APPENDIX - D

FIRST DRAFT OF THE DIAGNOSTIC TEST

DIAGNOSTIC TESTS FOR MATHEMATICS
(Please do all calculations on this test paper itself. Space for rough work is provided)

1. TEST OF BASIC SKILLS IN ARITHMETIC

A) Add:

i) $\begin{array}{r} 351 \\ +879 \\ \hline \end{array}$ ii) $\begin{array}{r} 432 \\ +\ 18 \\ \hline \end{array}$ iii) $\begin{array}{r} 200 \\ +564 \\ \hline \end{array}$ iv) $\begin{array}{r} 267 \\ +951 \\ +419 \\ \hline \end{array}$

B) Subtract the following:

i) $\begin{array}{r} 47 \\ -\ 31 \\ \hline \end{array}$ ii) $\begin{array}{r} 523 \\ -\ 215 \\ \hline \end{array}$ iii) $\begin{array}{r} 649 \\ -\ 15 \\ \hline \end{array}$ iv) $\begin{array}{r} 780 \\ -187 \\ \hline \end{array}$

C) Multiply the following:

i) $\begin{array}{r} 10 \\ \times\ 5 \\ \hline \end{array}$ ii) $\begin{array}{r} 810 \\ \times\ 20 \\ \hline \end{array}$ iii) $\begin{array}{r} 953 \\ \times 127 \\ \hline \end{array}$ iv) $\begin{array}{r} 13 \\ \times\ 12 \\ \hline \end{array}$

D) Divide the following:

i) $36 \div 6 =$ ii) $4\overline{)12} =$ iii) $48 \div 8 =$

iv) $1500 \div 3 =$ v) $125 \div 4 =$

E) Fill in the blanks:

i) $4 \times \_\_\_\_\_ = 1$ ii) $5 \div \_\_\_\_\_ = 1$

iii) $\frac{1}{9} \times \_\_\_\_\_ = 1$ iv) $\frac{2}{7} \div \frac{2}{7} = \_\_\_\_\_$

Rough Work

II. TEST OF BASICS IN ALGEBRA

Rough Work

A) Give 3 examples of variables _____ _____ _____

B) Give 4 examples of constants _____ _____ _____ _____

C) Add the following

i) $a + a =$ _____
ii) $a + b + a + b + b =$ _____
iii) $xy + xy + 1 =$ _____ + _____
iv) $2y + 3x + x + y + 5x =$ _____ + _____
v) $x^2 + x^2 + x^2 =$ _____
vi) $a + b =$ _____ + _____

D) Simplify

i) $\frac{b \times b \times b}{b \times b} =$ _____

ii) $\frac{a \times b \times c \times a}{2 \times a \times b \times b} =$ _____

E) Fill in the blanks:

i) $a =$ _____ x a
ii) $4y =$ _____ x y
iii) _____ x _____ $= 2d$
iv) _____ x _____ $= 2d + 2c$
v) $3y + 3d =$ _____ x _____

F) Which are the variables in the following: Put a '0' around it like this (34)

31, x, ab, $\frac{1}{2}$, 2.5, t, -4, $\frac{b}{c}$,

q, 10, r, m, 100, n, pq

Rough Work

III. TEST OF FRACTIONS:

Rough Work

A) (With same denominators)
Add the following:

i) $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} =$

ii) $\frac{1}{4} + \frac{1}{4} =$

iii) $\frac{2}{5} + \frac{4}{5} =$

iv) $\left(\frac{-1}{6}\right) + \left(\frac{-5}{6}\right) =$

v) $\left(\frac{-2}{3}\right) + \frac{5}{3} =$

B) Subtract the following:

$$\left(\frac{-2}{3}\right) + \left(\frac{-1}{3}\right) =$$

C) Divide the following:

$$\frac{3}{7} \div \frac{3}{7} = \_\_\_\_\_$$

B) (With different denominators) Rough Work

1) Add the following:

i) $\frac{1}{4} + \frac{1}{3} =$

ii) $\frac{2}{5} + \frac{3}{4} =$

iii) $\left(\frac{-2}{3}\right) + \frac{1}{4} =$

2) Subtract the following:

$$\left(\frac{-1}{5}\right) - \left(\frac{-1}{6}\right) =$$

3) Divide the following:

$$\frac{3}{5} \div \frac{6}{7} =$$

IV. TEST OF MONOMIAL – BINOMIAL MULTIPLICATION Rough Work
Multiply the following:

i) $a(x + 1)$

ii) $(a + b)2c$

iii) $(3x + y)\, z$

iv) $a(b + c)$

v) $(2x + 3y)\, 3r$

vi) $x(y - z)$

V. TEST OF BINOMIAL – BINOMIAL MULTIPLICATION
Multiply the following:

i) $(x + 1)\,(x + 1)$

ii) $(a + b)\,(a + b)$

iii) $(2a + 1)\,(3a + 1)$

iv) $(3y - x)\,(2y + x)$

VI. TEST OF INDICES
(With integer as base)

A) 1) Multiply using indices:

