# Anaikar Oriental Arabic Higher Secondary School Ambur.

**Weekly Test No-1** **Mathematics** **Max marks:50** **Time:90 min**

## I. Answer all the 5 questions. 4 x1 = 4

1. If $n(A\times B) = 6$ and $A = \{1, 3\}$ then $n(B)$ is (A) 1 (B) 2 (C) 3 (D) 6

2. $A = \{a,b, p\}$, $B = \{2, 3\}$, $C = \{p,q,r,s\}$ then $n[(A - C)\times B]$ is

(A) 8 (B) 20 (C) 12 (D) 16

3. If $A = \{1,2\}$, $B = \{1,2, 3, 4\}$, $C = \{5,6\}$ and D = {5, 6, 7, 8} then state which of the following statement is true.

(A) $(A\times C) - (B\times D)$ (B) $(B\times D) - (A\times C)$ (C) $(A \cup B) - (A\times D)$ (D) $(D\times A) - (B\times A)$

4. If there are 1024 relations from a set $A = \{1, 2, 3, 4, 5\}$ to a set $B$,

then the number of elements in $B$ is

(A) 3 (B) 2 (C) 4 (D) 8

## II Answer all questions. 5 x2 = 10

5. If A = {1,3,5} and B = {2,3}, then (i) find AxB and BxA

6 If A x B = {(3,2), (3,4), (5,2), (5,4)}, then find A and B.

7.Let A = {1,2,3} and B = { x/ x is a prime number less than 10}. Find A x B.

8. Let A={1,2,3,4,…,45} and R be the relation defined as "is a square of" on $A$. Write R as asubset of A×A. Also, find the domain and range of R.

9.A Relation R is given by the set $\{(x , y) \mid y = x+3, x\in\{0,1,2,3,4,5\}\}$. Find its domain and range.



## III Answer all the questions 4x5 = 20

10.Let A={ $x \in N / 1 < x < 4$}, B ={ $x \in W \mid 0 \le x < 2$} and C={ $x \in N \mid x < 3$}. Then verify thatA x (B U C) = (A x B ) U ( A x C )

11.Represent each of the given relations by (a) an arrow diagram, (b) a graph and (c) a set in rosterform, wherever possible. {$(x, y) / y = x+3$, $x$, $y$ are natural numbers < 10}

12. Let A={ $x \in N / 1 < x < 4$}, B ={ $x \in W \mid 0 \le x < 2$} and C={ $x \in N \mid x < 3$}. Then verify thatA x (B ∩ C) = (A x B ) ∩ ( A x C )

13. Let $A$ = The set of all natural numbers less than 8, $B$ = The set of all prime numbersless than 8, $C$ = The set of even prime number. Verify that $A\times(B - C) = (A\times B) - (A\times C)$

14. Let $A = \{3,4,7,8\}$ and $B = \{1,7,10\}$. Which of the following sets are relations from $A$ to $B$? (i) $R_1 = \{(3,7), (4,7), (7,10), (8,1)\}$ (ii) $R_2 = \{(3,1), (4,12)\}$ (iii) $R_3 = \{(3,7), (4,10), (7,7), (7,8), (8,11), (8,7), (8,10)\}$

## IV. Answer all the questions. 8x2= 16

15. Construct triangle similar to a given triangle LMN with its sides equal to $\frac{4}{5}$ of the corresponding side of the Triangle LMN (scale factor $\frac{4}{5}$ <1)

16. Construct triangle similar to a given triangle PQR with its sides equal to $\frac{3}{5}$ of the corresponding side of the Triangle PQR (scale factor $\frac{3}{5}$ <1)

# Anaikar Oriental Arabic Higher Secondary School Ambur.

**Weekly Test No-2 Mathematics X- STD Max Marks:50 Time:90 min**

## I.Answer all the questions. 4 x1 = 4

1. If $\{(a, 8),(6,b)\}$ represents an identity function, then the value of $a$ and $b$ are respectively
(A) (8,6) B) (8,8) (C) (6,8) (D) (6,6)

2. Let $A = \{1,2, 3, 4\}$ and $B = \{4, 8,9,10\}$. A function $f : A \to B$ given by $f=\{(1,4),(2,8),(3,9),(4,10)\}$ is a (A)Many-one function (B) Identity function (C) One-to-one function (D) into function

3. If $f : A \to B$ is a bijective function and if $n(B) = 7$ , then $n(A)$ is equal to (A) 7 B) 49 (C)1 (D) 14

4.The function f:N→N is defined by f(x)= 2x. Then the function f is (A)Not one-one but onto (B) one-one but not onto (C) one-one and onto (D) not one-one and not onto

## II.Answer all the questions. 5 x2 = 10

5. Let X = {1,2,3,4} and Y = {2,4,6,8,10} and R = {(1,2), (2,4),(3,6),(4,8)}. Show that R is a function and find its domain co-domain and range?

