# CBT CLASS XI MATHS FEBRUARY-2024

***GENERAL INSTRUCTION :***

**CHAPTER: STATISTICS & PROBABILITY**

| Sr.No | Question | Marks |
|---|---|---|
| | **Case Study 1**<br>**The Mean and Standard Deviation of some data for the time taken to complete a test calculated with the following results:**<br>**Number of Observation = 25 Mean = 18.2 seconds, standard deviation = 3.25 seconds.**<br>**Further, another set of 15 observations $x_1,x_2,x_3,....x_{15}$ also in seconds is now available we have $x_1+x_2+x_3+-----+x_{15} = 279$ and $x_1^2+x_2^2+x_3^2+-----+x_{15}^2 = 5524$.** | |
| 1 | **The sum of all 40 observations is**<br>(a) 734<br>(b) 455<br>(c) 576<br>(d) 644 | 1 |
| 2 | **The mean of all 40 observations is**<br>(a) 19.5<br>(b) 19<br>(c) 18.35<br>(d) 18.55 | 1 |
| 3 | **The sum of square of first 25 observations is**<br>(a) 8545.0625<br>(b) 7645.0625<br>(c) 8785.0325<br>(d) 8445.0325 | 1 |
| 4 | **The sum of square of first 40 observations is**<br>(a) 3169.0625<br>(b) 14069.0625<br>(c) 14309.0325<br>(d) 13969.0325 | 1 |
| | **Case Study 2: If two dice is thrown than following sample space is formed**<br>(1,1) (1,2) (1,3) (1,4) (1,5) (1,6)<br>(2,1) (2,2) (2,3) (2,4) (2,5) (2,6)<br>(3,1) (3,2) (3,3) (3,4) (3,5) (3,6)<br>(4,1) (4,2) (4,3) (4,4) (4,5) (4,6)<br>(5,1) (5,2) (5,3) (5,4) (5,5) (5,6)<br>(6,1) (6,2) (6,3) (6,4) (6,5) (6,6)<br>**The events A, B and C are as follows:**<br>**A: getting an even number on the first die.**<br>**B: getting an odd number on the first die.**<br>**C: getting the sum of the numbers on the dice ≤ 5.** | |

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| 5 | **What is the probability of A**<br>(a) 1/2<br>(b) 1/3<br>(c) 1/4<br>(d) 1/6 | 1 |
| 6 | **What is the probability of C**<br>(a) 11/18<br>(b) 5/18<br>(c) 7/18<br>(d) 1/18 | 1 |
| 7 | **Event A and B are known as**<br>(a) Mutually Exclusive Event<br>(b) Exhaustive Event<br>(c) Mutually Exclusive and Exhaustive Event<br>(d) Simple Events | 1 |
| 8 | **What is the probability of either of 4 or doublet**<br>(a) 11/36<br>(b) 1/6<br>(c) 17/36<br>(d) 4/9 | 1 |
| | **Directions: ( Q.9 – Q.10) Each of these questions contains two statements: Assertion (A) and Reason (R). Each of these questions also has four alternative choices, any one of which is the correct answer . You have to select one of the options (a) , (b) , (c) and (d) given below :**<br>**(a) A is true , R is true and R is a correct explanation for A**<br>**(b) A is true , R is true and R is not a correct explanation for Assertion**<br>**(c) A is true and R is false**<br>**(d) A is false and R is true** | |
| 9 | **Assertion(A):** Mean and Variance of 1,2,3,4,5,6,7 is 4, 4<br>**Reason(R):** Mean and Variance of n natural number is $(n+1)/2$, $(n^2 - 1)/12$ | 1 |
| 10 | Que 10: **Assertion(A):** P(AUB) = P(A) + P(B) -P(A∩B) where A and B are Mutually Exclusive event<br>**Reason(R):** A and B are mutually exclusive event than A∩B = ϕ<br>(a) (b) (c) (d) | 1 |

**Answer Key**

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| **Ans1** | **(a)** |
| **Feedback** | *Option a is correct, Since Mean = Sum of observation/Total No. of observation*<br>*Given mean of 25 observation = 18.2 sec,*<br>*18.2 = Sum of 25 observation/25*<br>*Sum of Observation = 18.2 X 25 = 455*<br>*And sum of remaining 15 observation = 279*<br>*Therefore Sum of 40 observation = 455+279=734* |
| **Ans2** | **(c)** |
| **Feedback** | *Option c is correct, Since Mean = Sum of observation/Total No. of observation*<br>*Mean = 734 /40 = 18.35* |
| **Ans3** | **(a)** |
| **Feedback** | *Option a is correct, Since Variance of 25 observation = $(SD)^2$ =$(3.25)^2$ =10.5625*<br>*Var. = (sum of square of first 25 observations)/25 – (Mean of 25 Observation)$^2$*<br>*10.5625 = (sum of square of first 25 observations)/25 – 18.2 X18.2*<br>*10.5625 + 331.24 = (sum of square of first 25 observations)/25*<br>*(sum of square of first 25 observations)/25 = 341.8025*<br>*(sum of square of first 25 observations) = 25 X 341.8025 = 8545.0625* |
| **Ans4** | **(b)** |
| **Feedback** | *Option b is correct, since Sum of square of 40 observations = Sum of square of first 25 observations + Sum of square of next 15 observations*<br>*= 8545.0625 + 5524 = 14069.0625* |
| **Ans5** | **(a)** |
| **Feedback** | *Option a is correct, Since P(A) = 18/36 =1/2* |
| **Ans6** | **(b)** |

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| **Feedback** | *Option b is correct, Since P(B) = 5 / 18* |
| **Ans7** | **(c)** |
| **Feedback** | *Option c is correct, AUB = Sample Space and A∩B =ϕ so events are Mutually Exclusive and Exhaustive* |
| **Ans8** | **(d)** |
| **Feedback** | *Option d is correct, Since P(AUB) = P(A) +P(B) – P(A∩B)*<br>*P(AUB) = 11/36 + 6/36 -1/36 = 16/36 = 4/9* |
| **Ans9** | **(a)** |
| **Feedback** | *Option a is Correct, Since assertion and reason both are correct and reason is correct explanation of assertion* |
| **Ans10** | **(d)** |
| **Feedback** | *Option d is Correct, Since A is false and R is true because if A and B are Mutually Exclusive than P(AUB) = P(A) + P(B)* |