i) $1^3 \times 1^2 = 1(\quad) =$ _____

ii) $2^5 \times 2^5 \times 2^5 = 2^{(\quad)}$

iii) $3 \times 3 \times 3 \times 3 \times 3 \times 3 = 3^{(\quad)}$

iv) $5 \times 5 \times 5 =$ _____

v) $(-1) \times (-1) =$ _____

vi) $3^{(-2)} \times 3^{(-2)} = (\qquad)^{(\quad)}$

vii) $(-4) \times (-4) \times (-4) \times (-4) = (\qquad)^{(\quad)}$

2) $2^6 =$ _____ (Write in expanded form)

3) Pick out the base in the following

4^5 , 7^3 , 2^6 , 10^4

4) $(2^3)^4 = 2^{(\ \ )}$

5) Give three examples of odd integers

B) (With variable as base) Rough Work
Multiply using indices

i) $a \times a = a^{(\ \ )}$

ii) $a \times a \times a \times ab = a^{(\ \ )}\, b^{(\ \ )}$

iii) $xy \times xy = (xy)^{(\ \ )}$

iv) $(xy)^2 = x^{(\ \ )}\, y^{(\ \ )}$

v) $xy \times yz = xz =$

vi) $b^2 \times b^3 \times b^4 = b^{(\ \ )}$

vii) $\left[\frac{a}{b}\right]^2 = \frac{a^{(\ \ )}}{b^{(\ \ )}}$

viii) $\frac{X^4}{Y^4} = \left[\frac{x}{y}\right]^{(\ \ )}$

ix) $a^2 b^2 c^2 = (\quad)^{(\ \ )}$

x) $2a \times a = (\quad)^{(\ \ )}$

xi) $c \times c \times 2c = (\quad)^{(\ \ )}$

C) (With rational base)

1) Multiply using indices:

i) $\frac{1}{5} \times \frac{1}{5} \times \frac{1}{5} \times \frac{1}{5} =$ _____

ii) $\left[\frac{-2}{5}\right] \times \left[\frac{-2}{5}\right] = (\quad)^{(\ \ )}$

iii) $\left[\frac{2}{3}\right]^4 \times \left[\frac{2}{3}\right]^5 = (\quad)^{(\ \ )}$

2) Fill in the blanks:

i) $\left(\frac{-1}{4}\right)^3 =$ _____ ii) $\left(\frac{1}{3}\right)^2 =$ _____

iii) $\frac{1}{2^3} = 2^{(\ )}$ iv) $\frac{3^5}{4^5} =$ _____

v) $\left(\frac{4^2}{3^2}\right)^5 = \left(\frac{4}{3}\right)^{(\ )}$

VII. TEST OF BRACKET EXPANSION:
Expand the following:

i) $(a + b)^2$

ii) $(x + 1)^2$

iii) $(a + b)^3$

iv) $(x + 2)^3$

VIII. TEST OF LINEAR EQUATIONS:
Fill in the blanks:

i) If $x + 1 = 0$ then $x =$ _____

ii) If $a = (-2)$ then $a + 2 =$ _____ $+ 2$

iii) Put '2' in place of 'x' in $x + 3$ $\therefore$ $x + 3 =$ _____ $+ 3$

iv) Find Value when

a) $y = 2$ b) $y = -1$ c) $y = 0$
$\therefore$ $y + 2 =$ _____ $+ 2$

v) If $3 - x = 0$, then $x =$ _____

vi) Put '(-1)' in place of 'b' in $1 + b$
$\therefore$ $1 + b = 1 +$ _____

vii) Find value when
a) $d = (-3)$ b) $d = (-4)$
In $d - 2$ and $3 + d$ $\therefore$ $d - 2$ _____ $- 2$
$\therefore$ $3 + d = 3 +$ _____

viii) If $2x = 1$ then $x =$ _____

ix) If $a + 1 = 2$ then $a =$ _____

x) If $2 + 3b = 8$ then $b =$ _____

Rough work

IX. TEST OF RATIONAL NUMBERS:

i) Give one example of positive rational number

ii) Give one example of negative rational number

iii) Which are the numerators in the following.

$\frac{6}{7}$, $\frac{12}{5}$, $\frac{11}{13}$, $\frac{2}{9}$, $\frac{5}{12}$

iv) $\frac{3}{4} \times \frac{2}{2} =$ _____

v) Pick out the rational numbers from the following:
Put a ' ◯ ' around it, like this (2)

5, $\frac{-1}{4}$, $\frac{7}{9}$, 64 , -10 , $\frac{-2}{5}$, -3 , $\frac{6}{11}$