

IGNOU COMPUTER SCIENCE

Topic:- PHDCS_IGNOU_FEB22_SET1

1) Suppose $A_1, A_2, \dots, A_{30}$ are the thirty sets each having 5 elements and $B_1, \dots, B_n$ are n sets each with 3 elements, let

$$U_{i=1}^{i=30} A_i = U_{j=1}^{j=n} B_j = S$$

and each element of S belongs to exactly 10 of A_i 's and exactly 9 of B_j 's. Then, n is equal to

[Question ID = 201][Question Description = 101_375_COSC_FEB22_Q01]

1. 20

[Option ID = 801]

2. 25

[Option ID = 802]

3. 30

[Option ID = 803]

4. 45

[Option ID = 804]

2) The set

$$(A \cap B')' \cup (B \cap C)$$

is equal to

[Question ID = 202][Question Description = 102_375_COSC_FEB22_Q02]

1. $(A' \cup B \cap C)$

[Option ID = 805]

2. $(A' \cup B)$

[Option ID = 806]

3. $(A' \cup B \cup C)$

[Option ID = 807]

4. None of these

[Option ID = 808]

3) If $A = \{1, 3, 5, 7, 9, 11, 13, 15, 17\}$, $B = \{2, 4, \dots, 18\}$ and N the set of natural numbers is the Universal set, then

$$(A' \cup (A \cup B) \cap B')$$

, where $'$ stands for complement, is equal to

[Question ID = 203][Question Description = 103_375_COSC_FEB22_Q03]

1. A

[Option ID = 809]

2. B

[Option ID = 810]

3. N

[Option ID = 811]

4. $(A \cup B)$

[Option ID = 812]

4) If $S = \{x \mid x \text{ is a positive multiple of 3 less than 100}\}$ and

$P = \{x \mid x \text{ is a prime number less than 20}\}$. Then $n(S) + n(P)$ is equal to, $n(\cdot)$ represent the number of elements.

[Question ID = 204][Question Description = 104_375_COSC_FEB22_Q04]

1. 43 [Option ID = 813]
2. 32 [Option ID = 814]
3. 41 [Option ID = 815]
4. 40 [Option ID = 816]

5) If X and Y are two sets and X' denotes the complement of X , then

$$X \cap (X \cup Y)'$$

is equal to

[Question ID = 205][Question Description = 105_375_COSC_FEB22_Q05]

1. Y
[Option ID = 817]
2. X
[Option ID = 818]
3. $X \cap Y$
[Option ID = 819]
4. ϕ
[Option ID = 820]

6) In a town of 840 persons, 450 persons read Hindi, 300 read English and 200 read both. Then the number of persons who read neither Hindi nor English, is

[Question ID = 206][Question Description = 106_375_COSC_FEB22_Q06]

1. 420 [Option ID = 821]
2. 290 [Option ID = 822]
3. 300 [Option ID = 823]
4. 400 [Option ID = 824]

7) If $X = \{8^n - 7n - 1 \mid n \in \mathbb{N}\}$ and $Y = \{49n - 49 \mid n \in \mathbb{N}\}$. Then,

[Question ID = 207][Question Description = 107_375_COSC_FEB22_Q07]

1. $X \subset Y$ [Option ID = 825]
2. $Y \subset X$ [Option ID = 826]
3. $X = Y$ [Option ID = 827]
4. $X \cap Y = \phi$ [Option ID = 828]

8) A survey shows that 63% of the people watch a new channel whereas 76% watch another channel. If $X\%$ watch both channels, then

[Question ID = 208][Question Description = 108_375_COSC_FEB22_Q08]

1. $X=13$ [Option ID = 829]
2. $X=63$ [Option ID = 830]
3. $X=39$ [Option ID = 831]
4. $39 \leq X \leq 63$

[Option ID = 832]

9) Let $n(A)=m$, number of elements in A and $n(B)=n$, number of elements in B . Then, the total number of non-empty relations that can be defined from A to B is

[Question ID = 209][Question Description = 109_375_COSC_FEB22_Q09]

1. m^n [Option ID = 833]
2. $n^m - 1$ [Option ID = 834]
3. $mn - 1$ [Option ID = 835]
4. $2^{mn} - 1$ [Option ID = 836]

10) If $R = \{(x, y) : x, y \in W, x^2 + y^2 = 25\}$, W is set of whole numbers, then the range of R is equal to

[Question ID = 210][Question Description = 110_375_COSC_FEB22_Q10]

1. $\{5, 4, 3, 0\}$ [Option ID = 837]
2. $\{3, 5, 6, 0\}$ [Option ID = 838]
3. $\{2, 1, 4, 6\}$ [Option ID = 839]

4. $\{1,2,3,4\}$ [Option ID = 840]

11) If $R = \{(x, y) \mid x \text{ and } y \text{ are integers and } x^2 + y^2 = 64\}$ is a relation then R is equal to

[Question ID = 211][Question Description = 111_375_COSC_FEB22_Q11]

1. $\{(0,8), (0, -8), (8,0), (-8,0)\}$ [Option ID = 841]
2. $\{(0,8), (8, 8), (8,0), (8,0)\}$ [Option ID = 842]
3. $\{(16,0), (16, 8), (8,16), (16,16)\}$ [Option ID = 843]
4. $\{(16,16), (8, 16), (16,8), (16,0)\}$ [Option ID = 844]

12) The Standard Deviation of the Binomial distribution is, symbols have there usual meaning

[Question ID = 212][Question Description = 112_375_COSC_FEB22_Q12]

1. $\sqrt{npq}$
[Option ID = 845]
2. $\sqrt{np}$
[Option ID = 846]
3. npq
[Option ID = 847]
4. pq
[Option ID = 848]

