Paper: Mathematics		Total Marks: 75
Month Test: 3rd Term		Obt. Marks: _____
Theme/Unit: 3, 4		Grand Total: _____
Objective/Subjective:	ID: _____	Time: _____
Name: _____	class: 10th	Section:

Q#1: Circle the correct option. 1*15=15

1- A relationship between two quantities of the same kind is called:
   a- Proportion b- ratio
   c- Consequent d- None

2- In ratio a : b, b is called:
   a- antecedent b- consequent
   c- unit d- element

3- Which term shows the relation as "y is directly proportional to x".
   a- $y \propto \frac{1}{x}$ b- $x \propto \frac{1}{y}$
   c- $x \propto y$ d- $y \propto x$

4- In a proportion a : b :: c : d, b and c are called:
   a- means b- extremes
   c- fourth proportional d- None

5- If three quantities a, b and c are related as a : b :: b : c, then 'c' is called:
   a- Third proportional b- fourth proportional
   c- mean proportional d- continued proportional

6- Find 'x' in proportion 4 : x :: 5 : 15.
   a- $\frac{75}{4}$ b- $\frac{4}{3}$
   c- $\frac{3}{4}$ d- 12

7- If $\frac{u}{v} = \frac{v}{w} = k$, then
   a- $u=wk^2$ b- $u=vk^2$
   c- $u=w^2k$ d- $u=v^2k$

8- The third proportional of x^2 and y^2 is:
   a- $\frac{y^2}{x^2}$ b- x^2y^2
   c- $\frac{y^4}{x^2}$ d- $\frac{y^2}{x^4}$

9- If a : b = x : y, then invertendo property is:
   a- $\frac{a}{x} = \frac{b}{y}$ b- $\frac{a}{a-b} = \frac{x}{x-y}$
   c- $\frac{a+b}{b} = \frac{x+y}{y}$ d- $\frac{b}{a} = \frac{y}{x}$

10- The function of the form $f(x) = \frac{N(x)}{D(x)}$, with $D(x) \neq 0$, where $N(x)$ and $D(x)$ are polynomials in x is called:
   a- an identity b- an equation
   c- a fraction d- None

11-$(5x^2+4)^2 = 25x^2+40x+16$ is:

a- A linear equation b- an equation

c- an identity d- none of these

12-$\frac{3x-1}{x^2-1}$ is

a- A proper fraction b- an improper fraction

c- an identity d- a constant term

13-Partial fraction of $\frac{x+2}{(x+1)(x^2+2)}$ are of the form

a- $\frac{A}{x+1}+\frac{B}{(x^2+2)}$ b- $\frac{A}{x+1}+\frac{Bx+C}{(x^2+2)}$

c- $\frac{Ax+B}{x+1}+\frac{C}{(x^2+2)}$ d- $\frac{A}{x+1}+\frac{Bx}{(x^2+2)}$

14-Partial fraction of $\frac{x^2+1}{(x+1)(x-1)}$ are of the form

b- $\frac{A}{x+1}+\frac{B}{x-1}$ b- $1+\frac{A}{x+1}+\frac{Bx+C}{x-1}$

c- $1+\frac{A}{x+1}+\frac{B}{x-1}$ d- $\frac{Ax+B}{x+1}+\frac{C}{x+1}$

15-Resolving the fraction into partial fraction is also known as:

a- An identity b- zeros' method

c- resultant fraction d- none of these

Q#1: Solve the following Questions. 2*6=12

(i) Define Proportion.

(ii) If $3(4x-5y)=2x-7y$, find the ratio $x:y$.

(iii) Find x if $\frac{3x-1}{7}:\frac{3}{5}::\frac{2x}{3}:\frac{7}{5}$.

(iv) Define Inverse variation and find the relation A varies directly as the square of r and $A=\frac{1782}{7}cm^2$, when $r=9cm$.

(v) Define fourth proportional and find the mean proportional between $15p^4qr^3\ and\ 135q^5r^7$.

(vi) State the Theorem of Componendo.

Q#2: Solve the following Questions. 2*6=12

(i) Prove that $a:b=c:d$ if $\frac{2a+9b}{2a-9b}=\frac{2c+9d}{2c-9d}$.

(ii) Define Joint variation with relation.

(iii) If w varies inversely as the cube of u, and w=5 when u=3. Find w, when u=6.

(iv) If a : b = c : d, then show that $\frac{a}{b}=\sqrt{\frac{a^2+c^2}{b^2+d^2}}$.

(v) If $\frac{9pq}{2lm}=\frac{18p}{5m}$, then 5q=_____.

(vi) If $z\propto xy$ and $z=36$ when x=2, y=3, then find z.

Q#3: Solve the following Questions. 2*6=12

(i) Define Rational Fraction with example.

(ii) Resolve the fraction $\frac{x^3-x^2+x+1}{x^2+5}$ into proper fraction.

(iii) Resolve into partial fraction $\frac{x-5}{(x-1)(x+3)}$.

(iv) How we can write in partial fraction $\frac{x^2+7x+11}{(x+2)^2(x+3)}$.

(v) Resolve $\frac{x^2}{(x+2)(x^2+4)}$ into partial fraction.

(vi) What are partial fractions? Whether $(x+3)^2=x^2+6x+9$ is an identity.

- Long Questions.

Q#1: (a) Two numbers are in the ratio 5 : 8. If 9 is added to each number, we get a new ratio 8 : 11. Find the numbers. (4)

(b) Use theorem of componendo-divindendo find the value of $\frac{s-3p}{s+3p}+\frac{s+3q}{s-3q}$, if $\frac{6pq}{s-3q}$. (4)

Q#2: (a) If $\frac{a}{b}=\frac{c}{d}=\frac{e}{f}\ (a,b,c,d,f\neq 0)$then show that $\frac{ac}{bd}+\frac{ce}{df}+\frac{ea}{fb}=\frac{a^2}{b^2}+\frac{c^2}{d^2}+\frac{e^2}{f^2}$. (4)

(b) In Hook's Law the force F applied to stretch a spring varies directly as the amount of elongation S and F=32lb when S=1.6 in. find (i) S when F=50lb (ii) F when S=0.8in. (4)

Q#3: (a) Resolve into partial fractions $\frac{x^4}{x^2(x-1)}$. (4)

(b) Resolve into partial fraction $\frac{x^2}{(x+1)(x^2+1)^2}$. (4)