C.is generally ------ in the initial stages of transistor amplifier.
Q.8: In order to properly reverse bias the collector-emitter junction Silicon transistor minimum collector-emitter voltage required is -------.
Q.9: In order achieve good stabilization in potential divider method, current through R_1 and R_2 should be at least ----- times base current I_B.
Q.10: If the operating point of the transistor changes then there is a -------.
Q.11: Stabilization of transistor means making ------- independent of temperature variation of transistor parameter.
Q.12: Resistance of emitter-base junction for forward bias condition is -------.
Q.13: Resistance of collector-base junction for reverse bias condition is -------.
Q.14: Stability factor for CE configuration is ------.
Q.15: What do you understand by transistor biasing?
Q.16: What is the need of transistor biasing?
Q.17: What is stabilization in transistor?
Q.18: Mention the essential of biasing circuit?
Q.19: What are the various methods of transistor biasing?
Q.20: What are disadvantages of the transistor biasing?
Q.21: What is operating of transistor ?
Q.22: What is thermal runaway?
Q.23: What is essential for proper working of transistor?
Q.24: Which bias is necessary for emitter-base junction?
Q.25: Which bias is necessary for collector-base junction?
Q.26: Define stability factor for base-bias method?
Q.27: Write stability factor for voltage-divider bias
Q.28: Write the advantages of the fixed-bias method
Q.29: Write the disadvantages of the fixed-bias method
Q.30: Write the advantages of collector to base method (Bias with feed back method)
Q.31: Write the disadvantages of collector to base method (Bias with feed back method)
Q.32: Which is the most commonly used biasing circuit?
Q.33: What is faithful amplification of transistor?
Q.34: State the requirements of biasing circuits.

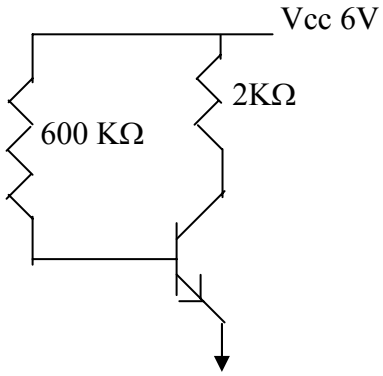
Questions for 4 marks

Q.1: What is faithful amplification and condition for amplification?
Q.2: Explain transistor biasing with it's needs
Q.3: Write the different methods of transistor biasing.
Q.4: Which are the disadvantages of biasing methods?
Q.5: Which are the advantages of biasing methods?
Q.6: Draw the diagram of voltage divider method
Q.7: Explain with diagram base-emitter resistor method of transistor biasing
Q.8: Explain with biasing with feed back resistor
Q.9: How thermal-runaway is avoided in transistor?
Q.10: Explain stability factor for CE circuit
Q.11: Derive an expression for stability factor for CE configuration
Q.12: Explain with diagram any one method of transistor biasing
Q.13: Derive the equation for stability factor for voltage divider biasing method
Q.14: Write the equation for stability factor for base bias with feed back resistor
Q.15: Explain the condition for the proper biasing of transistor
Q.16: Why fixed biasing circuit is not satisfactory?
Q.17: Which are the requirements of biasing circuit

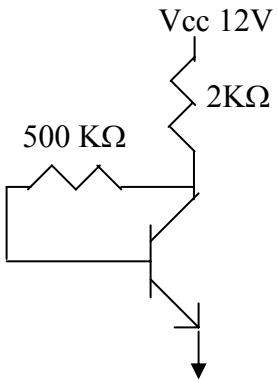
Questions for 6 marks

Q.1: What is faithful amplification? Explain the condition to be filled to achieve faithful amplification in transistor amplification.
Q.2: What do you understand by transistor biasing? What is its need?
Q.3: What are the various methods used for transistor biasing?
Q.4: What are the advantages and disadvantages of biasing methods?
Q.5: Explain voltage divider biasing method with circuit diagram
Q.6: Explain base-emitter method of transistor biasing. Write the advantages and disadvantages.
Q.7: Explain biasing with feed back resistor method for transistor biasing. Write the advantages and disadvantages.
Q.8: How stabilization of operating point is achieved by voltage divider bias method?
Q.9: Explain operating point and stabilization of transistor.
Q.10: Explain thermal runaway phenomenon related with transistor.
Q.11: Obtain an expression for stability factor in CE configuration.
Q.12: What is stability factor? Show that it is $1+\beta$ in case of CE configuration.
Q.13: What are the different methods of transistor biasing? Explain any one in datail.
Q.14: Write the equation of stability factor for different methods of transistor biasing.

Q.15: Calculate the collector current and the collector voltage for the circuit given below



Q.16: For a given collector to base circuit shown below find emitter current and collector voltage (β=50)



Chapter VII: Amplifier Circuits

Question for 2 marks.

Q.1: The input and output voltages of a common emitter transistor amplifier are --
-- out of phase.
Q.2: A single transistor amplifier stage contains -------- transistor.
Q.3: If collector resistor and load resistor are R_C and R_L then ac load line is ------.
Q.4: If collector supply voltage is 10 V, then its collector cut-off voltage under
d.c.condition is ----------.
Q.5: The point of intersection of a.c. and d.c.load line is the ----------.
Q.6: When a.c.signal is applied the operation point waves along ---------.
Q.7: Amplifiers are coupled to each other to ------ the gain.
Q.8: In the d.c.equivalent circuit of transistor amplifier the capacitor are to be ------.
Q.9: When the feed back energy is in phase with the input signal it is --------.
Q.10: When the feed back energy is in out of phase with the input signal it is --------.
Q.11: ------- feed back is used in amplifier circuit.
Q.12: ------- is used in oscillator circuit.
Q.13: Positive feed back -------- gain of an amplifier.
Q.14: Which are the important characteristics on an amplifier?
Q.15: Write the definition of feed back in amplifier circuit.
Q.16: Which are the different types of feed back?
Q.17: Explain positive feed in amplifier circuit.
Q.18: Explain negative feed in amplifier circuit.
Q.19: What are the advantages of negative feed back amplifier?
Q.20: In amplifier circuit which type of feed is used?
Q.21: Define frequency response of an amplifier.
Q.22: Define the band width of an amplifier.
Q.23: Define load line of transistor.
Q.24: What are different types of load line?
Q.25: Define d.c.load line of transistor.
Q.26: Define a.c.load line of transistor.
Q.27: Classify amplifier according to use.
Q.28: Classify amplifier according to frequency range.
Q.29: Classify amplifier according to coupled methods.
Q.30: Classify amplifier according to mode of operation.
Q.31: What is the use of emitter by pass capacitor CE in single stage amplifier circuit?
Q.32: Define voltage gain of an amplifier.
Q.33: Define current gain of an amplifier.
Q.34: Define power gain of an amplifier.
Q.35: What is the feed back in amplifier circuit?
Q.36: Define amplifier.
Q.37: Define voltage amplifier.
Q.38: Define band width and cut off frequency of an amplifier.
Q.39: Write the range of audio and radio frequency range.

Questions for 4 marks

Q.1: Draw the diagram of single stage transistor amplifier.
Q.2: Draw the circuit diagram and output characteristics of transistor.
Q.3: Classify amplifier according to use.
Q.4: Draw a.c.load line.
Q.5: Draw d.c.load line.
Q.6: Classify amplifier according to frequency range.
Q.7: Classify amplifier according to coupled methods.
Q.8: Classify amplifier according to mode of operation.
Q.9: Classify amplifier according to use.
Q.10: Write the equation of d.c.and a.c.load line.
Q.11: Explain the construction of a.c.load line.
Q.12: Explain the construction of d.c.load line.
Q.13: Write which currents are present in single stage transistor amplifier.
Q.14: Q.40: Define and explain voltage gain of an amplifier.
Q.15: Define and explain current gain of an amplifier.
Q.16: Define and explain power gain of an amplifier.
Q.17: What is the condition of feed back in amplifier circuit?
Q.18: Write the condition of positive feed back.
Q.19: Write the condition of negative feed back
Q.20: Explain the function of an amplifier.
Q.21: Draw the frequency response characteristics of single stage amplifier.
Q.22: Explain positive and negative saturation of transistor.
Q.23: Explain class A amplifier.
Q.24: Explain class B amplifier.
Q.25: Explain the gain of an amplifier.
Q.26: Explain the band width of an amplifier.
Q.27: Explain load line of a transistor.
Q.28: Explain biasing circuit of single stage CE amplifier.
Q.29: What is the function of by pass capacitor in common emitter circuit.
Q.30: Draw the input and output wave form for amplifier according to mode of operation.
Q.31: For a transistor amplifier Rc=4KΩ, Rf=5KΩ and Vcc=30V. Draw the d.c.load line
Q.32: How does an amplifier amplifies the signal?
Q.33: Name the methods of coupling amplifier.
Q.34: Explain the need of power amplifier.
Q.35: Write the uses of positive feed back.