13) If the mean of a Poisson distribution is m , then Standard Deviation of this distribution is

[Question ID = 213][Question Description = 113_375_COSC_FEB22_Q13]

1. m^2 [Option ID = 849]
2. $\sqrt{m}$ [Option ID = 850]
3. m [Option ID = 851]
4. None of these [Option ID = 852]

14) By considering h as the interval of differencing, the value of $(\Delta + \nabla)^2 (x^2 + x)$, ($h = 1$), is:

[Question ID = 214][Question Description = 114_375_COSC_FEB22_Q14]

1. 7 [Option ID = 853]
2. 8 [Option ID = 854]
3. 9 [Option ID = 855]
4. 10 [Option ID = 856]

15) By considering h as the interval of differencing, the value of $(\Delta^2 / E) \sin x$ is

[Question ID = 215][Question Description = 115_375_COSC_FEB22_Q15]

1. $2(\cosh - 1) \sin x$
[Option ID = 857]
2. $2(\cosh + 1) \sin x$
[Option ID = 858]
3. $2(\sinh - 1) \cos x$
[Option ID = 859]
4. $2(\sinh + 1) \cos x$
[Option ID = 860]

16) Which of the following is the correct value of “a” for the given table:

x:	45	50	55	60	65
y:	3.0	a	2.0	0.225	-2.4

[Question ID = 216][Question Description = 116_375_COSC_FEB22_Q16]

1. 2.590 [Option ID = 861]
2. 2.745 [Option ID = 862]
3. 2.875 [Option ID = 863]
4. 2.925 [Option ID = 864]

17) What is the correct value for

$$\Delta^{10}[(1-ax) (1-bx^2) (1-cx^3) (1-dx^4)].$$

[Question ID = 217][Question Description = 117_375_COSC_FEB22_Q17]

1. $abcd(8!)$ [Option ID = 865]
2. $abcd(9!)$ [Option ID = 866]
3. $abcd(10!)$ [Option ID = 867]
4. $abcd(11!)$ [Option ID = 868]

18) Which of the following is the correct value for $\Delta(e^x \log 2x)$.

[Question ID = 218][Question Description = 118_375_COSC_FEB22_Q18]

1. $e^x [e^h \log(1+h/x) + (e^h - 1) \log 2x]$ [Option ID = 869]
2. $e^x [e^h \log(1-h/x) + (e^h - 1) \log 2x]$ [Option ID = 870]
3. $e^x [e^h \log(1+h/x) + (e^{h+1}) \log 2x]$ [Option ID = 871]
4. $e^x [e^h \log(1-h/x) + (e^{h+1}) \log 2x]$ [Option ID = 872]

19) X is a normal variate with a mean 30 and Standard Deviation 5. For

$P(26 \leq X \leq 40)$, which of the following is correct value?

[Question ID = 219][Question Description = 119_375_COSC_FEB22_Q19]

1. 0.7653 [Option ID = 873]
2. 0.6328 [Option ID = 874]
3. 0.7120 [Option ID = 875]
4. 0.6982 [Option ID = 876]

20) In sampling a large number of parts are manufactured by a machine, the mean number of defectives in a sample of 20 is 2. Out of 1000 such samples, which of the following sample expected to contain at least 3 defective parts?

[Question ID = 220][Question Description = 120_375_COSC_FEB22_Q20]

1. 197 [Option ID = 877]
2. 268 [Option ID = 878]
3. 323 [Option ID = 879]
4. 415 [Option ID = 880]

21) A die is tossed thrice. A success is defined as 'getting 1 or 6' on a toss. Which of the following is the correct value of mean and variance of the number of successes respectively?

[Question ID = 221][Question Description = 121_375_COSC_FEB22_Q21]

1. 1, 3 [Option ID = 881]
2. 3, 4 [Option ID = 882]
3. 2, 3 [Option ID = 883]
4. 1, 4 [Option ID = 884]

22) A random variable X has the following probability function:

X: 0 1 2 3 4 5 6 7

P(X): 0 k 2k 2k 3k k^2 $2k^2$ $7k^2 + k$

What is the correct value of k?

[Question ID = 222][Question Description = 122_375_COSC_FEB22_Q22]

1. $1/7$ [Option ID = 885]
2. $1/8$ [Option ID = 886]
3. $1/9$ [Option ID = 887]
4. $1/10$ [Option ID = 888]

23) The odds that a book will be reviewed favorably by three independent critics are 5 to 2, 4 to 3 and 3 to 4 respectively. What is the probability that of the three reviews a majority will be favorable?

[Question ID = 223][Question Description = 123_375_COSC_FEB22_Q23]

1. 208/293 [Option ID = 889]
2. 209/343 [Option ID = 890]
3. 193/363 [Option ID = 891]
4. 297/387 [Option ID = 892]

24) A box A contains 2 white and 4 black balls. Another box B contains 5 white and 7 black balls. A ball is transferred from the box A to the box B , then a ball is drawn from the box B. What is the correct probability that it is white?

[Question ID = 224][Question Description = 124_375_COSC_FEB22_Q24]

1. 16/39 [Option ID = 893]
2. 10/39 [Option ID = 894]
3. 11/39 [Option ID = 895]
4. 15/39 [Option ID = 896]

25) Two cards are drawn in succession from a pack of 52 cards. Which of the following is the correct chance if the first card is a king , second card is a queen and if the first card is (i) replaced, (ii) not replaced?

[Question ID = 225][Question Description = 125_375_COSC_FEB22_Q25]

1. 1/169, 4/663 [Option ID = 897]
2. 2/169, 6/663 [Option ID = 898]
3. 1/256, 3/513 [Option ID = 899]
4. 2/256, 6/513 [Option ID = 900]

26) An urn contain 5 red and 10 black balls . Eight of them are placed in the second urn. What is the chance that the second urn contain 2 red and 6 black balls?