6.Let $X = \{3, 4, 6, 8\}$. Determine whether the relation $R = \{(x, f(x))/ x \in X, f(x) = x^2+1\}$ is a function from X to N?

7.If $A = \{-2, -1, 0, 1, 2\}$ and $f: A \to B$ is an onto function defined by $(x) = x^2 + x + 1$ then find $B$.

8.Let $A = \{1, 2, 3, 4\}$ *and* $B = N$. Let $f: A \to B$ be defined by $(x) = x^3$ then, (i) find the range of $f$ (ii) identify the typeof function.

9.Let $A = \{-1,1\}$, $B = \{0,2\}$ . If the function $f: A \to B$ defined by $(x) = ax + b$ is an onto function? Find a and $b$.

## III.Answer any 4 questions. 4 x5 = 20

10. Let $A = \{1,2,3,4\}$ *and* $B = \{2,5,8,11,14\}$ be two sets. Let $f: A \to B$ be a function given by $f(x) = 3x - 1$. Represent this function ( i) by arrow diagram (ii) in a table form (iii) as a set of ordered pairs (iv) in a graphical form.

11.If the function f is defined by $f(x) = \begin{cases} x+2 & if\ x > 1 \\ 2 & if\ -1 \le x \le 1 \\ x-2 & if\ -3 < x < -1 \end{cases}$

find the values of $(i)\ \ f(3)$ $(ii)\ f(0)$ $(iii)\ f(-1.5)$ $(iv)\ f(2) + f(-2)$.

12. Let $f : A \to B$ be a function defined by $f(x) = \frac{x}{2} - 1$ where $A = \{2, 4,6,10,12\}, B = \{0,1,2, 4,5,9\}$ . Represent $f$ by
(i) set of ordered pairs (ii) a table (iii) an arrow diagram (iv) a graph

13. A function $f : [-5,9] \to \mathbb{R}$ is defined as follows:

$f(x) = \begin{cases} 6x+1 & if\ -5 \le x < 2 \\ 5x2-1 & if\ 2 \le x < 6 \\ 3x-4 & if\ 6 \le x \le 9 \end{cases}$ Find (i) $f(-3)+ f(2)$ (ii) $f(7)- f(1)$ (iii) $2f(4)+ f(8)$ (iv) $\frac{2f(-2)-f(6)}{f(4)+f(-2)}$

14. Forensic scientists can determine the height (in cm) of a person based on the length of the thigh bone. They usually do so using the function $h(b) = 2.47b + 54.10$ where $b$ is the length of the thigh bone. (i) Verify the function $h$ is one – one or not. (ii) Also find the height of a person if the length of his thigh bone is 50 cm. (iii) Find the length of the thigh bone if the height of a person is 147.96 cm.

## IV.Answer all the questions. 2 x8 = 16

15.Construct a triangle similar to a given triangle $ABC$ with its sides equal to $\frac{6}{5}$ >1 of the corresponding sides of the triangle $ABC$ (scale factor $\frac{6}{5}$ >1).

16. Construct a triangle similar to a given triangle $PQR$ with its sides equal to $\frac{7}{3}$ >1 of the corresponding sides of the triangle $PQR$ (scale factor $\frac{7}{3}$ >1).

# Anaikar Oriental Arabic Higher Secondary School Ambur.

**Weekly Test No-3 Mathematics X- STD Max Marks:50 Time:90 min**

## I.Answer all the questions. 4 x1 = 4

1.If = $\{(a,8),(6,b)\}$represents an identity function, then the value of $a$ and $b$ are respectively

(A) (8,6) (B) (8,8) (C) (6,8) (D) (6,6)

2.Let $f$ and $g$ be two functions given by $f$=$\{(0,1),(2,0),(3,-4),(4,2),(5,7)\}$ $g$=$\{(0,2),(1,0),(2,4),(-4,2),(7,0)\}$ then the range of $f$ o $g$ is (A) {0,2,3,4,5} (B) {-4,1,0,2,7} (C) {1,2,3,4,5} (D) {0,1,2}

