Question Bank

Subject: Principles of Analog Electronics

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Unit 1:Passive Components

Short answer questions(2 marks)

1. Define i)Self Inductance ii)Mutual Inductance
2. State any two specifications of Capacitor
3. Define ideal current source and ideal voltage source.
4. Four resistors marked R47 are connected in series what is their equivalent resistance.
5. Draw circuit symbol of Fuse and Continuous adjustable Inductor.
6. Draw symbol of step up & step down transformer
7. Find the value of following resistors: a)yellow violet brown gold b) brown black orange silver c) green blue orange
8. Find turns ratio if number of turns in primary is 4 & number of turns in secondary is 8.
9. Define the terms: capacitive reactance
10. Determine the colour code for resistors: a)100kΩ $^{+}_{-}$10% b)4.7kΩ$^{+}_{-}$5%

Long Answer Questions(4 marks)

1. State any two important specification of i)Switch ii)Fuse
2. Draw diagram of i) Co-axial cable ii)Electronic relay
3. Explain construction of 1)slide switch ii)Reed Relay.
4. What is resistor? explain different types
5. What is capacitor ? write the unit. Explain different types of capacitors
6. Define following terms:
   a)Turns ratio b)voltage ratio c)current ratio d)transformer efficiency
7. What is transformer? Explain working principle of transformer.
8. What is cable? Explain working principle of different types of cables.
9. Find secondary voltage if number of turns in primary is 4 & number of turns

in secondary is 8 & primary voltage is 230v.also write type of transformer.

11. What is relay? Explain construction details and working principle of electromagnetic relay.

11. state different types of cables and connectors

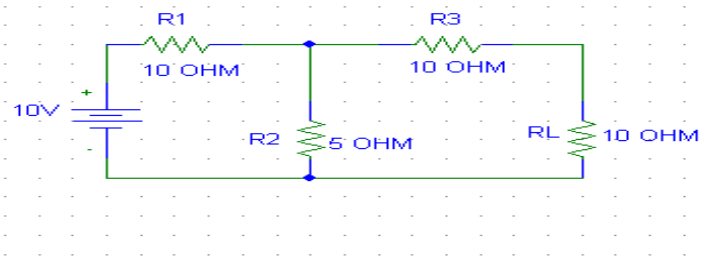
Unit 2: Basic Electrical circuits and Network Theorems

Short answer questions(2 marks)

1. State The venin's Network Theorems
2. State Kirchhoff Voltage law & Current law.
3. State superposition theorem.
4. Give statement of Norton's theorem.
5. Give statement of Thevenin's theorem.
6. Draw symbol of ideal current source and ideal voltage source.
7. What is value of internal resistance of ideal current and voltage source.
8. Draw symbol of dual power supply and dc voltage source.
9. Differentiate between AC and DC.
10. Define frequency and amplitude.
11. Define Angular velocity and wavelength.
12. What is phasor.Define phase angle.
13. Define Impedance.State its unit.
14. Define resistivity and state the unit.
15. Define time constant of the charging circuit.
16. Define Inductive and Capacitive reactance.
17. Define resonance.

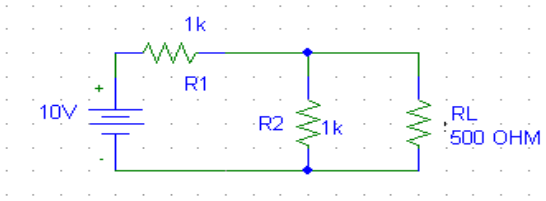
Long Answer Questions(4 marks)

1. Which are the different types of signals in Electronics? What are the parameters of symmetric square waves?
2. Explain series LCR circuit? Obtain expresses resonance frequency $F_{r.}$
3. Explain frequency response of Low pass passive Filter.
4. Explain frequency response of High pass passive Filter.
5. State & prove Maximum power transfer theorem.
6. Obtain an expression for voltage across capacitor in RC circuit when a step signal is applied across its input.
7. Explain charging and discharching of Capacitor through resistor.
8. Explain working of purely Resistive AC circuit.
9. Explain working of purely Inductive circuit.
10. Explain working of purely Capacitive circuit.
11. Explain working of series LCR circuit.
12. Explain High pass filter with frequency responance. Define cut of frequency.
13. Explain Lowpass filter with frequency responance.Define cut of frequency.
14. What is effect of R on the charging and discharging of circuit.
15. Write short note on step response of RCcircuit.
16. Show that in Inductive circuit current lags behind the applied voltage.
17. Find the voltage drop across load resistance RL using KVL.

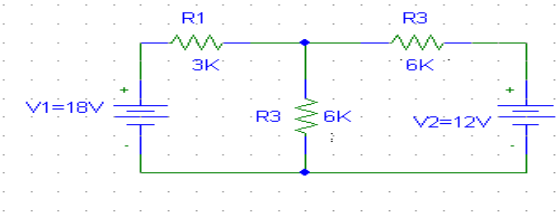


18. State Thevinin & Nortan's thm. Calculate the voltage across load resistance RL using

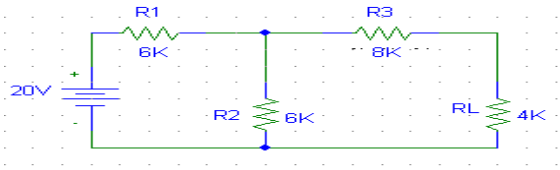
Thevinin thm.



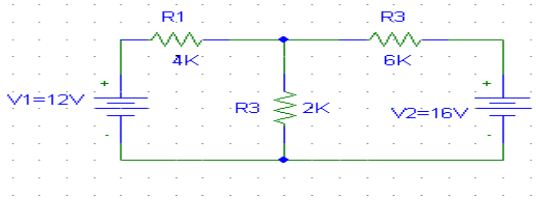
19. Find current flowing through R3 using Kirchoff's law.



