

SECTION 1 - NON CALCULATOR

- ①  $2^3 + 3^2 = 8 + 9 = 17$
- ②  $10x - 2x = 8x$
- ③  $2 - \frac{1}{3} = \frac{6}{3} - \frac{1}{3} = \frac{5}{3}$  or  $1\frac{2}{3}$
- ④ Butter needed =  $3 \times 250g = 750g$
- ⑤  $27^{\frac{1}{3}} = \sqrt[3]{27} = 3$
- ⑥  $0.12 - 0.1 = 0.12 - 0.10 = 0.02$
- ⑦ Side length =  $96cm \div 3 = 32cm$
- ⑧ C is the point (6, 5)
- ⑨  $\frac{2}{5}$  hrs =  $\frac{2}{5} \times 60$  min = 24 min
- ⑩  $\square + \Delta = 9; \therefore \square = 5, \Delta = 4$  (say)
- ⑪  $20\% = 40 \therefore 100\% = 5 \times 40 = 200$
- ⑫ Mean =  $\frac{9+9+12+15+20}{5} = \frac{65}{5} = 13$
- ⑬ Curved part =  $89m - (5+18+26)m = 40m$
- ⑭  $d = 3cm \times 10^6 = 3 \times 10^6 \div 10^5 km = 30 km$
- ⑮  $(8 \times 10^5) \div (2 \times 10^3) = 4 \times 10^2 = 400$
- ⑯ Relative size of MP3 players are not in proportion to sales.
- ⑰  $a \times a = a^2$  whilst  $2a = 2 \times a$
- ⑱ Decrease =  $\frac{15}{20} \times 100\% = 75\%$
- ⑲  $10 + ak = 10 + 7 \times (2) = 10 + 14 = 24$
- ⑳ Difference =  $[(5 \times 7) - (3 \times 3)] - [(3 \times 7) - (5 \times 3)]$   
 $= (35 - 9) - (21 - 15) = 26 - 6 = 20$
- ㉑  $\frac{1}{2} BD \times 8 = 48 \therefore BD = \frac{48 \times 2}{8} = 12 cm$
- ㉒  $\frac{x+4}{2} = 1$  and  $\frac{y+(-3)}{2} = 1$   
 $\therefore x = -2$  and  $y = 5 \therefore A$  is  $(-2, 5)$
- ㉓  $\sin \theta = \frac{x}{15} = \frac{4}{5} \therefore x = \frac{4 \times 15}{5} = 12$
- ㉔ Three prime factors are 2, 3 & 5
- ㉕ Geometrical instruments required to construct isosceles  $\triangle ABC$  where  $AB = CA$  and  $\hat{C} = 35^\circ$

SECTION 2 - PART A

- 26 Shaded angle is  $360^\circ - (140 + 130)^\circ = 90^\circ$   
 $\therefore$  It is right (D)
- 27 Rule is  $y = 4x - 1 \therefore$  (B)
- 28 Charges =  $22c + 15c \times 6 = \$1.12$  (D)
- 29 BD is a diagonal  $\therefore$  (B)
- 30  $m + m + m - n + n = 3m \therefore$  (D)
- 31 Age =  $2017 - 1961 = 56 \therefore$  (C)
- 32 Most = 159; least = 113  
 Difference =  $159 - 113 = 46 \therefore$  (D)
- 33 Value in 32 is range  $\therefore$  (A)
- 34  $P(3) = \frac{2}{6} = \frac{1}{3} \therefore$  (C)
- 35 Scale factor =  $\frac{3}{6} = \frac{1}{2} \therefore$  (A)
- 36 O/T pay =  $2 \times 1.5 \times \$18 = \$54 \therefore$  (D)
- 37  $2 \div 8 = 2 \times \frac{1}{8} \therefore$  (B)
- 38  $P(\text{Not 5}) = \frac{9}{10} \therefore$  (A)
- 39  $x > 3$  is  $\xrightarrow{3}$   $\therefore$  (A)
- 40  $5x^2 + 8 = 5 \times 1 + 8 = 13 \therefore$  (D)
- 41 Tai rec'd  $\frac{4}{9} \times 108$  messages = 48  $\therefore$  (C)
- 42  $A = \frac{1}{2} \times 8 \times 15 = 60 cm^2 \therefore$  (B)
- 43  $l = 2\pi r = 2 \times \pi \times 7 \approx 44 cm \therefore$  (C)
- 44 Graph of  $y = x^2 + 2$  is (A)
- 45  $A = (200 \times 300) cm^2 = 60000 cm^2$  (D)
- 46 Boys : Girls =  $15 : 20 = 3 : 4 \therefore$  (A)
- 47  $P(\text{Comedy}) = \frac{15}{40} = \frac{3}{8} \therefore$  (B)
- 48  $6z + 15 = 3(2z + 5) \therefore$  (D)
- 49  $A = \frac{1}{2} \times h(a+b) = \frac{1}{2} \times 4(9+6) \therefore$  (B)
- 50  $E = (\frac{1+7}{2}, \frac{5+1}{2}) = (4, 3) \therefore$  (A)
- 51 Difference =  $-7.6 - (-11) = -7.6 + 11$   
 $= 11 - 7.6 = 3.4 \therefore$  (B)
- 52  $BC = (10 - 6) cm = 4 cm \therefore$  (A)
- 53 Finishing Time =  $10:30 am + 2hrs 18min$   
 $= 12:48 pm \therefore$  (C)