Questions for 6 marks.

Q.1: Explain single stage transistor amplifier by using circuit diagram.
Q.2: Explain output characteristics of transistor.
Q.3: What is the function of each component used in single stage amplifier.
Q.4: Explain a.c.load line analysis.
Q.5: Explain d.c.load line analysis.
Q.6: Explain classification of amplifier.
Q.7: Explain how amplifiers are classified according to frequency range.
Q.8: Explain how amplifiers are classified according to coupling methods.
Q.9: Explain how amplifiers are classified according to mode of operation.

Q.10: What do you understand by d.c.and a.c.load line? Draw them by the out put characteristics of transistor with their respective equivalent circuit.
Q.11: What do you understand by d.c.load line? Explain its construction on out put characteristics.
Q.12: What do you understand by d.c.load line? Explain its construction.
Q.13: What are the different currents are present in single stage amplifier circuit?
Q.14: Define voltage, current and power gain of an amplifier.
Q.15: What is the feed back? What are its types?
Q.16: Explain positive and negative feed back.
Q.17: Explain frequency response curve for single stage amplifier.
Q.18: Explain operating point on load line analysis.
Q.19: Explain the concept of amplifier.
Q.20: Explain the difference between voltage and power amplifier.
Q.21: Explain the function of amplifier.
Q.22: Define the active, cut off and saturated region of transistor.
Q.23: Draw the characteristics of transistor and indicate active, cut off and saturated region.
Q.24: Explain base, emitter and collector current in amplifier.
Q.25: Explain with input\output wave form amplifier according to mode of operation.
Q.26: Explain the function of each component present in CE amplifier.
Q.27: Show that the output voltage of single stage CE amplifier is 180^0 out of phase with the input voltage.
Q.28: Compare the performance of amplifier according to coupling method.
Q.29: Find the operating point for transistor if Vcc=30V, R1=20KΩ, R2=20KΩ, Rc=4KΩ and Re=5 KΩ.
Q.30: Which is the most commonly used transistor amplifier? Explain its action.
Q.31: What are the advantages and disadvantages of direct coupled amplifier.
Q.32: Distinguish between class A, class B and class C amplifier.
Q.33:Why power amplifier is necessary? Explain in detail.
Some examples are there for six marks

Chapter VIII: Unijunction transistor

Question for 2 marks.

Q.1: What do you mean by UJT?
Q.2: State the three terminals of UJT?
Q.3: What do you mean by UJT? Give its symbol.
Q.4: State any two applications of UJT?
Q.5: Draw the equivalent circuit of a uni junction transistor.
Q.6: Draw the characteristics of UJT and show different regions.
Q.7: Define intrinsic stand off ratio of UJT.
Q.8: Define inter-base resistance of UJT.
Q.9: An oscillator made up using UJT is called as relaxation oscillator. Comment.
Q.10: Emitter of UJT is always shown with an arrow, explain why it is leaned in the direction of B1
Q.11: State minimum and maximum values of intrinsic stand off ration of an UJT.
Q.12: Explain the meaning of each term involved in the following equation in connnection with UJT:

Question for 4 marks:

Q.1: Explain how UJT is constructed with the helpof n-type silicon bar. Draw necessary diagram.
Q.2: Explain an equivalent circuit of UJT with necessary circuit diagram.
Q.3: With neat diagram explain basic principle of operation of UJT.
Q.4: Explain the action of an equivalent circuit of UJT.
Q.5: Draw the characteristics of UJT and explain them.
Q.6: Explain the negative resistance region of an UJT in its characteristics.
Q.7: Explain the action of UJT as an electronic swithch.
Q.8: Explain the action of UJT as a relaxation oscillator.
Q.9: Define for UJT i) inter-base resistance and ii) intrinsic stand off ratio.
Q.10: An UJT has 8 V between the bases and intrinsic stand off ration is 0.7.Find the value of peak point voltage.
Q.11: An UJT has = 0.65 used in a relaxation oscillator circuit with R1=5 K and C= 0.02 .Determine the period and frequency of oscillations.
Q.12: Intrinsic stand off ratio for UJT is 0.6. If the inter-base resistance is 10 what are the values of RB1 and RB2 ?
Q.13: Intrinsic stand off ratio for UJT is 0.75. If the inter-base resistance is 10 what are the values of RB1 and RB2?
Q.14: Find out the value of C for UJT relaxation oscillator, if R=14 K n=0.75 and f=1 KHz.
Q.15: For UJT relaxation oscillator show that;
T= 2.30 RC log10

Questions for 6 Marks:

Q.1: Explain the construction and operation of an UJT.
Q.2: State the applications of UJT. Explain the action of UJT as a switch.
Q.3: State the applications of UJT. Explain the action of UJT as a relaxation oscillator.
Q.4: Explain the following terms for UJT:

i) Negative resistance region
ii) Intrinsic stand off ration

iii) Inter-base resistance

Q.5: With neat circuit diagram explain the action of an equivalent circuit of UJT. Hence find the value of

Chpater IX: Field Effect Transistor

Questions for 2 marks:

Q.1: Draw the symbol on n-channel JFET and name the terminals of it.
Q.2: Draw the symbol of P- channel JFET and name the terminals of it.
Q.3: A FET is also called as unipolar transistor. Comment.
Q.4: A FET is a voltage driven device. Comment.
Q.5: The gate of JFET is always reverse biased. Comment.
Q.6: Which are the charge carriers in a p-channel FET?
Q.7: Explain what happens to the width of conducting channel, if the reverse bias on the gate of a FET is increased.
Q.8: How many terminals are asociated wth the MOSFET?
Q.9: Draw the symbol of n-channel MOSFET?
Q.10: A FEThas..... power gain.
i. Small ii. Very high iii. Very small iv. None of the above.
Q.11: A FET has high input impedance because.....
i. it is made up of semiconductor material ii. Its input is reverse biased iii. Of impurity atoms. Iv. None of the above.
Q.12: In a field effect transistor, when drain voltage is equal to pinch-off voltage,the depletion layers.....
i. almost touch each other ii. Have large gap iii. Have moderate gap iv.none of the above.
Q.13: In a field effect transistor, what do you mean by Idss?
Q.14: A MOSFET is sometimes called as..... FET.
i] many gate ii] Open gate iii] Insulated gate iv] None of the above.
Q.15: What do you mean by channel ohmic region of JFET?
Q.16: Draw the transfer characteristics of JFET.
Q.17: What are the disadvantage of FET?
Q.18: The static resistance of a JFET is given by,
i] ii] iii] iv] None of the above
Q.19: The input impedance of a MOSFET is of the order of.....
i] ii] A few hundred iii] K iv] Several M
Q.20: The gate voltage in a JFET at which drain current becomes zero is called..... voltage.
i. saturation ii. Pinch-off iii. Active v. Cut-off
Q.21: Draw the symbol of n-channel DE MosFET and name the terminals of it.
Q.22: Draw the symbol of p channel DE MosFET and name the terminals of it.
Q.23: Draw the symbol of E only n-channel DE MoSFET and name the terminals of it.
Q.24: Compared to a bipolar junction transistor, the JFET has a much higher.....
i. voltage gain ii. Input resistance iii. Supply voltage iv. Currrent.

