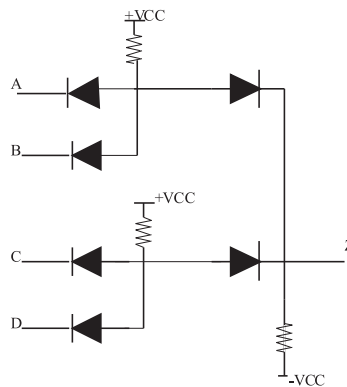1. Implement XNOR gate using NAND.

Ans:

2. The output of the following circuit is_____

   a) (A+B) (C+D)   b) AB+CD   c) AC+BD   d) (A+D) (B+C)

3. Which of the following memory element can have possible race condition _____.

   a) Transparent latch   b) RS latch   c) JK flip flop   d) All of the above

4. Design a circuit which gives the output as multiply by 4 without using any gates?

Ans:

5. Convert JK flip-flop to D flip-flop?

Ans:

6.   Design a mealy FSM (Finite State Machine) to detect a sequence 101(over lapping)?
Ans:

7.   In a serial IO system, the rate at which the bits are transmitted is known as _____

8.   What is the difference between RAM and FIFO?
Ans:

9.   What is RACE AROUND problem? How can you rectify it?
Ans:

10.   Design D-FF into divide by 2 counter.
Ans:

11. $(23)_{10} = (212)_x$ find 'x'
Ans:

12.   A four stage twisted- ring counter will develop how many unique outputs before repeating _____

13. Implement xor gate using mux only

Ans:

14. When a clock frequency of 125Khz inputs a six stage asynchronous counter the output frequency of a flip flop #3 is ?

Ans :

15. What is dynamic timing analysis?

Ans:

16. Gray code for $(97)_{10}$?

Ans:

17. Differentiate between CPLD and FPGA?

Ans:

18. Prove that AB+BC+A'C = AB +A'C

Ans:

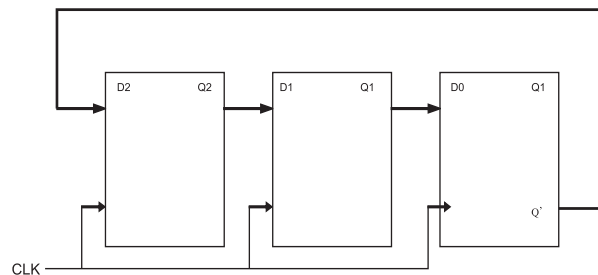19. Design 4 bit gray to binary code converter?
Ans:

20. Abbreviate

a) MOSFET :

b) LFSR :

c) TTL :

d) RTL :

e) ASIC :

21. Before applying first clock pulse $Q2Q1Q0 = 000$ how many clock pulses requires to get the same output at $Q2Q1Q0$. _____.
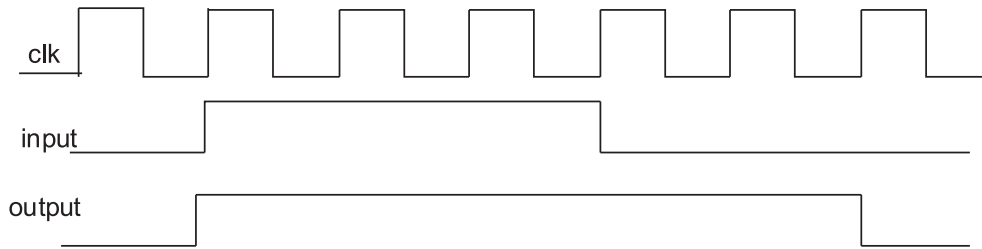

22. What is difference between latch and a flip-flop?
Ans:

23. How to implement a master slave flip-flop using a 2:1 mux?
Ans:

24. Design a circuit for the below wave-forms

Ans:

25. Build a 4:1 multiplexer using 2:1 multiplexer only.
Ans:

26. Simplify the below Boolean expressions
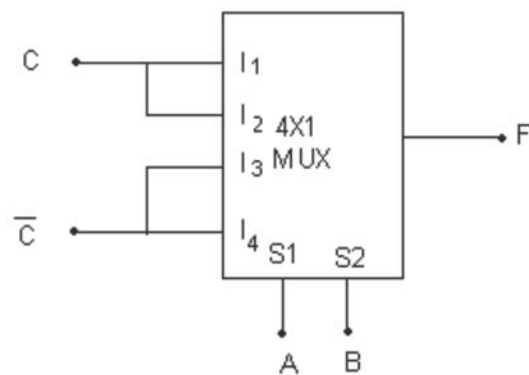   (a) (AD' (C+BD)+A'D')C
     b) AB+B'C+AC
Ans:

