TEST NO. 4
(Ch.5,6 12,(Theorum.#-2,3). (Def. of Ch-5,6)

MATHEMATICS (SCIENCE) **019-(10TH CLASS)** **Time Allowed:15 Min.**
Paper: IV (Objective Type) **Maximum Marks: 15**

$$Q' = \left\{ x \mid x \neq \frac{m}{n} \text{ where } m, n \in Z \text{ and } n \neq 0 \right\}$$

1.1 A set _____ is called a set of:
(a) Rational Numbers (b) Prime Numbers (c) Irrational Numbers (d) Real Numbers

2. $A \cap A^c =$ _____:
(a) A (b) U (c) A^c (d) ϕ

3. If X = {1, 3, 5, 7}, Y = {0, 2, 4, 6,8} and Z = {2, 3, 5, 7, 11} then $X \cap (Y \cap Z)$ is equal to:
(a) ϕ (b) {2} (c) {3, 5, 7} (d) {2, 3, 5, 7, 11}

4. The number of elements in power set of {1, 2, 3} is:
(a) 4 (b) 6 (c) 8 (d) 9

5. Indicate the function R = {(a, b), (b, a), (c, d), (d, e)}:
(a) Into function (b) One-one function (c) Onto function (d) Objective function

6. The data presented in the form of frequency distribution is called:
(a) Distribution (b) Grouped Data (c) Range Data (d) Ungrouped Data

7. Formula to determine the size of a class is:
(a) $X_{max} - X_{min}$ (b) $X_{max} + X_{min}$ (c) $\frac{\text{Groups}}{\text{Weight}}$ (d) None of these

8. The total of frequency up to an upper-class limit or boundary is called:
(a) Frequency (b) Class frequency (c) Cumulative frequency (d) Relative frequency

9. Sum of the deviations of values x from its mean is always " $\Sigma(X - \bar{X})$ " is to equal:
(a) Itself (b) Zero (c) Median (d) Mode

10. Coding formula of group data of the arithmetic mean is:
(a) $\bar{X} = \frac{\Sigma fX}{\Sigma f}$ (b) $\bar{X} = \frac{\Sigma fD}{\Sigma f}$ (c) $\bar{X} = A + \frac{\Sigma fU}{\Sigma f} \times h$ (d) $\bar{X} = A + \frac{\Sigma fU}{\Sigma f}$

11. When the number of observations of a set of data is even then the median formula is:
(a) $\tilde{X} = \text{Size of } \left(\frac{n}{2}\right)^{th} \text{ observation}$
(b) $\tilde{X} = \frac{1}{2}\left(\text{Size of } \left(\left(\frac{n}{2}\right)^{th} + \frac{n}{2} + 1^{th} \right) \text{ observation} \right)$
(c) $\tilde{X} = \frac{1}{2}\left(\text{Size of } \left(\frac{n}{2}\right)^{th} \text{ observation} \right)$
(d) $\tilde{X} = \text{Size of } \left(\frac{n+1}{2}\right)^{th} \text{ observation}$

12. The formula of group data of the median is:
(a) $\tilde{X} = l + \frac{h}{f}\left(\frac{n}{2} - C\right)$ (b) $\tilde{X} = l + \frac{\Sigma fX}{\Sigma f} \times n$
(c) $\tilde{X} = l + \frac{f_m - f_1}{2f_m - f_1 - f_2} \times h$ (d) $\tilde{X} = A + \frac{\Sigma fU}{\Sigma f} \times n$

13. The geometric mean of the observations 2, 4, 8 is:
(a) 2 (b) 8 (c) 4 (d) No geometric mean

14. If variance is equal to 36 then the standard deviation will be:
(a) 36 (b) 6 (c) – 6 (d) None of these

15. Formula of variance is for group data is:

(a) $S^2 = \frac{\Sigma(X-\bar{X})^2}{n}$ (b) $S^2 = \frac{\Sigma fX^2}{\Sigma f} - \left(\frac{\Sigma fX}{\Sigma f}\right)^2$

(c) $S = \frac{\sqrt{\Sigma(X-\bar{X})^2}}{n}$ (d) $S = \frac{\sqrt{\Sigma f(X-\bar{X})^2}}{\Sigma f}$

TEST NO. 4

(Ch.5,6 12,(Theorum.#-2,3). (Def. of Ch-5,6)

MATHEMATICS (SCIENCE) **019-(10TH CLASS)** **Time Allowed:2:10 hours**
Paper: IV (Essay Type) **Maximum Marks: 60**

(PART – I)

2. Write short answer to any SIX (6) questions: **12**

(i) If X = {1, 4, 7, 9} and Y = {2, 4, 5, 9}. Then find $X \cap Y$, $Y \cup X$.