Questions for 4 marks:

Q.1: Distinguish between JFET and bipolar junction transistor.
Q.2: Explain the difference between JFET and MOSFET.
Q.3: Draw the static characteristics of JFET and indicate different regions.
Q.4: For JFET explain the following
Q.5: Pinch off region and ii. Breakdown region
Q.6: Draw the transfer characteristics of JFET and explain them in brief.
Q.7: Give the constructional details of DE MOSFET.
Q.8: Draw the static characteristics of a DE MoSFET and explain them in brief.
Q.9: Give the schematic symbols for
i] N-channel DE MOSFET and ii] P-channel DE MOSFET
Q.10: State the advantages of FET.
Q.11: Describe the construction of JFET
Q.12: Explain the working principle of JFET.
Q.13: Sketch the well-labeled characteristics of JFET.
Q.14: Deswcribe the construction of the DE MOSFET.
Q.15: Draw the drain characteristics of DE MOSFET. Give the conclusions of these characteristics.
Q.16: Explain with neceswsary diagram the construction of enhancement only MOSFET.
Q.17: Describe the working principle of E only MOSFET.
Q.18: Write a short note on, pinch-off voltage in connection with the JFET characteristics.
Q.19: Explain how FET can be used as a voltage variable resistor.
Q.20: Why MoSFET is called as an insulated gate FET (IGFET)?
Q.21: Draw the tree diagram of a FET family.

Questions for 6 marks:

Q.1: Explain in detail the use of FET as VVR.
Q.2: With necessary diagram explain the principle of working of depletion mode n-channel DE MOSFET.
Q.3: With necessary diagram explain the principle of working of enhancement mode n-channel DE MOSFET.
Q.4: Sketch the static characteristics of JFET and explain them in brief.
Q.5: Explain the working principle of DE MOSFET in the depletion mode of operation.
Q.6: Write a short note on
i] N-channel DE MoSFET and ii] p-channel DE MOSFET
iii] Distinguish between DE MOSFET and E only MOSFET.
Q.7: Explain the working principle of DE MOSFET in the Enhancement mode of operation.
Q.8: Describe construction and working principle of JFET. Also explain its action with necessary characteristics.

Paper II
Basic Digital Electronics

Chapter I: Number System

Question for 2 marks:

Q.1: Define Radix or base of number system.
Q.2: Define Number
Q.3: What is weighted binary code? Give its example.
Q.4: What do you mean by binary number system.
Q.5: How many digits are present in decimal number system.
Q.6: What is mean by Non-weighted binary code? Give its example.
Q.7: What do you mean by octal number system.
Q.8: What do you mean by BCD code.
Q.9:..... is the base of binary number system.
Q.10: The base or rodix of Hexa decimal system is ....
Q.11: Gray code is ..... code
Q.11: Ascii code is ..... bit code.
Q.12: The excess- 3 code is ..... bit code.
Q.13: The decimal number system consist of .... digit.
Q.14: 8421 BCD code is..... code.
Q.15: The method used for decimal to binary conversion is called as
Q.16: convert the decimal number 297 into binary number.
Q.17: Match the following.

Seat A	Seat B
i] octal number	base is 2
ii] 8421 BCD code	unweighted code
iii] grary code	weighted code
iv] binary number	base is 8

Q.18: Match the following.

Seat A	Seat B
i] A	0100 0010
ii] 10101	001010000111
iii] 287	01000001
iv] 66	2 1

Q.19: Convert the binary number 110/111 into decimal number system.
Q.20: Which number system consists of digits and alphabets?
Q.21: convert the following binary number into decimal number system. i] 1011.1011 ii] 11001.10101
Q.22: Convert the following decimal number into Binary number system i] 35.687 ii] 82.626
Q.23: In hexadecimal number system the unmber 15 is represented by ..... character.

1. .... is the Ascii code for Letter B

Questions 4 marks.

Q.1: What i BCD code? What are advantages and disadvantages of BCD code over binary code.
Q.2: Convert the decimal number 7537-3768 to its binary equivalent.
Q.3: Write short note on Excess-3 code.
Q.4: Explain the binary to gray code conversion with an example.

Q.5: What is ASCII code? How it differ from other code.
Q.6: Convert the binary number 1010111.01011 to its decimal equivalent.
Q.7: Write shgort note on 8421 BCD code.
Q.8: Convert the octal number 556.34 to its decimal equivalent.
Q.9: What do you mean by weighted and unweighted code? Give atleast one example of each.
Q.10: Convert the decimal number 775.35 to its octal equivalent.
Q.11: Write procedure to convert Hexadecimal to binary with suitable example.
Q.12: Convert the octal number 428.35 to its binary equivalent.
Q.13: What is binary code? Discuss types of binary code.
Q.14: Convert the binary number 101110101.11010 to its octal equivalent.
Q.15: Write short note on octal number system.
Q.16: Discuss Hexadecimal number system with suitable example.
Q.17: Explain the double dable method of decimals to binary conversion with suitable example.
Q.18: Write procedure to convert octal to decimal number.

1. Explain binary to decimal conversion with suitable example.
2. Convert the following Hexa-decimal number to its decimal equivalent.
   i. A8 D5 .92 ii. D 5 E2 .54

Q.19: Convert the following decimal number to its Hexadecimal equivalent.
   ii. 3756.58 ii. 3355.3333
Q.20: Convert the following Hexadecimal number to its binary equielent.
i. D2 FC ii. E 8 C
Q.21: Convert the following binary number to its Hexadecimal equivalent.
   i. 11010101.0111 ii. 10101111.0011
Q.22. Convert the following decimal numbers to equivalent hexadecimal number.
   i. 132 ii. 375 iii.74 m iv. 592
Q.23: What do you understand by ASCII ? Discuss its area of applications.

Questions 6 marks:

Q.1: What is binary number system? Why does a computer use binary numbers for its internal processing?
Q.2: What is BCD system? Where is it used? What are its demeritsw as compared to hexadecimal system?
Q.3: Convert the following hexadecimal numbers to Equivalent binary number.
   iii. 5 D 2 ii. A 9 iii. E F D
Q.4: What is octal number system? How many sysmbols does it use ? With suitable example explain how decimal number is converted into its octal equivalent.
Q.5: Convert the following binary numbers to equivalent hexadecimal number
i. 101010 ii. 1101101 iii.1011000
Q.6: Write short note on the following-
i. Gray code ii. Excess-3 code.
Q.7: Convert the following octal number to equivalent binary number.
   i.75 ii.575 iii.78.57

Chapter II: Logic Gates

Questions for 2marks:

Q.1: Define (a) Logic Gate (b) Truth table
Q.2: Write the names of universal gates.
Q.3: Give the Boolean expressions for the following gates (a) OR gate (b) AND gate
Q.4: Give the Boolean expressions for the following gates (a) NOR gate (b) NAND gate
Q.5: When does an OR gate give HIGH output?
Q.6: When does an AND gate give HIGH output?
Q.7: Can Ex-OR gate be used as an inverter? Explain using truth table.
Q.8: Draw symbol of 2-input OR gate & write its truth table.
Q.9: Draw symbol of 2-input AND gate & write its truth table.
Q.10: Draw symbol of NOT gate & write its truth table.
Q.11: Draw symbol of 2-input NOR gate & write its truth table.
Q.12: Draw symbol of 2-input NAND gate & write its truth table.
Q.13: Draw symbol of 2-input Ex-OR gate & write its truth table.
Q.14: Draw symbol of 2-input OR gate & write its Boolean equation.
Q.15: Draw symbol of 2-input AND gate & write its Boolean equation.
Q.16: Draw symbol of 2-input NOR gate & write its Boolean equation.
Q.17: Draw symbol of NOT gate & write its Boolean equation.
Q.18: Draw symbol of 2-input NAND gate & write its Boolean equation.
Q.19: Draw symbol of 2-input Ex-OR gate & write its Boolean equation.
Q.20: Draw a circuit containing NAND gates only to realize OR logic function.
Q.21: Draw a circuit containing NOR gates only to realize AND logic function.
Q.22: What is logic gate? Construct truth table for 3-input NOR gate.
Q.23: What is logic gate? Construct truth table for 3-input NAND gate.
Q.24: What is the difference between NOR gate & OR gate?
Q.25: What is the difference between NAND gate & AND gate?
Q.26: Which basic gates can be combined to give a NOR gate? Write its truth table.
Q.27: Which basic gates can be combined to give a NAND gate? Write its truth table.
Q.28: In a 2-input NAND gate, one input is permanently connected to ground, what will be the output?
Q.29: In a 2-input NOR gate, one input is always HIGH, What will be the output?
Q.30: State the parity of following numbers a) 1111 0000 1100 0011 b) 1100 0011 1100 0111
Q.31: Why the Ex-OR gate is ideal for checking parity of binary number?
Q.32: Realise Ex-OR logic operation using only NOR gates.
Q.33: Realise Ex-OR logic operation using only NAND gates.
Q.34: Construct 6-input Ex-OR gate using 2-input Ex-OR gates only.
Q.35: Two voltages are -5 V & -10 V. In positive logic
- (a) -5 V is 1 & -10 V is 0
- (b) -10 V is 1 & -5 V is 0
- (c) -5 V is 1 in some circuits & 0 in others
- (d) -10 V is 1 in some circuits & 0 in others