3.If $g$ = {(1,1),(2, 3),(3,5),(4,7)} is a function given by g(x) = $\alpha x+\beta$ then the values of $\alpha$ and $\beta$

(A) (–1,2) (B)(2, –1) (C) (–1, –2) (D) (1,2)

4.f(x) = $(x+1)^3-(x-1)^3$ represents a function which is (A) linear (B) cubic (C)reciprocal (D)quadratic

## II.Answer all the questions. 5 x2 = 10

5. Find $f$ o $g$ and $g$ o $f$ when $f(x) = 2x+1$ and $g(x) = x^2-2$

6. If (x) = 3x − 2, g(x) = 2x + k and if fog = gof, then find the value of k.

7.Represent the function $f(x)=\sqrt{2x^2-5x+3}$ as a composition of two functions

8. Let $f(x) = x^2 - 1$. Find fofof

9. Let f = {(−1, 3), (0, −1), (2, −9)} be a linear function from Z into Z. Find f(x).



## III.Answer any 4 questions. 4 x5 = 20

10. If (x) = 2x + 3,g (x) = 1 – 2x and h(x) = 3x. Prove that fo (goh) = (fog) o h.

11. Let A, B, C⊆ N and a function f: A → B be defined by f(x) = 2x + 1 and g: B → C be defined byg(x) = $x^2$.
Find the range fog and gof

12.Find $x$ if $gff(x) = fgg(x)$, given $f(x) = 3x+1$ and $g(x) = x+3$ .

13.Consider the functions f (x ), g (x ), h ( x) as given below. Show that $(f \text{ o } g) \text{ o } h = f \text{ o } (g \text{ o } h)$ such that $f(x) = x-1$, $g(x) = 3x+1$ and $h(x) = x^2$

14. If (x) = x-4, g (x) = $x^2$ and h(x) = 3x-5 . Prove that (fog)oh = fo(goh).

## IV.Answer all the questions. 2 x8 = 16

15.Construct a triangle similar to a given triangle $PQR$ with its sides equal to $\frac{2}{3}$ <1 of the corresponding sides of the triangle $PQR$ (scale factor $\frac{2}{3}$ <1).

16. Construct a triangle similar to a given triangle $PQR$ with its sides equal to $\frac{7}{4}$ >1 of the corresponding sides of the triangle $PQR$ (scale factor $\frac{7}{4}$ >1).

# Anaikar Oriental Arabic Higher Secondary School Ambur.

**Weekly Test No-4 Mathematics X- STD Max Marks:50 Time:90 min**

## I.Answer all the questions. 4 x1 = 4

1.Given $F_1 = 1$ , $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then $F_5$ is (A)3 (B)5 (C)8 (D)11

2.Euclid's division lemma states that for positive integers $a$ and $b$, there exist unique integers $q$ and $r$ such that $a = bq + r$ , where $r$ must satisfy. (A) $1 < r < b$ (B) $0 < r < b$ (C) $0 \leq r < b$ (D) $0 < r \leq b$

3.If the HCF of 65 and 117 is expressible in the form of $65m - 117$ , then the value of $m$ is (A) 4 (B) 2 (C) 1 (D) 3

4 Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are

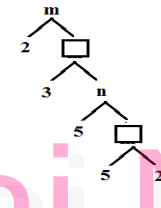
(A) 0, 1, 8 (B) 1, 4, 8 (C) 0, 1, 3 (D) 1, 3, 5

## II.Answer all the questions. 5 x2 = 10

5.We have 34 cakes. Each box can hold 5 cakes only. How many boxes we need to pack and how many cakes are unpacked?

6. Prove that two consecutive positive integers are always coprime.

7.In the given factorisation, find the numbers $m$ and $n$.




8. '$a$' and '$b$' are two positive integers such that $a^b \times b^a = 800$. Find '$a$' and '$b$'.

9.If $13824 = 2^a \times 3^b$ then find $a$ and $b$.



## III.Answer any 4 questions. 4 x5 = 20

10. Find the HCF of 396, 504, 636.

11. If $d$ is the Highest Common Factor of 32 and 60, find $x$ and $y$ satisfying $d = 32x + 60y$ .

12. If $p_1^{x_1} \times p_2^{x_2} \times p_3^{x_3} \times p_4^{x_4} = 113400$ where $p_1, p_2, p_3, p_4$ are primes in ascending order and $x_1, x_2, x_3, x_4$ are integers, find the value of $p_1, p_2, p_3, p_4$ and $x_1, x_2, x_3, x_4$.

