INFORMATION AND COMMUNICATION TECHNOLOGY – MCQ BOOKLET

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1. Basics of Computers and Information Technology

Artificial Intelligence (AI) and Machine Learning (ML) Basics: Core Concepts and Applications

1. Which of the following statements are correct regarding Centre for Development of Advanced Computing (C-DAC) of India?

- **1. The setting up of C-DAC was to build Supercomputers in context of denial of import of Supercomputers by USA**
- **2. C-DAC started building Indian Language Computing Solutions with setting up of GIST group (Graphics and Intelligence based Script Technology)**
- **3. This institute was started in the year 1995**

A. 1 and 2 only
B. 2 and 3 only
C. 1 and 3 only
D. 1, 2 and 3

Ans: A

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- Statement 1 is correct. C-DAC was established in 1988 as a response to the denial of the sale of a Cray supercomputer by the United States to India. The objective was to build indigenous supercomputing capability, leading to the development of the PARAM series of supercomputers. - Statement 2 is correct. C-DAC's GIST (Graphics and Intelligence based Script Technology) group pioneered the development of solutions for Indian language computing, enabling software and hardware support for various Indian scripts, which was crucial for localizing computing. - Statement 3 is incorrect. C-DAC was established in 1988, not 1995.

2. The probability of a lottery ticket being a prized ticket is 0.2. When 4 tickets are purchased, what is the probability of winning a prize on at least one ticket?

A. 0.3964
B. 0.5904
C. 0.6824
D. 0.7804

Ans: B

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The probability of a lottery ticket being a prized ticket (winning) is p = 0.2. The probability of a lottery ticket not being a prized ticket (losing) is q = 1 - p = 1 - 0.2 = 0.8. 4 tickets are purchased independently. We want the probability of winning a prize on at least one ticket. It is easier to calculate the complement probability: the probability of winning a prize on none of the tickets (i.e., losing on all 4 tickets). The probability of losing on one ticket is 0.8. Since the tickets are independent, the probability of losing on all 4 tickets is the product of the individual probabilities: P(Losing on all 4) = q q q q = $q^4 = (0.8)^4$. $(0.8)^4 = (0.8)^2 (0.8)^2 = (0.64) (0.64)$. 0.64 0.64 = 0.4096. The probability of winning a prize on at least one ticket is 1 minus the probability of winning on none: P(Winning at least one) = 1 - P(Losing on all 4) = 1 - 0.4096 = 0.5904.

3. For the following geometric series what would be its 10th term? $$ \frac{1}{16807}, \frac{1}{2401}, \frac{1}{343}, \frac{1}{49}, ... $$

A. – 49
B. – 343
C. – 2401
D. None of the above

Ans: D

GPSC Prelims CSP-1-2023

The given series is $\frac{1}{16807}, \frac{1}{2401}, \frac{1}{343}, \frac{1}{49}, ...$ This is a geometric series. Let the first term be a_1 and the common ratio be r. $a_1 = \frac{1}{16807}$. The common ratio r is found by dividing any term by its preceding term. $r = \frac{1/2401}{1/16807} = \frac{16807}{2401}$. We recognize that the denominators are powers of 7: $49 = 7^2$ $343 = 7^3$ $2401 = 7^4$ $16807 = 7^5$ So the series is $\frac{1}{7^5}, \frac{1}{7^4}, \frac{1}{7^3}, \frac{1}{7^2}, ...$ The first term is $a_1 = \frac{1}{7^5}$. The common ratio is $r = \frac{1/7^4}{1/7^5} = \frac{7^5}{7^4} = 7$. The formula for the n-th term of a geometric series is $a_n = a_1 \cdot r^{n-1}$. We need to find the 10th term, so $n=10$. $a_{10} = a_1 \cdot r^{10-1} =

a_1 \cdot r^9$. $a_{10} = \frac{1}{7^5} \cdot 7^9 = 7^{9-5} = 7^4$. Calculate 7^4: $7^1 = 7$ $7^2 = 49$ $7^3 = 343$ $7^4 = 2401$. The 10th term is 2401.

4. If the first, second and last terms of the Arithmetic Progression are 5, 9, 101, respectively, how many total number of terms are there in the Progression?