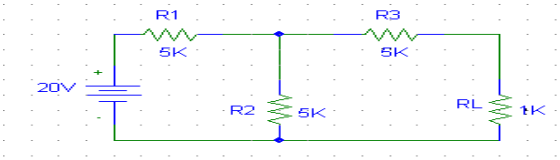
20. Draw the Thevenin's equivalent circuit for following circuit:



21. Find current flowing through R3 using superposition thm.



22. Draw the Nortan equivalent circuit for following circuit:



Unit 3: Semiconductor diodes

Short answer questions(2 marks)

1. Draw symbol of PN Junction diode & Zener Diode.
2. Draw symbol of i)LDR ii)Reset
3. Draw I-V characteristics of zener diode.
4. Define i)Peak Inverse voltage ii)Ripple factor
5. Draw diagram of opto-coupler.
6. Draw I-V characteristics of forward & reverse Bias PN junction diode.
7. Define i)Ripple Factor ii)Peak Inverse Voltage
8. List different types of diode.Draw its symbol.

Long Answer Questions (4 Marks)

1. Draw and explain I-V characteristics of P-N junction diode.
2. Explain with neat circuit diagram PN junction diode in forward & reverse Bias.
3. What are the specifications of LED.Explain each.
4. What is an opto-coupler? Explain its working with neat circuit diagram.
5. Compare Photo Diode & LED.
6. Explain working of LED with circuit diagram.
7. Explain Photo diode action neat circuit diagram.
8. Explain working of reverse bias PN junction diode.
9. Explain working of zener diode as a voltage regulator.
10. Explain Zener breakdown mechanism and Avalanche breakdown in brief.
11. Draw circuit diagram of bridge rectifier and explain its working with waveforms.
12. Explain working of full wave bridge rectifier with circuit diagram.
13. Draw circuit diagram of half wave rectifier and explain its working with waveforms.

Unit 3: Bipolar Junction Transistor

Short answer questions(2 marks)

1. Draw symbol for NPN and PNP transistor.
2. Draw IV characteristics of BJT.
3. Define α & β.
4. State different configuration of BJT.
5. Define Voltage gain & current gain.
6. Explain need of multistage amplifier.
7. Define D.C. load line & operating point of an amplifier.
8. Define Power Gain & Bandwidth of an amplifier.
9. What is biasing of transistor? Why it is needed?
10. A transistor has α=0.99.Calculate the base circuit, if the emitter current is 8mA.
11. State Specification parameters for BJT.
12. Define D.C. load line and Q point w.r.t amplifier.
13. Find α for β=190 & β=50.

Long Answer Questions (4 Marks)

1. Give construction of NPN transistor with neat diagram.
2. Explain working of NPN transistor with neat circuit diagram.
3. Draw and Explain I-V characteristics of BJT.
4. Draw Block diagram of an amplifier. Explain each block.
5. What are different methods of biasing a transistor? Which method is widely used & why?
6. How transistor can be used as a switch.
7. Explain classification of amplifier based on operating point.
8. Explain BJT as an Amplifier.
9. Define α & β.Give the relationship between them.
10. What is Current amplifier?Explain in transistor as a current amplifier.
11. What is direct coupled ampifier?Draw circuit and frequency response of amplifier.
12. Compare between CB,CE,CC configuration of Tansistor .

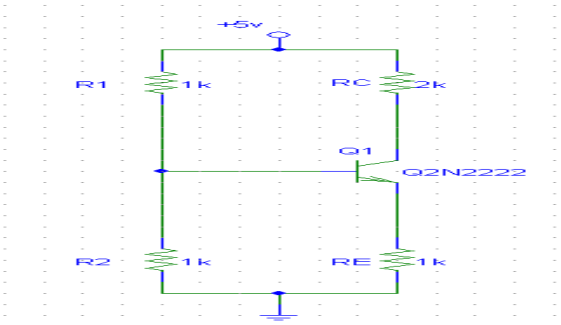
13.Draw the DC load line for the given circuit. State the biasing method used in the circuit.VBE=0.7v

Vcc=10v

10k 10k

2k 1k

14. Draw dc load line for given circuit: VBE=0.7V, B=100



Unit 5: Field Effect transistor

Short answer questions(2 marks)

1. Define Tran conductance and Amplification factor of FET.
2. State any two advantages of FET over BJT.
3. Draw symbol of n-channel JFET & P-channel FET.
4. Explain JFET as a switch.
5. Sate any four applications of FET
6. Draw symbol of UJT & MOSFET.
7. Draw Drain Characteristics of JFET
8. Draw transfer characteristics of JFET.
9. Explain MOSFET as a switch.
10. Comment ''FET is unipolar device while BJT is bipolar device.''
11. State applications of UJT.
12. Define intrinsic stand off ratio.
13. Define i)IDSS ii)VGS(cut off)

14.Comment “Input Impedance of FET amplifier is higher than BJT amplifier.”
15.Draw I-V characteristics of UJT.

Long Answer Questions (4 Marks)

1. State the basic principle of working of UJT. Where it is used?
2. Explain the construction and working of UJT.
3. Draw the equivalent circuit of UJT and explain its with neat circuit diagram. Define intrinsic stand off ratio.
4. Draw and explain UJT characteristics.
5. Explain the construction and working of JFET with circuit diagram.
6. Compare FET and BJT.
7. Draw and Explain characteristics of JFET.
8. Explain FET as a Voltage Variable Resistor.
9. Explain the construction and working of MOSFET.
10.Explain working of depletion mode MOSFET with circuit diagram.
11.Explain working of Enhancement mode MOSFET with circuit diagram.
12.State the specification parameters for JFET and MOSFET.
13.Define parameters of FET
i) A.C. drain resistance ii)D.C. drain resistance
iii) Transconductance iv)Amplification factor
14.The intrinsic stand-off ratio for UJT id determined to be 0.6. If the interbase resistance is 20kΩ,What are the values of RB1 and RB2?