13. Find the LCM and HCF of 408 and 170 by applying the fundamental theorem of arithmetic.

14. Find the HCF of 252525 and 363636.

## IV.Answer all the questions. 2 x8 = 16

15.Construct a triangle similar to a given triangle $LMN$ with its sides equal to $\frac{4}{5} < 1$ of the corresponding sides of the triangle $LMN$ (scale factor $\frac{4}{5} < 1$).

16. A bus is travelling at a uniform speed of 50 km/hr. Draw the distance-time graph and hence find

(i) the constant of variation (ii) how far will it travel in $1\frac{1}{2}$ hr (iii) the time required to cover a distance of 300 km from the graph.

# Anaikar Oriental Arabic Higher Secondary School Ambur.

**Weekly Test No-5 Mathematics X- STD Max Marks:50 Time:90 min**

## I.Answer all the questions. 4 x1 = 4

1. $7^{4k} \equiv$ _____ (mod 100) (A) 1 (B) 2 (C) 3 (D) 4

2. Given $F_1 = 1$ , $F_2 = 3$ and $F_n = F_{n-1} + F_{n-2}$ then $F_5$ is (A)3 (B)5 (C)8 (D)11

3. The least number that is divisible by all the numbers from 1 to 10 (both inclusive) is

(A) 2025 (B) 5220 (C) 5025 (D) 2520

4. The sum of the exponents of the prime factors in the prime factorization of 1729 is (A) 1 (B) 2 (C) 3 (D) 4

## II.Answer all the questions. 5 x2 = 10

5. Find the remainders when 70004 and 778 is divided by 7.

6. Compute $x$, such that $10^4 \equiv x \pmod{19}$

7. Today is Tuesday. My uncle will come after 45 days. In which day my uncle will be coming?

8. The general term of a sequence is defined as $a_n = \begin{cases} n(n+3); n \in N \text{ is odd} \\ n^2+1; n \in N \text{ is even} \end{cases}$

Find the eleventh and eighteenth terms.

9. Find the first four terms of the sequences whose $n^{th}$ terms are given by $a_n = (-1)^{n+1} n(n+1)$

## III.Answer any 4 questions. 4 x5 = 20

10. Prove that $2^n + 6 \times 9^n$ is always divisible by 7 for any positive integer $n$.

11. Solve $8x \equiv 1 \pmod{11}$

12. Find the least positive value of $x$ such that (i) $67 + x \equiv 1 \pmod 4$ (ii) $98 \equiv (x + 4) \pmod 5$

13. If $a_1 = 1$, $a_2 = 1$, $a_n = 2a_{n-1} + a_{n-2}$, $n \geq 3$, $n \in N$, then find the first six terms of the sequence.

14. Find the indicated terms of the sequences whose $n^{th}$ terms are given by

(i) $a_n = \frac{5n}{n+2}$ ; $a_6$ and $a_{13}$ (ii) $a_n = -(n^2 - 4)$ ; $a_4$ and $a_{11}$

## IV.Answer all the questions. 2 x8 = 16

15. Construct a triangle similar to a given triangle $PQR$ with its sides equal to $\frac{7}{3}$ of the corresponding sides of the triangle $PQR$ (scale factor $\frac{7}{3} > 1$).

16. Varshika drew 6 circles with different sizes. Draw a graph for the relationship between the diameter and circumference (approximately related) of each circle as shown in the table and use it to find the circumference of a circle when its diameter is 6 cm.

| Diameter (x)cm | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Circumference(y) cm | 3.1 | 6.2 | 9.3 | 12.4 | 15.5 |

# Anaikar Oriental Arabic Higher Secondary School Ambur.

**Weekly Test No-6 Mathematics X- STD Max Marks:50 Time:90 min**

## I.Answer all the questions. 4 x1 = 4

1. If 6 times of $6^{th}$ term of an A.P. is equal to 7 times the $7^{th}$ term, then the $13^{th}$ term of the A.P. is

(A) 0 (B) 6 (C) 7 (D) 13

2. In an A.P., the first term is 1 and the common difference is 4. How many terms of the A.P. must be taken for their sum to be equal to 120? (A) 6 (B) 7 (C) 8 (D) 9

3.If $A = 2^{65}$ and $B = 2^{64} + 2^{63} + 2^{62} + \ldots + 2^0$ which of the following is true?