A. 24
B. 26
C. 28
D. None of the above

Ans: D

GPSC Prelims CSP-1-2023

The given progression is an Arithmetic Progression (AP). The first term is $a_1 = 5$. The second term is $a_2 = 9$. The last term is $a_n = 101$. The common difference d of an AP is the difference between consecutive terms: $d = a_2 - a_1 = 9 - 5 = 4$. The formula for the n-th term of an AP is $a_n = a_1 + (n-1)d$. We are given $a_n = 101$, $a_1 = 5$, and $d=4$. Substitute these values into the formula to find n: $101 = 5 + (n-1)4$. Subtract 5 from both sides: $101 - 5 = (n-1)4$. $96 = (n-1)4$. Divide both sides by 4: $n-1 = \frac{96}{4}$. $n-1 = 24$. Add 1 to both sides: $n = 24 + 1 = 25$. There are 25 terms in the Arithmetic Progression.

5. If 'X $ Y' means 'X is father of Y'; 'X # Y' means 'X is mother of Y'; 'X × Y' means 'X is sister of Y', then how is S related to N in 'N # P $ Q × S'?

A. Nephew
B. Granddaughter
C. Grandson
D. Cannot be determined

Ans: D

GPSC Prelims CSP-1-2023

Let's decipher the relations given in the expression 'N # P $ Q × S': 1. 'N # P' means N is mother of P. (N is female, P's gender is not determined here). 2. 'P $ Q' means P is father of Q. (P is male, Q's gender is not determined here). 3. 'Q × S' means Q is sister of S. (Q is female, S's gender is not determined here).Combine the relations: - N is the mother of P. - P is the father of Q. - Q is the sister of S.From 'N is mother of P' and 'P is father of Q', N and P are the parents of Q. N is the mother and P is the father. From 'P is father of Q' and 'Q is sister of S', P is the father of both Q and S (since Q and S are siblings). Q is a female. S's gender is not specified.So, we have: - N is the mother of P. - P is the father of S. - Q is the sister of S (and daughter of P, and grandchild of N).N is the mother of P, and P is the parent of S. This makes N the grandmother of S. The question asks how S is related to N. S is the child of P, who is the child of N. Thus, S is the grandchild of N. The gender of S is not specified ('Q is sister of S' implies Q is female, but S can be male or female). If S is male, S is the grandson of N. If S is female, S is the granddaughter of N. Since S's gender is not determined by the given relations, we cannot definitively state whether S is a grandson or granddaughter.

6. Out of given options which one is different from other three?

A. BDW
B. GIQ
C. FHS
D. IKP

Ans: B

GPSC Prelims CSP-1-2023

Let's assign numerical positions to the letters in the English alphabet (A=1, B=2, ..., Z=26). A) BDW: B=2, D=4, W=23 B) GIQ: G=7, I=9, Q=17 C) FHS: F=6, H=8, S=19 D) IKP: I=9, K=11, P=16Let the three letters in each option be L_1, L_2, L_3 with positions p_1, p_2, p_3. Let's look for patterns in the positions. Check the difference between the positions of the first two letters: A) $p_2 - p_1 = 4 - 2 = 2$. B) $p_2 - p_1 = 9 - 7 = 2$. C) $p_2 - p_1 = 8 - 6 = 2$. D) $p_2 - p_1 = 11 - 9 = 2$. All options show a difference of +2 between the first and second letter positions.Now let's check the relationship between the second and third letters. Consider the sum of positions of the second and third letters: A) $p_2 + p_3 = 4 + 23 = 27$. B) $p_2 + p_3 = 9 + 17 = 26$. C) $p_2 + p_3 = 8 + 19 = 27$. D) $p_2 + p_3 = 11 + 16 = 27$.In options A, C, and D, the

sum of the positions of the second and third letters is 27. This means the second and third letters are complementary letters with respect to the alphabet (e.g., B+Y=2+25=27, C+X=3+24=27). In option B, the sum of the positions of the second and third letters is 26.Therefore, option B (GIQ) does not follow the pattern ($p_2+p_3=27$) observed in the other three options.