Q.36: A logic circuit is an electronic circuit which
- (a) makes logic decision
- (b) allows electron flow only in one direction
- (c) works on binary algebra
- (d) alternates between 0 & 1 values.

Q.37: An Ex-OR gate produces an output only when its two inputs are
(a) high (b) low (c) different (d) same

Q.38: An AND gate
(a) implements logic addition
(b) is equivalent to a series switching circuit
(c) is an any-or-all gate
(d) is equivalent to a parallel switching circuit

Q.39: When an input electrical signal A = 10100 is applied to a NOT gate, its output signal is
(a) 01011 (b) 10101 (c) 10100 (d) 00101

Q.40: The only function of a NOT gate is to
(a) stop a signal (b) recomplement a signal
(c) invert an input signal (d) acts as a universal gate.

Q.41: A NOR gate is ON only when all its inputs are
(a) ON (b) positive (c) high (d) OFF

Q.42: The output of two input OR gate is high
(e) Only if both inputs are high
(f) Only if both inputs are low
(g) Only if one input is high & other is low
(h) If at least one of the input is high

Q.43: The output of two input AND gate is high
(a) Only if both inputs are high
(b) Only if both inputs are low
(c) Only if one input is high & other is low
(d) If at least one of the input is low

Q.44: The output of two input NOR gate is high
(i) Only if both inputs are high
(j) Only if both inputs are low
(k) Only if one input is high & other is low
(l) If at least one of the input is high

Q.45: The output of two input NAND gate is high
(a) Only if both inputs are high
(b) Only if both inputs are low
(c) Only if one input is high & other is low
(d) If at least one of the input is low

Q.46: A digital word has even parity
(e) If it has even number of 1's
(f) If it has even number of 0's
(g) If the decimal value of digital word is even
(h) None of these

Q.47: An Ex-OR gate gives a high output
(i) If there are odd number of 1's in the input
(j) If there are even number of 1's in the input
(k) If there are odd number of 0's in the input
(l) If there are even number of 0's in the input

Q.48: The gate ideally suited for bit comparison is
(m) Two input Ex-OR gate
(n) Two input Ex-NOR gate
(o) Two input NOR gate
(p) Two input NAND gate

Q.49: The total number of input states for 4-input OR gate is
(a) 20 (b) 16 (c) 12 (d) 8
Q.50: In a 4-input AND gate, the total number of High outputs for 16 input sates are (a) 16 (b) 8 (c) 4 (d)1
Q.51: In a 4-input OR gate, the total number of High outputs for 16 input sates are (a) 16 (b) 15 (c) 8 (d) 1
Q.52: Which of these are universal gates
(a) only NOR (b) only NAND
(c) both NOR & NAND (d) both OR & AND

Questions for 4 marks

Q.1: Distinguish between positive & negative logic.
Q.2: Explain positive & negative logic with suitable examples.
Q.3: Illustrate the positive & negative logic systems.
Q.4: Draw the circuit symbols for the following gates.
OR, AND, NOT, NAND, NOR, Ex-OR.
How will you obtain NOT gate from (a) NOR gate & (b) NAND gate?
Q.5: Explain working of OR gate using diodes and resistors.
Q.6: Explain working of AND gate using diodes and resistors.
Q.7: Draw a circuit diagram for OR gate using diode logic. Explain its working.
Q.8: Draw a circuit diagram for AND gate using diode logic. Explain its working.
Q.9: How would you build a simple 2-input OR gate using diodes? Explain its working.
Q10: How would you build a simple 2-input AND gate using diodes? Explain its working.
Q11: How would build a simple NOT gate using NOT gate? Explain its working.
Q12: How would build a simple a simple 2-input OR gate using diodes? Give the verification of truth table.
Q13: How would build a simple a simple 2-input AND gate using diodes? Give the verification of truth table.
Q14: How do you build a NOT gate using transistor? Give the verification of truth table.
Q15: Explain working of NOT gate using transistor and resistors.
Q16: Draw the circuit of two input OR gate using diodes. Give its Boolean equation & explain its truth table.
Q17: Draw the circuit of two input AND gate using diodes. Give its Boolean equation & explain its truth table.
Q18: Explain why NOR gate is called as universal building block.
Q19: Explain why NAND gate is called as universal building block.
Q20: Give the symbol & truth table of 2-input Ex-OR gate. Where it is used?
Q21: Explain Ex-OR gate as a parity checker.
Q22: What is OR gate? Give symbol & truth table for two inputs OR gate. Write its Boolean equation.
Q23: What is AND gate? Give symbol & truth table for two inputs AND gate. Write its Boolean equation.
Q24: What is NAND gate? Give its symbol & truth table with Boolean equation for output.
Q25: Realise the following logic operations NOR gates only.
(a) NOT (b) AND (c) OR (d) NAND
Q26: What is NOR gate? Give its symbol & truth table with Boolean equation for output.
Q27: What is the practical application of parity generation & checking?
Q28: Realise the following logic operations NAND gates only.

(a) NOT (b) AND (c) OR (d) NOR

Q29: What is an Ex-OR gate? How it is different from OR gate?
Q30: Explain the concept of parity.
Q31: Draw the circuit of 8-bit controlled inverter & explain its working.
Q32: Explain Ex-OR gate as controlled inverter. Where this circuit is used?
Q33: Explain how Ex-OR gates can be used to generate 1's complement of binary number.
Q34: Explain Ex-OR gate as a bit comparator.
Q35: What is Ex-OR gate? Explain its working & tabulate the truth table.

Questions for 6 marks:

Q1: Explain construction & working of 2-input OR gate using diodes & resistors. Draw symbol and write its Boolean equation & truth table.
Q2: Explain construction & working of 2-input AND gate using diodes & resistors. Draw symbol and write its Boolean equation & truth table.
Q3: Describe why NAND gate is called universal building block.
Q4: Describe why NOR gate is called universal building block.
Q5: 'NAND gate is called as universal building block.' Justify the statement.
Q6: 'NOR gate is called as universal building block.' Justify the statement.
Q7: Construct Ex-OR gate using basic gates & explain its working. Draw symbol, write Boolean equation & truth table.
Q8: Describe Ex-OR gate as a parity checker & explain its application.
Q9: Distinguish between positive & negative logic. What is its effect on OR & AND gates?

1. Show how you will simulate Ex-OR gate
   (a) using only NAND gates only
   (b) using only NOR gates only
   (c) using NAND & NOR gates.