(A) $B$ is $2^{64}$ more than $A$ (B) $A$ and $B$ are equal (C) $B$ is larger than $A$ by 1 (D) $A$ is larger than $B$ by 1

4.If the sequence $t_1, t_2, t_3, \ldots$ are in A.P. then the sequence $t_6, t_7, t_8, \ldots$ is

(A) a Geometric Progression (B) an Arithmetic Progression (C) neither an Arithmetic Progression nor a Geometric Progression (D) a constant sequence

## II.Answer all the questions. 5 x2 = 10

5. Check whether the following sequences are in A.P. or not? $x + 2, 2x + 3, 3x + 4, \ldots$

6. Find the number of terms in the A.P. 3, 6, 9, 12,…, 111.

7. Write an A.P. whose first term is 20 and common difference is 8.

8.Find the $19^{th}$ term of an A.P. -11,-15,-19

9. Find $x$, $y$ and $z$, given that the numbers $x$, 10, $y$, 24, $z$ are in A.P.



## III.Answer any 4 questions. 4 x5 = 20

10.Determine the general term of an A.P. whose $7^{th}$ term is −1 and $16^{th}$ term is 17.

11. In an A.P., sum of four consecutive terms is 28 and the sum of their squares is 276. Find the four numbers.

12.If $l^{th}$ , $m^{th}$ and $n^{th}$ terms of an A.P. are $x$, $y$, $z$ respectively, then show that $x(m-n)+y(n-l)+z(l-m) = 0$

13.In a winter season let us take the temperature of Ooty from Monday to Friday to be in A.P. The sum of temperatures from Monday to Wednesday is 0° C and the sum of the temperatures from Wednesday to Friday is 18° C. Find the temperature on each of the five days.

14.The sum of three consecutive terms that are in A.P. is 27 and their product is 288.Find the three terms.

## IV.Answer all the questions. 2 x8 = 16

15.Construct a triangle similar to a given triangle $ABC$ with its sides equal to $\frac{6}{5}$ of the corresponding sides of the triangle $ABC$ (scale factor $\frac{6}{5} > 1$).

16. A garment shop announces a flat 50% discount on every purchase of items for their customers. Draw the graph for the relation between the Marked Price and the Discount. Hence find

(i) the marked price when a customer gets a discount of ₹3250 (from graph)

(ii) the discount when the marked price is ₹2500

# Anaikar Oriental Arabic Higher Secondary School Ambur.

**Weekly Test No-7 Mathematics X- STD Max Marks:50 Time:90 min**

## I. Answer all the questions. 4 x1 = 4

1.The first term of an arithmetic progression is unity and the common difference is 4.
Which of the following will be a term of this A.P. (A) 4551 (B) 10091 (C) 7881 (D) 13531

2.The sum of the exponents of the prime factors in the prime factorization of 1729 is

(A) 1 (B) 2 (C) 3 (D) 4

3.An A.P. consists of 31 terms. If its $16^{th}$ term is *m*, then the sum of all the terms of this A.P. is

(A) 16 m (B) 62 m (C) 31 m (D) $\frac{31}{2}$ m

4.Using Euclid's division lemma, if the cube of any positive integer is divided by 9 then the possible remainders are (A) 0, 1, 8 (B) 1, 4, 8 (C) 0, 1, 3 (D) 1, 3, 5

## II. Answer all the questions. 5 x2 = 10

5.Find the sum of first 15 terms of the A.P. $8, 7\frac{1}{4}, 6\frac{1}{2}, 5\frac{3}{4}, \ldots$

6. In an A.P. the sum of first *n* terms is $\frac{5n^2}{2}+\frac{3n}{2}$. Find the $17^{th}$ term.

7. Find the sum of all odd positive integers less than 450.

8. Find the sum of first 28 terms of an A.P. whose $n^{th}$ term is 4n-3



9.A mosaic is designed in the shape of an equilateral triangle, 12 ft on each side. Each tile in the mosaic is in the shape of an equilateral triangle of 12 inch side. The tiles are alternate in colour as shown in the figure. Find the number of tiles of each colour and total number of tiles in the mosaic.

## III. Answer any 4 questions. 4 x5 = 20

10.Find the sum of all natural numbers between 300 and 600 which are divisible by 7.

11.The houses of a street are numbered from 1 to 49. Senthil's house is numbered such that the sum of numbers of the houses prior to Senthil's house is equal to the sum of numbers of the houses following Senthil's house. Find Senthil's house number?

12.The sum of first *n*, 2*n* and 3*n* terms of an A.P. are $S_1$, $S_2$, and $S_3$ respectively. Prove that $S_3=3(S_2-S_1)$

13.Find the sum of all natural numbers between 602 and 902 which are not divisible by 4.

