

Section-1 Medium

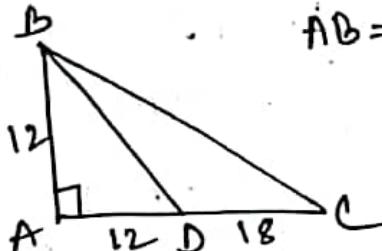
1. According to question,  $x = (13y+7)$

and  $(13y+7)^\vee$  should be greater than 2512

$\therefore 2512 \approx 2500 \approx (50)^\vee \therefore 13y+7$  will be any value greater than 50. So, lowest value of  $x$  will be  $13 \times 4 + 7 = 59$ .

∴ Answer will be  A.

2.  $AB = 12, AC = 30 \quad AD = \frac{2}{5} AC = \frac{2}{5} \times 30 = 12$



$$\therefore AD = 12$$

$$\therefore AB = AD \therefore \angle ABD = \angle ADB = 45^\circ$$

$$\therefore \angle BDC = 135^\circ$$

∴ Answer  A

CareENG

3. Let,  $a_1 = n, n = n+1, b = n+2$

$$\therefore \frac{a_1 s}{n} = \frac{n(n+2)}{n+1}$$

$$= \frac{n^2 + 2n}{n+1}$$

$$\left| \begin{aligned} n - \frac{1}{n} &= n+1 - \frac{1}{n+1} \\ &= \frac{n^2 + 2n + 1 - 1}{n+1} \\ &= \frac{n+1}{n+1} \end{aligned} \right.$$

∴ Answer  C

4.  $\frac{\text{Q. A}}{\text{Total Possibility}} \rightarrow 06, 16, 26, \dots, 86 = 09 \quad \therefore \text{Probability} = \frac{09}{87}$

$$\frac{\text{Q. B}}{\text{Total possibility}} \rightarrow 60, 61, 62, \dots, 68, 69 = 10 \quad \therefore \text{Probability} = \frac{10}{87}$$

∴ Answer  B

5. Only integers - 4011 4012, 402 Mathsd (all) - 4016 Primitive on negativ  
41 4017-4018, 4019, 4020, 4021 (4017-4021) D  
- 4016 Primitive 4017-4021 Ann 4016 Neg. 2015 4016

6.  . କ୍ଷିଳ୍ପ କୁଣ୍ଡଳ ବିଶ୍ୱାସ ରୀତ୍ୟା ବାହେ ନା । କୁଣ୍ଡଳ ଆଏ ଏହି କ୍ଷିଳ୍ପ ଚିତ୍ରନା ମୁଖ୍ୟାଙ୍ଗ ଦର୍ଶକ ହେଉଛି । କୁଣ୍ଡଳ ଅପରେ ମାତ୍ରମେ ଉଚ୍ଚ ଅଧିକ ଦୈର୍ଘ୍ୟରେ ଉପରେ ଉଚ୍ଚ ଅଧିକ ଦୈର୍ଘ୍ୟରେ ଉଚ୍ଚ ଅଧିକ ଦୈର୍ଘ୍ୟରେ

T. Region,  $\frac{1}{2}$  ft<sup>2</sup>. Individual area (एक व्यक्ति का क्षेत्र), - Answer [D]

प्रावित, Region A मध्ये 100 दुपारांमध्ये 7% एवढे 17% CareEng

∴ Combined Percentage  $\% = \frac{28}{200} \times 100 = 14\%$ . then Answer C

କୋର୍ପ୍, ଫେଜିମ ଓ ଫାର୍ମ ହାତରେ ଦେଖାଯାଇଛନ୍ତି । ୧୮୮୦ ମୁହଁନାଟିରେ

$$\therefore \text{Combined Percentage } \frac{22.5}{150} \times 100 = 15\% \quad \text{Answer A}$$

ତାହାର Shortest ଏ-ମେଲ୍ Compare କିମ୍ବା ଫୁଲି ଛାନ୍ତିମୁଖୀ. Original measurement  
ରୀ ପ୍ରକଳ୍ପ ଯାଏ ତଥାପି-Answer ଦେଇଲେ ହୁଏ **D**.

8.  $\text{O}(\text{A} \times \text{B})$  and  $C \subset \text{A}$ , both positive (acc. loc.)

Q:  $A \rightarrow a^{c-d}$  अर्थात्  $a^{-1} = \frac{1}{a}$   
 Q:  $B \rightarrow b^{d-c}$  अर्थात्  $b^1 = b$ .  
 मिला  $a < b < 1 \therefore$  Answer [A]

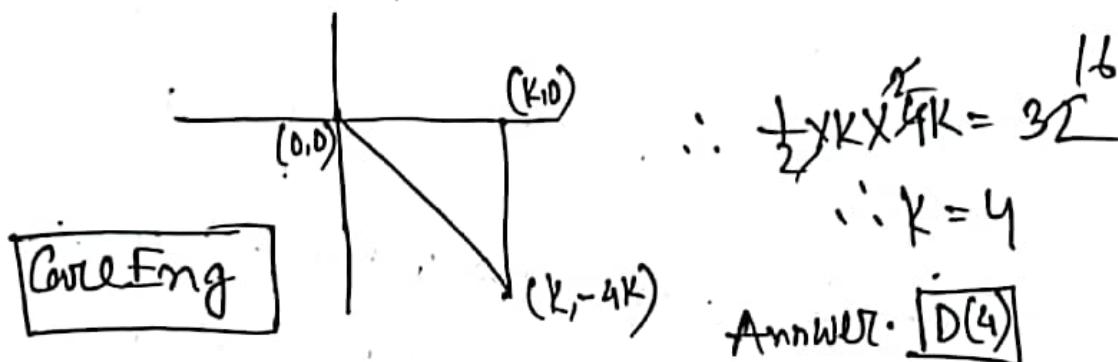
9. Total 10 ft Number of (2) 90%. What is 10th Number of (2) 90%  
Answer  $\boxed{105}$  E

$$10. n = 5^r = (-1)^r = f^6 = (u^4)^6 = b^{24} \text{ - Ans. } \boxed{B(24)} E$$

11. According to question, - total sell,  $1285 \times \frac{3}{2} = 1927.5$

$$2x + k + \frac{1}{2}k = \frac{3}{2}(k) \rightarrow 1285$$

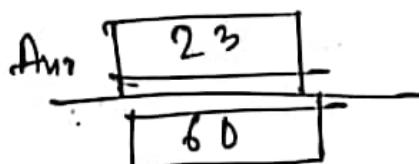
12. Draw according to Question,



$$13. \text{One Car} = 740, \text{Two Cars (at least)} = 1800 \times \frac{1}{3} = 600$$

$$\text{Greatest possible value of no Cars} = 1800 - (740 + 600)$$

$$\therefore \text{Ratio} = \frac{600}{600} = \frac{23}{60} = 460$$



14. Diagram - ജപ്പാൻ മാനുസ്കരണ രഹസ്യം ആശാനി വരുത്താം  
എൻ അപാര അക്കൗൺട്ടിങ്ച് സർവ്വേ ഓഫ് ഇന്ത്യ  
രഹസ്യം :

1998 സാമ്ന് China റൂപ കോറോൺ കുഴച്ച നാലു  
(68-46) ദശാംശം 22 dozen. dozen =  $22 \times 12 = 264$  million

Ans.  $\boxed{B(264)}$

$$15. \text{Acc. to Ques. } \frac{43}{9} = \frac{x}{3} \therefore x \approx 14$$

[Let,  $x$  = last three month imported quantity].  $\therefore$  total =  $14 + 43 = 57$  million of dozen

Ans.  $\boxed{57}$

$$16. \frac{54}{22} = \frac{27}{11} \approx \frac{2.5}{1.0} = \boxed{5} \quad \therefore 5 \text{ to } 2$$

$c(5:2)$

Ex. 102) Different integers - अंक, तथा उनके योग -

$$1+2+3+4+5+6+7+8+9 = 45$$

$$\therefore \text{Maximum Integer} = 101 - 245 = \boxed{56}$$

Ans. 5b CareEng

Q8: Cumulative frequency  $\Rightarrow$  4, 10, 29, 37, 43, 45, 47

$\therefore$  median = 24 which falls in 3<sup>rd</sup> value group, which is 17  
Ans.  $Q \rightarrow 17$

10. + 7% price d

$$\therefore \frac{d}{t} (1+2500) = \boxed{\frac{dt+2500d}{t}}$$

Ann:

20.  $\frac{2}{3}$  beam add ২৫% মাত্র একাদশ ক্ষেত্র অংশ (ইন্সেপ্ট) ।  
 ১৬.৫০. (৫৫ টাকা ০৩) - প্রতিশত ক্ষেত্রের value-ক্ষেত্রের গড় average change হয়ে (২-৫০) - বলা যাবে কি? [২]  
 তাৰ একাদশ median = ৫০. - ক্ষেত্র গড়ের গড় ৭২.৫০  
 ক্ষেত্রের ক্ষেত্র মোট ২০. - Answer E

## Section-4-Medium

1.  $y-x=1 \therefore (x-y)=-1$  Now,  $5^y/5^x = 5^{y-x} = 5^{-1} = \frac{1}{5}$  Ans. C

2. Let Dia of largest circle = D  $\therefore D = d_1 + d_2 + d_3 + d_4 + d_5$

$$\begin{aligned}\text{Circumference of smaller circles} &= \pi d_1 + \pi d_2 + \pi d_3 + \pi d_4 + \pi d_5 \\ &= \pi(d_1 + d_2 + d_3 + d_4 + d_5) \\ &= \pi D \rightarrow \text{Circ. of largest circle}\end{aligned}$$

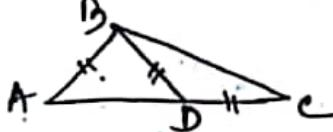
Answer C

3.  $x \geq 0$ . Value  $\pi - 2$  (प्राचीन त्रिकोण 'x-3')  $\geq 0$  if always positive  $\forall x$   
from  $x \geq 3$   $\Rightarrow x-3$  always negative.

