

Q1. Two bodies changed from  $p_1 v_1$  to  $p_2 v_2$  state in two ways. The heat supplied is  $\Delta Q$  and work done is  $\Delta W$

Then what is constant in these two processes

- (a)  $\Delta q$
- (b)  $\Delta w$
- (c)  $\Delta q + \Delta w$
- (d)  $\Delta q - \Delta w$

Ans. (d)

Q2. \_\_\_\_\_ have same atomic number and same mass number are

- (a) Isotopes
- (b) Isotones
- (c) Isomers
- (d) Isobars

Ans. (c)

Q3. When a free electron is placed in a plane of electro magnetic then it moves in

- (a) in the direction of the electric field
- (b) in the direction of magnetic field
- (c) of propagation of wave
- (d) of the plane containing magnetic field and propagation direction.

Q4. Name the phenomena in which one proton is jumped from one isomer to another isomer to create two different elements

- (a) functional isomerism
- (b) stereo isomerism
- (c) tautomerism
- (d) polymerism

Ans. (c)

Q5. In the below compounds which one has 40% C, 6.7% H and 53.3 % O what is its empirical formula

- (a) CHO
- (b) CH<sub>2</sub>
- (c) C<sub>2</sub>H<sub>2</sub>O<sub>2</sub>
- (d) C<sub>2</sub>H<sub>3</sub>O<sub>2</sub>

Ans: (b)

Q6. X rays are coming from X ray tube, the wavelength is \_\_\_\_\_ a certain wavelength/s

- (a) below
- (b) above
- (c) inbetween
- (d) out of

Ans. (c)

Q7. In a triode valve in order to increase the saturation current what has to be done

- (a) increase plate voltage
- (b) reduce distance between grid and plate
- (c) increase cathode potential
- (d) reduce grid potential

Ans. (d )

Q8. Seven different toys are distributed among 3 children how many different ways are possible?

- (a)  ${}^7C_3$
- (b)  ${}^7P_3$
- (c)  $3^7$
- (d)  $7^3$

Ans. (c)

Q9. A, B and C are three speakers. They have to speak randomly along with another 5 speakers in a function.

A has to speak before B and B has to speak before C. What is the probability.

Ans.  $1/6$

Q10. If  $dy = (\sec x + y \tan x)dx$ , Then the curve is

- (a)  $x = y \cos x$
- (b)  $x = y \sin x$
- (c)  $x = y \tan x$
- (d)  $x = y \sec x$

Ans. (a)

Q11. Two series are 16,21,26.... and 17,21,25.....  
What is the sum of first hundred common numbers

- (a) 101100
- (b) 110100
- (c) 101110
- (d) 110101

Ans. (a)

Q12. There are two sections in a question paper each contain five questions. A students has to answer 6 questions.

Maximum no. of questions that can be answered from any section is 4. How many ways he can attempt the paper?

- (a) 50
- (b) 100
- (c) 120
- (d) 200

Ans. (d)

Q13. a and b are two numbers selected randomly from 1,2,3.... 25 what is the probability of a and b are not equal.

- (a)  $1/25$
- (b)  $24/25$
- (c)  $13/25$
- (d)  $2/25$

Ans. (b)

Q14. The sum of the series  $1 + 1(1+1/n) + 3(1+1/n)^2 + \dots$  is equal to?

Ans.  $n^2$

Q15. Two circles of different radii intersects each other what is the maximum no of intersections

- (a) 0
- (b) 1
- (c) 2
- (d) 3

Ans. (c)

Q16. If  $x = \sin^{-1}(t)$ ,  $y = \log(1-t^2)$ , find  $d^2y/dx^2$  when  $t=1/2$

- (a) 1
- (b) 0
- (c)  $-8/3$
- (d)  $-2/3$

Ans. (c)

Q17. If  $x$  approaches infinity, then  $(\int e^x dx) / (\int e^{2x} dx)$  is ?

- (a) 1
- (b) 0
- (c) -1
- (d) 2

Ans. (a)

Q18. If  $f(x) = 1 - \cos(1 - \cos x)/x^4$  is continuous at  $f(0)$  then what is  $x$

- (a) 1
- (b) 0
- (c)  $1/4$
- (d)  $-1/4$

Ans. (c)

Q19. For the word SURITI, if you arrange the letters in dictionary order then what is its rank?

- (a) 234
- (b) 235
- (c) 236
- (d) 237

Ans. (c)

Q20. Period of  $\sin((2t + 3) / 6\pi)$

- (a)  $6\pi$
- (b)  $6\pi^2$
- (c)  $3\pi$

Ans. (b)

Q21 - Q23. Four questions given on the below data

X, Y and Z are senior engineers. A, B, C, D are junior engineers. Company wants to select 4 engineers. Two will be senior and two will be juniors. The company wants these engineers to work in the most productive way so they respect each person's likes/dislikes.

- $\lambda$  Y is not friends with A
- $\lambda$  Z is not friends with C
- $\lambda$  B is not friends with A

1. If B is selected then who will be the remaining 4 members ?
2. If C is selected, Z and \_\_\_\_ cannot be selected?
3. D is always selected if \_\_\_\_ is selected?

Q24. A speaks truth 70% of the times, B speaks truth 80% of the times.  
What is the probability that both are contradicting each other is ?

Q25.  $\int ((2x-3)/(x^2+x+1)^2) dx$  is ?