Chapter III: Logic Family

Questions for 2 marks:

Q1: Does power drain of CMOS increases with operating frequency? Why?
Q2: What is Noise Margin? Why is it important?
Q3: What is generally accepted as the number of gates per chip for SSI & MSI?
Q4: What is generally accepted as the number of gates per chip for LSI & VLSI?
Q5: Define (a) Noise margin (b) propagation delay time.
Q6: Define fan-in & fan-out.
Q7: Draw a circuit of PMOS inverter.
Q8: Draw a circuit of PMOS inverter.
Q9: Draw a circuit of 2-input NMOS NOR gate.
Q10: Draw a circuit of 2-input NMOS NAND gate.
Q11: Draw a circuit of 2-input CMOS NOR gate.
Q12: Draw a circuit of 2-input CMOS NAND gate.
Q13: Noise margin is expressed in
(a) decibel (b) watt (c) volt (d) ampere
Q14: A unique advantage of CMOS logic family is its
(q) use of NMOS circuit
(r) power dissipation in nanowatt range
(s) speed
(t) dependence on frequency for power dissipation
Q15: CMOS circuits are extensively used for one chip computers mainly because of their extremely
(a) low power dissipation (b) large packing density
(c)) high noise immunity (d) low cost
Q16: CMOS family uses only
(a) MOSFETs & resistors (b) NMOS circuits
(c) MOSFETs (d) bipolar transistors
Q17: Power is drawn by a CMOS circuits only when
(a) its output is high (b) its output is low
(c) it switches logic level (d) in static state
Q18: The term VLSI generally refers to a digital IC having
(a) more than 100 gates
(b) more than 100 but less than 999 gates
(c) more than 1000 gates
(d) more than 1000 but less than 9999 gates
Q19: Digital technologies being used now-a- days are
(a) DTL & EMOS
(b) TTL, ECL, CMOS & RTL
(c) TTL, ECL, CMOS
(d) TTL, ECL, CMOS & DTL
Q20: TTL uses
(a) multi emitter transistors
(b) multi collector transistors
(c) multi base transistors
(d) any of above
Q21: As compared to TTL, ECL has
(e) lower power dissipation

(f) lower propagation delay
(g) higher propagation delay
(h) higher noise margin

Q22: As compared to TTL, CMOS logic has
(i) higher speed of operation
(j) higher power dissipation
(k) smaller physical size
(l) all the above

Q23: CMOS is extensively used in
(m) pocket calculators
(n) digital wrist watches
(o) satellites
(p) all the above

Q24: Which has the lowest propagation delay time?
(a) ECL (b) TTL (c) CMOS (d) PMOS

Q25: Which has the highest power dissipation per gate?
(a) ECL (b) TTL (c) CMOS (d) PMOS

Q26: The power dissipated per gate
(a) is constant at all frequencies
(b) increases with frequency
(c) decreases with frequency
(d) may increases or decrease with frequency

Q27: The fastest logic family is
(a) TTL (b) ECL (c) DTL (d) IIL

Questions for 4 marks:

Q1: What is logic family? List the types of logic families you have studied.
Q2: Name the various digital IC families & subfamilies. Which one is being used now a day?
Q3: How SSI, MSI, LSI & VLSI are defined.
Q4: Explain why CMOS is preferred?
Q5: Define & explain the terms in connection with logic family.
(a) Fan in & Fan out (b) Propagation delay time.
Q6: 'The power dissipation of CMOS ICs increases when transition n output takes place' Comment.
Q7: What are the special aspects of MOS ICs.
Q8: Give a brief account of the various factors deciding the performance of a gate.
Q9: How the logic families are classified? Give their classification.
Q10: Draw & explain the basic CMOS inverter circuit.
Q11: Draw circuit diagram of 2-input CMOS NAND gate & explain its working.
Q12: Draw circuit diagram of 2-input CMOS NOR gate & explain its working.
Q13: Discus the characteristics of CMOS family.
Q14: Explain the principle of working of MOS family.
Q15: What are the comparative advantages & disadvantages of a CMOS device over an NMOS device?
Q16: Why CMOS ICs preferred in low power applications? Where they are used?
Q17: State & explain the different performance parameters of logic families that you have studied.

Questions for 6 marks:

Q1: Define & explain the following specifications in connection with logic families.
Fan-in, Fan-out, Noise margin

Q2: Define & explain the following specifications in connection with logic families.
Supply voltage, Propagation delay time, Noise margin

Q3: Define & explain the following specifications in connection with logic families.
Fan-in, Fan-out, Power dissipation, Propagation delay time

Q4: State & explain any six performance parameters of logic family.

Q5: Draw a circuit of NMOS NOR gate. Explain construction & working of it. Write its truth table.

Q6: Draw a circuit of NMOS NAND gate. Explain construction & working of it. Write its truth table.

Q7: Draw a circuit of CMOS NOR gate. Explain construction & working of it. Write its truth table.

Q8: Draw a circuit of CMOS NAND gate. Explain construction & working of it. Write its truth table.

Q9: Explain the term logic family. Which different logic families do you know? What are their key features?

Q10: Write short notes on: (a) noise immunity (b) fan-in & fan-out.

Q11: Describe various characteristics of IC logic families.

Q12: What are fan-in & fan-out for a logic circuit? A three input NAND gate can drive eight similar gate inputs. What is its fan-in & fan-out?

Chapter IV: Boolean algebra and binary arithmetic

Questions for 2 marks:

Q.1: State De Morgan's theorem.
Q.2: Prove with appropriate theorem NOR to AND conversion.
Q.3: Prove with appropriate theorem NOR to OR conversion.
Q.4: What is 1's complement. Give an example.
Q.5: What is 2's complement. Give an example.
Q.6: Draw the block diagram of full adder.
Q.7: Draw neat-labeled diagram of half adder.
Q.8: Reduce the following identity using Boolean equation
a) ABC+ABC+ABC+ABC=BC+BC b) AC+ABC=AC
Q.9: Determine the logic gate required to implement the following relations
a) Y=B+C b) Y=AB+AB
Q.10: Perform the binary operation for the following
a) add $(110011)_2$ to $(101101)_2$ b) add $(11101)_2$ to$(01011)_2$
Q.11: Subtract following using Boolean identities a) subtract $(0111)_2$ from $(1001)_2$ b) subtract $(01011)_2$ from $(10110)_2$
Q.12: Give the rules of binary addition
Q.13: Give the rules of binary subtraction.
Q.14: Draw logic diagram for the following a) Y=AB+CD b) Y=(A+B)(B+C) c) Y=A+AB
Q.15: Prove the following a) ABC+ABC+ABC=A(B+C) b) (A+B)(A+C)=A(B+C)

Questions for 4 marks:

Q.1: State and prove DeMorgan's first theorem
Q.2: State and prove DeMorgan's second theorem
Q.3: Show that complement of sum is product of complement using appropriate logic diagrams
Q.4: Show that complement of product is sum of complements using appropriate logic diagrams
Q.5: State the set of rules for binary addition
Q.6: State the set of rules for binary subtraction
Q.7: State the set of rules for binary multiplication
Q.8: Draw the schematic diagram of half adder and explain its working
Q.9: Reduce the following Boolean expressions
i) (A+B)(A+C=A+BC) ii) AB+ABC+AB+ABC=B+AC iii) ABC+ABC+ABC=A(C+B) iv) (A+B+C)(A+B+C)=A+BC+BC v) A+|AB=A+B vi) ABC+ABC+ABC=A(B+C) vii) ABC+ABC+ABC+ABC+ABC=A+ABC viii) ABC+ABC+ABC+ABC=1 ix) (A+B+C)(A+B+C)=A+BC+CB x) (A+B)(A+B)(A+C)=AC
Q.11: Draw the logic diagram for the following i) Y=AB+AB ii) Y=AB+(B+C) iii) Y=ABC+ABC+ABC+ABC iv) Y=(A+B)(AC+B) v) Y=(A+BC)(AC+B) vi) Y=ABC+ABC+ABC+ABC
Q.12: How 2's complement of binary number is obtained.
Q.13: Draw the logic diagram of I) AB+AB ii) Y=ABC
Q.14: State duality theorem.