∴ Answer B

Core Eng

4. Can't determine. Say,  $\frac{2D}{5} = 4$ ,  $\frac{2D}{5} = 5$  Both  $n=k$  but are differ.

5.   $\angle ABD = 80^\circ$ ,  $AB = BD$  so,  $\angle BAD = \angle BDC = 50^\circ$   
 $\angle BDC = 180^\circ - 50^\circ = 130^\circ \therefore \angle DBC = \angle DCB = 25^\circ$

Answer. B

6.  $x^1 y^1 > 0$  or,  $\frac{1}{xy} > 0$  So, Both x, y will same sign and between  
x & y which one is greater can't identify.

So ans will be D Answer. D

7. Let Machine worth was 100 a year ago. So present worth 80  
According to question,  $100 = 0.8$  (Value two years ago's worth)

$\therefore$  Worth of machine at two years ago =  $125 \rightarrow (125 \times 0.8)$

$\therefore$  percentage of worth less than two years ago is  $= \frac{45 \times 100}{125} = 36$

∴ Answer. B

[सहज मत्त्वे] x का Percentage तरंगे का (वृद्धि) Value

-तरंगे का अपना उपर्युक्त उत्तर दो D. जैसे 100 से 125 (25%)

उत्तर जैसे उत्तर 22.5 (मै. 100-45. अर्थ 55%)

Percentage =  $(\frac{\text{उत्तर}}{\text{पूर्ण उत्तर}} \times 100) \%$ , Value =  $\frac{\text{उत्तर}}{\text{पूर्ण उत्तर}} \times \text{पूर्ण उत्तर}$

Ques. A

$$\frac{100!}{99!} \rightarrow \frac{100 \times 99!}{99!} = 100;$$

Ques. B

$$\frac{100! - 99!}{98!} = \frac{100 \cdot 99! - 99!}{98!} = \frac{99!(100 \cdot 99 - 1)}{98!} = 99 \times 99$$

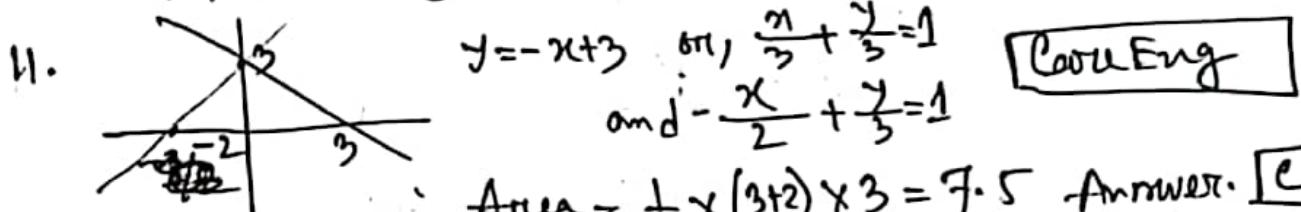
Answer [B]

$$9 \cdot 3 \text{ qv}, 1 \text{ P}, 1.5 \text{ C} = 3 \times 2 \times 2 \times 8 + 1 \times 2 \times 8 + 1.5 \times 8 = 124 / 12 \\ = 10.34 \\ \approx 10$$

Answer [C]

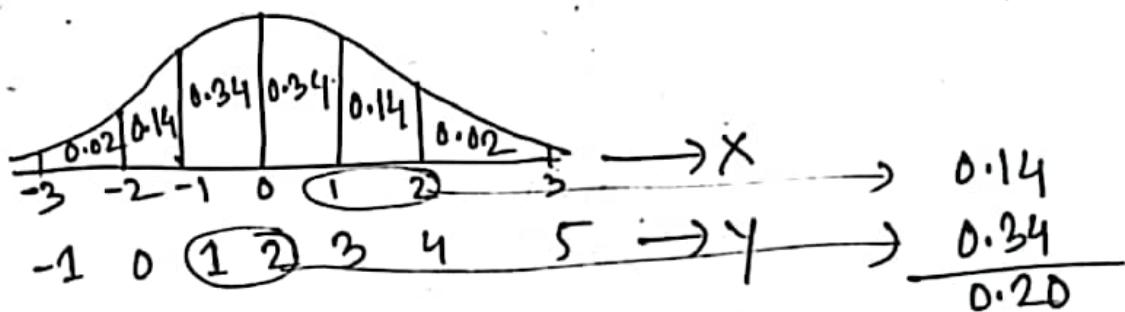
10.  $\frac{2+n+y+7}{4} = 3 \therefore n+y = 3 \text{ in integers so they will be } 182$

$\therefore$  Median (1, 2, 2, 7) will be 2. Answer [B]



Co-ord Eng

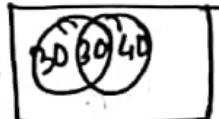
12.



Answer. [D]

13.  $100 = 60 + 70 - \text{Both}$

$\therefore \text{Both} = 30$



14. Serial नंगामी Customer ≠ No. 2nd Counter 1-7.

⇒ NO customer को service प्राप्त करते हैं Counter-2

⇒ 8 NO customer को service प्राप्त करते हैं 9 NO customer  
अपर 1 को Counter-1 ⇒ 10 NO customer करते हैं 1

Answer [E]

15. From graph it is clear that Customer 1b has no jobs.

Answer: E

16. Service-time for Customer 15 = 2 min  
and  $n = 15$   $\therefore \text{Range} = 9 - 2 = 7$

Answer: C

17.  $\frac{1}{12^{14}} \times 12 = \frac{3}{12^3 \times 12} = \frac{4}{(12^3)^2 \times 12} = \frac{5}{(12^3)^3 \times 12}$   
 $\therefore 12^{14+1} = 12^{15} = 12^3 \therefore n = 15$

Answer: 15

18.  $a \square b = a + 3b + 1$   
 $\therefore c \square c = c + 3c + 6$  or,  $-3c = 6 \therefore c = -2$

Answer: B

Care Eng

19. 15 feet contrn  $\frac{\pi(5)^2}{4}$ .

Now,  $\frac{\frac{\pi(5)^2}{4} \times 250 \times \frac{\pi}{4} \times 9}{\frac{\pi}{4} \times 5^2} = \boxed{810}$  from formula

Ans: B

20. According to question,  $\frac{150000+x}{70000+x} = 1.2$   
 $\therefore x = 330,000$

So value less than 330,000 will give ratio greater than 1.2. So Ans: A, B

From:  $\frac{10}{5} = 2$  but  $\frac{10+5}{5+5} = \frac{15}{10} = 1.5$

and  $\frac{10+7}{5+7} = 1.4$  and  $\frac{10+3}{5+3} = 1.63$

## Section-5-Hard

2. All prime numbers are odd except 2 and  $\text{odd} + \text{odd} = \text{even}$   
 $\text{and } 2 \text{ odd} + \text{even} = \text{odd}$   
as  $x+y \rightarrow \text{odd}$ , so only one of them must be 2.  
And  $x < y$  so  $x$  must be 2

$\therefore$  Answer is B

3. If  $n=5$  (Given from Quesn B), mental  $= 18$  which is less than <sup>23</sup>  
again if  $n=9$ ,  $n = 10$   $n$  values  $n = n$

So Answer D

$$4. \frac{1}{5} \% \text{ of } 50 = \frac{0.2}{100} \times 50 = 0.2 \times \left(\frac{50}{100}\right) \rightarrow \text{less than } 1$$

$\therefore$  Answer B

$$5. (x-3)(x+3) = (2x-1) \Rightarrow x^2 - 9 = 2x - 1 \quad \text{or}, x^2 - 2x - 8 = 0$$

$$\text{or}, (x-4)(x+2) = 0 \quad \therefore x = 4, -2$$

Core Eng

$\therefore$  Answer D

If  $Q = -0.9$ , and  $R = 0.9$

$$\therefore QR = 1.8$$

and  $P = -2.1$  then  $PR = 1.2$

$$\therefore PR > QR$$

again, if  $Q = -0.1$  and  $R = 0.1$

$$\therefore QR = 0.2$$

and  $P = 2.9 \therefore PR = 2.8$

$$\therefore PR > QR$$

$\therefore$  Answer D

$$7. \text{According to Question, } 2(ab+bc+ca) = 550$$

$$\text{or, } 2(2a^2 + 6a^2 + 3a^2) = 550$$

Taking,  
 $a = x, b = 2x, c = 3x$

$$\therefore x = 5$$

$$\therefore \text{Volume} = x \times 2x \times 3x = 6x^3 = 6 \times 5^3 = 750$$

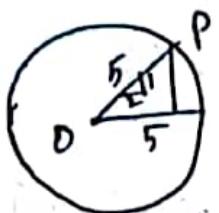
Ans. 750

$$8(6) \frac{9\pi}{x^2} = \frac{(2\pi)^2}{(x)^2} \therefore \text{Shade ratio } \text{side } \pi : \text{side } 2\pi$$

