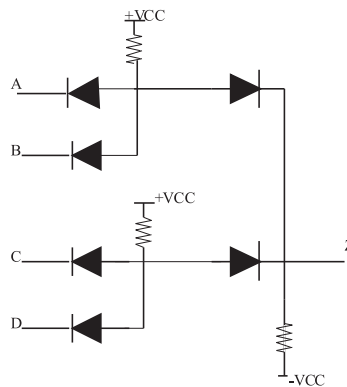


1. Implement XNOR gate using NAND.

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 :

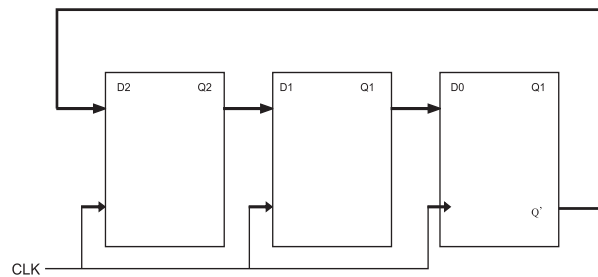
b) LFSR :

c) TTL :

d) RTL :

e) ASIC :

21. Before applying first clock pulse  $Q_2Q_1Q_0 = 000$  how many clock pulses requires to get the same output at  $Q_2Q_1Q_0$ . \_\_\_\_\_.



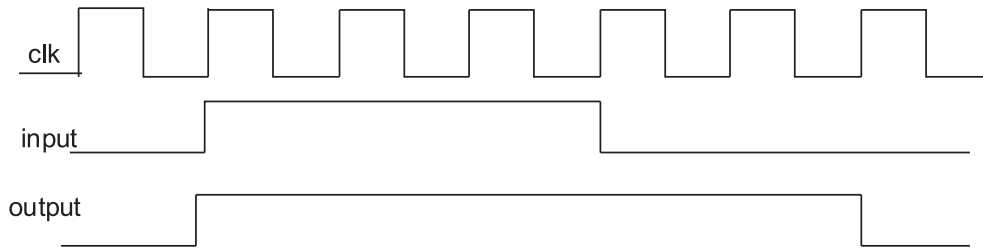
22. What is difference between latch and a flip-flop?

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:

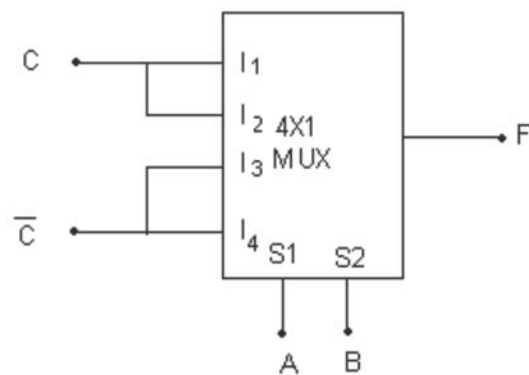
27. Implement ABCD using 2 input NAND gates?

Ans:

28. The binary subtraction of decimal 28 from 86 will produce how many borrow bits?

Ans:

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



Ans:

30. Draw the CMOS-inverter.

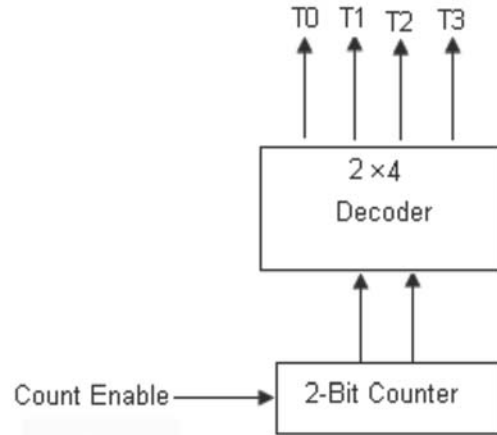
Ans:

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  $\frac{3}{4}$ th full. When two bottles of oil is poured into it, it is  $\frac{4}{5}$ th 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  $\frac{1}{2} : \frac{1}{3}$ . 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  $\frac{5}{8}$ . 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)  $17\frac{1}{25}$                                       b)  $12\frac{7}{11}$                                       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)  $6\sqrt[3]{36}$