- 54 Parallel lines in diagram is (B)  
 (Vert. Opp. L's & Supp. Co-interior L's)
- 55  $x = 360 - (115 + 80 + 70) = 95^\circ \therefore$  (C)
- 56 Greatest perimeter is shape (A)
- 57  $c = \sqrt{a^2 + b^2} = \sqrt{1^2 + 2^2} = \sqrt{5} \therefore$  (D)
- 58 Median score is 3.5  $\therefore$  (B)
- 59 Increase =  $\frac{80}{20} \times 100\% = 400\% \therefore$  (C)
- 60 No. of grains =  $5 \times 10^8 \times 6 \times 10^4$   
 $= 3 \times 10^{13} \therefore$  (A)
- 61 Net Pay =  $\frac{65}{100} \times 68720 \times \frac{1}{12} = \$3722 \therefore$  (C)
- 62 Volume =  $LBH = 6 \times 2 \times 3 = 36 cm^3 \therefore$  (A)
- 63 Time taken =  $(3 \text{ min } 10 \text{ sec}) \times 10 = 31 \text{ min } 40 \text{ sec} \therefore$  (C)
- 64 GST (per GST) =  $\frac{22}{110} \times 100 = \$20 \therefore$  (C)
- 65  $y = mx + b$  where  $m = \frac{1}{2}$  and  $b = 2$   
 $\therefore$  Eqn of line is  $y = \frac{1}{2}x + 2 \therefore$  (A)
- 66  $\tan 35^\circ = \frac{20}{BC}$   
 $\therefore BC = \frac{20}{\tan 35^\circ} = 29.6 m$  (1 dp)  $\therefore$  (D)
- 67 SA =  $2(15 \times 2 + 10 \times 2 + 15 \times 10) = 400 cm^2$  (A)
- 68  $2x - 3 = 15 \therefore x = \frac{15+3}{2} = 9 \therefore$  (C)
- 69 Total Wage =  $(40 \times 8.75) + (3 \times 1.5 \times 8.75)$   
 $+ (4 \times 2 \times 8.75) = \$497.38 \therefore$  (C)
- 70 Mean =  $\frac{(3 \times 7) + (2 \times 12)}{5} = \frac{45}{5} = 9 \therefore$  (B)
- 71  $x = 180 - \frac{180 - 40}{2} = 180 - 70 = 110 \therefore$  (B)
- 72 In Square,  $\hat{T} = (x+3) + 5 = x + 8 \therefore$  (A)
- 73  $\frac{4x}{5} + \frac{x}{3} = \frac{3 \times 4x + 5 \times x}{15} = \frac{17x}{15} \therefore$  (C)
- 74 Correct statement is (B)  
 (Parallelogram - diagonal bisect each other)
- 75  $x = 180 - (2 \times 25) = 130 \therefore$  (A)  
 (Alternate L's equal & Angle sum of  $\triangle$ )

76 (a), (b) & (c) are correct.  
(d) is incorrect.

77 (a), (c) & (d) are correct.  
(b) is incorrect.

78 (a) & (d) are correct.  
(b) & (c) are incorrect

79 (a) & (d) are correct.  
(b) & (c) are incorrect.

80 (b) & (d) are correct.  
(a) & (c) are incorrect.

SECTION 2 PART B

81 (a) (i)  $P = 2w + 2l \therefore l = \frac{P-2w}{2}$   
∴  $l = \frac{28-2 \times 5}{2} = 9m$

(ii)  $A = l \times w = 9 \times 5 = 45m^2$

(iii)  $P = 2w + 2l \therefore w = \frac{P-2l}{2}$   
∴  $w = \frac{28-2 \times 10}{2} = 4m$

(b)  $P = 4s$  when  $s =$  side length  
∴  $28 = 4s \Rightarrow s = \frac{28}{4} = 7m$   
 $A = s^2 = 7^2 = 49m^2$

∴ Fertiliser needed =  $49 \times 90g$   
 $= 4410g$  or  $4.41kg$

82 (a) (i)  $A = \pi r^2 = \pi \times 16^2$   
 $= 804 cm^2$  (to nearest  $cm^2$ )

(ii) New Area =  $\pi \times 18^2 = 324\pi cm^2$

Previous Area =  $\pi \times 16^2 = 256\pi cm^2$

Increase in Area =  $324\pi - 256\pi$   
 $= 68\pi$

Percentage increase in A =  $\frac{68\pi}{256\pi} \times 100\%$   
 $= 26.5625\%$

(b)  $4P + d = 62$  and  $2P + d = 34$  ① ②

① - ②  $\Rightarrow 2P = 28 \therefore P = \frac{28}{2} = 14$

Sub  $P=14$  in ②  $28 + d = 34$   
∴  $d = 34 - 28 = \$6$  (del. charge)

83 (a) ABCD is a kite

(b)  $P = 2(7+24) = 62 cm$

(c) (i)  $A_{\text{area of } \Delta ABC} = \frac{1}{2} \times 24 \times 7 = 84 cm^2$

(ii)  $AC^2 = 7^2 + 24^2 = 625$   
∴  $AC = \sqrt{625} = 25 cm$

Area of ABCD =  $2 \times 84 = 168 cm^2$

∴  $\frac{1}{2} (BD \times 25) = 168$

∴  $BD = (2 \times 168) \div 25 = 13.44 cm$

84 (a) when  $g = 10, t = 1.3 + 0.3 \times 9 = 4$

(b)  $t = g \times 0.3 + 1$

(c)  $t = g \times 0.3 + 1$

If  $t = 6$  then by substitution we get  
 $6 = 0.3g + 1$

∴  $g = \frac{(6-1)}{0.3} = 16.6$

Since  $g$  is not an integer,  
then there cannot be a gear  
that gives exactly 6 teeth  
wheel turns.