Given, Total surface area 144  $\therefore$  side will be 12  
 $\therefore 3a+a=12 \therefore 4a=12 \therefore a=3$   
 So radii of two shades are  $3 \times 3 = 9$  and  $1 \times 3 = 3$   
 $\therefore$  Area of shaded shade =  $9 \times 3 = 27$

Answer 27

10.



$$\therefore (1x)^2 + (2x)^2 = 5^2 \quad (\text{slope } 1:2)$$

$\therefore x = \sqrt{5}$  coordinate of point  $(2\sqrt{5}, \sqrt{5})$

Answer (2\sqrt{5}, \sqrt{5})

11. For, DEBBIE,  $\frac{6!}{2!2!} = 180$  Answer B

12.  $\frac{k_1 \times 5c_1}{12c_2} = \frac{5}{66}$

13.  $-2 = 123^4 - 123^3 + 123^2 - 123 = 123^3(123-1) + 123^2(123-1)$   
 $= 123^3 \times 122 + 123 \times 122$

$\therefore$  Remainder = 'D' Answer A

14.  $\frac{95}{900} \times 100 = 8.3\%$  An. D

15. Exactly 2  $\Rightarrow 610 - 250 = 360$  at least 2 at least 3 Answer B

16. Exactly 1 and 2 motor vehicles  $= (900 - 610) + (610 - 250)$   
 $= 650$

$\therefore$  more than 2  $= 900 - 650 = 250$

17. Probability  $= \frac{250}{900} = 5/18$  An. A

$\frac{a}{c} = 75/1000 \therefore a:c = 75:1000 \therefore b:c = 9/100 \therefore b:c = 9:100 = 90:1000$   
 $\therefore a:c:b = 75:1000:90 = 25:250:18$

Answer E 250

18. Simply putting values from options in equation,  $y = -\frac{1}{n}$ ; let  $x=0 \therefore y=0$

19.  $(-0.5)^{-1} = -2$ ,  $(-0.5)^{-2} = 4 \therefore \text{range } -4 - (-2) = 6$  Answer E

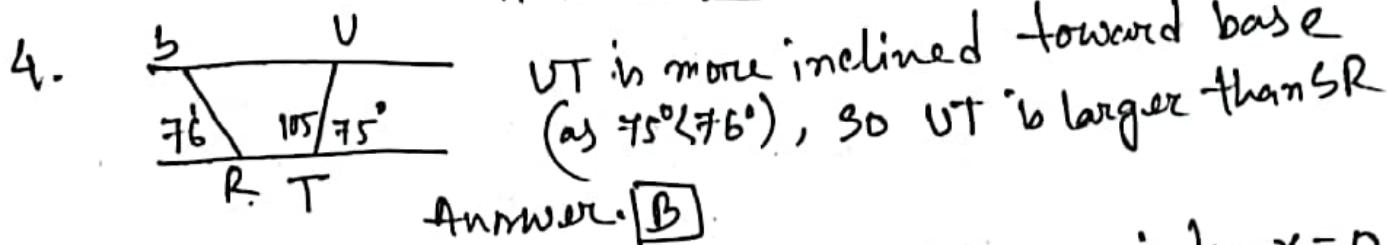
20. Early, one can start price increase mismatch B, G, H

## Section - 06 Medium

1.  $(x-y)^2 = x^2 + y^2 - 2xy = 89 - 80 = 9$   
 $\therefore x-y = \pm 3 \therefore |x-y| = 3$  Answer. [C]

2.  $\text{Remaining } 10^2 \text{ numbers} - \text{Avg. } 1 \text{ m/o } 70.54$   
 $2125/2, \text{ so discarded number is } 210 \quad (53-10) = 34$   
 Answer. [B]

3. Quantity A  $\rightarrow$  area  $= d^{\sqrt{3}}$   
 Quantity B  $\rightarrow$  area  $= \frac{\pi}{4} d^2$   $-(2723 \frac{\pi}{4} < 1 \text{ so, Q.A is } 210)$   
 Answer. [A]



5.  $\frac{15a}{6} = \frac{3 \times 5 \times a}{3 \times 2}$  so, a may be 2, so remainder  $x=0$   
 if a  $\in 3$ ,  $x=3$   
 Answer. [D]

6.  $(\cancel{4}2 \ 10 \ 8) \Rightarrow 100 - (42+10+8) = 40\% \text{ Answer. [A]}$

7.  $5(x-y+20) = y+100 \text{ or, } 5x-5y+100 = y+100$   
 $\therefore \frac{x}{y} = \frac{6}{5} \rightarrow 1 \text{ A} \quad \text{Answer. [A]}$

8.  $a=2 \ b=\frac{1}{2} \text{ Q.T. answer B} \quad \therefore \text{Answer. [D]}$   
 or,  $a=1/2 \ b=2 \text{ n. n A}$

9. consecutive even integers are  $\rightarrow 2x, 2x+2, 2x+4$   
 $\text{sum} = 2x+2x+2+2x+4 = 6x+6 = 6(x+1)$   
 must be divided by 6: Answer. [B]

10. percentage of at least 26 years old but less than 35 years old  $= \frac{26}{100} = \frac{13}{50} \approx \frac{1}{4}$   
 Probability  $= \frac{26}{100} = \frac{13}{50} \approx \frac{1}{4}$   
 Answer. [P]

[Percentage of less than 16.4%  
 and 35% of 26%]

11. For Maril,  $x = 30 \times 13$ , for Juani,  $x = y (-13)$

$$\text{or, } 30 \times 13 = y (-13) \\ \therefore y = \frac{30 \times 13}{-13} \cdot \text{Ans. } \boxed{D}$$

12. Checking  $\frac{y_2 - y_1}{x_2 - x_1} = m$  eqn;  $m = \frac{4-1}{4-3} = 3$  Ans.  $\boxed{D}$

13. According Q.  $1.5\sigma = 16.89 - 14.31 = 2.58 \therefore \sigma = \boxed{1.72}$

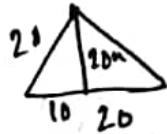
14. Checking from optionn. For,  $E = \frac{150}{30} = 5$  Ans.  $\boxed{E}$

15. 10% of all faculty member under 40 years =  $\frac{(156+714)}{100} \times 10 = 85$   
Now,  $\frac{85}{120} \times 100 = 70.83 \approx 70$

16.   $\therefore$  Either associate members or at least 60 or both =  $712 + 30 + 158 - 60 = 900$   
Ans.  $\boxed{D}$

17.  $7, 7^2 = 49, 7^3 = 343, 7^4 = \dots 1, 7^5 = \dots 7$  and so on  
So unit digit for  $7^{24}$  will be 9 ( $7^{32+2}$ )<sub>unit</sub> = 9  
 $6, 6^2 = 36, 6^3 = \dots 6$  So  $\sim 6^{24}$  u u 6  
 $\therefore 24 = \boxed{54}$  Carry Eng.

18.  $y < x \quad y = 15$ . So  $y$  is greater than r & s,  $r = 10$  &  $s = 2$  is largest  
 $\therefore$  r, s, y, x, z  $\therefore$  median  $\boxed{4}$  Ans.  $\boxed{D}$

19.  Now,  $(20)^2 + 10^2 = x^2 \therefore x = \sqrt{3} / 2$  Ans.  $\boxed{B}$

20. 25 वर्षों की 22 वर्ष 80 वर्ष और 21 वर्ष। Median द्वितीय 21वर्ष  
की 15वर्ष student का प्राप्ति 22 वर्ष का है।

option A. एक average का अधिक महत्व (2)। निम्नलिखित Median द्वितीय 21वर्ष

option C. 15वर्ष student का 25वर्ष महान होने का प्राप्ति 22 वर्ष  
100वर्ष student का प्राप्ति 22 वर्ष द्वितीय

option B. 20वर्ष 80 वर्ष का 22 वर्ष और 21 वर्ष का 21 वर्ष  
निम्नलिखित student का अधिक महत्व Median.  
Ans.  $\boxed{B}$

## Section: 7-Hard

1.  $12 \text{ ounces} \times 8 = 96 \text{ ounces} = 6 \text{ pounds}$

$\therefore$  The weight of the birdseed in the bird feeder that was not consumed  $\Rightarrow x - 6 \text{ pounds}$ .

: Answer - **B**

2.  $a, b$  can both '+' or '-' or either '+' or '-'  
if  $a = -4, b = -6$  then  $|a+b| = 10$  or,  $a = -4, b = 6$  then  $|a+b| = 2$

So answer - **D**

[Formulas Math -  $\sqrt{+}, \sqrt{-}, \sqrt[3]{+}, \sqrt[3]{-}$  option performs (ANS - G) [ANS - A]  $\Rightarrow$  **D**]

3.  $-10 \leq x \leq 10$  and  $-5 \leq y \leq 15$  so N(b) common range ~~-5 to 10~~  
 $= 16$

: Answer - **C**

Core Eng

4.  $11\% \text{ of } x = \frac{11}{100} \text{ max } \frac{1}{0.09} x \therefore \text{Answer: A}$

5. An  $26n$  is a multiple of 12  $\therefore \frac{26n}{12} = \frac{13 \times n}{6}$  : Lowest of  $n = 6$  and it may 12, 18, 24...