14.Find the sum $\left[\frac{a-b}{a+b}+\frac{3a-2b}{a+b}+\frac{5a-3b}{a+b}+\cdots to\ 12\ terms\right]$.

## IV. Answer all the questions. 2 x8 = 16

15.Construct a triangle similar to a given triangle *PQR* with its sides equal to $\frac{2}{3}$ of the corresponding sides of the triangle *PQR* (scale factor $\frac{2}{3}<1$)

16. Draw the graph of $xy = 24$, $x,y > 0$. Using the graph find, (i) *y* when $x = 3$ and (ii) *x* when $y = 6$.

# Anaikar Oriental Arabic Higher Secondary School Ambur.

**Weekly Test No-8 Mathematics X- STD Max Marks:50 Time:90 min**

## I. Answer all the questions. 4 x1 = 4

1. A system of three linear equations in three variables is inconsistent if their planes

(A) intersect only at a point (B) intersect in a line (C) coincides with each other (D) do not intersect

2. I f ($x$-6) is the HCF of $x^2 - 2x - 24$ and $x^2 - kx - 6$ then the value of $k$ is

(A) 3 (B) 5 (C) 6 (D) 8

3. $\frac{3y-3}{y} \div \frac{7y-7}{3y^2}$ is (A) $\frac{9y}{7}$ (B) $\frac{9y^3}{(21y-21)}$ (C $\frac{21y^2-42y+21}{3y^3}$ (D) $\frac{7(y^2-2y+1)}{y^2}$

4. Which of the following should be added to make $x^4+64$ a perfect square

(A) $4x^2$ (B) $16x^2$ (C) $8x^2$ (D) $-8x^2$

## II. Answer all the questions. 5 x2 = 10

5. If a matrix has 18 elements, what are the possible orders it can have? What if it has 6 elements?

6. Construct a 3x3 matrix whose elements are given by $a_{ij} = |i - 2j|$

7. $A = \begin{bmatrix} 5 & 4 & 3 \\ 1 & -7 & 9 \\ 3 & 8 & 2 \end{bmatrix}$ then find the transpose of $A$.

8. If $A = \begin{bmatrix} 5 & 2 & 2 \\ -\sqrt{17} & 0.7 & \frac{5}{2} \\ 8 & 3 & 1 \end{bmatrix}$ then verify $(A^T)^T = A$

9. In the matrix $A = \begin{bmatrix} 8 & 9 & 4 & 3 \\ -1 & \sqrt{7} & \frac{\sqrt{3}}{2} & 5 \\ 1 & 4 & 3 & 0 \\ 6 & 8 & -11 & 1 \end{bmatrix}$, write (i) The number of elements (ii) The order of the matrix (iii) Write the elements $a_{22}$, $a_{23}$, $a_{24}$, $a_{34}$, $a_{43}$, $a_{44}$.



## III. Answer any 4 questions. 5x4=20

10. If $A = \begin{bmatrix} 1 & 9 \\ 3 & 4 \\ 8 & -3 \end{bmatrix}$, $B = \begin{bmatrix} 5 & 7 \\ 3 & 3 \\ 1 & 0 \end{bmatrix}$ then verify that (i) $A+B= B+A$ (ii) $A+(-A)=(-A)+A=O$

11. If $A= \begin{bmatrix} 4 & 3 & 1 \\ 2 & 3 & -8 \\ 1 & 0 & -4 \end{bmatrix}$, $B= \begin{bmatrix} 2 & 3 & 4 \\ 1 & 9 & 2 \\ -7 & 1 & -1 \end{bmatrix}$ and $C= \begin{bmatrix} 8 & 3 & 4 \\ 1 & -2 & 3 \\ 2 & 4 & -1 \end{bmatrix}$ then verify that $A+(B+C)=(A+B)+C$

12. Find $X$ and $Y$ if $X+Y = \begin{bmatrix} 7 & 0 \\ 3 & 5 \end{bmatrix}$ and $X- Y = \begin{bmatrix} 3 & 0 \\ 0 & 4 \end{bmatrix}$

13. If $A = \begin{bmatrix} 0 & 4 & 9 \\ 8 & 3 & 7 \end{bmatrix}$ and $B= \begin{bmatrix} 7 & 3 & 8 \\ 1 & 4 & 9 \end{bmatrix}$ find the value of (i) $B -5A$ (ii) 3A-9B