Questions for 6 marks:

Q.1: State and prove DeMorgan's theorem.
Q.2: Show that NOR gate can be used as universal logic gate.
Q.3: Show that NAND gate can be used as universal logic gate
Q.4: Draw the schematic diagram of half adder and explain its working.
Q.5: Draw the schematic diagram of full adder and explain its working.
Q.6: Draw the block diagram of full adder and write the truth table
Q.7: Reduce the following equation using Boolean expression,
a) (A+B)(A+B)(A+B=AB b) ABC+ABC+ABC+ABC+ABC=A+ABC
c) A+AB+AB=A+B d) AB+AC+ABC(AB+C)
Q.8: Write down 1's complement and 2's complement of the following a) 1110 b) 110101 c) 1001
Q.9: Explain the rules of binary addition and hence add a) $(111)_2$ to $(110)_2$ b) $(100)_2$ to $(011)_2$
Q.10: Find the 2's complement of the following number a) 1101 b) 11010 c) 1001 d) 0010 e) 1100 f) 0101
Q.11: State and verify DeMorgan's theorem.
Q.12: Prove the following a) (A+B)(A+C)=A+BC b) (A+B)(A+B) (A+C)=AC
c) (A+B+C)(A+B+C)=A+BC+CB d) (A+B)(A+B)=B

Chapter V: Data Processing Circuits

Questions for 2 marks:

Q.1: Define multiplexing
Q.2: How Many select are required by 4 to 1 line multiplexer?
Q.3: How Many select are required by 2 to 1 line multiplexer?
Q.4: How Many select are required by 8 to 1 line multiplexer?
Q.5: Explain the function of data select, enable input of a multiplexer.
Q.6: Define De- multiplexer.
Q.7: How many select are required by 1 to 2-line demultiplexer?
Q.8: How many select are required by 1 to 4-line demultiplexer?
Q.9: How many select are required by 1 to 8-line demultiplexer?
Q.10: Define decoder.
Q.11: How will you convert demultiplexer in to decoder?
Q.12: Define encoder.
Q.13: Draw block diagram of 2 to 1 line multiplexer.
Q.14: Draw block diagram of 4 to 1 line multiplexer.
Q.15: Draw block diagram of 8 to 1 line multiplexer.
Q.16: Draw block diagram of 1 to 2 line multiplexer.
Q.17: Draw block diagram of 1 to 4 line multiplexer
Q.18: Draw block diagram of 1 to 8 line multiplexer.
Q.19: Draw block diagram of decoder.
Q.20: Draw block diagram of encoder.
Q.21: Draw logic diagram of 2 to 1 line multiplexer.
Q.22: Draw logic diagram of 4 to 1 line multiplexer.
Q.23: Draw logic diagram of 1 to 2 line multiplexer.
Q.24: Draw logic diagram of 1 to 4 line multiplexer.

Questions for 4 marks:

Q.1: What is multiplexer explain with block diagram.
Q.2: Explain the working of 2 to 1 line multiplexer with logic diagram.
Q.3: Explain the working of 4 to 1 line multiplexer with logic diagram.
Q.4: Explain the working of 8 to 1 line multiplexer with logic diagram.
Q.5: Explain the working of 1 to 2 line demultiplexer with logic diagram.
Q.6: Explain the working of 1 to 4 line demultiplexer with logic diagram.
Q.7: Explain the working of 1 to 8 line demultiplexer with logic diagram.
Q.8: Give the application of multipxer of demultiplexer
Q.9: How will you convert demultiplexer in to decoder explain with suitable example.
Q.10: Define encoder & decoder
Q.11: Describe deimal of BCD encoder
Q.12: Describer BCD to decimal decoder
Q.13: Give the advantage of multiplexer
Q.14: Give the application of multiplexer
Q.15: Give the application demultiplexer
Q.16: Give application of decoder
Q.17: Give the truth table of 2 to 1 line multiplexer.
Q.18: Give the truth table of 4 to 1 line multiplexer.

Q.19: Give the truth table of 8 to 1 line multiplexer.
Q.20: Give the truth table of 1 to 2 line De multiplexer.
Q.21: Give the truth table of 1 to 4 line De multiplexer.
Q.22: Give the truth table of 1 to 8 line De multiplexer.
Q.23: Draw the logic diagram of 2 to 1 line multiplexer
Q.24: Draw the logic diagram of 4 to 1 line multiplexer
Q.25: Draw the logic diagram of 8 to 1 line multiplexer
Q.26: Draw the logic diagram of 1 to 2 line multiplexer
Q.27: Draw the logic diagram of 1 to 4 line multiplexer
Q.28: Draw the logic diagram of 1 to 8 line multiplexer
Q.29: Explain the difference between encoder & decoder.

Questions for 4 marks:

Q.1: Explain the working of 2 to 1 line multiplexer with logic diagram & truth table.
Q.2: Explain the working of 4 to 1 line multiplexer with logic diagram & truth table.
Q.3: Explain the working of 8 to 1 line multiplexer with logic diagram & truth table.
Q.4: Explain the working of 1 to 2 line multiplexer with logic diagram & truth table.
Q.5: Explain the working of 1 to 4 line multiplexer with logic diagram & truth table.
Q.6: Explain the working of 1 to 8 line multiplexer with logic diagram & truth table.
Q.7: Describe to working of BCD to decimal decoder with neat diagram.
Q.8: Define encoder describe the working of decimal to BCD encoder.

Chapter VI: Flip-flops

Questions for 2 marks:

Q.1: Explain what is Flip-flop?
Q.2: What are different types of Flip-flops?
Q.3: Explain the concept of Preset.
Q.4: Explain the concept of Clear.
Q.5: What is Clock? State its importance.
Q.6: What is Edge Triggering?
Q.7: Draw the block diagramod Flip-flop and give meaning of each label.
Q.8: What is T Flip-flop? Give its truth table.
Q.9: Draw the circuit diagram of clocked R.S. Flip-flop.
Q.10: Draw neat-labelled diagram of Flip-flop using NAND gates.
Q.11: Draw the basic diagram of R.S. Flip-flop using NOR gates hense give its truth table.
Q.11: What D type Flip-flop Give its Block Diagram?
Q.12: State the importance of D Flip-flop.
Q.13: Draw the block diagram of R S Flip-flop with Preset and Clear and give its truth table.
Q.14: Draw the logic diagram of J.K. Flip-flop.
Q.15: Draw the logic symbol of J.K. Flip-flop and give its truthtable.
Q.16: Explain race around condition.
Q.17: Give the logic symbols of

a. Positive Edge Triggered R.S. Flip-flop
b. Negetive Edge Triggered R.S Flip-flop

Q.18: Explain the concept of " Master-Slave" in J.K Flip-Flop.
Q.19: What is T Type Flip-flop? Draw the block diagram converting J.K. Flip-flop to T Flip-flop.
Q.20: Draw the logic diagram of T Flip-flop. Give its Truth Table.
Q.21: Explain the mechanism-avoiding race around problem in the Flip-flop.
Q.22: Distinguish between D and T Type Flip-flop.
Q.23: Explain the role played by " Clock" in Flip-flop.
Q.24: Write short note on Positive Edge Triggering.
Q.25: Write short note on Negative Edge Triggering.
Q.26: Draw the Block Diagram od Master Slave Flip-flop
Q.27: Explain the working J K of Flip Flop.
Q.28: Explain the basic circuit and working of R.S. Flip-flop.
Q.29: Explain the working of T- Type Flip-flop.

Questions for 4 marks:

Q.1: What is Flip-flop. State its important applications
Q.2: Draw the neat diagram of D Flip-flop and explain its working.
Q.3: Draw detailed diagram of master slave Flip-flop and label it.
Q.4: What is Flip-flop? Explain R.S. Flip-flop
Q.5: Describe D.and T Type Flip-flop.
Q.6: What is D Flip-flop. Explained clocked R.S. Flip-flop.
Q.7: Describe the working of J.K. Flip-flop.
Q.8: Describe the working of R.S. Flip-flop.
Q.9: How can R.S. Flip-flop be constructed by using NOR gate, Explain its working.
Q.10: Write note on Race around condition.