27. Implement ABCD using 2 input NAND gates?
Ans:

28. The binary subtraction of decimal 28 from 86 will produce how may borrow bits?
Ans:

29. What is the output for the realized circuit shown below?

C —— I_1
      I_2 4X1
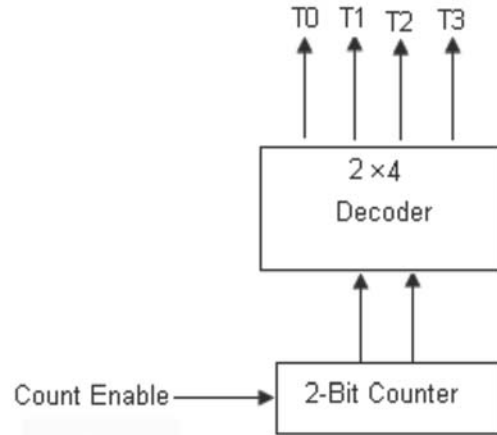 I_3 MUX —— F
$\overline{C}$ —— I_4 S1   S2

A   B

Ans:

30. Draw the CMOS-inverter.
Ans:

31. SIX's complement of the number 54321 is:—————————————————————————————.

32. Write the truth table and design the full subtractor ?
Ans:

33. The circuit shown works as a _____.

34. Draw state diagram for D Flip-flop?
Ans:

35. Draw the truth table for equivalence gate and check its duality equals to which gate?
Ans:

APTITUDE

36. The sum of a number and the number preceding it is 33. By how much is two less than six times the number?
   a) 196   b) 94   c) 90   d) 100

37. If the length and breadth of a room are increased by y feet each, the perimeter increases by 16 feet. Find y
   a) 8   b) 2   c) 6   d) 4

38. One-fourth of a number is greater than one-fifth of the number succeeding it by 1. Find the number.
    a) 24   b) 42   c) 36   d) 48

39. An oil cylinder was 3/4th full. When two bottles of oil is poured into it, it is 4/5th full. How many bottles of oil can the full cylinder hold?
    a) 20   b) 15   c) 40   d) 30

40. The ratio of present age of A and B is 4:3. A will be 26yrs old in 6yrs from now. How old is B now?
    a) 15yrs   b) 20yrs   c) 25yrs   d) 10yrs

41. A profit of Rs. 500 is divided between X and Y in the ratio of ½ : ⅓ .What is the difference between their profit shares ?
    a) Rs. 200   b) Rs. 100   c) Rs. 300   d) Rs. 50

42. the sum of the present ages of A, B, C is 45 yrs. Three years ago their ages were in the ratio 1:2:3. What is the present age of A
    a) 10yrs   b) 6yrs   c) 8yrs   d) 9yrs

43. If the denominator of a fraction is increased by 4, then the fraction becomes 5/8. If the numerator is 11 less than the denominator, find the numerator.
    a) 25   b) 20   c) 30   d) 35

44. 15-mangoes and 7-apples cost as much as 10-mangoes and 9-apples. What is the ratio of cost of one mango to cost of one apple?
    a) 2:5   b) 5:2   c) 3:4   d) Cannot be determined

45. A person sold his watch for 96 $ and got some percentage of profit which was numerically equal to the cost price. What is the cost price of the watch
    a) 50 $ b) 54 $ c) 60 $ d) 80 $

46. Tap A can fill an empty tank in 6-hours and Tap B can empty the full tank in 8-hours. If the tank is empty when tap A is opened at 9:00 am and tap B is opened at 11:00 am, then at what time is the tank filled?
    a) 6:00pm   b) 3:00 am   c) 3:00pm   d) 6:00am

47. 20 men can plant 50 saplings in 8-hours. In how many hours can 15men plant 80 saplings?
    a) $17\,{}^{1}/_{25}$ b) $12\,{}^{7}/_{11}$ c) 20   d) None of these

48. A man can row at 6 km/h in still water and at 4 km/h upstream. How long will the man take to go to a place 1 km downstream and return?
    a) 36 min   b) 24 min   c) 12 min   d) 18min

49. Some telegraph poles are placed 20 m apart. How many poles will a train pass in 3-hours at 60km/h ?
    a) 1200   b) 2500   c) 4000   d) 9000

50. A hollow rectangular metal box of outer dimensions 30cmx24cmx18cm and of thickness 3cm is melted to form a solid cube. What is the measure of side of the cube (in cm)?
    a) $36\sqrt{36}$ b) 6   c) $18\sqrt[3]{36}$ d) $6\sqrt[3]{36}$