Unit 6: Operational Amplifier

Short answer questions(2 marks)

1. Define Op-amp. Or what is an Operational Amplifier.
2. What do you mean by CMRR? Or Define CMRR.
3. Draw symbol of Op-amp.
4. What is Virtual ground?
5. State parameters or Characteristics of op-amp.
6. Define Input Impedance and output Impedance.

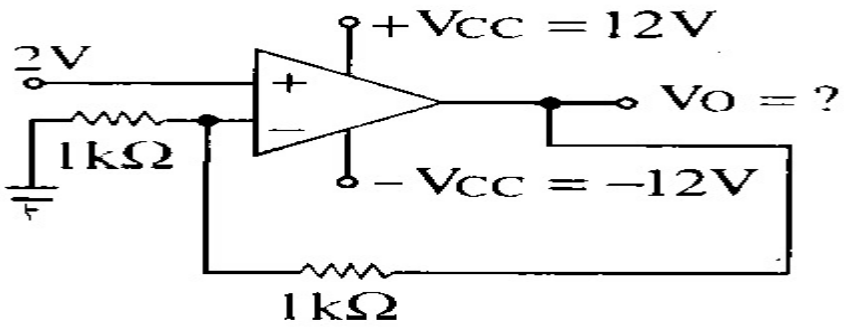
7. Define open loop gain of op-amp.
8. State Ideal values of op-amp IC 741 parameters.
9. Define Slew Rate of an operational amplifier.
10.Define the terms Input offset voltage, PSRR, Input bias current.
11.Draw circuit diagram of voltage follower or Unity gain amplifier.
12.Draw circuit Diagram of Inverting Amplifier.
13.Draw circuit Diagram of Non-Inverting Amplifier.
14.State Applications of Op-amp.
15.Draw circuit diagram of op-amp as an adder.
16.Draw circuit diagram of op-amp as a Subtractor.
17.What are the operations that can be performed by using operational amplifier?
18.What is Comparator?
19.Define Hysteresis.
20.Draw diagram of Inverting Comparator.

Long Answer Questions (4 Marks)

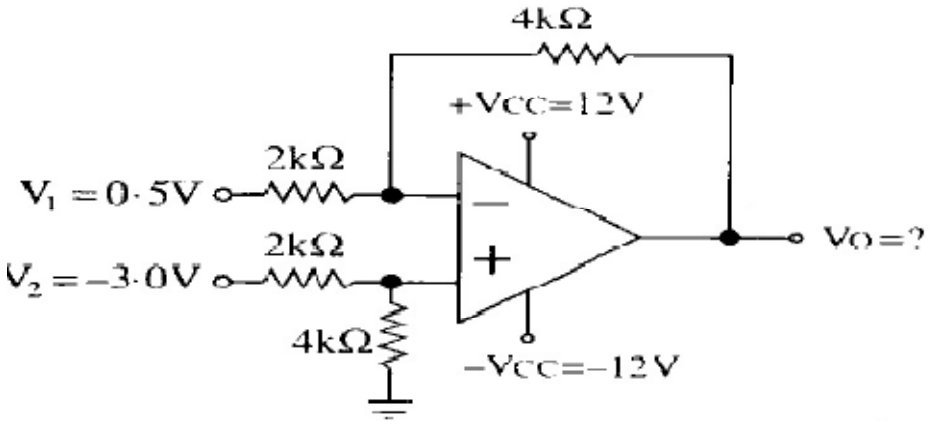
1. Draw block diagram of operational amplifier & explain each block.
2. State and Explain parameters of op-amp(any 4)
3. Compare ideal and practical parameters of op-amp.
4. With Neat circuit diagram explain concept of virtual ground.
5. Draw circuit diagram of op-amp in inverting amplifier. Find the expression for its output voltage & gain.
6. Draw circuit diagram of op-amp in Non-inverting amplifier. Find the expression for its output voltage & gain.
7. Explain working of op-amp as an adder with neat diagram.
8. Explain working of op-amp as a subtractor with neat diagram.
9. What is comparator? Explain Inverting comparator with neat circuit diagram.
10.What is comparator? Explain Inverting comparator with neat circuit diagram.
11.With neat circuit diagram explain Schmitt trigger circuit. Derive relation for UTP & LTP.
12.Compare Comparator and Schmitt Trigger .

Problems on Op-amp

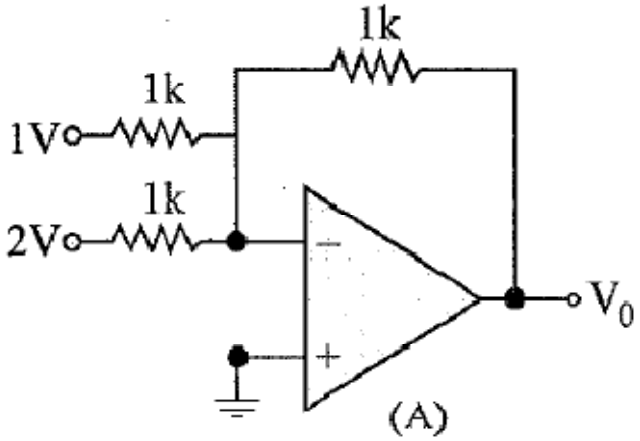
1. Identify the configuration of Op-amp and then find output voltage.


+Vcc = 12V
2V
Vo = ?
1kΩ
– Vcc = –12V
1kΩ

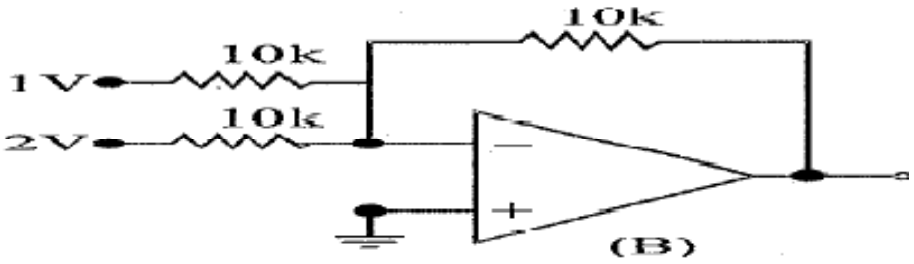
2.