: Answer - **D**

6. Solve it by drawing diagram; it may ~~X~~ or ~~X~~

: Answer - **D**

7. **Q8** If  $n=5$  then Average of 53.8 (from Q.B. value)

Now  $n > 3$  giving 52.8% from average formula

: Answer **A**

8. Formula Math,  $C = p(1+n)^n$  1st-3rd year  $C = m(1+0.04)^3 = m(1.04)^3$   
2nd-3rd  $n$   $C = m(1.04)^2$   
and 3rd  $n$   $C = m(1.04)$

Ans. **D**  $C = m(1.04) + m(1.04)^2 + m(1.04)^3$

18. Four different prime numbers whose product is 10 are to divide  
- 10 by 2, 3, 5, 7, 11, 13, 17, 19, 23, 29, 31, 37, 41, 43, 47, 53, 59, 61, 67, 71, 73, 79, 83, 89, 97.  
So, number should must be 2, 3, 5, 7, 11, 13.

$$\therefore \frac{2 \times 3 \times 5 \times 7 \times x}{5} = 22x \text{ is one option (C)}$$

Check कृपा इसमें से किसी भी Prime number का option  
match हो। ऐसा नहीं होता। तो यह 66

$$\text{Answer: } \boxed{C} 66$$

$$11. z = x^y. \text{ Now, } x = 0.6n, y = 1.5 \therefore z = (0.6)^{1.5} \times 1.5y \\ \Rightarrow 0.54x^y y$$

- Answer:  $\boxed{E}$  46%.

Carefully

12. According to Question, diagonal of square =  $2x$

$$\text{Let, } a \text{ be the side of square.} \therefore a^2 + a^2 = 4x^2 \text{ or, } 2a^2 = 4x^2 \\ \therefore a = \sqrt{2}x$$

$$\therefore \text{radius of small circle} = \frac{\sqrt{2}}{2}x$$

$$\therefore \text{Area} = \pi \left( \frac{\sqrt{2}}{2}x \right)^2 = \pi \frac{x^2}{2}$$

$$\text{Answer: } \boxed{C} \frac{\pi x^2}{2}$$

$$13. \text{According to Question, } \frac{21\pi}{2} = 20 \therefore \pi = \frac{20}{\pi}$$

$$\therefore \text{Area} = \frac{\pi \pi^2}{2} = \frac{1}{2} \times \frac{10\pi \times 400}{\pi^2} = \frac{200}{\pi}$$

Ans.  $\boxed{D}$

14. 16 - Data interpretation. Very easy

17. ~~বেগুন কোরার পুরুষ হিসেবে আপনি আপনার অসমীয়া এবং বাঙালি মুল্লো মুল্লো~~  
 - একটি অসমীয়া multiple - দুটোজুড়ে - Answer.

Multiple - এ - technique - i. Decimal এ এখন আপনি 0.25 ও 0.50  
 ii. ২টো কোরার পুরুষ হিসেবে আপনি 0.25 ও 0.50  
 একটি অসমীয়া 0.25 ও 0.50,

$$- \text{ভোজা } 9/2 = 4.5 \times 4.5 = 20.25 \\ (4 \overset{4}{\times} 5)$$

$$\text{again } 29/2 = 14.5 \times 14.5 = 210.25 \\ (14 \overset{14}{\times} 15)$$

Carrying

18. Easier way দ্বারা আপনারে দ্বারা Draw কোরা - | . Distance  
 (কোরা)

19. Equation of Circle  $(x-a)^2 + (y-b)^2 = 5^2$

$$\therefore x^2 + y^2 = 5^2 \quad \text{check from option.}$$

$$\text{প্রমাণ: } 14^2 + 48^2 = 5^2$$

Answer. A, B, D

20. According to Question.  $Q_1 = x, Q_2 = x, Q_3 = 2x, Q_4 = 2x + 6x/2$

$\therefore Q_4 = 2x + 6x$  ইত্যাদি ফর্মুলা দেওয়া মান।

$$\text{if } Q_4 = 2x \text{ then } \frac{2x}{6x} = \frac{1}{3} \text{ and } Q_4 = 6x \text{ then, } \frac{6x}{10x} = \frac{3}{5}$$

$\therefore$  Ans. B, C, D, E  $\rightarrow$  or  $\Delta 2$  value এর মতো  $\frac{3}{5}$  এর মতো দ্বিতীয়।

### Section-8 (Medium)

1. Area  $\Rightarrow \frac{1}{2} \pi r^2 = 64 \pi \therefore r = 16 \therefore$  it must be greater than 16. Answer. [A]
2. n is an odd integer greater than 50.  $\therefore$  Median value is  $\frac{n+1}{2}$  Double, - $\therefore$  Median  $\therefore$  Average value is greater than  $\frac{n+1}{2}$ . Value of sum of numbers is  $\frac{n(n+1)}{2}$ ,  $\therefore$  Average  $\therefore$  Median  $\therefore$  Answer. [A]

3.  $\therefore$  Consecutive odd integers  $\therefore$  common difference is least common multiple of 2 or multiple.  $\therefore$  LCM: 3 & 5 is 15, 739 & 63  
-Ans. [C]

4.  $n > 10000$ ; take  $n = 10001$  Quant. B  $>$  A but  $n = 70000$   $A > B$ : Ans. [D]
5.  $1 \leq x+1 \leq 3$  or,  $0 \leq x \leq 2 \therefore (x-5) \geq (x-5) \geq 0 \therefore (x-5) - (x-5) \leq 0$   
-Ans. [B]

6. Year  $\therefore$  the previous month  $\therefore$  Median  $\therefore$  After Feb. 28 / 29  $\therefore$  Relation (r^2). Ans. [C]

7.  $a_{20} \in (20, 0) \therefore$  Distance  $a_{20} = \sqrt{(20-0)^2 + (0-1)^2} = \sqrt{401}$  Ans. [C]

8.  $|x| < 1-x \quad x < 1-x \quad | -x < 1-x \\ \therefore x < \frac{1}{2}$  | can determine Ans. [D]

9.  $\frac{2}{3}$  of softball game  $= \frac{2}{3} \times 75 = 50$ . Using Venn  $\rightarrow$   $\boxed{10(50)25} \Rightarrow 100 - 85 = 15$ .  
Ans. [B]

10. Retail Price at least \$100.  $\therefore$  Discounted prices are 90, 80, 84, 88. (Least price)  
A. Here Range (90-80)  $\Rightarrow \$10$  Ans. [A]  
B. Here Least Median is 86 Ans. [B]  $\therefore$  Average = 85.5 Ans. [C]

11. Let Revenue  $K \times n$ , and Revenue at discounted price =  $0.8 K n$   
Acc. to Q.  $K n = 0.8 K n \therefore K = 1.25 K$  Ans. 25%. [C]

12. Largest value  $= \frac{\text{largest of } T}{\text{largest of } R} = \frac{8}{3}$  Lowest value  $= \frac{\text{lowest of } T}{\text{lowest of } R} = \frac{2}{9}$   
 $\therefore$  Range  $= \frac{8}{3} - \frac{2}{9} = \frac{22}{9}$  Ans. [C]

13. Price at Wednesday = 56; Price at Friday =  $56 - 56 \times \frac{25}{100} = 42$

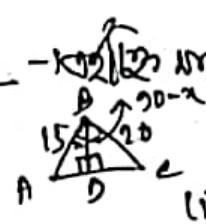
- Price at Monday = n  $\therefore \frac{n}{42} = \frac{32}{21} \therefore n = 64$  Ans. [b] 4

14. Highest Rental rate = 1 Bedroom  $\rightarrow$  Rent Oceanview = 1000  
 Lowest  $n \times n = 2 \times 2$  from inland = 500  
 $\therefore$  Range = 1000 - 500 = 500 Ans. E

15. 10 couples  $\cdot$  1/2 Bayside House  $\rightarrow$  4 Bedrooms  $\rightarrow$   $4 \times 2 \rightarrow$  8 couples  
 Cost  $\rightarrow$   $800 + 800 = \$1600$

for minimum, rent of 2 bedrooms  $\rightarrow$  remaining 2 couples = 600  
 Total  $1600 - 600 = \$1000$  Purchase =  $\frac{2200}{10} = \$220$

16. Checking option Math. if we take 11 min 4-bedroom, Rent =  $11 \times 1000 = \$11000$   
 and 01 3-bedroom and 02 2-bedroom  
 Total =  $11000 + 600 + 500 = \$11,800$  Ans. D

17.  $\text{Let } x = 15^\circ \text{ and } y = 20^\circ$  angle, figure would confuse us or not?  
 Now,   $\cos x = \frac{y}{15}$  (i);  $\cos(90 - x) = \frac{y}{20}$  or,  $\sin x = \frac{y}{20}$  — (ii)  
 $(i)^2 + (ii)^2 \rightarrow \cos^2 x + \sin^2 x = \frac{y^2}{15^2} + \frac{y^2}{20^2}$   
 $\cos x \cdot 1 = \frac{y^2}{15^2} + \frac{y^2}{20^2} \therefore y = 12$  Ans. 12

18.  $\frac{1}{2} \times x\% = 2/3 \therefore \frac{1}{2} \times \frac{x}{100} = \frac{2}{3} \text{ m}, x = 133 \frac{1}{3}\%$ .

