

MUHANGA DISTRICT

MATHEMATICS MARKING GUIDE S₃

①

SECTION A (Attempt All Questions)

① (a) F

(b) F

(c) T

(d) T

(e) T

② (i) T

(ii) T

(iii) T

(iv) F

③ C $x = 7$

④ (d) $\{(1,1)\}$

⑤ C $x \notin \{-3, 0, 3\}, E = \frac{1}{2}$

⑥ B: $4y + 5x = 60$

⑦ (iii) 4, 8 60 frw

⑧ (i) C: 4 (iv) D: 0.7

(ii) A: 2

(iii) C: 14

⑨ B: 1005.44 cm^3

⑩ B: 15.87 cm

⑪ C: $\frac{-85 - 7\sqrt{143}}{2}$

⑫ i) $x = -5$ and $y = 9$

(iii) $\sqrt{16}$

⑬

$x = -4, x = -3$

D) $x = \{-4, -3\}$

⑭ B: 61,586

⑮ B: $\frac{1}{24}$

SECTION B (Attempt only 3 Questions)

16 a) $95\% \text{ of } p = 1900$

$0.95p = 1900$

$p = \frac{1900}{0.95}$

$p = 2,000$

$$16) b) A = P \left(1 + \frac{r}{100}\right)^{nt}$$

$$A = 30,000 \left(1 + \frac{0.06}{2}\right)^{2 \times 3}$$

$$A = \underline{\underline{35,821.56}} \text{ Rs}$$

(c)	P	M	d
	6	40320	7
	8	x	3

$$\frac{7}{3} = \frac{40320 \times 8}{x \times 6}$$

$$x = \frac{40320 \times 8 \times 3}{7 \times 6}$$

$$\boxed{x = 23040}$$

$$17) f(-2) = 0$$

$$a(-2)^3 + a(-2)^2 + b(-2) + 12 = 0$$

$$\boxed{-4a - 2b = -12} \quad (1)$$

$$\boxed{-2a - b = -6} \quad (2)$$

$$f(3) = 0$$

$$a(3)^3 + a(3)^2 + b(3) + 12 = 0$$

$$27a + 9a + 3b + 12 = 0$$

$$\boxed{36a + 3b = -12}$$

$$\boxed{12a + b = -4}$$

$$\begin{cases} 2a + b = 6 & \times -1 \\ 12a + b = -4 & \times 1 \end{cases}$$

$$+ \begin{cases} -2a - b = -6 \\ 12a + b = -4 \end{cases}$$

$$10a = -10$$

$$a = -10/10$$

$$\boxed{a = -1}$$

$$\boxed{b = 8}$$

$$b) \text{ Degree of function is } \underline{\underline{3}}$$

$$(c) f(x) = 0$$

$$f(x) = -x^3 - x^2 + 8x + 12$$

$$-(x^3 + x^2 - 8x - 12)$$

$$-(x+2)(x-3)(x+2)$$

$$(x+2)^2(x-3) = 0$$

$$x = -2, x = -2, x = 3$$

or

-1	-1	8	12
	2	-2	-12
-1	1	6	0

$$(x+2)(-x^2 + x + 6) = 0$$

$$(x+2)(x^2 - x - 6) = 0$$

$$(x+2)(x+2)(x-3) = 0$$

$$x = -2, -2, 3$$

$$18) (a) \text{ complete frequency table}$$

heights	mid-heights	f	fx	cum.f
---	---	-	-	-
---	---	-	-	-
---	---	-	-	-
		$\Sigma f = 50$	$\Sigma fx = 13470$	

$$(b) \text{ Modal class } 175 - 179 \text{ because it has highest frequency}$$

$$(c) \text{ Mean} = \frac{\Sigma fx}{\Sigma f} = \frac{13470}{50} = \underline{\underline{269.4}}$$

$$(d) \text{ Median} = L + \left(\frac{\frac{N}{2} - cfb}{f_m}\right) \times i$$

$$= 169.5 + \left(\frac{\frac{50}{2} - 21}{9}\right) \times 5 = \underline{\underline{171.5}}$$

19) a) $a^2 + b^2 = c^2$
 $(x)^2 + (x+8)^2 = (10)^2$
 $x^2 + x^2 + 4x + 4 = 100$
 $2x^2 + 4x - 96 = 0$
 $x^2 + 2x - 48 = 0$
 $(x+8)(x-6) = 0$
 $x = -8 \text{ or } x = 6$

b) $p = s + s + s$

$p = (6 + 8 + 10) = 24 \text{ cm}$

c) $A = \frac{B \times h}{2} = \frac{6 \times 8}{2} = 24 \text{ cm}^2$

(d) $\tan \theta = \frac{\text{opp}}{\text{adj}}$ | $\theta = \tan^{-1}\left(\frac{6}{8}\right)$
 $\tan \theta = \frac{6}{8}$ | $\theta = \underline{\underline{36.9^\circ}}$

20) $A = (-1, 2)$ $B(1, 5)$ $C(3, 4)$

a) $A'(2, -1)$ $B'(5, 1)$ $C'(4, 3)$

(b) $A''(-2, 1)$ $B''(-5, -1)$ $C''(-4, -3)$

(c) $A'''(-1, -2)$ $B'''(1, -5)$ $C'''(3, -4)$