4kΩ
+Vcc=12V
2kΩ
V1 = 0·5V
2kΩ
V2 = –3·0V
Vo=?
4kΩ
–Vcc=–12V

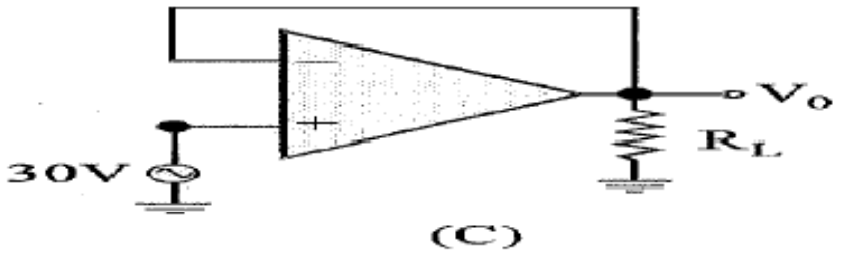
3)


1k
1k
1V
1k
2V
V0
(A)

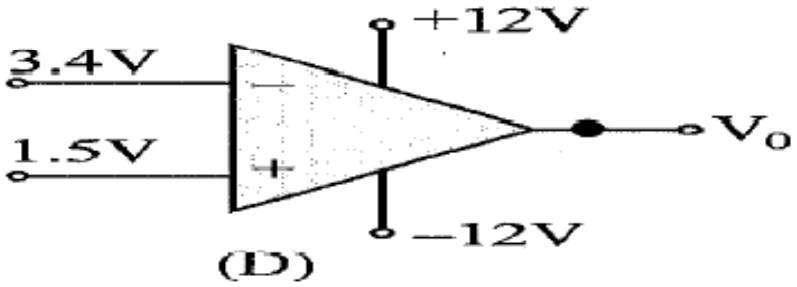
4)


10k
10k
1V
10k
2V
(B)

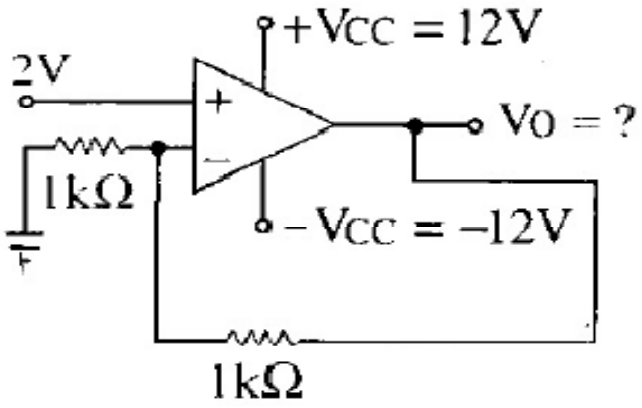
5)


V_o
R_L
30V
(C)

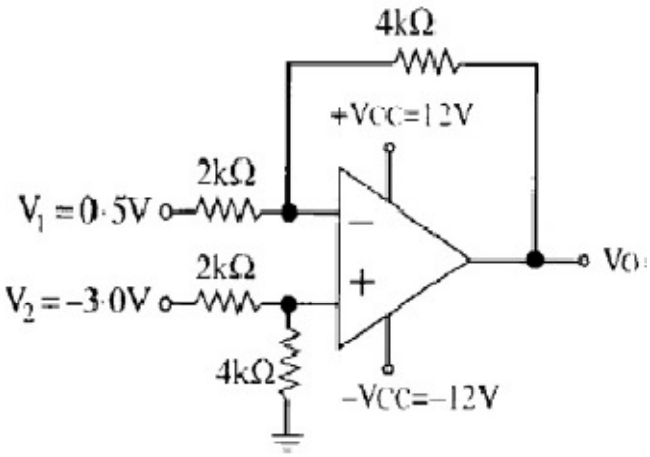
6)


+12V
3.4V
1.5V
V_o
−12V
(D)

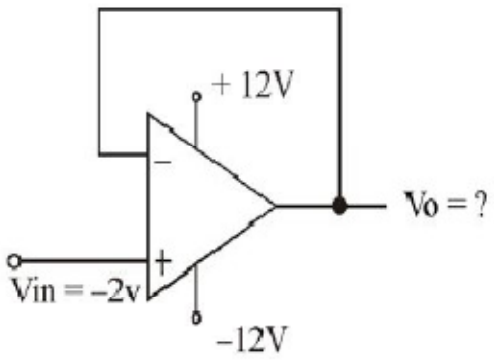
7)


+Vcc = 12V
2V
Vo = ?
1kΩ
− Vcc = −12V
1kΩ

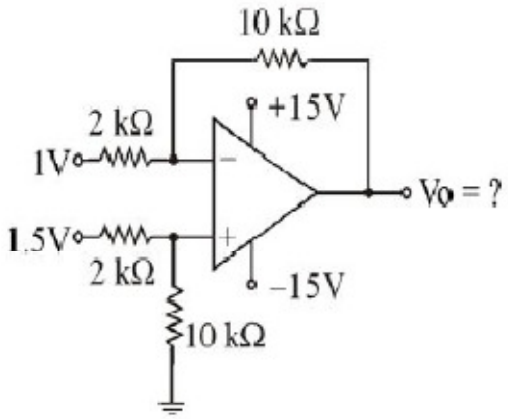
8)