14. Solve for $x, y$ : $\begin{bmatrix} x^2 \\ y^2 \end{bmatrix} + 2\begin{bmatrix} -2x \\ -y \end{bmatrix} = \begin{bmatrix} 5 \\ 8 \end{bmatrix}$

## IV. Answer all the questions. 2 x8 = 16

15. Construct a triangle similar to a given triangle $ABC$ with its sides equal to $\frac{6}{5}$ of the corresponding sides of the triangle $ABC$ (scale factor $\frac{6}{5} < 1$)

16. A school announces that for a certain competitions, the cash price will be distributed for all the participants equally as show below

| No. of participants ($x$) | 2 | 4 | 6 | 8 | 10 |
|---|---|---|---|---|---|
| Amount for each participant in ₹ ($y$) | 180 | 90 | 60 | 45 | 36 |

(i) Find the constant of variation.

(ii) Graph the above data and hence, find how much will each participant get if the number of participants are 12.

# Anaikar Oriental Arabic Higher Secondary School Ambur.

**Weekly Test No-9 Mathematics X- STD Max Marks:50 Time:90 min**

## I. Answer all the questions. 4 x1 = 4

1.Find the matrix $X$ if $2X + \begin{bmatrix}1 & 3\\5 & 7\end{bmatrix} = \begin{bmatrix}5 & 7\\9 & 5\end{bmatrix}$ (A)$\begin{bmatrix}-2 & -2\\2 & -1\end{bmatrix}$ (B) $\begin{bmatrix}-2 & -2\\2 & -1\end{bmatrix}$ (C) $\begin{bmatrix}-2 & -2\\2 & -1\end{bmatrix}$ (D) $\begin{bmatrix}-2 & -2\\2 & -1\end{bmatrix}$

2.Transpose of a column matrix is (A) unit matrix (B) diagonal matrix (C) column matrix (D) row matrix

3.If number of columns and rows are not equal in a matrix then it is said to be a

(A) diagonal matrix (B) rectangular matrix (C) square matrix (D) identity matrix

4. For the given matrix $A = \begin{bmatrix}1 & 3 & 5 & 7\\2 & 4 & 6 & 8\\9 & 11 & 13 & 15\end{bmatrix}$ the order of the matrix $A^T$ is

(A)2×3 (B) 3×2 (C) 3×4 (D) 4×3

## II. Answer all the questions. 5 x2 = 10

5. If $= \begin{bmatrix}\cos\theta & 0\\0 & \cos\theta\end{bmatrix}$, $B = \begin{bmatrix}\sin\theta & 0\\0 & \sin\theta\end{bmatrix}$ then show that $A^2 + B^2 = I$ .

6. If $A = \begin{bmatrix}2 & -2\sqrt{2}\\\sqrt{2} & 2\end{bmatrix}$ and $B = \begin{bmatrix}2 & 2\sqrt{2}\\-\sqrt{2} & 2\end{bmatrix}$ Show that $A$ and $B$ satisfy commutative property with respect to matrix multiplication.

7.If $A = \begin{bmatrix}\cos\theta & sin\theta\\-sin\theta & \cos\theta\end{bmatrix}$ prove that $AA^T=I$

8 . Verify that $A^2=I$ when $A = \begin{bmatrix}5 & -4\\6 & -5\end{bmatrix}$

9.I f $A$ is of order $p \times q$ and $B$ is of order $q \times r$ what is the order of $AB$ and $BA$?



## III. Answer any 4 questions. 4 x5 = 20

10. Given that $A = \begin{bmatrix}1 & 3\\5 & -1\end{bmatrix}$, $B = \begin{bmatrix}1 & -1 & 2\\3 & 5 & 2\end{bmatrix}$, $C = \begin{bmatrix}1 & 3 & 2\\-4 & 1 & 3\end{bmatrix}$ verify that $A(B+ C)= AB+ AC$.

11. If $A = \begin{bmatrix}5 & 2 & 9\\1 & 2 & 8\end{bmatrix}$, $B = \begin{bmatrix}1 & 7\\1 & 2\\5 & -1\end{bmatrix}$ verify that $(AB)^T=B^TA^T$

12. Let $A = \begin{bmatrix}1 & 2\\1 & 3\end{bmatrix}$, $B = \begin{bmatrix}4 & 0\\1 & 5\end{bmatrix}$ , $C = \begin{bmatrix}2 & 0\\1 & 2\end{bmatrix}$ Show that $A(BC)=(AB)C$