[Question ID = 226][Question Description = 126_375_COSC_FEB22_Q26]

1. 120/429 [Option ID = 901]
2. 140/427 [Option ID = 902]
3. 120/427 [Option ID = 903]
4. 140/429 [Option ID = 904]

27) If a five figure number is formed of the digits 0, 1, 2, 3, 4 without repetition. Find the probability that the number formed is divisible by 4.

[Question ID = 227][Question Description = 127_375_COSC_FEB22_Q27]

1. 5/16
[Option ID = 905]
2. 2/9
[Option ID = 906]
3. 4/15
[Option ID = 907]
4. 2/7
[Option ID = 908]

28) What is the correct value of $|D|$?

$$\text{Matrix } D = \begin{bmatrix} \cos x - \alpha & \cos x - \beta & \cos x - \gamma \\ \cos y - \alpha & \cos y - \beta & \cos y - \gamma \\ \cos z - \alpha & \cos z - \beta & \cos z - \gamma \end{bmatrix}$$

[Question ID = 228][Question Description = 128_375_COSC_FEB22_Q28]

1. 0 [Option ID = 909]
2. 1 [Option ID = 910]
3. 2 [Option ID = 911]
4. 3 [Option ID = 912]

29) The value of k so that the system of equations

$$x - y + z = 4$$

$$2x + y - kz = 0$$

$$x + ky + z = 2$$

have a unique solution

[Question ID = 229][Question Description = 129_375_COSC_FEB22_Q29]

1. 3 [Option ID = 913]

2. -2 [Option ID = 914]
3. -1 [Option ID = 915]
4. None of these [Option ID = 916]

30) If A is a non-zero ($n \times 1$) column vector then the rank of the matrix AA^t is

[Question ID = 230][Question Description = 130_375_COSC_FEB22_Q30]

1. 0 [Option ID = 917]
2. 1 [Option ID = 918]
3. $n-1$ [Option ID = 919]
4. n [Option ID = 920]

31) If A is a square matrix such that $AA^t = I$, then value of A^tA is

[Question ID = 231][Question Description = 131_375_COSC_FEB22_Q31]

1. A^2 [Option ID = 921]
2. I [Option ID = 922]
3. A^{-1} [Option ID = 923]
4. A [Option ID = 924]

32) If $A \begin{bmatrix} 0 & 1 \\ 2 & -1 \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$ where $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, then A is

[Question ID = 232][Question Description = 132_375_COSC_FEB22_Q32]

1. $\begin{bmatrix} 2 & 1 \\ 0 & 1 \end{bmatrix}$
[Option ID = 925]
2. $\begin{bmatrix} 0 & 1 \\ 2 & -1 \end{bmatrix}$
[Option ID = 926]
3. $\begin{bmatrix} 2 & 1 \\ -1/2 & -1/2 \end{bmatrix}$
[Option ID = 927]
4. $\begin{bmatrix} 2 & 1 \\ -1 & 0 \end{bmatrix}$
[Option ID = 928]

33) If $\begin{bmatrix} 5 & 4 \\ 1 & 1 \end{bmatrix} X = \begin{bmatrix} 1 & -2 \\ 1 & 3 \end{bmatrix}$, then X equals

[Question ID = 233][Question Description = 133_375_COSC_FEB22_Q33]

1. $\begin{bmatrix} -3 & -14 \\ 4 & 17 \end{bmatrix}$
[Option ID = 929]
2. $\begin{bmatrix} 1 & -2 \\ 3 & 1 \end{bmatrix}$
[Option ID = 930]
3. $\begin{bmatrix} 1 & 3 \\ -2 & 1 \end{bmatrix}$
[Option ID = 931]
4. $\begin{bmatrix} 3 & -14 \\ 4 & -17 \end{bmatrix}$
[Option ID = 932]

34) If $3x+2y+z=0$, $x+4y+z=0$, $2x+y+4z=0$, be a system of equations, then

[Question ID = 234][Question Description = 134_375_COSC_FEB22_Q34]

1. It is inconsistent [Option ID = 933]
2. It has only the trivial solution [Option ID = 934]
3. It can be reduced to a single equation and so a solution does not exist [Option ID = 935]
4. Determinant of the matrix of coefficients is zero [Option ID = 936]

35) For the given matrix

$$\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$$

which of the following is the correct value of eigenvector?

[Question ID = 235][Question Description = 135_375_COSC_FEB22_Q35]

1. (4,1), (1, -1)

[Option ID = 937]

2. (5,2), (2, -2)

[Option ID = 938]

3. (3,2), (1, 1)

[Option ID = 939]

4. (4,2), (-1, 1)

[Option ID = 940]

36) If $\begin{bmatrix} 2 & 1 \\ 3 & 2 \end{bmatrix} * A * \begin{bmatrix} -3 & 2 \\ 5 & -3 \end{bmatrix} = \begin{bmatrix} -2 & 4 \\ 3 & -1 \end{bmatrix}$

which is the correct value of matrix A?