4kΩ
+VCC=12V
2kΩ
V1 = 0·5V
2kΩ
V2 = −3·0V
4kΩ
−VCC=−12V
Vo

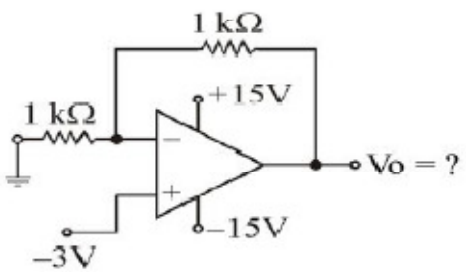
9)


+ 12V
Vo = ?
Vin = −2v
−12V

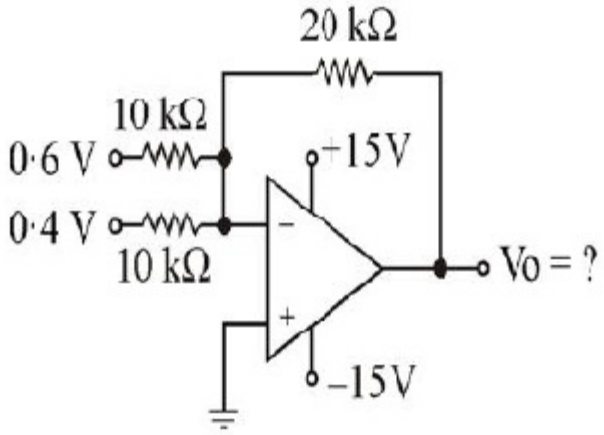
10)


10 kΩ
+15V
2 kΩ
1V
Vo = ?
1.5V
2 kΩ
−15V
10 kΩ

11)


1 kΩ
+15V
1 kΩ
Vo = ?
−15V
−3V

12)



F.Y. B.Sc. (Comp. Sci.)

PDE QUESTION BANK

(As per syllabus implemented from Academic Year 2013-14)

UNIT-I
Number Systems and Logic Gates

Q. 1. Convert the following decimal number into:

$(89)_{10}$ =(?)$_{16}$ =(?)8 = (?)$_2$

Q. 2. Convert the decimal number $(128)_{10}$ into binary, octal, hexadecimal number system.

Q. 3. Convert decimal number 125.85 into its binary equivalent

Q. 4. What is the decimal equivalent of binary number 10110.010?

Q. 5. In two's complement method of subtraction, what indicates the polarity of result?

Q. 6. Convert the following octal numbers into binary equivalent 563.213, 24.76.

Q. 7. Convert the given decimal number into binary number: $(37)_{10}$

Q. 8. Describe Hexadecimal and octal number system in detail. How can decimal numbers be converted to hexadecimal and octal numbers?

Q. 9. Convert 2479 to hexadecimal.

Q. 10. Perform the following subtraction using 2's complement method, and interpret the result.

$(27)_{10} - (32)_{10}$

Q. 11. Give the radix or base of the following number systems :

1. Binary 2. Decimal 3. Octal 4. Hexadecimal

Q. 12. Convert the following numbers:

1. $(35)10 = (?)_{16}$

2. $(48)8 = (?)_{10}$

Q13. Convert the following numbers

(89)10 = (?)2 = (?)Gray

Q. 14. Solve using 2's complement method:

1. $(1101)_2 – (011)_2$

2. $(1100)_2 – (1111)_2$

Q. 15. Construct a BCD and Excess 3 code for decimal number 0 to 9.

Q. 16. Convert the decimal number $(128)_{10}$ into binary, Gray and Excess-3 number systems.

Q. 17. Construct the BCD and Gray code for decimal number 0 to 9 .

Q. 18. 1101 is not a BCD number. justify.

Q. 19. Write a short note on weighted and unweighted codes with two examples each.

Q. 20. Gray code is not used for performing arithmetic operations, Why ?

Q. 21. Convert binary 1001 to its gray equivalent and gray 0110 to its binary equivalent.

Q. 22.Convert the following binary numbers into gray code.

i. 01011

ii. 11010

Q. 23. Describe the BCD code and ASCII code

Q. 24. What is ASCII code? Where is it used?

Q. 25. Write a short note on Gray code.

Q.26. Explain the weighted and nonweighted codes with suitable examples.

Q.27. Construct Hamming code for data 11110011 with even parity .

Q. 28. What is ASCII code ? Where it is used?

Q. 29. What do you mean by Weighted code and Non-weighted code ? Give example of each for decimal 7.

Q. 30. What is the difference between BCD and Binary Code ? Give the BCD and Binary Equivalent for $(15)_{10}$.

Q.31. What is the parity? What is the use of Parity Bit?

Q.32. Convert the following into gray code.

1. $(23)_8$ 2. $(23)_{10}$

Q. 33. What is parity code? How is error detected with it? What is its limitations?

Q.34 How can be basic logic gates obtained using only NAND & only NOR gates?

Q.35 Draw a circuit symbol & write the truth table for:

1) NAND gate 2) NOR 3) AND

4) OR gate 5) NOT 6) EX-NOR

Q.36 Build basic gates AND, NOT, OR using NOR gate.

Q.37 Explain the EX-OR gate. Specify its symbol and write its truth table. Write the application of Ex-OR gate.

Q.38 What is positive and negative logic? Explain working of 2 input positive logic OR gate using a diode circuit.

Q.39 Draw the equivalent circuit of all the gates using NAND gates.

Q.40 Which logic gates are known as universal gates? Draw their symbols.

UNIT-II
Boolean Algebra and Karnaugh maps

Q.1 Minimizing the following logical function using k-map.
Y = AB'C'D+A'BCD+A'BCD'+A'B'CD+ABC'D+ABC'D' & Draw simplified logical diagram.