Q.10: How can R.S. Flip-flop be constructed by using NAND gate, Explain its working .
Q.11: Explain Master Slave Flip-flop .
Q.12: Describe the concept of edge triggering .
Q.13: What is Edge Triggering ? State its importance.
Q.14: Explain clocked D Flip Flop and draw its logic diagram.
Q.15: Describe Preset and Clear.
Q.16: Explain the working of J.K Flip-Flop with truth table and logic symbol.
Q.17: Explain the working of R.S Flip-Flop with truth table and logic symbol.
Q.18: Explain the working of D Flip-Flop with truth table and logic symbol.
Q.19: Explain the working of T Flip-Flop with truth table and logic symbol.
Q.20: Explain edge triggering in flip-flop .
Q.21: Explain clock, Preset,and clear input in detail for Flip-Flop.
Q.22: Explain Master Slave Flip-Flop in detail with truth table and symbol.
Q.23: What is Flip-Flop? What are its applications ? Enlist different types of Flip- Flops.
Q.24: Explain R.S.Flip-Flop using NOR gates.
Q.25: Explain R.S.Flip-Flop using NAND gates.
Q.26: Describe in short

1) Clock
2) Preset
3) Clear
4) Race around condition

Q.27: Explain in short

1) Preset and Clear input
2) Race around Condition.

Q.28: What is race around condition. How it is avoided?
Q.29: Explain how J.K Flip-Flop can be converted into T Flip-Flop.
Q.30: Draw the circuit symbol of J.K.Flip-Flop and state its advantages over R.S.Flip-Flop

Questions for 6 marks:

Q.1: Draw the circuit diagram of Master-Slave J.K Flip-Flop and write down the truth table and explain its working.
Q.2: What is Flip-Flop. Show how will you convert R.S.Flip-Flop into D Flip-Flop? Explain its working.
Q.3: What is Flip-Flop? State its applications? Describe the R.S.Flip-Flop using NOR gates.
Q.4: What is Flip-Flop? State its applications ? Describe the R.S.Flip-Flop using NAND gates.
Q.5: What is R.S.Flip-Flop. Compair the circuit diagram of R.S.Flip-Flop using NOR gate and NAND gate.
Q.6: Draw the circuit diagram of R.S.Flip-Flopusing NAND gate and explain the working.
Q.7: Describe in detailthe logic circuit and working of R.S.Flip-Flop using NOR gate.
Q.8: Draw the logical circuit diagram of R.S.Flip-Flop using NOR gate and NAND gate and show the truth table.
Q.9: Give the circuit symbol of R.S. Flip-Flop using Preset and Clear inputs . Hense explain clocked R.S.Flip-Flop.
Q10: What is clock. Explain circuit diagram and working of clocked R.S.Flip-Flop.
Q11: Explain Preset and Clear input .Draw the neat logical diagram of R.Sflip-Flop using Preset and Clear inputs and its circuit symbol.
Q12: Describe with neat logical diagram, the working of R.S.
Q13: Flip-Flopwith Preset and Clear inputs.
Q14: Draw the logical symboland circuit diagram of R.S. .
Q15: Flip-Flop using Preset and Clear inputs. Give its Truth- table.

Q16: How the J.K.Flip-Flopis converted from R.S.Flip-flop Explin its working.
Q17: Give the circuit diagram of the J.K Flip-Flop and explain the truth table.
Q18: Give the symbol of J.K.Flip-Flop. Draw the logical circuit and truth table of J.K.Flip-Flop.
Q19: Explain in detail race around condition.
Q20: What is race around condition in Flip-Flop how it can be elliminated?
Q21: Explain the idea of edge triggering. Why it is useful?
Q22: Explain in detail Master Slave J.K Flip-Flop.
Q23: Give the logical symbol, block diagram of Master-Slave J.K.Flip-Flop. Explain working of it.
Q24: What is T Flip-Flop Show how it is converted from J.K.Flip-Flop.
Q25: Explain how J.K.Flip-Flop can be converted into T- Flip-Flop.
Q26: Explain Preset and Clear. Describe the R.S.Flip-Flop using Preset and Clear inputs.
Q27: Explain the working of J.K.Flip-Flop with necessary logic diagram.
Q28: What is Flip-Flop? State its applications . Show how R.S.Flip-Flopcan be built from NOR and NAND gates
Q29: Explain the concept of Positive edge triggering and Negetive edge triggering in Flip-Flops.and give the respective circuit symbols.
Q30: Explain the terms.

a) Preset and clear
b) Race around condition

Q30: Explain in Flip-Flop

a) Race around condition
b) Edge triggering.

Chapter VII: - Shift registers [10 M]

Questions for 2 marks:

Q.1: Define a shift register
Q.2: Define serial shifting and parallel shifting
Q.3: Name the four basic register
Q.4: Draw the timing diagrams to shift the number 1100 into a 4-bit serial input shift register
Q.5: Draw a logic diagram of a 4-bit serial input register
Q.6: What is the largest number that can be stored in a k4-bit and 8 bit shift register
Q.7: How long will it take to serially shifts 4bits into a 4 bit register if the clock is said to MHz.
Q.8: Give 2 applications of shift register
Q.9: What is a ring counter
Q.10: What is slowest type of shift register and why
Q.11: Find the number of flip-flops needed to construct a shift register to capable of storing a 6 bit number
Q.12: Define a bi-directional shift register
Q.13: Explain the terms clear and preset
Q14: Draw the timing diagram to shift 1011 into a 4 bit serial input shift register
Q.15: A 4 bit serial input shift register has 0110 stored in it, draw the timing diagrams for four clock transitions assuming that J and K are low
Q.16: Draw the timing diagram showing how decimal no.14 is shifted into 4 bit serial in shift register
Q.17: If the time required to shift 1 bit of data into a 4 bit serial register in 30 ns, what is the frequency of the clock?

Questions for 4 marks

Q.1: Draw the simple block diagram
Q.2: Explain the working of 4-bit serial in-serial out shift register with neat logic diagram.
Q.3: Draw the logic diagram of 4 bit serial in-serial out shift register and explain its working.
Q.4: Draw the logic diagram and explain how a parallel in – parallel out shift register works.
Q.5: Explain the working of parallel in – parallel out shift register with the help of logic diagram
Q.6: A shift register has 4 flip-flops, what is the largest a) binary number b) decimal number c) hexadecimal number that an be stored in it.
Q.7: Determine the number of flip-flops needed to construct a shift register capable storing a) decimal number upto 32 b)hexadecimal number upto F
Q.8: Explain the shift left and shift right operation in shift register
Q.9: Draw the pin diagram of 7495 register and explain its different mode of operation.
Q.10: Draw and logic diagram of a ring counter and explain its working.
Q.11: Draw and explain timing diagram, if all 1's have to shifted in ring counter.
Q.12: How long will it take to shift an 4 bit number into a) a serial register b) parallel register if the frequency of the clock used is 1 MHz

Q.13: If the frequency of the clock is 100 KHz how much time will be required to shifts 4 bits into a parallel register.

Questions for 6 marks:

Q.1: What do you understand by shift-register? Explain in detail about serial in-serial out.
Q.2: What do you understand by shift-register? Explain in detail about serial in-parallel out.
Q.3: What do you understand by shift-register? Explain in detail about parallel in-serial out.
Q.4: What do you understand by shift-register? Explain in detail about parallel in-parallel out.

Chapter VIII: Semiconductor memories

Question of 2 marks:

Q.1: The typical semiconductor memory consists of rectangular array of ……..
a) memory cell b) register c) capacitor d) transistors
Q.2: An application in which data change frequently call ……
a) ROM b) EPROM c) RAM d) memory
Q.3: An application in which data does not change known as …….
a) ROM b) EPROM c) RAM d) memory
Q.4: In RAM allows a single bit of information to be stored pin any of memory cell this is ……. operation.
a) read b) write c) read-write d) none of these
Q.5: …….. is a device which can store a symbol selected from a set of symbol.
a) memory cell b) keyboard c) mouse d) plotter
Q.6: If symbol can be stored in a cell indefinitely without continuous supply of energy it is known as …….. cell.
a) volatile memory b) non-volatile memory
c) memory cell d) MOS
Q.7: ROM provides …… data storage.
a) volatile memory b) non-volatile memory
c) EPROM d) EEROM
Q.8: …….. is a semiconductor memory in which data store semi permanently & data may be erase & new data written in it.
a) EPROM b) ROM c) RAM d) EEROM
Q.9: ……. Memory electrical pulses are use instead of altra-voilet light to erase memory.
a) EPROM b) PROM c) RAM d) EEPROM
Q.10: …… is EPROM.
a) error program read only memory
b) error processor read only memory
c) erasable program read only memory
d) erasable program random access memory
Q.11: Define memory cell.
Q.12: Write definition of volatile memory?
Q.13: Define static memory.
Q.14: Define DRAM.
Q.15: Explain matrix addressing in short (2/3 lines).
Q.16: Define memory cell.
Q.17: What is MOS & CMOS?
Q.18: Define term access time in memory.
Q.19: Define term seek time.
Q.20: What are the applications of ROM's?