7. RATION is to RATNIO as TRIBAL is to -

A. TIRLAB
B. TRIALB
C. TİRLBA
D. TRILBA

Ans: D

HAS Prelims-2023

The transformation from RATION to RATNIO involves keeping the first three letters in their original positions (RAT) and reordering the last three letters (ION). The order of the last three letters changes from 123 (I O N) to 312 (N I O).

8. kcaC : Cack : : XgmF : ...

A. EmgF
B. EgmX
C. FmgX
D. GmeF

Ans: C

HAS Prelims-2023

The transformation from kcaC to Cack involves reversing the order of the letters while preserving the case of each individual letter based on its original position. k(lower) c(lower) a(lower) C(upper) -> C(upper) a(lower) c(lower) k(lower). The letter originally at position 1 (k) moves to position 4 and keeps its lower case. The letter at position 2 (c) moves to position 3 and keeps its lower case. The letter at position 3 (a) moves to position 2 and keeps its lower case. The letter at position 4 (C) moves to position 1 and keeps its upper case.

9. In a certain code, '247' means 'spread red carpet', '256' means 'dust one carpet' and '264' means 'one red carpet'. Which digit in that code means 'dust'?

A. 2
B. 3
C. 5
D. 6

Ans: C

HAS Prelims-2023

This is a coding-decoding problem where digits represent words. The codes for individual words are determined by identifying common words and common digits across the given statements.

10. In a certain code, '256' means 'red colour chalk', '589' means 'green colour flower' and '245' means 'white colour chalk'. Which digit in that code means 'white'?

A. 2
B. 4
C. 5
D. Can't be determined

Ans: B

HAS Prelims-2023

This is a coding-decoding problem. Codes for words are found by comparing statements.

11. In a certain code language, '526' means 'sky is blue', '24' means 'blue colour' and '436' means 'colour is fun'. Which digit in that language means 'fun'?

A. 5
B. 4
C. 3
D. 2

Ans: C

HAS Prelims-2023

This is a coding-decoding problem. Codes for words are found by comparing statements.

12. Which letter is in the 125th position in the alphabet series AABABABCABCDABCDEAB-CDEF...

A. B
B. D
C. E
D. F

Ans: C

HAS Prelims-2023

The series is formed by concatenating increasing lengths of the alphabet: Block 1: A (Length 1) Block 2: AB (Length 2) Block 3: ABC (Length 3) Block n: ABC... (Length n)The total number of letters up to the end of Block n is the sum of lengths 1 + 2 + ... + n, which is given by the formula n(n+1)/2. We need to find which block contains the 125th letter. Let's find n such that n(n+1)/2 is close to 125. For n=15, total length = 15 16 / 2 = 120. This means the first 15 blocks (A, AB, ABC, ..., ABC... with 15 letters) contain a total of 120 letters. The 15th block ends at position 120. The 16th block starts at position 121. The 16th block consists of the first 16 letters of the alphabet: A, B, C, D, E, F, ..., P. The 125th position is 125 - 120 = 5 letters into the 16th block. The 5th letter of the alphabet is E.

13. Who is M's father?

A. O
B. R
C. N
D. Data inadequate

Ans: option5

HAS Prelims-2023

The puzzle description or passage containing the family relationships and identifying M's father is missing. Without this source information, it's impossible to determine who M's father is among the options or if the father is mentioned.

14. Which of the following pair of number is different from other ?

A. 13 : 91
B. 17 : 119
C. 19 : 131
D. 23 : 161

Ans: C

HAS Prelims-2023

The problem tests the ability to identify a common mathematical relationship or pattern between numbers in given pairs and find the pair that deviates from this pattern. In this case, the pattern is a simple multiplicative relationship.

15. Select a figure from amongst the answer figure which will continue the same series as established by the question figures.

A. Figure (A)
B. Figure (B)
C. Figure (C)
D. Figure (D)

Ans: C

HAS Prelims-2023

Visual reasoning series problems rely on observing how the figures evolve from one step to the next and predicting the subsequent transformation. Key aspects to look for include changes in shape, size, position, rotation, reflection, number of elements, and shading/colouring.

16. If TABLE is coded as UBCMF, then in the same language CHAIR will be coded as -

A. DIJBS
B. DIBJS
C. DIBRS
D. DICKS

Ans: A

HAS Prelims-2023