Question Bank (March- 2020)

Class:- F.Y.B.Sc

Subject:- Electronic Science

Sem- II, Paper:- II

Name:- Digital Circuits & IC Technology

Q.1) Objective Questions (1 Mark)

1] A 4:1 multiplexer has…….. select line

a) 1 b) 2 c) 3 d) 4

2] A De-Multiplexer has…….. inputs

a) 4 b) 3 c) 2 D) 1

3] Multiplexer is also called as……

a) data selector b) data encoder c) data decoder d) none

4] A decimal to BCD convertor has ……. input and…….. outputs

a) 10,4 b) 4,10 c) 9,4 d) 4,9

5] Binary to octal decoders has…… outputs

a) 2 b) 7 c) 8 d) 96

6] Seven segment display can display only……..

a) alphabets b) digits from 0-9 c) images d) Name of the above

7] De-multiplexer can be used as…….

a) Encoder b) Decoder c) Multiplexer d) Counter

8] Flip-Flop is a……..

a) 2-bit storage b) 1-bit storage c) 3-bit storage

d) None of the above

9] A RS FF is called SET if the outputs Q and Q are ……and…….....

10] To use J-K FF in toggle mode J & K inputs should be ……..and…….

a) 0, 0 b) 0, 1 c) 1, 0 d) 1,1

11] D – F F can be derived from ……

a) J-K b) R – S c) both (a) and (b) d) None of the above

12] A Mod-4 counter will counts……..

a) From 0 to 4 b) from 0 to 3 c) from 4 to 0 d) from 0 to 6

13] A basic storage element in a digital system is…….

a) Counter b) flip-flop c) mux d) NAND

14] A 3 bit up counter will count…….

a) from 000 to 0 111 b) from 111 to 000n c) from 000 to 101

d) from 101 to 000

15] IC 7490 can not be used as……..

a) mod-10 counter b) mod- 12 counter c) mod- 8 counter d) mod-5

16] 3-bit ripple counter has natural count ……..

a) 4 b) 6 c) 8 d) 10

17] What is the major advantage of ECL logic family…….

a) very high power b) low cost c) very high speed d) None of above

18]. ……..logic family has the shortest propagation delay

a) RTL b) DTL c) TTL d) ECL

19]. ……is a unipolar logic family

a) TTL b) RTL c) CMOS d) ECL

20]. ……..is a bipolar logic family

a) RTL b) DTL c) TTL d) ECL

Q. 2) Ans in short (1Mark / 2 Mark)

1] Define the terms :_____

a) power dissipation b) Figure of merit

2] " CMOS logic family is better than bipolar family" Comment

3] State advantages of ECL family.

4] Draw equivalent circuit of multiemitter transistor.

5] Define the terms:_____

a) Noise immunity b) Noise margin

6] Explain the terms:- a) Fan-in b) Fan-out

7] What is a unipolar logic family?

8] What is synchronous counter?

9] What are the types of counter?

10] Define the terms “modulus”

11] What are the types of registers?

12] Name the various types of FFs.

13] What is the difference between FET and BJT?

14] Define ----------

a) combinational circuit b) sequential circuit

15] What are the applications of mux?

16] How de-mux is different from mux?

17] Define ----------

a) Encoder b) Decoder

18] Explain the function KB encoder

19] Define ----------

a) multiplexer b) Demultiplexer

20] What are the application of decoder?

21] What is a 7 segment display?

22] What are the types of 7 segment display?

Que. 3) Write a short note on (4 Marks)

1] Write a short note on----------

a) combinational circuits b) sequential

2] Write a short note on----------

a) Mux b) De-Mux

3] Write a note on flip-flops.

4] Write a brief note on registers.

5] Write a note on high speed counters.

6] Write a note on----------

a) TTL b) CMOS

7] Write a brief note on IC parameters.

8] Write a note on decade counter.

9] Write a short note on KB encoders.

10] Write a note on modulus counters.

11] Write a note on universal shift register.

12] Write a note on binary to decimal decoder.

13] Write a note on priority encoder.

14] Write a brief note on tri-state logic.

15] Write a note on logic families.

16] Write a note on asynchronous counters.

17] Write a brief note on single i /p FFs.