[Question ID = 236][Question Description = 136_375_COSC_FEB22_Q36]

1. $\begin{bmatrix} 26 & 13 \\ -23 & 18 \end{bmatrix}$

[Option ID = 941]

2. $\begin{bmatrix} 12 & 16 \\ -33 & 18 \end{bmatrix}$

[Option ID = 942]

3. $\begin{bmatrix} 26 & 17 \\ -15 & 18 \end{bmatrix}$

[Option ID = 943]

4. $\begin{bmatrix} 24 & 13 \\ -34 & -18 \end{bmatrix}$

[Option ID = 944]

37) $\lim_{\theta \rightarrow 0} \frac{1 - \cos 4\theta}{1 - \cos 6\theta}$

is equal to

[Question ID = 237][Question Description = 137_375_COSC_FEB22_Q37]

1. 4/9 [Option ID = 945]

2. 1/2 [Option ID = 946]

3. -1/2 [Option ID = 947]

4. -1 [Option ID = 948]

38) $\lim_{x \rightarrow 0} \frac{(1+x)^n - 1}{x}$

is equal to

[Question ID = 238][Question Description = 138_375_COSC_FEB22_Q38]

1. n [Option ID = 949]

2. 1 [Option ID = 950]

3. -n [Option ID = 951]

4. 0 [Option ID = 952]

39) $\lim_{x \rightarrow \pi} \frac{\sin x}{x - \pi}$

is equal to

[Question ID = 239][Question Description = 139_375_COSC_FEB22_Q39]

1. 1 [Option ID = 953]

2. 2 [Option ID = 954]

3. -1 [Option ID = 955]

4. -2 [Option ID = 956]

40) Which of the following mentioned Standard Probability density functions is applicable to discrete Random Variables?

[Question ID = 240][Question Description = 140_375_COSC_FEB22_Q40]

1. Gaussian Distribution
[Option ID = 957]
2. Poisson Distribution
[Option ID = 958]
3. Rayleigh Distribution
[Option ID = 959]
4. Exponential Distribution
[Option ID = 960]

41) Which of the following statement/statements correspond to errors?

- I. H_0 , true; accept H_0
- II. H_0 , true; reject H_0
- III. H_1 , true; accept H_1
- IV. H_1 , true; reject H_1

[Question ID = 241][Question Description = 141_375_COSC_FEB22_Q41]

1. II Only [Option ID = 961]
2. I Only [Option ID = 962]
3. IV only [Option ID = 963]
4. II and IV [Option ID = 964]

42) Given $f(x) = a_0x^n + a_1x^{n-1} + a_2x^{n-2} + \dots + a_{n-1}x + a_n$ then the largest root of the equation $f(x) = 0$ may be approximated by the root of the equation :

[Question ID = 242][Question Description = 142_375_COSC_FEB22_Q42]

1. $x + a_1 = 0$ only
[Option ID = 965]
2. $x^2 + a_1x + a_2 = 0$ only
[Option ID = 966]
3. One of these
[Option ID = 967]
4. None of these
[Option ID = 968]

43) If $f(x)$ is continuous on $[a, b]$ and a, b are two real numbers then

[Question ID = 243][Question Description = 143_375_COSC_FEB22_Q43]

1. If $f(a)$ and $f(b)$ are of opposite sign then there are odd number of roots of the equation $f(x) = 0$ in $[a, b]$
[Option ID = 969]
2. If $f(a)$ and $f(b)$ are of same sign then there are odd number of roots of the equation $f(x) = 0$ in $[a, b]$
[Option ID = 970]
3. If $f(a)$ and $f(b)$ are of opposite sign then there are no roots of the equation $f(x) = 0$ in $[a, b]$
[Option ID = 971]
4. If $f(a)$ and $f(b)$ are of same sign then there are even number of roots of the equation $f(x) = 0$ in $[a, b]$
[Option ID = 972]

44) Using Gauss Seidal Method the solution of the following system of linear equations

$$\begin{bmatrix} 25 & 5 & 1 \\ 64 & 8 & 1 \\ 144 & 12 & 1 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 106.8 \\ 177.2 \\ 279.2 \end{bmatrix}$$

With initial solution (1, 2, 5), is $x_1 = \dots, x_2 = \dots, x_3 = \dots$ respectively.

[Question ID = 244][Question Description = 144_375_COSC_FEB22_Q44]

1. -3.672, -7.851, -155.36 [Option ID = 973]
2. 3.672, -7.851, -155.36 [Option ID = 974]
3. 3.673, 7.852, -155.36 [Option ID = 975]
4. 3.671, -7.853, 155.36 [Option ID = 976]

45) The cube root of 2 using Newton Raphson Method, starting with

$$x_0 = 1.8$$

is

[Question ID = 245][Question Description = 145_375_COSC_FEB22_Q45]

1. 1.405 [Option ID = 977]
2. 1.274 [Option ID = 978]
3. 1.260 [Option ID = 979]
4. 1.259 [Option ID = 980]

46) In Trapezoidal Rule formula for area approximating the definite integral in an interval, the interval is divided into :

[Question ID = 246][Question Description = 146_375_COSC_FEB22_Q46]

1. Even number of sub-intervals of equal width [Option ID = 981]
2. Even number of sub-intervals of unequal width [Option ID = 982]
3. Any number of sub-intervals of equal width [Option ID = 983]
4. Odd number of sub-intervals of equal width [Option ID = 984]

47) Using direct iteration to solve the equation $x^3 - x - 1 = 0$, which of the following will converge

I. $x_{n+1} = x_n^3 - 1.$

II. $x_{n+1} = (x_n + 1)^{1/3}$

With initial value $x_0 = 1$

[Question ID = 247][Question Description = 147_375_COSC_FEB22_Q47]

1. I only [Option ID = 985]
2. II only [Option ID = 986]
3. Both I and II [Option ID = 987]
4. None [Option ID = 988]

48) If a bag contain 5 red , 7 green and 8 black marbles . If four marbles are drawn one by one without replacement. The probability of getting a red marble,a green marble and a blue marble is:

[Question ID = 248][Question Description = 148_375_COSC_FEB22_Q48]

1. 1/98 [Option ID = 989]
2. 1/999 [Option ID = 990]
3. 7/171 [Option ID = 991]
4. None of these [Option ID = 992]

49) Three cards are drawn from a pack of 52 cards ,The probability of getting a King and two other cards is :

[Question ID = 249][Question Description = 149_375_COSC_FEB22_Q49]

1. 1128/5525 [Option ID = 993]
2. 72/5525 [Option ID = 994]
3. 4324/5525 [Option ID = 995]
4. 1/5525 [Option ID = 996]

50) The equation $x^5 - 80x + 6 = 0$ has — — — — — real roots.