19.  $x < y$  let  $x = \frac{2}{5}, y = \frac{3}{5}$  so option A X; but  $2x - y < y$   
 $x = .2, y = .5$  in B X in  $2x - y < y$   
 $x = -3, y = -2$  in C X in  $2x - y < y$   
 $x = 2, y = 3$  in E X in  $2x - y < y$   
 Ans. D

20. Eqn of circle  $(x-h)^2 + (y-k)^2 = r^2$ .

$$\therefore (x+2)^2 + (y+1)^2 = r^2 \quad (1)$$

(2, 1) Pairs left  $\therefore (2+2)^2 + (1+1)^2 = r^2$

$$\therefore r = 2\sqrt{5}$$

$\therefore$  Circumference =  $2\pi r = 2 \times \pi \times 2\sqrt{5}$   
 $= 4\pi\sqrt{5}$

Ans. E

## Section - 9 - Hard

1. Question - 6 एका दूसर्याचे highest-tax bill name वर्ष 12, तरीचा Bill \$250 आहे किमतीचा - प्रथमचा highest tax bill आवडता तरीचा Bill आपासून Rango - (प्रथमांचे माझीचे जातीचे अंदाज) आहे. Standard deviation - तोका 27%. Ans. B

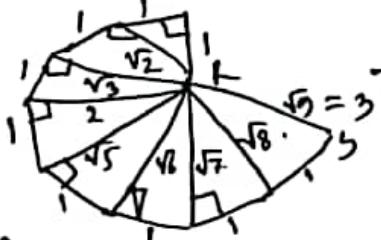
2. We know,  $m = \frac{y_2 - y_1}{x_2 - x_1}$ ; according to Q.,  $m = 3 = \frac{5 - 2}{4 - 2} \therefore$  इतका निर्धारित T का Coordinate - तो कोणी संकेतात ? Ans. D

3. केवळ 1000<sup>2</sup> Number - का 21 इतर Quant. Box, वरूप 12 वा NO number 39 अनुग्रहात नाही तर 31 इतर Quant A का. Ans. D

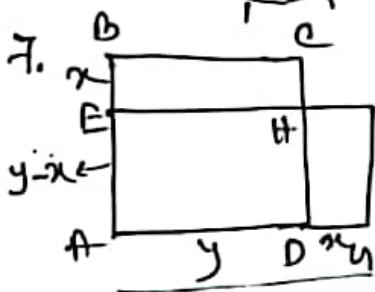
4.  $5^x y^3 = 5^{x+3}$  तर,  $y^3 = 5^3 \therefore y = 5 \therefore z = 5$  Ans. C

5.  $x > 0 \therefore \frac{1}{x} x = 11\% \text{ of } x \frac{11}{100} x = \frac{1}{9.09} x$  Ans. A

6.



→ Simply Formulas. Ans. E



$$\text{let, } BE = DG = x$$

$$\text{Area of square} = y^2$$

$$\text{Area of Rectangle} = (y+x)(y-x) = y^2 - x^2 < y^2$$

Ans. A

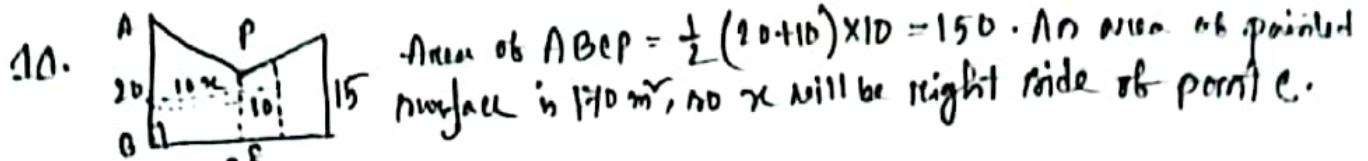
CalcEng

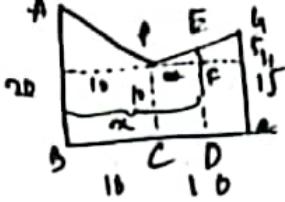
8. Now,  $b_1 = 20 \times \frac{3}{4} \xrightarrow{45 \text{ min}} 45 \text{ km. } b_2, (40-15) = 30 \times t_1 \therefore t_1 = 50 \text{ min}$   
Total run,  $x = 2 \text{ hr} (120 \text{ min}) - (50+45) = 25 \text{ min}$  Ans. B

9.  $\begin{array}{r} 7x \\ + 6y \\ \hline 47x \end{array}$   $6+x=7$  ठिकाणी खुलाई  $x$  असेल तर  $7+y=x$  ठिकाणी  
यातीले 4 शृंखला, तरीच्या 01 काऱ्य वापरात असेल  
 $6+x=7$  ठिकाणी. अशी  $y$  पाची  $x=0$  तरीचा काऱ्य घेऊ लागेत नाही  
तरीचा 27. Ans. E

10. Total sum after 01 year =  $15000 + 15000 \times 8/100 = 16200 \therefore$  Per month sum = 1350  
Subtracting 1350 from 16200 for each month we will get

Answer. C, D, E, F → these are the months where total amount less than \$10,000.





Let,  $x = 11$ : Area of  $\triangle ABDE$   
 $= \text{Area of } \triangle ABCP + \text{Area of } \triangle PPDE$   
 $\text{Now, } DE = 10 + 0.5 = 10.5$   
 $= 10.5$

$\therefore \text{Area of } \triangle ABDE = 150 + \frac{1}{2} \times 1 \times (10 + 10.5)$   
 $= 160.25$

Similarly, when  $x=12$   
 $EF = 1$

When,  $x=12$ , Area of  $\triangle ABDE$

$$= 150 + \frac{1}{2} \times 2 \times (10 + 11)$$

$$= 171$$

[CareEng]

[CareEng]

$\therefore$  range  $11 < x < 12$  Ans. D

12.  $(-5)^v = 25$ ,  $5^v = 25$  so,  $-5$  to  $5$  element will be  $\boxed{-5, -4, -3, -2, 0}$

13.  $7^1 = 7$ ,  $7^v = 9$ ,  $7^3 = 3$ ,  $7^4 = 1$ ,  $7^5 = 7$ ,  $7^6 = 9$  So after  $4n+2$ , 7<sup>n</sup> ones digit is 9. From option,  $4 \times 25 + 2 = 102$ ,  $4 \times 26 + 2 = 106$ ,

Ans. B, F

14.  $\frac{1530 \times 20\% + 250}{760 + 250} \times 100 = \frac{402}{1010} \times 100 = 39.8\% \approx 40\%$ . Ans. C

15.  $\frac{1530 \times 30\%}{760 \times 75\%} = 1.25 \approx 5 \text{ to } 4$

16. Average salary =  $\frac{0.3 \times 1530 \times 2 + 0.3 \times 1530 \times 4 + 0.4 \times 1530 \times 2}{1530} = 0.3x + 0.34 + 0.42$   
 Ans. B

17.  $(0) * (-1) + (-1) * 0 = \frac{0^v}{-1} + \frac{-1^v}{0} + \frac{(-1)^v}{0} + \frac{0^v}{-1} = \boxed{-2}$

18.  $\frac{12}{x_2} + \frac{12}{x_3} = 1$ ,  $\therefore \frac{1}{x_2} + \frac{1}{x_3} = \frac{1}{12}$  again,  $\frac{9}{x_1} + \frac{9}{x_2} + \frac{9}{x_3} = 1$

$$\text{or}, \frac{9}{x_1} + 9 \left( \frac{1}{x_2} + \frac{1}{x_3} \right) = 1$$

$$\text{or}, \frac{9}{x_1} + \frac{9}{12} = 1 \therefore x_1 = 36$$

Ans. E

19. Maximum Probability of Both event occur =   
 Ans. A when,  $M = R \cap M$

20. Let,  $6n=330$  whence,  $6n/75$  gives remainder 30  $\therefore n=55 \therefore 7n=385$  rem. 10  
 similarly, checking other values option E satisfies Ans. E

$$\begin{aligned} 75 \times 2 + 30 &= 180 \therefore n=31 \\ \therefore 7n &= 217 \\ 7n/75 &\rightarrow \text{remain} \rightarrow 66 \end{aligned}$$

## Section-1D (Medium)

1.  $x^3 - x^2 - 2x = 0$ ;  $x(x^2 - x - 2) = 0$ ;  $x \neq 0$  given  $x \neq 0$  so no need of further calculation as sum of one of the roots is  $x=0$ . So multiplication of three roots must be zero. Ans. [A]

2.  $\frac{1}{1+\frac{1}{x}} \Rightarrow \frac{1}{\frac{x+1}{x}} \Rightarrow \frac{x}{x+1} = B$  Ans. [C]

3.  From figure, as the circle is above the x-axis so its radius must be less than 6. Ans. [B]

4. If  $y=4$  and  $x=1$  then, greatest possible value of  $\sqrt{\frac{y}{x}} = 4$   
Ans. [A]

5.  $f(n) = n^2 - 2n + 8$  if  $f(b) \rightarrow 2b = b \therefore n = 3 \therefore f(6) = 9^2 - 6 + 8 = 11$   
Ans. [D] CareEng