18] Write a note on up-down counter.

19] Write a note on binary counter.

20] Write a note on fan-in X fan-out.

Q. 4) Short Answer Questions (4 Marks)

1] What do you mean by code converter. Explain encoder and decoder with suitable Example.

2] What is multiplexer? Draw logic diagram for 4 line to 1 line multiplexer.

3] Draw logic diagram of 1 to 2 line de-mux. Explain its action with truth table.

4] What is decoder? Explain BCD to seven segment decoder.

5] Multiplexing means " Time sharing" Comment.

6] Define the following ----------

a) Mux b) de-mux c) Encoder d] Decoder

state one application of each.

7] Draw neat circuit diagram of keyboard encoder. Explain its operation with truth Table.

8] Define the term modulus of a counter. Draw the circuit diagram for mod-3 counter with its timing diagram.

9] Define the terms----------

i) positive edge triggered FF ii) Negative edge triggered FF

Draw the circuit symbol of J-K FF with negative edge triggered clock input.

10] Explain the operation of SISO shift register for 4-bit data. Draw logic diagram and timing diagram.

11] Draw logic diagram of up-down counter. Explain it's working.

12] Explain working of J-K FF with logic diagram, symbol and truth table.

13] State the applications of ----------

a) counters b) shift registers

14] Distinguish between serial and parallel counter

15] What is FF? What are the limitation of SR FF?

16] What is synchronous counter? Find out total propagation delay of 4-bit synchronous counter, if propagation delay of FF is 20 nsec.

17] "CMOS logic family is superior them bipolar family" comment

18] What is the difference between decoder and de-multiplexer?

19] Explain the action of 2-input TTL NAND gate.

20] What is meant by open collector gates? State its advantages.

21] List the various characteristics of logic family.

22] Give the comparison of TTL & CMOS

Q. 5)Logic answer questions (6-Marks / 12 Marks)

1] Draw active segment diagram for displaying 0 to 9 decimal numbers. Show the arrangement of LED's in CA display with diagrams.

2] Explain the following with suitable example

i) Mux ii) de-mux iii) Encoder

3] Define the terms encoder and decoder. Explain the need with suitable example. Draw neat circuit diagram of KB encoder & explain.

4] What do you mean by multiplexing? Explain 4:1 mux using 2:1 mux. Mention various applications of multiplexer.

5] Draw the block diagram and explain how BCD to 7- Segment decoder is used to interface seven segment display. Write the truth table for CA display.

6] Explain the term de-multiplexing. Determine the no of control lines for a de-multiplexer having 64 outputs. Give the logic diagram of 1:4 de-mux

7] What is FF?

Mention various types.

Explain working of clocked R-S FF

With logic diagram and truth table

8] What do you mean by IC?

Explain purpose with simple example.

Give IC numbers for the following functions:-

i) quad 2-I/P AND gate ii) Decoder counter iii) 4:1 mux iv) 1:4de-mux

9] What are types of counters?

Draw logic and timing diagram for three bit down counter.

Mention it's applications.

10] Define the term-register

Draw logic diagram of PISO shift register

Explain it's action

Mention it's use in digital circuits.

11] Define the term modulus of counter.

How many FF are required to design mod- 15 counter?

Draw logic diagram for mod-7 Counter. Explain it's action.

12] What do you mean by edge triggering? Explain positive edge triggered J-K FF with its logic diagram and timing diagram.

13] Define logic family. List the various characteristics of logic family.

Why CMOS logic family is better than bipolar family?

14] Define the term- logic family'

Give the classification of logic families.

Explain the action of 2- I/P TTL NAND gate.

15] Describe the terms saturated and non saturated logic families.

Explain the necessity of logic families with example.

16] Give the comparison of TTL & CMOS gates'

Explain the action of TTL NOT gate.

Mention few advantages.

17] What are types of digital circuits?

Explain various parameters in detail.

18] What is difference between asynchronous and synchronous counters?

Explain the operation of ring counter.

State it's application

19] What are the applications of----------

a) Flip-Flops b) Counters c)Registers

20] Draw the internal block diagram of IC-7490.

Design following using IC-7490----------

a) Mod-2 counter b) Mod-10 counter

----------xxx----------

.

.