(ii) If U = {x | x ∈ N ∧ 3 < x ≤ 25}, X = {x | x is prime ∧ 8 < x < 25} and Y = {x | x ∈ W ∧ 4 ≤ x ≤ 17}. Find the value of $(X \cap Y)'$.

(iii) If U = {1, 2, 3, . . . , 10}, A = {2, 3, 5, 7} and B = {3, 5, 8}, then find A – B and B'.

(iv) If A = N and B = W, then find the value of B – A.

(v) Write the names of types of frequency distribution on the basis of variable or data.

(vi) What is meant by class boundaries?

(vii) What is cumulative frequency?

What is meant by measures of central tendency and write their names.

(viii) Find arithmetic mean of data 45, 60, 74, 58, 65, 63, 49.

3. Write short answer to any SIX (6) questions: **12**

(i) If A, B and C are the subsets of U and A = {1, 2, 4, 8}, B = {2, 4, 6} and C = {3, 4, 5, 6} then verify $(A \cup B) \cup C = A \cup (B \cup C)$.

(ii) Find a and b, if (3 – 2a, b – 1) = (a – 7, 2b + 5).

(iii) Find the sets X and Y, if X × Y = {(a, a), (b, a), (c, a), (d, a)}.

(iv) If A = {0, 2, 4} and B = {– 1, 3}, then find A × A and B × B.

(v) Write formula of arithmetic mean (coding and short cut method) for grouped and ungrouped data.

(vi) Define median and write its formula for grouped and ungrouped data.
On 5 term tests in mathematics, a student has made marks of 82, 93, 86, 92 and 79. Find the median for the marks.

(vii) Define mode and write its formula for grouped and ungrouped data.

(viii) Define Geometric Mean and write its formula for grouped and ungrouped data.

4. Write short answer to any SIX (6) questions: **12**

(i) Define Bijective function or one to one correspondence.

(ii) Define one to one function.

(iii) Indicates R_4 = {(1, 1), (2, 3), (3, 4), (5, 4)}. Also find its domain and the range.

(iv) If set M has 5 elements, then find the number of binary relations in M.

(v) Write the properties of Arithmetic Mean.

(vi) What is measures of dispersion and how it is calculated?

(vii) What is Range? Write its formula.

(i) For the following data find the Harmonic mean.

X	12	5	8	4

(viii) What is Histogram?

(PART – II)

Note : Attempt any THREE question in all.

5. **(a)** If A = {0, 2, 4}, B = {2, 4, 6, 8}, C = {1, 4, 8}. Prove that A∪(B∩C) = (A∪B) ∩ (A∪C) **4**

(b) If L = {x | x ∈ N ∧ x ≤ 5}, M = {y | y ∈ P ∧ y < 10}, then make the following relations from L to M: **4**

(i) $R_1 = \{(x, y) \mid y < x\}$ **(ii)** $R_2 = \{(x, y) \mid y = x\}$

(iii) $R_3 = \{(x, y) \mid x + y = 6\}$ **(iv)** $R_4 = \{(x, y) \mid y - x = 2\}$

Also write the domain and range of each relation.

6. **(a)** If U = N; then verify De-Morgan's laws using A = ϕ and B = P. **4**

(b) The salaries of five teachers in Rupees are as follows. 11500, 12400, 15000, 14500, 14800. Find Range and Standard Deviation. **4**

7. **(a)** The marks obtained by students of class XI in Mathematics are given below: **4**

Class/group	**0___9**	**10__19**	**20__29**	**30__39**	**40__49**	**50__59**	**60__69**	**Total**
Frequency	**2**	**10**	**5**	**9**	**6**	**7**	**1**	**40**

Compute arithmetic mean by direct and indirect methods.

(b) If U={1,2,3,.....10}, A = {1,3,5,7,9} and B= {2,3,4,5,8} , then prove the equation by Venn diagram **4**

$$B - A = B \cap A'$$

8. **(a)** The following frequency distribution, the weights of boys in kilogram. Compute **4**

Mean, Median and Mode.

Class intervals	1___3	4___6	7___9	10___12	13___15	16___18	19___21
Frequency	2	3	5	4	6	2	1

(b) The marks of seven students in Mathematics are as follows. Determine variance and standard deviation. Also interpret the results **4**

Student No	1	2	3	4	5	6	7
Marks	45	60	74	58	65	63	49

9. **Prove that any two angles in the same segment of a circle are equal.** **8**

OR

Prove that the angle:

1. **In a semi-circle is a right angle.**
2. **In a segment greater than a semi-circle is less then a right angle.**
3. **In a segment less then a semi-circle is greater than a right angle.**