Q.2 Reduce the following expression using K map & draw the simplified circuit:
Y = A'B'C'D + A' B C' D+A B C' D + A B' C' D + A B C D+ A B' C D

Q.3 Using K-map, obtain simplified logic circuit for:
Y=A'B'C'D+A'BC'D+ A'BCD+AB'C'D+ABC'D+ABCD

Q.4 Write short note on k map

Q.5 State and prove De Morgan's theorems.

Q.6 Prove A+ AB = A+B using Boolean algebra.

Q.7 Draw the logic circuit diagram to realize the following output: Y= BC + BCA

Q.8 Give symbol, Boolean equation and truth table for – NAND, AND gates.

Q.9 A digital system has 4-bit input from 0000 to 1111. Design a logic circuit that produces high output when input is less than 1000. Use K-map technique.

Q.10 Give the statements of De-morgans theorem.

Q.11 What is Karnaugh map? Give the structure of two, three and four variable K-map. How a quad eliminates two variables?

Q.12 A digital system has a 4 bit input from 0000 to 1111. Design a logic circuit that produces high output whenever the input is greater than 1101. Use K-map technique.

Q.13 Simplify (A'+B+C). (A+B'+C). Draw simplified logic diagram.

Q.14 Simplify the following Boolean equation using k-map:
Y= A'BCD + ABC'D' + ABC'D + ABCD + ABCD' + AB'C'D + AB'CD + A'BC'D

Q.15 Simplify the Boolean expression F = C(B + C)(A + B + C).
Q.16 Simplify the following expression into sum of products using Karnaugh map
F(A,B,C,D)= ∑(1,3,4,5,6,7,9,12,13)

Q.17 Reduce the following Boolean expression using K-map.
F(A,B,C,D)= Σ(0,1,2,4,5,7,8,9,10,11,14)

Q.18 Prove algebraically (X + YZ) =(X+Y) (X+Z)

Q.19 Draw the logic diagram of expression AB`C`+B`C+ABC.

Q.20 Reduce A(A + B)

Q.21 Reduce A'B'C' + A'BC' + A'BC.

Q.22 Reduce AB + (AC)' + AB'C(AB + C)

Q.23 Simplify the following expression Y = (A + B)(A+ C')(B' + C')

Q.24 Find the minterms of the logical expression Y =A'B'C' + A'B'C + A'BC + ABC'

Q.25 Write the maxterms corresponding to the logical expression
Y = (A + B + C')(A + B' + C')(A' + B' + C)

Q.26 What are basic properties of Boolean algebra?

Q.27 State the associative property of Boolean algebra.

Q.28 State the commutative property of Boolean algebra.

Q.29 State the distributive property of Boolean algebra.

Q.30 State the absorption law of Boolean algebra.

Q.31 State the limitations of Karnaugh map.

Q.32 What are called don’t care conditions?

Q.33 Give the structure of 2,3,4 variable k-map

Q.34 Explain the term SOP and POS related to Boolean function.

Q.35 State the disadvantages of algebraic method of simplification.

Q.36 Prove that AB+A'C+BC = AB + A'C

Unit 3

Arithmetic Circuits

Q.1 Explain with example the binary addition and subtraction.

Q.2 Write arithmetic rules for binary Addition

Q.3 Write the four rules of binary subtraction

Q.4 What happens whenever we borrow a 1 from another column?

Q.5 What does it mean to complement a binary number

Q.6 Write the 1's complement for each of the following 5-bit binary numbers.

a. 01001_2
b. 01011_2
c. 00111_2
d. 00001_2

Q.7 Subtract the following 4-bit binary numbers.

a. $1011_2 - 1001_2$
b. $1100_2 - 0110_2$
c. $1010_2 - 0011_2$
d. $1101_2 - 1011_2$
e. $1001_2 - 0111_2$
f. $1100_2 - 1001_2$

Q.8 For each of the subtraction problems in question 7, convert the problem and your answer to decimal to check your work.

Q.9 Subtract the following 8-bit binary numbers.

a. 11001010_2 - 10011010_2
b. 10011100_2 - 01111001_2
c. 11001011_2 - 10000011_2
d. 11100001_2 - 10011101_2
e. 10000001_2 - 01100110_2
f. 10010011_2 - 10000111_2

Q.10 Give and explain the advantages of of ones compliment representation.

Q.11 Explain with example 2s compliment method used for subtraction.

Q.12 What is 2s compliment number?

Q.13 Perform the following subtraction using 2's complement method, and interprete the result. (27)10 – (32)10

Q.14 What extra step do we take when we form the 2's complement of a negative binary number?

Q.15 Use 2's complement to perform
a) (1111 –1101)2
b) (10111 –10011)2
c) (1101 –1001)2

Q.16 Find the 2's complement of 1001001?

Q.17 Define binary adder.

Q.18 Write short notes on
a) Half Adder b) Full Adder c) Half Subtractor d) Full Subtractor

Q.19 Draw the logic circuit of the Half adder and write its truth table.

Q.20 Draw the logic circuit of the full adder using 2 half adders and write its truth table.

Q.21 Draw the logic circuit of the Half Sutractor and write its truth table.

Q.22 Draw the logic circuit of the full Sutractor using 2 half subtractors and write its truth table.

Q.23 Design the half adder circuit by using K-map method & draw the logic diagram.

Q.24 Design the full adder circuit by using K-map method.

Q.25 Design the half subtractor circuit by using K-map method.

Q.26 Design the half subtractor circuit by using K-map method & draw the logic diagram.

Q.27 Explain the concept of parallel adder.

Q.28 Draw the block diagram of 4 bit parallel adder & explain it in detail.

Q.29 What number of half and full adders we require for the designing of 4 bit parallel adder?

Q.30 What is nibble adder/subtractor?

Q.31 With block diagram, explain the working of 4 bit adder/subtractor.

Q.32 Draw the logic diagram of 4 bit universal adder and subtractor using IC7483 & Ex-OR gates. Explain the roll of Ex-OR logic in detail

Q.33 With the help of suitable table diagram explain the working of 8-bit parallel adder/ subtractor.

