	HSC 1ST YEAR	UNE I	MATHEMATICS		TOTAL:- 50
			Basic Algebra SECTION A		
	Note:- Solution for One v Choose the correc	vords is must. • t answer:-			10 x 1 = 10
1)	The simplest form of	f $\sqrt{50}$ is			
	(A) 5√10	(B) 5√2	(C) 10√5	(D) 25√2	
2)	$\sqrt[4]{11}$ is equal to				
-	(A) $\sqrt[8]{11^2}$	(B) $\sqrt[8]{11^4}$	(C) $\sqrt[8]{11^8}$	(D) $\sqrt[8]{11^6}$	
3)	$\frac{2}{\sqrt{2}}$ is equal to (A) $2\sqrt{2}$	(B) √2	(C) $\frac{\sqrt{2}}{2}$	(D) 2	
4)	The ratioanlising fac	tor of $\frac{5}{\sqrt[3]{3}}$ is	-		
	(A) $\sqrt[3]{6}$	(B) $\sqrt[3]{3}$	(C) ³ √9	(D) ³ √27	
5)	Which one of the following is not true?				
	(A) $\sqrt{2}$ is an irrational number				
	(B) $\sqrt{17}$ is a irrational number				
	(C) 0.10110011100011110 is an irrational number				
	(D) $\sqrt[4]{16}$ is an irrational number				
6)	Given that x, y and $b = (1)$ $xb < yb$	are real numbers x (2) $xb > yb$	x < y, b > 0, then (3) $xb \le yb$	$(4) \frac{x}{b} \ge \frac{y}{b}$	
7)	If $\frac{ x-2 }{x-2} \ge 0$, then x belongs to				
	(1) $[2,\infty)$	(2) $(2,\infty)$	(3) $(-\infty, 2)$	(4) $(-2,\infty)$	
8)	The solution of $5x - (1, 5)$	1 < 24 and 5x +	1 > -24 is		
	(1) $(4,5)$	(2) $(-5, -4)$	(3) (-5,5)	(4) $(-5,4)$	
9)	The solution set of the (1) $[0, 2]$	e following inequation (2) $[2, \infty)$	ality $ x - 1 \ge x - 3 $ is	(4) (
10)	(1) $[0, 2]$	(2) $[2,\infty)$	(3) $(0,2)$	(4) $(-\infty, 2)$	
10)	Find a so that the sum and product of the roots of the equation $2x^2 + (a-3)x + 3a - 5 = 0$ are equal is				
	(1) 1	(2) 2	(3) 0	(4) 4	

SECTION B

Answer any 5 of the following (Question no 11 is compulsory):-

5 x 2 = 10

11)Prove that $\sqrt{3}$ is an irrational number.

12) Find all pairs of consecutive odd natural numbers both of which are larger than 10 and their sum is less than 40.

13)Find the real roots of $x^4 = 16$.

14) Resolve into partial fractions

actions
$$\frac{1}{(x+3)(x-4)}$$
.

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15)Find the roots of the equation of the polynomial equation $(x-1)^3 (x+1)^3 (x+5) = 0$ and state their multiplicity.

16) If the logarithm of 324 to base a is 4, then find a.

SECTION C

Answer any 5 of the following (Question no 21 is compulsory):- $5 \times 3 = 15$

17) Solve $2|x+1| - 6 \le$ and graph the solution set in a number line.

18)A model rocket is launched from the ground. The height h reached by the rocket after t seconds from lift off is given by $h(t) = -5t^2 + 100t$, $0 \le t \le 20$. At what time the rocket is 495 feet above the ground ?

19)Find the number of solution of $x^2 + |x - 1| = 1$.

20)Solve
$$\frac{x+1}{x+3} < 3$$
.

Answer the following:-

21)Determine the region in the plane determined by the equalities.

 $2x + 3y \le 6$; $x + 4y \le 4$: $x \ge 0$ and $y \ge 0$.

22) if x =
$$\sqrt{2} + \sqrt{3} find \frac{x^2 + 1}{x^2 - 2}$$
.

SECTION D

 $3 \times 5 = 15$

1) If
$$\frac{\log x}{y-z} = \frac{\log y}{z-x} = \frac{\log z}{x-y}$$
, then prove that $xyz = 1$

Or

ReSolve $\frac{6x^2 - x + 1}{x^3 + x^2 + x + 1}$ into Partial fraction and support your answer with verification.

2)Use the method of undetermined coefficients to find the sum of $1 + 2 + 3 + ..., n, n \in N$.

Or

Solve $2x^2 + x - 15 \le 0$. 3) If one root of $k(x-1)^2 = 5x - 7$ is double the other root. Show that k = 2 or -25. Or

Find the number of digits in $2^8 3^{12} \{ log_{10}2 = 0.30103 \text{ and } log_{10}3 = 0.47712 \}.$