[Question ID = 250][Question Description = 150_375_COSC_FEB22_Q50]

1. 2 [Option ID = 997]
2. 5 [Option ID = 998]
3. 4 [Option ID = 999]
4. 3 [Option ID = 1000]

51) ----- representation is most efficient to perform binary arithmetic operations

[Question ID = 251][Question Description = 151_375_COSC_FEB22_Q51]

1. Sign-magnitude [Option ID = 1001]
2. 1's complement [Option ID = 1002]
3. 2's complement [Option ID = 1003]
4. 10's complement [Option ID = 1004]

52) The six status flags used during computation are stored in ` _____

[Question ID = 252][Question Description = 152_375_COSC_FEB22_Q52]

1. Auxiliary Register [Option ID = 1005]
2. Status Register [Option ID = 1006]
3. Test Register [Option ID = 1007]
4. Log Register [Option ID = 1008]

53) ----- is used to reduce the memory access time

[Question ID = 253][Question Description = 153_375_COSC_FEB22_Q53]

1. Heap [Option ID = 1009]
2. RAM [Option ID = 1010]
3. SDRAM [Option ID = 1011]
4. Cache [Option ID = 1012]

54) To run a program of size larger than the RAM size, _____ is used.

[Question ID = 254][Question Description = 154_375_COSC_FEB22_Q54]

1. Secondary Memory
[Option ID = 1013]
2. Virtual Memory
[Option ID = 1014]
3. Associative Memory
[Option ID = 1015]
4. RAID
[Option ID = 1016]

55) Which one of these is not true in IEEE 754 2008 standard?

[Question ID = 255][Question Description = 155_375_COSC_FEB22_Q55]

1. Unlike in a binary floating-point format, in a decimal floating-point format a number might have multiple representations. [Option ID = 1017]
2. The set of representations a floating-point number maps to is called the floating-point number's family. [Option ID = 1018]
3. The members of a cohort are distinct representations of the same floating-point numbers. [Option ID = 1019]
4. Formats are characterized by their radix, precision, and exponent range, and each format can represent a unique set of floating-point data. [Option ID = 1020]

56)

The transformation matrix for shear along the line $x = x_1$ is $\begin{bmatrix} 1 & 0 & 0 \\ k_1 & 1 & -k_2 * x_1 \\ 0 & 0 & 1 \end{bmatrix}$ Where:

[Question ID = 256][Question Description = 156_375_COSC_FEB22_Q56]

1. $k_1 > k_2$

[Option ID = 1021]

2. $k_1 < k_2$

[Option ID = 1022]

3. $k_1 = k_2$

[Option ID = 1023]

4. $\text{Max}(k_1, k_2) = k_1 = k_2$

[Option ID = 1024]

57) Using midpoint algorithm for drawing circle , the first point on the circumference of the circle centered at origin is (0,10) , what is initial value of the decision parameter:

[Question ID = 257][Question Description = 157_375_COSC_FEB22_Q57]

1. -8.25 [Option ID = 1025]
2. -9 [Option ID = 1026]
3. -8 [Option ID = 1027]
4. -10 [Option ID = 1028]

58) The sum of all blending functions of a Bezier Curve is equal to:

[Question ID = 258][Question Description = 158_375_COSC_FEB22_Q58]

1. 1 [Option ID = 1029]
2. 0 [Option ID = 1030]
3. -1 [Option ID = 1031]
4. Number of control points [Option ID = 1032]

59) Which one of these is false:

[Question ID = 259][Question Description = 159_375_COSC_FEB22_Q59]

1. Return 0; in C++ a return code of 0 for the main function is generally interpreted as the program did not work as expected during its execution [Option ID = 1033]
2. Namespaces in C++ allow to group named entities that otherwise would have global scope into narrower scopes [Option ID = 1034]
3. Variables with static storage that are not explicitly initialized are automatically initialized to zeroes [Option ID = 1035]
4. C++ programs handle data independent of the devices used [Option ID = 1036]

60) Which one of the following is false :

[Question ID = 260][Question Description = 160_375_COSC_FEB22_Q60]

1. In C++ in hierarchical inheritance, all features that are common in child classes are included in the base class [Option ID = 1037]
2. The destructor of inherited classes are called in the same order in which they are inherited [Option ID = 1038]
3. Compile time polymorphism is achieved by function overloading or operator overloading. [Option ID = 1039]
4. Reinterpret_cast is a type of casting operator used in C++. It is used to convert one pointer of another pointer of any type, no matter either the class is related to each other or not. [Option ID = 1040]

61) Which one of the following is not true for the statement

`int main( int argc, char *argv [ ] )`

[Question ID = 261][Question Description = 161_375_COSC_FEB22_Q61]

1. The command line arguments have been handled via the main() function [Option ID = 1041]
2. argc denotes the number of arguments to be passed [Option ID = 1042]
3. *argv [] denotes to a pointer array which points to each argument passed to the program [Option ID = 1043]
4. *argv[0] gets the pointer to the 1st command line argument and *argv[argc] denotes the last argument of the list [Option ID = 1044]

62) IPv4 addresses are unique in the sense that

[Question ID = 262][Question Description = 162_375_COSC_FEB22_Q62]

1. each address defines one, and only one, connection to the Internet [Option ID = 1045]
2. each address defines one, and only one, device [Option ID = 1046]

3. each address can be defined in one, and only one representation [Option ID = 1047]
4. each address has unique prefix

[Option ID = 1048]

63) A 32-bit IPv4 address is:[Question ID = 263][Question Description = 163_375_COSC_FEB22_Q63]

1. Not hierarchical [Option ID = 1049]
2. Hierarchical [Option ID = 1050]
3. Circular [Option ID = 1051]
4. None of these [Option ID = 1052]

64) For the proper operation of the CIDR, which of the following **statement/statements is true?**

- I. The number of requested addresses, N, needs to be a power of 2
- II. The first address needs to be divisible by the number of addresses in the block.
- III. The last address needs to be divisible by the number of addresses in the block.