13. If $A = \begin{bmatrix}3 & 1\\-1 & 2\end{bmatrix}$ show that $A^2 - 5A + 7I_2 = O$

14. If $A = \begin{bmatrix}a & b\\c & d\end{bmatrix}$ and $I = \begin{bmatrix}1 & 0\\0 & 1\end{bmatrix}$ show that $A^2 - (a + d)A = (bc - ad)I_2$

15.State and prove Thale's Theorem

## IV. Answer all the questions. 2 x8 = 16

16.Construct a triangle similar to a given triangle $LMN$ with its sides equal to $\frac{4}{5}$ of the corresponding sides of the triangle $LMN$ (scale factor $\frac{4}{5} < 1$)

17. Graph the following linear function $Y = \frac{1}{2}x$ . Identify the constant of variation and verify it with the graph.

Also (i) find $y$ when $x$ =9 (ii) find $x$ when $y$ =7.5 .

# Anaikar Oriental Arabic Higher Secondary School Ambur.

**Weekly Test No-10 Mathematics X- STD Max Marks:50 Time:90 min**

## I.Answer all the questions. 4 x1 = 4

1.The square root of $\frac{256x^8y^4z^{10}}{25x^6y^6z^6}$ is equal to (A) $\frac{16}{5}\left|\frac{x^2z^4}{y^2}\right|$ (B)16 $\left|\frac{y^2}{x^2z^4}\right|$ (C) $\frac{16}{5}\left|\frac{y}{xz^2}\right|$ (D) $\frac{16}{5}\left|\frac{xz^2}{y}\right|$

2.If the roots of the equation $q^2x^2 + p^2x + r^2 = 0$ are the squares of the roots of the equation $qx^2 + px + r = 0$ , then $q$, $p$, $r$ are in (A) *A.P* (B) *G.P* (C) Both *A.P* and *G.P* (D) none of these

3.The values of $a$ and $b$ if $4x^4 - 24x^3 + 76x^2 + ax + b$ is a perfect square are

(A) 100,120 (B) 10,12 (C) -120 ,100 (D) 12,10

4. The solution of $(2x-1)^2 = 9$ is equal to (A) -1 (B) 2 (C) –1, 2 (D) None of these

## II.Answer all the questions. 5x2=10

5.Find the square root of the following expression $\mathbf{256(x-a)^8(x-b)^4(x-c)^{16}(x-d)^{20}}$

6. Find the square root of the following $\frac{\mathbf{144a^8b^{12}c^{16}}}{\mathbf{81f^{12}g^4h^{14}}}$

7. Find the square root of the following $\mathbf{4x^2 + 20x + 25}$

8. .Find the square root of the following expression $\frac{\mathbf{7x^2+2\sqrt{14}x+2}}{x^2-\frac{1}{2}x+\frac{1}{16}}$

9. Find the square root of the following rational expressions. $\frac{\mathbf{121(a+b)^8(x+y)^8(b-c)^8}}{\mathbf{81(b-c)^4(a-b)^{12}(b-c)^4}}$

## III.Answer any 4 questions. 5x4=20

10. Find the square root of the following $\mathbf{(4x^2 - 9x + 2)(7x^2 - 13x - 2)(28x^2 - 3x - 1)}$

11.Find the square root of $\mathbf{64x^4 - 16x^3 + 17x^2 - 2x + 1}$

12. If $\mathbf{9x^4 + 12x^3 + 28x^2 + ax + b}$ is a perfect square, find the values of $\boldsymbol{a}$ and $\boldsymbol{b}$.

13. Find the square root of the following polynomials by division method $\mathbf{16x^4 + 8x^2 + 1}$

14.Find the values of $\boldsymbol{m}$ and $\boldsymbol{n}$ if the following polynomials are perfect sqaures $\mathbf{x^4 - 8x^3 + mx^2 + nx + 16}$

## IV.Answer all the questions. 2 x8 = 16

15. Construct a triangle similar to a given triangle *LMN* with its sides equal to $\frac{4}{5}$ of the corresponding sides of the triangle *LMN* (scale factor $\frac{4}{5} < 1$).

16. Nishanth is the winner in a Marathon race of 12 km distance. He ran at the uniform speed of 12 km/hr and reached the destination in 1 hour. He was followed by Aradhana, Jeyanth, Sathya and Swetha with their respective speed of 6 km/hr, 4 km/hr, 3 km/hr and 2 km/hr. And, they covered the distance in 2 hrs, 3 hrs, 4 hrs and 6 hours respectively.

Draw the speed-time graph and use it to find the time taken to Kaushik with his speed of 2.4 km/hr.