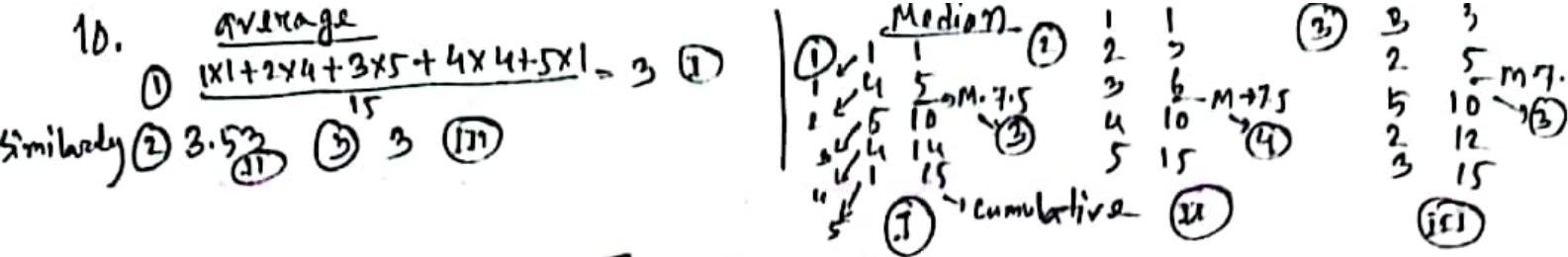
6.  $(x+2)x = x^2 + 2x$        $\frac{Q.A}{(x+2)(x-2)} = x^2 - 4$       A > B  
 if  $n=2 \rightarrow 2^2 + 2 \times 2 = 8$        $x=2 \rightarrow 2^2 - 4 = 0$   
 if  $n=-3 \rightarrow (-3)^2 + 2(-3) = 3$        $x=-3 \rightarrow 9 - 4 = 5$       B > A  
 Ans. [D]

7.  $\frac{1}{2} < n < 1$ , if  $n = \frac{3}{4} \rightarrow \frac{Q.A}{2 \times \frac{3}{4}} = \frac{6}{4} \quad \frac{Q.B}{\frac{3}{4}} = 4 / 3 \quad \therefore A > B$   
 i.e. if  $n = \frac{3}{4} = 0.75$ ;  $2 \times 0.75 = 1.50 \quad \frac{6}{4} = 1.50 \quad B > A$

8. Let 2 points round = n and 4 points = y  
 Average,  $\frac{2n+4y}{n+y} = 3.8$  m,  $2n+4y = 3.8n + 3.8y$  m,  $1.8n = 0.2y$   
 $\therefore y = 9n$   $\rightarrow$  Quant A      Ans. [C]  
 Quant B

9.  $x, y, z$  are consecutive positive integers and  $x+y+z = \text{even}$   
 So, ~~any two~~  $x$  and  $z$  must be odd as  $\text{odd} + \text{even} + \text{odd} = \text{even}$ .  
 As odd even from:  $x+y \rightarrow \text{even}$ ,  $y+z \rightarrow \text{even}$ ,  $z+x \rightarrow \text{odd}$ ,  $x+y+z = \text{even}$ .  
 Ans. [D]

ANS



Ans.  $\boxed{C}$  I & II only

11.  $\frac{y}{x} + \frac{x}{4\sqrt{5}} = 1$  from fig.  $\boxed{A}$

12. ~~Per~~  $5C_3 \times 3! = 60 \rightarrow$  as there pictures can hang 3! ways (interchange)

13.  $\frac{8.2}{x} = \frac{1}{64} \therefore x = 512 \text{ cm Ans. } \boxed{5.2m}$

14.  $560000 \times \frac{12}{100} \rightarrow \text{turnover service}$   
 $= 12,43,200 \approx 12,00,000 \text{ Ans. } \boxed{B}$

15.  $1999 \rightarrow \frac{5000000}{360000} = \frac{5}{3.6} \approx 4 \text{ to } 3 \text{ Ans. } \boxed{C} \text{ [using calculator]}$

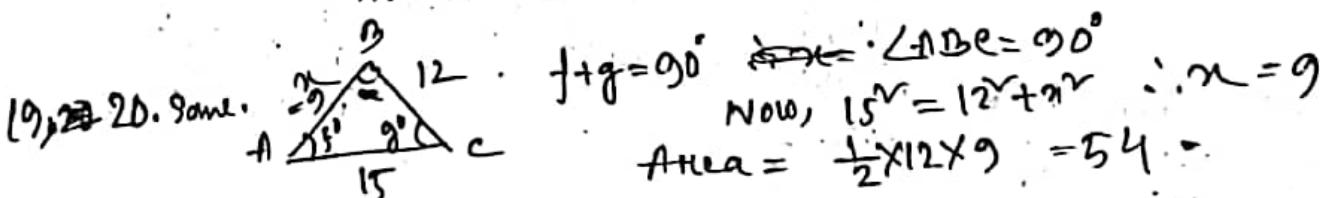
16. acc. to Question ~~in~~ in 1999 customer service = 12% of 560000 = 67200  
~~Carefully~~  $\therefore \frac{67200}{500000} \times 100 = 13.44 \approx 13\%. \text{ Ans. } \boxed{D}$

17. if sum of n numbers  $\geq 48$  then  $n = \frac{48}{1.2} = 40$  So n must be greater than 40 as sum greater than 48. At least possible of n is required so, n must be 41. Ans.  $\boxed{41}$

18. 72 degrees rotation per 0.1 second  
 $\text{So } 360 \text{ " } \rightarrow \frac{260 \times 0.1}{72} = 0.5 \text{ sec } \rightarrow 2\pi r \text{ distance} = \pi \times 26$

Now,  $\pi \times 26$  inches travel in 0.5 sec

$\therefore$  in 2 sec it travels  $= 4 \times 26\pi = 104\pi$  Ans.  $\boxed{D}$



Ans.  $\boxed{D}$

Section. II Hard

Q1.  $111/31 \rightarrow 31 \times 3 = 93$  so,  $111 - 93 = 18 > 16$  Ans. A.

Q2.  $C_{25} = \frac{13+13+10}{2} = 36 \therefore b=18 \therefore \text{Area} = \sqrt{18(18-13)(18-13)(18-10)} = 20\sqrt{3}$   
Ans. B

Q3. full capacity Combe 209 as  $209 \times 9 = 1881$  rest are in 10th trip  
as well n n 211 as  $211 \times 9 = 1899$  n n n n  
Ans. D

Q4.  $x^2+y^2 > 0 \nrightarrow x^2 > 0$  as there are various option for  $x^2y^2$  such as  
x,y may both positive or both negative ; x may  $0 < x < 1$  and  $y > 1$   
and vice versa so ans must be D CareEng

Q5. If all the numbers of  $K^n$  are less than 30 then Quant B  
will be answer  
if all the numbers of  $K^n$  are greater than 31 and if  $M^n$   
all are 30-to 31 then Quant will greater. So. Answer D

Q6. Check for value of y, tens digit of x must be equal y.  
such as  $y=1, 10 \times 1 + 2 = 12 \quad y=3; 10 \times 3 + 2 = 32$  so on.

Q7.  $2\pi r = y \therefore r = \frac{y}{2\pi} \quad \text{Area} = \pi \times \left(\frac{y}{2\pi}\right)^2 = \frac{y^2}{4\pi} < \frac{y^2}{4}$   
 $\therefore$  Ans. B

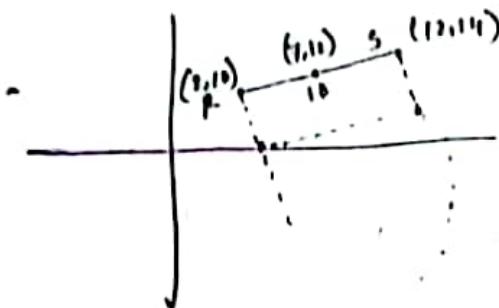
Q8.  $I = Pnr \rightarrow 2400 = 48000 \times \frac{n}{100} \times \frac{1}{126} \therefore n = 6\%$ . Ans. C

Q9. Checking from 1 to 7, found  
the result for 7. Ans. B  
$$f\left(\frac{2x+1}{2x+1}\right) = \frac{1}{3} = 1 \cdot f(2) = \frac{3}{5} \cdots \frac{1}{3} \times \frac{3}{5} \times \frac{5}{7} \times \frac{7}{9} \times \frac{9}{11} \times \frac{11}{13} \times \frac{13}{15} \times \frac{15}{17} = \frac{1}{17}$$

Q10. 1993 Jan'01  $\rightarrow$  1993 Jan Dec '31  $\rightarrow$  1994 Dec '31  $\rightarrow$  So total 02 years  
 $\therefore 1.2m = 1280000 \times \frac{20}{100} \therefore n = 235000$  again;  $\frac{235000}{1.2} = 195833$   
 $\frac{0.1 \text{ year}}{(1994 \text{ Jan}'31)} \quad \frac{0.1 \text{ year}}{(1993 \text{ Jan}'01)}$

Ans. C

10.