Question of 4 marks:

Q.1: Difference between volatile & non-volatile data storage.
Q.2: What is memory cell? What are the main characteristics of memory cell?
Q.3: Write short note on RAM.
Q.4: Write short note on ROM.

Q.5: What is matrix addressing & linear addressing?
Q.6: In 4x4 memory to select single cell activate one & only one row & one & only one column describe with example.
Q.7: What would be the structure of binary address for a memory system having a capacity of 1024 bits?
Q.8: What is decimal address for the binary address 1011001101?
Q.9: Draw a logic diagram of 64bit (16x4) bipolar memory.
Q.10: Draw a block diagram of 56/7488A us 256 bit (32x8) ROM.
Q.11: Describe logic diagram of PROM.
Q.12: Describe disadvantage type of PROM.
Q.13: Difference between RAM & ROM.
Q.14: Write read operation in RAM.
Q.15: How write operations are performing in RAM?
Q.16: Draw a block diagram of 7489 64-bit RAM.
Q.17: Describe static RAM operation.
Q.18: Define address set up & address holds time.
Q.19: Draw a block diagram of static RAM.
Q.20: Difference between static RAM & dynamic RAM.
Q.21: Describe write operation in dynamic RAM.
Q.22: Write a short note on memory cells.
Q.23: Draw a diagram of one transistor dynamic memory cell.
Q.24: Explain DATA IN & DATA OUT operation.
Q.25: Explain the difference between EPROM & PROM.
Q.26: Explain the term volatile memory.
Q.27: Explain why EPROM is volatile memory.
Q.28: Explain why an EPROM is not a volatile memory.
Q.29: Show the different possible rectangular arrangement for a memory that contains 32 memory cells. How many rows & columns for each case?
Q.30: Explain the meaning of the terms RAS & CAS.
Q.31: Draw a logic diagram for a two hundred fifty six word 8 bit memory using 2005.
Q.32: Define the term mash programmable.
Q.33: Deference between RAM & ROM.
Q.34: Explain static RAM.
Q.35: Explain dynamic RAM.
Q.36: Design the logic circuits to provide a read & write cycle for a 7489.
Q.37: Write a Short note on write cycle in memory cell.
Q.38: Draw a block diagram of memory cell for NMOS static RAM.
Q.39: What are the characteristics of memory element?
Q.40: What is the need of address lines in a memory chip?
Q.41: Describe Read Cycle in memory cell.
Q.42: What are the applications of ROM'S?

Question for 6 marks:

Q.1: Explain difference between brust & distributed refresh in RAM.
Q.2: Explain DRAM in detail.
Q.3: Explain structure of EPROM in detail.
Q.4: Draw Logic block diagram & pin out for 54/74186.
Q.5: Explain memory cell in detail.

Q.6: Explain semiconductor memory in detail.
Q.7: Explain memory-addressing mode.
Q.8: Explain static RAM in detail.
Q.9: Explain dynamic RAM in detail.
Q.10: Draw a circuit diagram of diode matrix ROM & explain its working.
Q.11: Draw a circuit diagram of bipolar RAM cell and explain it?
Q.12: What are static and dynamic RAM cells? Give their relative advantages and disadvantages?
Q.13: What is meant by volatile and nonvolatile memories? Give their examples?
Q.14: Explain the memory organization.

Chapter IX: Display Devices

Question for 2 marks:

Q.1: The following is not an LCD mode of operation
a) memory effects b) phase change 3) dynamic twisting d) twisted nematic
Q.2: The use liquid crystal for display application is possible because of its following optical properties a} reflection b) refraction c) diffraction d) birefringence
Q.3: Choose the correct statements a) Liquid crystals for display purpose have isotropic properties b) compared to twisted nematic mode, the dynamic scattering mode of LCD provides long life and good contrast
Q.4: Which of the following is not true for LCD a) Give off visible light when is not energized b) consumes less power than LCD c) poor response time than LCD d) has very good brightness
Q.5: An LCD requires a power of a) 20 w b) 20 mw c) 20 μw d) 20nw
Q.6: The turn on and turn off time of a LCD is of the order of a) 1s b) 1 ms c) 10 ms d) 10 ns
Q.7: The switching time of LCD is of the order of a) 1 s b) 1 ms c) 1 μs d) 1ns
Q.8: LCD emits light a) only in red color b) only in yellow color c) only in green color d) in red, green, yellow and amber color
Q.9: The LCD for their display requires a) voltage 1.2 V and current of 20 mA b) voltage 2.5 V and current of 20 mA c) a) voltage 1.2 V and current of 100 mA d) a) voltage 2.5 V and current of 100 mA
Q.10: The power requirement of LCD is a) 40 mw per numeral b) 40 μw per numeral c) 10 μw per numeral d) 10 mw per numeral
Q.11: What is LCD display?
Q.12: What is LED display?
Q.13: Which are the types of LED display?
Q.14: The choice of the LCD display depends upon which factors?
Q.15: Which type of configuration requires common anode connection?
Q.16: Which type of configuration requires common cathode connection?
Q.17: Which type connection is used in active low configuration?
Q.18: Which type connection is used in active high configuration?
Q.19: Which type of logic is used in active high configuration?
Q.20: Draw schematic symbol of 7 segment LED display
Q.21: Due to which type of optical property liquid crystal is used for display applications?
Q.22: Draw symbol of LED.
Q.23: How much power is required to drive LCD?
Q.24: How much power is required to drive LED?
Q.25: Draw schematic diagram of common cathode LED display.
Q.26: Draw schematic diagram of common anode LED display.
Q.27: LCD requires ac drive, is it true?
Q.28: ------- has very good brightness.
Q.29: Liquid crystals for display purpose have -------- properties.
Q.30: -------- requires external illumination.
Q.31: -------- gives off visible light when it is energized.
Q.32: Liquid crystals are -------- compounds.

Questions for 4 marks:

Q.1: Draw diagram of common anode LED display. Which segments are to be made low to display number 4?
Q.2: Explain dynamic scattering mode of LCD display.
Q.3: Distinguish between LED and LCD display.
Q.4: Draw diagram of common cathode LED display. Which segment are to made HIGH to display number 3?
Q.5: Write note on 7 segment LED display.
Q.6: Explain 5 x 7 dot matrix display.
Q.7: Explain the common anode type 7 segment LED display.
Q.8: Describe 7 segment LED for numerical display.
Q.9: Explain the theory of LCD.
Q.10: Explain the advantages of LCD.
Q.11: Explain the working of LCD.
Q.12: Explain the disadvantages of LCD.
Q.13: Explain the advantages of LED.
Q.14: Explain the disadvantages of LED.
Q.15: Explain the concept of liquid crystal display.
Q.16: With neat diagram explain common cathode LCD display.
Q.17: With neat diagram explain common cathode LED display
Q.18: What are the advantages of LCD over LED display?
Q.19: What are the disadvantages of LED over LCD display?

Questions for 6 marks:

Q.1: Write a note on 7-segment display.
Q.2: Explain LED display. State their applications.
Q.3: With neat diagram explain common anode and common cathode LED display.
Q.4: What are the advantages of dot matrix array over 7 segment LED display? Explain the functioning of 5 x 7 LED matrix display.
Q.5: Give the comparison between LCD and LED display.
Q.6: With the help nematic liquid crystals explain the operation of LCD display.
Q.7: With schematic diagram explain 5 x 7 dot matrix, explain how particular character is displayed.
Q.8: What is liquid crystal display? Explain dynamic scattering mode of LCD display.
Q.9: Draw the diagram of common anode and common cathode LED display. Which segments are to be made low and high respectively?