Q.34 List out the applications of comparators?

Q.35 What is digital comparator?

Q.36 Explain 2 bit Magnitude Comparator.

Q.37 Explain 4 bit Magnitude Comparator.

Q.38 What is the purpose of ALU unit in CPU?

Q.39 Write a short note on ALU.

Q.40 Draw and explain the block diagram of ALU.

Q.41 What are the types of ALU?

Q.42 Explain each block of ALU in detail.

Q.43 Perform following subtraction
(i) 11001-10110 using 1's complement
(ii) 11011-11001 using 2's complement

Q.44 Draw the block schematic of Magnitude comparator and explain its operation.

Unit 4

Combinational Circuits

Q.1 What is multiplexer? Draw circuit diagram of 8 : 1 multiplexer. Explain its working in brief.

Q.2 Write short note on IC 74148.

Q. 3 Explain decoder 7447 with its truth table and write down the function of each pin.

Q. 4 Draw the circuit for a 2 : 1 multiplexer and explain its working in brief.

Q. 5 Explain action of demultiplexer with IC 74154.

Q. 6 With neat logic diagram explain the working of an Octal to binary Encoder.

Q. 7 Explain BCD to seven segment decoder driver.

Q. 8 Write functions of the following ICs: 7447, 74138, 74150, 74154.

Q. 9 What is a nibble multiplexer?

Q.10 What is multiplexer? Explain function of a 4 : 1 multiplexer with logic diagram.

Q. 11 explain decoder IC 7447 with its truth table and write functions of its pins.

Q. 12 IC 7447is_____

Q. 13 what is demultiplexer ? Explain working of a 1:4 demultiplexer with logic diagram.

Q. 14 Explain the working of an octal to binary encoder. What is a priority encoder?

Q.15 Write a short note on 7 segment display. Mention the two ICs used for driving 7 segment displays using a BCD input.

Q.16 Identify the function of the following IC's :

i. IC 74150

ii. IC74148

Q. 17 What is multiplexer? Draw a circuit diagram of 4:1 multiplexer and explain

Q.18 What do you mean by multiplexer tree ? How will you construct 32:1 Multiplexer using 16:1 multiplexer.

Q.19 What is the difference between demultiplexer and decoder ? Write a short note on IC 7447.

Q.20 Identify the following ICs :

i. IC 74154

ii. IC 74138

Q.21 Define multiplexing.

Q.22 What is decoder ? What is the importance of IC 7447?

Q.23 With the suitable circuit diagram explain the working of nibble multiplexer.

How will you extend the circuit for byte multiplexer ?

Q.24 What is the difference between demultiplexer and decoder ?

Q.25 Explain how a 16 : 1 multiplexer can be built using 8:1 multiplexer units.

Q.26 Draw the logic circuit of 1:8 demultiplexer and explain how it works . How one can use this circuit as a 3 to 8 decoder ?

Q.27 Identify the function of following IC's :

1. 74150 2. 74138 3. 74154 4. 7448

Q.28 What is Encoding ? With logic diagram explain the working of decimal of binary encoder.

Q.29 What is IC 7447 ? Give the function of following pins:

1. LT and 2. RBI.

Q.30 what do you mean by multiplexing ? Design a 32: 1 Multiplexer using two 16: 1 Multiplexers.

Q.31 What is the difference between Demultiplexer and decoder ? Give the function of ICs.

1. IC 7486 2. IC 7400 3. IC 74148 4. IC 74138.

Q.32 What is difference between demultiplexer and decoder ?

Q.33 What is meant by Multiplexer? Explain with diagram and truth table the Operation of 4-to-1 line multiplexer.

Q.34 What is meant by Decoder? Explain 3-to-8 line decoder with diagram and truth table.
Q.35 Draw symbol of Multiplexer.

Q.36 What Is data selector?

Q.37 Draw symbol Demultiplexer.

Q.38 What is application of Encoder

Q.39 Design a 32:1 multiplexer using two 16:1 multiplexers and a 2:1 multiplexer.

Q.40 Draw the diagram of decimal to BCD priority encoder. What do you mean by encoding?

Q.41 What is the importance of strobe input in a multiplexer? What does active low strobe means?

Q.42 Draw the logic diagram of BCD to Decimal decoder and explain its operations.

Q.43 Define combinational logic

Q.44 Explain the design procedure for combinational circuits

Q.45 What is binary decoder?

Q.46 What is priority Encoder?

Q.47 What is Decimal to binary code convertor & design and draw the logic diagram of Decimal to binary code convertor.

Q.48 What is Hexadecimal to binary code convertor & design and draw the logic diagram of Hexadecimal to binary code convertor.

Q.49 What is BCD to decimal code convertor & design and draw the logic diagram of BCD to decimal code convertor.

Q.50 Design and Draw the diagram of 3x4 matrix keyboard encoder & explain its working principle.

Q.51 Draw the symbol of BCD to 7 segment decoder.

Q.52 State the truth table of BCD to 7 segment decoder.

Unit 5
Sequential Circuits

Q.1 Explain the working of JK flip-flop. How can you convert the flip-flop into D flip-flop?

Q.2 Write a note on IC 7475.

Q.3 Define

a. clock

b. Positive edge trigger

c. Negative edge trigger

d. Clear

e. Preset

Q.4 What is flip-flop? Explain R-S flip-flop using NAND gates.

Q.5 What is race around condition in JK flip-flop? Explain how it is avoided in JK master slave FF.

Q.6 “RS flip-flop cannot be converted to T flip-flop but JK flip-flop can be converted to T flip-flop”. Justify this statement.

Q.7 What is the race around condition in J-K flip-flop? Explain how it is avoided master-slave arrangement.

Q.8 For a T flip flop Tout =_____xT code'

Q.9 What is the difference between synchronous & asynchronous sequential circuits?

Q.10 Working of clocked RS flip-flop.