Sixin & sixin, difference of x must be 10  
and sixin & sixin, y " " " u less 10  
Checking option. A. (6,0)  $\rightarrow 10-0=10 \rightarrow$  thin point valid  
in respect of x  
B. (8,2)  $\rightarrow 24-14=10 \rightarrow$  ~~thin point~~  
C. (8,14)  $\rightarrow 24-14=10 \rightarrow$  ~~thin point~~  
D. Point b(8,14)  
E. (16,4)  $\rightarrow 14-4=10 \rightarrow$  thin point

$\therefore$  Ans. B

12.  $\frac{16.8 \times 10^3}{0.51 \times 10^{11}} = \frac{16.8 \times 10^3}{5.1 \times 10^{12}} = \frac{16.8}{5.1} \times 10^{-9} = 3.3 \times 10^{-9}$  Ans. A

13.   
Circular surface of Red required. For thin white  
Cube must be placed in 1, 2, 3, 4, 5, 6 and 7th in the  
centre which will remain invisible.  
So total ~~red~~ white visible surface = 6 and Red = 48

Careless

14. acc. to Q.  $17.8 = 1.1 x \rightarrow 17.8 \div 1.1 = x \rightarrow x = 16.2\%$ . Ans. D

15. acc. to Q.  $63.8 \times \frac{98.7}{100} = 24.6\%$ ;  $63.8 - 24.6\% = 39.11 \approx 40\%$ .  
Ans. B

16.   
neither having bond nor mutual funds =  $100 - 3.3 - 7.9 - 14.1 = 74.0\%$ .

17.  $1 \cdot \frac{7 \times 12}{12} = 1 \cdot \frac{12 \times 12}{12} = \frac{(12^2)^{\vee} + 12}{12^2} = \frac{(12^2)^{\vee} + 12}{12^2} = \frac{12^2 + 12}{12^2} = \frac{12^2}{12^2} = 1 \therefore m = 15$   
Ans. 15

18. Larry get 90th percentile while Tony get 70th percentile in respective  
office.

In option C  $\rightarrow$  Larry's office 80th percentile is greater than 70th percentile of  
Tony's office. So 90th percentile of Larry's must be greater

Ans. C

19. Possible Triangle  $5c_3 = 10$  but  $(4, 5, 11), (4, 7, 11)$  could not form triangle  
 $\therefore$  Probability =  $\frac{10-2}{10} = \frac{8}{10} = \frac{4}{5}$  Ans. D

20. <sup>Least</sup> Probability of choosing a boy from each group =  $\frac{20}{60} \times \frac{7}{n}$  which must be less than  $\frac{1}{15}$   
 $\therefore \frac{20}{60} \times \frac{7}{n} < \frac{1}{15} \Rightarrow \frac{7}{n} < \frac{1}{15} \therefore n > 105$  Ans. A

Section-12 (Medium)

Q1.  $(4x)(3(-2x+1)) = (4)(3x)(1-2x)$  Ans. [C]



Ans. [D]



Q2 intersection

Q3. Average decrease from 26, so discarded number must be greater than 26. Ans. [A]

Q4. Same as section-8 No-02

Core Eng

Q5.  $x^3 + \frac{1}{x^3} = (x + \frac{1}{x})^3 - 2x\frac{1}{x} = (x + \frac{1}{x})^3 - 2 = 4 - 2 = 2$

$$x^3 + \frac{1}{x^3} = (x + \frac{1}{x})^3 - 3x\frac{1}{x}(x + \frac{1}{x}) = 8 - 3 \times 2 = 8 - 6 = 2$$

Ans. [C]

Q6.  $m^3 m^4 = \frac{1}{16} \quad m, m m^3 = \pm \frac{1}{4} \quad \therefore m^7 = \pm \frac{1}{4m} = \frac{1}{4m}, -\frac{1}{4m}$

Ans. [D]

Q7.  $12,000,000 / 12$  leaves no remainder, so 11,999,999 leaves remainder 11. Ans. [C]

Q8. Least possible total number =  $20+21+22+23+24$  [as different numbers in each day] = 110

Q9.  $\frac{2.5 \times 10^6}{2.5 \times 10^6 - 3.5 \times 10^6} = \frac{1}{1 - \frac{3.5 \times 10^6 - 1}{2.5 \times 10^6}} = \frac{1}{1 - \frac{3.5 \times 10^6 - 1}{2.5 \times 10^6}}$  very small value  
nearly 1  
 $\approx 1$  Ans. [E]

Q10.  $100-100 = 100, 300-300 = 0, 500-500 = 0, 700-700 = 0, 900-900 = 0$  Ans. [D]

Q11.  $2\pi((r+3)) - 2\pi r = 2\pi r + 6\pi - 2\pi r = 6\pi$  Ans. [E]

Q12. Lowest 3-digit multiple of 7 is 105 and highest 994.  $\therefore$  range = 994 - 105 = 889

Q13. x, y are even integers. For greatest possible value of  $x+y$  let one be 12 and another -2

$$\therefore x+y = 12-2 = 10 \quad \text{Ans. } [F]$$

14.  $960/8 = 120 \text{ in}/12 = 10 \cdot 11 \times 3.2 = \$32$  Ans. [C]

15.  $1.6/2.65 \approx 0.6 \approx 30\%$  Ans. [D]

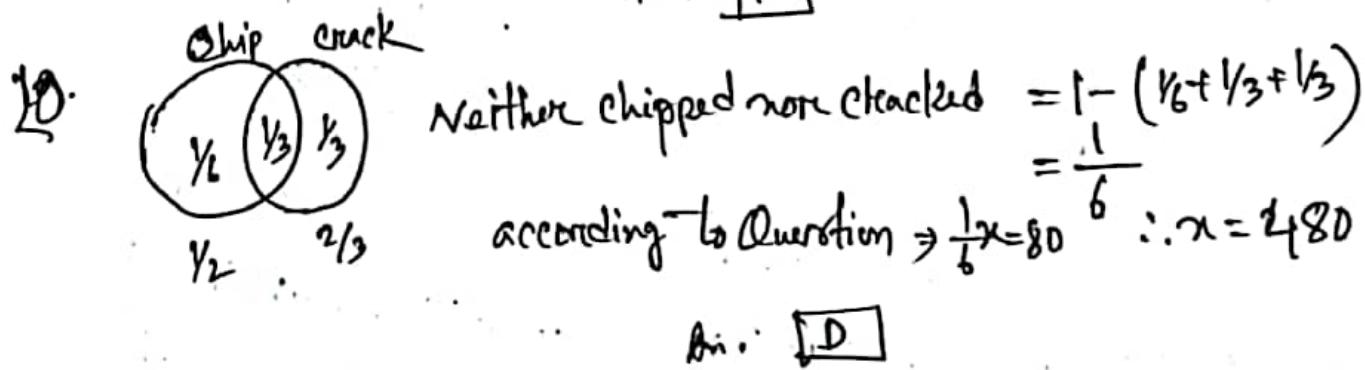
16. Perfect 8 inches Maple Spruce = \$2.90  
 and n = 4 in in = \$1.50  
 According to Q.  $2.9 \times n - 2 \times n \times 1.5 = 1.5$   
 $\therefore n = 15$  Ans. [D]

	<u>Temperature</u>	<u>Frequency</u>	<u>Cumulative Frequency</u>
	68	3	3
	69	0	3
	70	5	8
	71	2	10
	72	1	

Range = 72 - 68 = 4  
 Ans. [B, C]

" Median =  $11/2 = 5.5$   
 $\therefore$  Med.  $= 70^\circ$   
 also Mode = 70

17. To make cube from 7 by 6 by 3 size rectangle block  
 take least common multiple of 7, 6, 3 that is 42  
 Ans. [H2]



19. According to Question  $\rightarrow \frac{25-20}{20} \times 100 = 25\%$

### Section-13 (Hard)

1. 40% left before 6 P.M. So remaining = 60%.  $\therefore$  70% of remaining =  $60 \times \frac{70}{100} = 42\%$ .

$\therefore$  Total leave before 6 P.M. =  $40 + 42 = 82\%$ .

$\therefore$  Not  $n$   $n = 100 - 82\% = 18\%$ . Ans. A

2. If greatest number = 10 then negative is also present which is -10.  $\therefore$  Range =  $10 - (-10) = 20$  satisfy the question.

Ans. C

3.  $l_1 l_1 l_2 \therefore \underline{\cancel{38}} \quad \cancel{65} \quad \cancel{37}$   $\cancel{123}$   $\cancel{38} = n$   $\cancel{123}$   $\cancel{37} = y$   $n > y$  Ans. A

4.  $-8, -3, 5, 8, 3, 5, 2, 3, \underbrace{1, 2, 1, 1}_{3 \text{ times}}$  Ans. A

5. There is not given enough information as median doesn't depend on value of a number. For example if 10 numbers are  $61, 62, 63, 63, 64, 66, 66, 66, 66, 66$ . and  $61, 62, 63, 64, 66, 78, 78, 79, 79$ , median = 65 median also 65

6.  $|3n+2| = n+b$  if  $(3n+2)$  Positive then  $n=2$   
and  $n$  negative  $n=-2$  Ans. D

$$7. 89! - 88! - 87! = 89 \times 88 \times 87! - 88 \times 87! - 87!$$

$$= 87! (89 \times 88 - 88 - 1) = 87! (89 \times 88 - 89)$$

$$= 87! 89 (88 - 1)$$

$$= 87! 89 \times 87$$

$$\text{and } 88^V = 7744$$

Care Eng

$\therefore$  Ans. B

8.  $OD = 55 + 75 - \text{Both} \therefore \text{Both} = 40$

$$W \quad R$$

$$\therefore \text{Only White} = \frac{15}{90}$$

$$= \frac{1}{6}$$

Ans. A

9. Section-7 and -10 (Repeat) 11) which passes

10. Perpendicular to  $x+y=4$  in  $x-y+k=0$  (1) which passes through  $(7, 7)$   $\therefore 7-7+k=0 \therefore k=0 \therefore x-y=0$  (2)  
 $\therefore$  Intersection point of (1) & (2) in  $x=2, y=2$   $(2, 2)$  and  $(a, b)$  is middle of  $(2, 2)$  and  $(7, 7)$   $\therefore (a+b) = (4, 5, 4, 5)$   $a+b=9$  Ans. B

13.  $\frac{5+\frac{5}{x}}{5} = 5$  or,  $x = \frac{1}{4}$  [This is not answer] = 0.25 (Ans.) 0.25

14.  $\frac{6848}{2176000} \approx \frac{1}{300}$  C  $\Rightarrow 1.7\% \text{ of } 3027699$

15. Non-federal development land in Contiguous United States = 5%.  
 $= \frac{5}{100} \times 3027699 \approx 151385$

Now, 2% of 151385 = 3027 (California and Minnesota)  
 Ans. 2 C

16. Federal Land =  $3027699 \times \frac{12.7}{100} = 626733$

Now,  $\frac{75012}{626733} \times 100 \approx 12\%$ . Ans. E

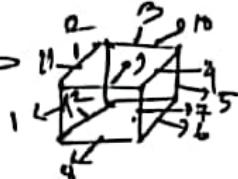
17. Sales-tax Country A = 25%.