Q26. Ram starts from A walking 2 km North and turns right and walks 4 km and turns right again and walks 4 km and turns right again and walks 4 km and meets Radha at B walking in the opposite direction to Ram .

- a) Which direction does Ram walk after the first turn?
- b) Distance between A and B

Q27. If the equation  $x^2 - 3x + a = 0$  has the roots (0,1) then value of a is ?

Q28. A and B's temperature are  $10^\circ\text{C}$  and  $20^\circ\text{C}$  having same surface , then their ratio of rate of emissions is ?

Q29. An atomic particle exists and has a particular decay rate . It is in a train . When the train moves, a person observes \_\_\_\_\_ for whether the decay rate

- (a) increases
- (b) decreases
- (c) depend on the directions of movement of train

Q30. Which of the following exchanges positive ions

- (a).  $\text{Cl}^-$
- (b)  $\text{NH}_2^-$
- (c)  $\text{CH}_2$

Ans. (b)

Q31. After execution of CMP, a instruction in Intel 8085 microprocessor

- (a) ZF is set and CY is reset.
- (b) ZF is set CY is unchanged
- (c) ZF is reset, CY is set
- (d) ZF is reset , CY is unchanged .

Ans. ZF is set and CY is reset

Q32. The best tool for editing a graphic image is ?

Q33. Network scheme defines

- a.) one to one
- b.) many to many
- c.) one to ,many ?

Q34. A person wants to measures the length of a rod. First he measures with standing ideally then he measures by moving parrel to the rod

- (a) the length will decrease in second case
- (b) length will be same
- (c) length will increase in the second case.

Q35. One U-230 nucleus is placed in a train moving by velocity emitting alpha rays . When the train is at rest the

distance between nucleus and alpha particle is  $x$  . One passenger is observing the particle . When the train is moving

what is the distance between particle and nucleus ?

- (a)  $x$
- (b)  $x + vt$
- (c)  $x - vt$

Q36. What is the resulting solution when benzene and toluene are mixed ?

Q37. If the word FADENCOMT equals 345687921 then

1. What is FEAT
2. Find representation of 2998

Q38. Given 10 alphabets out of which 5 are to be chosen. How many words can be made with atleast one repetition.

Q39. Arrange by acidic values : phenol, nitrotolouene and o-cresol?

Q40. Find sum of  $3 + 5/(1+2^2) + 7/(1 + 2^2 + 3^2) + \dots$

Ans.  $3n/(1 + n)$

**The following are few sample questions that maybe asked in the software paper. We haven't been able to give the values in certain problems ; only the type of questions have been mentioned.**

Q What sorting algos have their best and worst case times equal ?

Ans.  $O(n \log n)$  for mergesort and heap sort

Q. What page replacement algo . has minimum number of page faults ?

Ans. Optimality algorithm

Q. What is the use of virtual base class in c++

Ans. Multiple lines between derived classes.

Q. Find the eccentricity of a given node in a directed graph

Q. Convert the infix to postfix for  $A-(B+C)*(D/E)$

Ans.  $ABC+DE/*-$

Q. What is swapping

Q. Assignment operator targets to

Ans. l-value

Q. A byte addressable computer has memory capacity of  $2^m$  Kbytes and can perform  $2^n$  operations

an instruction involving three operands and one operator needs maximum of ---bits

Ans.  $3m + n$

Q. In round robin scheduling, if time quantum is too large then it degenerates to

Ans. FCFS

Q. What is network schema?

Q. Packet Burst is \_\_\_\_\_

Q. Picard' s method uses \_\_\_\_\_?

Ans. Successive Differentiation.

**The following are few sample questions that maybe asked in the hardware paper. We haven't been able to give the values in certain problems ; only the type of questions have been mentioned.**

Q. Concentration and restivity is given and conductivity is asked for ?

Q. R , resistance and C, capacitance is given , find the frequency and Q factor of the crystal ?

Q. Critical fequency and angle theta is given ; the max useable frequency is to becalculated

Q. Questions on parabolic reflector anttena' s and half wave dipole antenna' s design

Q. Ramp signal is generated from integrator . Whether it is a low or high pass filter .?

Q. Calculate FM bandwidth given max modulation fequency FM , max freq deviation ,  $\delta f$  and 8 pairs alllowable side band component ?

## **Hardware Paper**

**1. Add 79H and 86H and tell the contents of flags**

**2. Scr is used for \_\_\_\_\_ ( ac, dc , both )**

**3. Push pull amplifier is used to remove which harmonics ( even , odd , both )**

**4. PAM is demodulated using \_\_\_\_ ( low pass filter , high pass filter )**

**5. 16k memory is needed. How many chips with 12 address buses and 4 data buses are needed.**



6. AM wave is detected using \_\_\_\_\_ detector
7. Which flip flop is used for shift registers
8. Program counter does what \_\_\_\_ (stores a memory address, address of the present instruction)
9. In a bistable multivibrator communication capacitor is used for \_\_\_\_\_ ( speed up response , ac coupling)
10. Totem pole is what?
11. Time constant for an integrator and differentiator should be ( small , high etc.)
12. TV waves are \_\_\_\_ ( sky waves , space waves etc.)
13. Which configuration has highest i/p imp. ( ce , cb , cc )
14. Parabolic antenna with 2degree angle. What is its directivity.
15. Given 10 mhz pe modulation and we got a 100 mhz band.  
How many channels can be there.