Q.11 What is flip-flop? What are the different types of flip-flops?

Q.12 What is the relation between Clock Pulse Width and Propagation Delay Time

Q.13 How race around condition occurs in JK flip-flop? How it can be avoided?

Q.14 Explain working of JK flip-flop with logic diagram and truth table .

Q.15 What are T and D types of flip flops ?

Q.16 Draw the logic diagram of clocked RS flip flop and explain its working.

Q.17 Draw the logic diagram of clocked RS flip flop using NAND gates.

Q.18 Explain D flop flip with proper logic diagram .

Q.19 What are the types of shift register ? Explain PISO shift register in detail.

Q.20 Explain with neat diagram 3 bit parallel in serial out shift register .

Q.21 Explain how IC 7495 is used in left shift and right shift operation.

Q.22 Name the different operations that can be carried with shift register . Draw block diagrams of each. Which is the fastest operation and why ? Write down the number of 4 bit universal shift register integrated circuit.

Q.23 How much time will be required to parallely load and serially shift a 4 bit data in a shift register operating at a d clock frequency 1 MHz?

Q.24 Explain the action of 4-bit parallel in serial out shift register with suitable circuit diagram. Mention the number of universal 4-bit shift register IC.

Q.25 State various types of shift registers.

Q.26 Draw a circuit diagram of 3-bit parallel-in serial-out shift register and explain its working.

Q.27 What are the four modes of Shift Register? Which is fastest of them? Why?

Q.28 Draw the timing diagram for loading the data 1010 using SIPO mode of shift register.

Q.29 What is a register? Explain 4-bit serial in serial out shift register.

Q.30 Draw the internal block diagram of IC 7490 and explain the function of R01, R02, R91, R92

Q.31 Explain working of 4 bit negative edge triggered asynchronous counter.

Q.32 Explain the action of IC 7490 in MOD 7with timing diagram.

Q.33 Explain the working of 4 bit ripple counter with the help of circuit and timing diagram.

Q.34 What is a counter? What are the two important types of counters? Explain the working of a 3-bit counter of any one type with suitable diagram and input – output wave forms.

Q.35 Give internal block diagram of 3-bit asynchronous up-down counter and explain its working.

Q.36 Draw neat diagram of 3-bit asynchronous up-down counter and explain its working.

Q.37 What is the difference between synchronous and asynchronous counters ? Explain how MOD -7 operation is carried out using IC 7490.

Q.38 How many flip flops will be required to build the following counters :

i. Mod19 ii. Mod6

Q.39 With the help of suitable diagram explain the working of 3-bit up-down counter 37. Differentiate between synchronous counters, Explain the working of 3-bit synchronous counter using circuit diagram and timing diagram.

Q.40 With the help of logic diagram, truth table and timing waveforms, explain how IC 7490 works in binary decade counter mode.

Q.41 Explain the working of a 3-bit Ripple counter with timing diagrams.

Q.42 With the help of internal block diagram of IC 7490 , explain how it works as a 'MOD8' counter.

Q.43 Give the difference between Synchronous and Asynchronous counter.

Q.44 With the help of internal block diagram of IC 7490, explain how it works as a decade counter.

Q.45 Draw a diagram of 4-bit asynchronous up-down counter. Explain its working with the help of timing diagrams.

Q.46 Explain working of IC 7490 as a decade counter along with timing diagram.

Q.47 Explain 4bit asynchronous down counter with truth table and timing diagram.

Q.48 What are the different types of flip-flop?

Q.48 What is the operation of RS flip-flop, JK flip-flop, D flip-flop, T flip-flop?

Q.49 What is a master-slave flip-flop?

Q.50 Define rise time & fall time.

Q.51 Define registers & shift registers.

Q.52 Define sequential circuit?

Q.53 What do you mean by present state & next state of flip-flop?

Q.54 Draw the logic diagram for SR latch using two NOR gates.

Q.55 What are the steps for the design of asynchronous sequential circuit?

Unit 6

Logic Families

Q.1 Give the classification of logic families

Q.2 Classify the logic family by operation?

Q.3 State the classifications of FET devices.

Q.4 Mention the classification of saturated bipolar logic families.

Q.5 Mention the different IC packages?

Q.6 Mention the important characteristics of digital IC's?

Q.7 Define Fan-out?

Q.8 What is propagation delay?

Q.9 Define noise margin?

Q.10 Define fan in?

Q.11 What is Operating temperature?

Q.12 What is High Threshold Logic?

Q.13 What are the types of TTL logic?

Q.14 List the different versions of TTL

Q.15 Why totem pole outputs cannot be connected together.

Q.16 State advantages and disadvantages of TTL

Q.17 What happens to output when a tri-state circuit is selected for high impedance.

Q.18 Draw the circuit diagram TTL NAND gate.

Q.19 Draw the circuit diagram TTL NOR gate.

Q.20 Draw the circuit diagram TTL NOT gate.

Q.21 Draw the circuit diagram TTL NAND gate.

Q.22 Give the advantages of active pull-up over passive pull-up.

Q.23 Mention the important characteristics of different logic families?

Q.24 Explain the use of multi-emitter inputs

Q.25 What is active pull-up load & passive pull-up load?

Q.26 Compare the performance of TTL, CMOS and ECL logic.

Q.27 Explain the features of CMOS.

Q.28 State the application of CMOS logic inverter.

Q.29 What are the precautions taken while using CMOS ICs?

Q.30 Explain the terms SSI,MSI,LSI,VLSI.

Q.31 Explain with diagram the working of High-Threshold logic(HTL). State the advantage of HTL over DTL.

Q.32 Explain briefly the operation of TTL NAND gate in tristate output configurations.

Q.33 Explain the ECL circuit.

Q.34 State the specifications of standard TTL family.

Q.35 Explain 7400 TTL series. Sketch pin-outs of different ICs of 7400 series and state their functions.