[Question ID = 264][Question Description = 164_375_COSC_FEB22_Q64]

1. I only

[Option ID = 1053]

2. II only

[Option ID = 1054]

3. I and III only

[Option ID = 1055]

4. I and II only

[Option ID = 1056]

65) Find the odd man out in routing algorithms :

[Question ID = 265][Question Description = 165_375_COSC_FEB22_Q65]

1. Centralized Algorithm [Option ID = 1057]
2. Isolation Algorithm [Option ID = 1058]
3. Distributed Algorithm [Option ID = 1059]
4. Random Walks [Option ID = 1060]

66) For CDMA protocol, the chips for a network with two stations are:

[Question ID = 266][Question Description = 166_375_COSC_FEB22_Q66]

1. [+1 +1] and [-1 -1] [Option ID = 1061]
2. [+1 +1] and [+1 -1] [Option ID = 1062]
3. [-1 +1] and [+1 -1] [Option ID = 1063]
4. [+1 -1] and [+1 -1] [Option ID = 1064]

67) Which one of these is IoT Data Protocol:

[Question ID = 267][Question Description = 167_375_COSC_FEB22_Q67]

1. Lo RaWAN [Option ID = 1065]
2. ZigBee [Option ID = 1066]
3. Bluetooth Low Energy [Option ID = 1067]
4. Constrained Application Protocol [Option ID = 1068]

68) Match List I with List II

List I	List II
BRANCH OF AI	TASK
A. Robotics	I. Parsing and producing language
B. Computer Vision	II. Detecting patterns in the given data and adapting to new scenario on its own
C. Machine Learning	III. Moving objects and itself through space.
D. Automated Reasoning	IV. Perceiving objects in its surroundings
E. Knowledge Representation	V. Intelligence
F. Natural Language Processing	VI. Storing and retaining what is known by it

Choose the correct answer from the options given below:

[Question ID = 268][Question Description = 168_375_COSC_FEB22_Q68]

1. A - III, B - IV, C - II, D - V, E - VI, F - I [Option ID = 1069]
2. A - I, B - VI, C - II, D - V, E - III, F - IV [Option ID = 1070]
3. A - II, B - IV, C - III, D - V, E - VI, F - I [Option ID = 1071]
4. A - IV, B - III, C - II, D - V, E - VI, F - I [Option ID = 1072]

69) Which of these is the disadvantage of the semantic network?

[Question ID = 269][Question Description = 169_375_COSC_FEB22_Q69]

1. Simple approach to investigate the problem space [Option ID = 1073]
2. Characterized by greater cognitive adequacy compared to logic-based formalism [Option ID = 1074]
3. Semantic Nets are not intelligent [Option ID = 1075]
4. Use of effective inference algorithm [Option ID = 1076]

70) Find which one of these is true, in Semantic Web,

[Question ID = 270][Question Description = 170_375_COSC_FEB22_Q70]

1. The search is carried out not only focusing on the parameters searched, but on their semantics . [Option ID = 1077]
2. The semantic web is mainly about content extracted from text. [Option ID = 1078]
3. RDF is not responsible for establishing relationships between data. [Option ID = 1079]
4. Ontologies are not collections of statements that encompass the relationships between concepts and the rules of logic. [Option ID = 1080]

71) The defining conditions of the t-norm are exactly those of

[Question ID = 271][Question Description = 171_375_COSC_FEB22_Q71]

1. A partially ordered abelian monoid on the real unit interval [0, 1]. [Option ID = 1081]
2. A totally ordered abelian monoid on the real unit interval [0, 1]. [Option ID = 1082]
3. A partially ordered monoid on the real unit interval [0, 1]. [Option ID = 1083]
4. A totally ordered monoid on the real unit interval [0, 1]. [Option ID = 1084]

72) Which one of these is not true in OODBs?

[Question ID = 272][Question Description = 172_375_COSC_FEB22_Q72]

1. OODBs are extensible
[Option ID = 1085]
2. OODMs implement conceptual models directly and can represent complexities that are beyond the capabilities of relational systems
[Option ID = 1086]
3. OODBs have better concurrency control
[Option ID = 1087]
4. Most OODBMSs provide a DML that is not computationally complete compared with SQL
[Option ID = 1088]

73) In relational algebra for database relations r and s , for defining union of r and s which one is correct:

[Question ID = 273][Question Description = 173_375_COSC_FEB22_Q73]

1. r and s must have the same number of attributes.
[Option ID = 1089]
2. Attribute domains are not compatible.
[Option ID = 1090]
3. Duplicate tuples are not eliminated
[Option ID = 1091]
4. r and s must not be temporary relations
[Option ID = 1092]

74) Given a relation $R(A,B,C,D,E)$ with set of functional dependencies $F = \{ A \rightarrow BC, C \rightarrow B, D \rightarrow E, E \rightarrow A \}$ the primary key of R is :

[Question ID = 274][Question Description = 174_375_COSC_FEB22_Q74]

1. AB [Option ID = 1093]
2. BC [Option ID = 1094]
3. AD [Option ID = 1095]
4. CE [Option ID = 1096]

75) Match List I with List II

List I	List II
A. XML DOM	I. XML document is a tabular structure
B. In XML empty element	II. XML document as a tree-structure.
C. XSLT	III. ' '
	IV. < element/>
	V. Transform XML into HTML
	VI. Transfer HTML into XML

Choose the correct answer from the options given below:

[Question ID = 275][Question Description = 175_375_COSC_FEB22_Q75]

1. A - VI, B - III, C - V

[Option ID = 1097]

2. A - III, B - I, C - V

[Option ID = 1098]

3. A - II, B - IV, C - V

[Option ID = 1099]

4. A - I, B - III, C - II

[Option ID = 1100]

76) _____ is not a big data technology.

[Question ID = 276][Question Description = 176_375_COSC_FEB22_Q76]

1. Hadoop [Option ID = 1101]
2. Artificial Intelligence [Option ID = 1102]
3. NoSQL databases [Option ID = 1103]
4. None of these [Option ID = 1104]

77) A -----graph provides a useful tool for understanding how different modules of a program interact

[Question ID = 277][Question Description = 177_375_COSC_FEB22_Q77]

1. module dependency [Option ID = 1105]
2. citation graph [Option ID = 1106]
3. call graph [Option ID = 1107]
4. precedence graph [Option ID = 1108]

78) If p is prime and a is an integer not divisible by p , then (by a Lemma) $a^{p-1} \equiv x$. The value of x is :

[Question ID = 278][Question Description = 178_375_COSC_FEB22_Q78]

1. $1 \pmod{p}$ [Option ID = 1109]
2. $2 \pmod{p}$ [Option ID = 1110]
3. $1 \pmod{(p-1)}$ [Option ID = 1111]
4. $1 \pmod{(p-2)}$ [Option ID = 1112]

79) In $\mathbb{Z}_7$, the inverse of 3 is :

[Question ID = 279][Question Description = 179_375_COSC_FEB22_Q79]

1. 3 [Option ID = 1113]
2. 5 [Option ID = 1114]
3. 6 [Option ID = 1115]
4. Does not exist [Option ID = 1116]

80) The ring $(\mathbb{Z}, +, \cdot)$ contains :

[Question ID = 280][Question Description = 180_375_COSC_FEB22_Q80]

1. Three divisors of zero [Option ID = 1117]
2. Two divisors of zero [Option ID = 1118]
3. One divisor of zero [Option ID = 1119]
4. No divisor of zero [Option ID = 1120]

81) An automorphism of a group is:

[Question ID = 281][Question Description = 181_375_COSC_FEB22_Q81]

1. An isomorphism from the group to itself [Option ID = 1121]
2. a bijective endomorphism of the group [Option ID = 1122]
3. A homomorphism that is both an endomorphism and an isomorphism [Option ID = 1123]
4. All of these [Option ID = 1124]

82) Which one does not use stack?:

[Question ID = 282][Question Description = 182_375_COSC_FEB22_Q82]

1. Parenthesis balancing /matching [Option ID = 1125]
2. Infix to postfix conversion of arithmetic expression [Option ID = 1126]
3. Handling of recursive functions ,call and return [Option ID = 1127]
4. Jobs sent to a line printer for printing [Option ID = 1128]

83) The postfix form of the expression

((2 * (3+4)/5) -6*(7 +8/9))) is

[Question ID = 283][Question Description = 183_375_COSC_FEB22_Q83]

1. 2 3 4 +5/*6 7 8 9/+* [Option ID = 1129]
2. 2 3 4 +5/*6 7 8 9/+ -* [Option ID = 1130]
3. 2 3 4 +5/*6 7 8 9/* + - [Option ID = 1131]
4. 2 3 4 +5*/6 7 8 9/+* [Option ID = 1132]

84) Match List I with List II, for time complexity, n and k have their usual meaning:

List I (ALGORITHM)	List II (BEST CASE)
A. Bubble Sort	I. $O(n^2)$
B. Counting Sort	II. $O(n \cdot \log(n))$
C. Selection Sort	III. $O(n)$
D. Merge Sort	IV. $O(n + k)$
	V. $O(n^3)$

Choose the correct answer from the options given below:

[Question ID = 284][Question Description = 184_375_COSC_FEB22_Q84]

1. A - II, B - IV, C - V, D - I [Option ID = 1133]
2. A - III, B - IV, C - I, D - II [Option ID = 1134]
3. A - IV, B - I, C - II, D - III [Option ID = 1135]
4. A - I, B - III, C - IV, D - II [Option ID = 1136]

85) The equation $T(N) = aT\left(\frac{N}{b}\right) + \theta(N^k)$, $a \geq 1, b > 1$, When $a > b^k$ it simplifies to :

[Question ID = 285][Question Description = 185_375_COSC_FEB22_Q85]

1. $T(N) = O(N^k \log N)$
[Option ID = 1137]
2. $T(N) = O(N^{ka})$
[Option ID = 1138]
3. $T(N) = O(N^{\log_b a})$
[Option ID = 1139]
4. $T(N) = O(N^{kab})$
[Option ID = 1140]

86) Comparison tree is :

[Question ID = 286][Question Description = 186_375_COSC_FEB22_Q86]

1. Technique for obtaining lower bounds consisting of making the use of an oracle [Option ID = 1141]
2. Computational model useful for determining lower bounds for sorting and searching problems [Option ID = 1142]
3. Technique to reduce the given problem for which a lower bound is already known [Option ID = 1143]
4. Substitution and linear independence technique used for deriving lower bounds on algebraic and arithmetic problems [Option ID = 1144]

87) To access services of the Operating System an interface is provided by the -----

[Question ID = 287][Question Description = 187_375_COSC_FEB22_Q87]

1. System Calls [Option ID = 1145]
2. Library [Option ID = 1146]
3. API [Option ID = 1147]
4. None of these [Option ID = 1148]

88) While executing a program, if the program references a page which is not available in the main memory then it is known as:

[Question ID = 288][Question Description = 188_375_COSC_FEB22_Q88]

1. Demand Paging [Option ID = 1149]
2. Frame Fault [Option ID = 1150]
3. Page Fault [Option ID = 1151]
4. Processor Fault [Option ID = 1152]

89) Which of the following is not process scheduling algorithms?

[Question ID = 289][Question Description = 189_375_COSC_FEB22_Q89]

1. S R T [Option ID = 1153]
2. S J N [Option ID = 1154]
3. Priority Scheduling [Option ID = 1155]
4. SCAN [Option ID = 1156]

90) Consider four conditions:

1. Process switches from the running to the waiting state.
2. Process switches from the running state to the ready state.
3. Process switches from the waiting state to the ready state.
4. Process has finished its execution and terminated.

The scheduling is called non-pre-emptive, when

[Question ID = 290][Question Description = 190_375_COSC_FEB22_Q90]

1. Only conditions 1 and 3 apply [Option ID = 1157]
2. Only conditions 1 and 4 apply [Option ID = 1158]
3. Only conditions 2 and 4 apply [Option ID = 1159]
4. Only conditions 2 and 3 apply [Option ID = 1160]

91) Which of these is not included in feasibility study:

[Question ID = 291][Question Description = 191_375_COSC_FEB22_Q91]

1. Technical issues [Option ID = 1161]
2. Operational issues [Option ID = 1162]
3. Economic issues [Option ID = 1163]
4. Reliability issues

[Option ID = 1164]

92) Which one of these statements is not true, for the tools mentioned?

[Question ID = 292][Question Description = 192_375_COSC_FEB22_Q92]

1. Static analysis tools: Wrong syntax, undefined symbols or variables, use of uninitialized variables but do not check dead code. [Option ID = 1165]
2. Static analysis tools: Wrong syntax, undefined symbols or variables, use of uninitialized variables, checks also the dead code [Option ID = 1166]
3. Dynamic Analysis tools: Identifies pointer arithmetic error [Option ID = 1167]
4. Dynamic Analysis tools: detects memory leaks [Option ID = 1168]

93) The basic steps in software project estimation are:

[Question ID = 293][Question Description = 193_375_COSC_FEB22_Q93]

1. Estimate the size only [Option ID = 1169]
2. Estimate the size, effort only [Option ID = 1170]
3. Estimate the size, effort, cost only [Option ID = 1171]
4. Estimate the size, effort, cost and schedule [Option ID = 1172]

94) Which of the following is not true in respect of software reengineering:

[Question ID = 294][Question Description = 194_375_COSC_FEB22_Q94]

1. Improvement opportunity [Option ID = 1173]
2. Portability [Option ID = 1174]
3. Reduction in risks [Option ID = 1175]
4. Optimization [Option ID = 1176]

95) Which of the following is not true in the dependency inversion principle

[Question ID = 295][Question Description = 195_375_COSC_FEB22_Q95]

1. It is a specific form of loosely coupling software modules [Option ID = 1177]
2. High-level modules should not import anything from low-level modules [Option ID = 1178]
3. Abstractions should depend on details [Option ID = 1179]
4. Both high-level and low-level objects must depend on the same abstraction [Option ID = 1180]

96) What is the language generated by the following grammar?

$$G = (\{S\}, \{0\}, \{S \rightarrow SS\}, S)$$

[Question ID = 296][Question Description = 196_375_COSC_FEB22_Q96]

1. $0^N, N \geq 0$
[Option ID = 1181]
2. $0^N, N \geq 1$
[Option ID = 1182]
3. 0^N
[Option ID = 1183]
4. ϕ
[Option ID = 1184]

97) An ϵ -NFA accepting decimal numbers having fractional part only, consists of :

[Question ID = 297][Question Description = 197_375_COSC_FEB22_Q97]

1. An optional + or - sign ,a string of digits and a decimal point [Option ID = 1185]
2. An optional + or - sign , a decimal point and a string of digits [Option ID = 1186]
3. An optional + or - sign ,a string of digits a decimal point followed by a string of digits. [Option ID = 1187]
4. A string of digits [Option ID = 1188]

98) CFLs are closed under:

[Question ID = 298][Question Description = 198_375_COSC_FEB22_Q98]

1. Intersection [Option ID = 1189]
2. Difference [Option ID = 1190]
3. Complement [Option ID = 1191]
4. Union [Option ID = 1192]

99) Which of the statements is not true

[Question ID = 299][Question Description = 199_375_COSC_FEB22_Q99]

1. G be a grammar and $w \in L(G)$ is unambiguous with respect to G if and only if w has a unique parse tree with respect to G [Option ID = 1193]
2. A grammar can be generated for matching parentheses [Option ID = 1194]
3. In LL(1) The first 'L' means Left-Derivation, second 'L' refers to, input is scanned from left to right and '1' means the number of look aheads. [Option ID = 1195]
4. Synthesized attributes represent information that is being passed up the parse tree. The attribute can take value only from its children (Variables in the RHS of the production). [Option ID = 1196]

100) CNF parse tree's string yield can not be longer than --- , given that the height of the parse tree is h.

[Question ID = 300][Question Description = 200_375_COSC_FEB22_Q100]

1. 2^h [Option ID = 1197]
2. 2^{h-1} [Option ID = 1198]
3. 2^{h+1} [Option ID = 1199]
4. 2^{h+2} [Option ID = 1200]