" " Country B = 20%.

$\therefore \frac{25-20}{20} \times 100 = \frac{5}{20} \times 100 = 25\%$ . Ans. 25%

18.  $6a^2 = 384 \therefore a = 8$

$\therefore 12a = 12 \times 8 = 96$



Ans. E

19. R and T may not both occur.

$S_0, P(R \cap T) = 0$

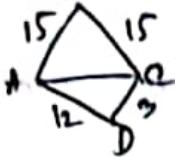
~~Q~~ Ans. 0 A

20. ~~M+C=16~~ and  $\frac{1}{2}M + \frac{2}{3}C = \text{even}$  or,  $\frac{1}{2}(16-C) + \frac{2}{3}C = 8 - \frac{c}{2} + \frac{2c}{3}$   
 $\Rightarrow 8 + \frac{c}{6}$ ; as even must be integer so  $c$  must be ~~multiple~~ 6 or 12.  
 - taking  $c=6$ ; even =  $8 + \frac{6}{6} = 9$  and  $c=12$ , even =  $8 + \frac{12}{6} = 10$   
 Ans. E/F

### Section-14 (Medium)

1.  $y = 2(n-3) = 2n-6$  as  $n$  is negative so  $y$  must be negative. Ans. B

2. Let,  $y = 0.88 \therefore 1.25 + 0.88^y = 2.02 \dots > 2$  Ans. B (as  $y$  must be less than 0.)

3.  In  $\triangle ABC$  AC must be  $9 < AC < 15$ . [as  $12+3=15$  and  $9+3=12$ ] As  $AB=AC \therefore \angle BCA = \angle CAB$ . Again as AC must be less than 15, so  $\angle BAC = \angle BCA > 60^\circ$  Ans. A

4. Let original price =  $x \therefore$  sale-tax =  $x \times \frac{89}{100} \times \frac{4}{100} = 0.032$  Ans. A  
and 3% on original price =  $x \times \frac{3}{100} = 0.03$

5. Let thin net ob-data be  $x_1, x_2, x_3, \dots, 24, 30$

$$\begin{aligned}\text{The sum of deviations} &= x_1 - 10 + x_2 - 10 \dots + x_{24} - 10 \\ &= (x_1 + x_2 + x_3 + \dots + x_{24}) - 240 \\ &= (25 \times 10 - 30) - 240 < 0 \quad \text{Ans. } \boxed{B}\end{aligned}$$

6. Let 5 biggont numbers are 20, 19, 18, 17 and sum = 74  
 $\therefore$  15th number =  $(87 - 74) = 13$  Ans. B Care Eng

7. Use Calculator

8. Area =  $Bh/3$  where  $B = (230.4)^{\sqrt{3}}$   $\therefore Bh/3 = \frac{(230.4)^{\sqrt{3}} \times 138}{3} = 2456.027 \approx 2.5 \text{ millions}$   
Ans. B

9. Let  $m = 53+21=74$  and  $P = 53+25=78$

$$\therefore np = 74 \times 78 = 5712 = 108 \times 53 + 48 \quad \text{Ans. } \boxed{48}$$

10.  Connecting any three points must create a triangle.  
So any selected 3 points must be vertices of triangle  
 $\therefore$  Probability = 1 Ans. A

11.  $n(A \cup B \cup C) = 28$ ,  $n(A) + n(B) = 12 + 15 = 27 < 28$  so  $n(A \cap B)$  can be zero  
 $n(A \cap B \cap C) \leq n(A \cap B) \leq n(A) = 12$  so  $n(A \cap B \cap C) \leq 12$   
 $n(B) + n(C) = 15 + 18 = 33 > 28$  so  $n(B \cap C)$  can't be zero  
and  $n(A) + n(C) = 12 + 18 = 30 > 28$  so,  $n(A \cap C)$  can't be zero

Ans. B, C

12.  $3/4^{\phi} = \rho \left(1 - \frac{n}{100}\right)^4 \Rightarrow n = 7\%$ .

13.  $f(K+24) = 8K \therefore K = \boxed{72}$

11. Cost for water meter =  $\pi$  (from Kilotwatt-hr)

$$\therefore \text{Total cost for } n \text{ units} = 0.2\pi n$$

and  $n$  in other household =  $0.8 \times \pi \times 2 = 1.6\pi$

$$\therefore \text{Ratio} = \frac{0.2\pi}{0.2\pi + 1.6\pi} = \frac{0.2\pi}{1.8\pi} = \frac{1}{9} \quad \text{Ans. } \boxed{B}$$

12.  $\pi + \alpha - 6 < 0 \quad n_1(\alpha+3)(\alpha-2) < 0 \quad \therefore -3 < \alpha < 2 \quad \therefore \alpha = -2, -1, 0, 1$   
Ans.  $\boxed{C}$

13.  $\frac{1}{2}\pi r^2 + \pi (r^2) + \pi (r^2) = 48\pi$   
 $\therefore r=8 \quad \therefore A = 2\pi r = 8 \times 2 = \boxed{16}$

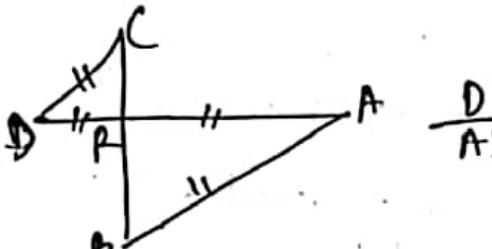
14. 4.6 7.3  $\boxed{21.5}$  31.3 35.3  
Median :  $\frac{60}{120} \times 21.5\% = 12.9 \approx 13 \text{ billion}$  Ans.  $\boxed{B}$

15. for 4.6%  $\rightarrow 2.766$  and from 35.3%  $\rightarrow 21.18$   
 $\therefore \text{Range} = 18.42 \text{ billion} \approx \boxed{18} \text{ (nearest)}$

16.  $60 \times 35.3\% = 21.18 \text{ billion} \therefore \text{for total} = \frac{21.18}{129} \approx 15\% \quad \text{Ans. } \boxed{B}$

17. Landscaping =  $\frac{1}{3}$  Gym building =  $(1 - \frac{1}{3}) \times \frac{1}{8} = \frac{1}{12}$

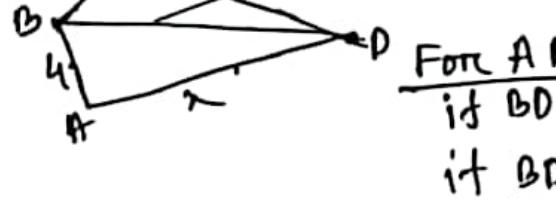
Carry Eng not marked land landscaping on gym =  $1 - (\frac{1}{3} + \frac{1}{12})$   
 $= \frac{7}{12}$

18.  $\frac{DP}{AB} = \frac{DR}{AR}$  Ans. A to R  $\boxed{A}$

19.  $x \circ y = \frac{1}{m} + \frac{1}{n}; \quad \frac{1}{m} \circ \frac{1}{n} = \frac{1}{m} + \frac{1}{m+n} = m+n \quad \boxed{A}$   
 $m \circ n = \frac{1}{m} + \frac{1}{n} = \frac{m+n}{mn} \quad \boxed{B}$

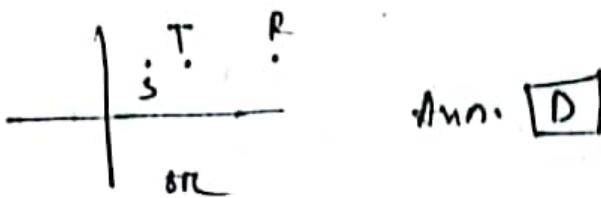
$m \circ n = \frac{1}{m} + \frac{1}{n} = \frac{1}{n} + \frac{1}{m} = n \circ m \quad \boxed{C}$

$5+7=12 \rightarrow 7 < BD < 17 \rightarrow m+n=17 \quad \boxed{A, B, C}$

20.   
For  $\angle ACD$   
if  $BD \parallel AD$   $3 < \angle ACD < 11$  Combining  $3 < \angle ACD < 21$   
if  $BD < 17$   $13 < \angle ACD < 21 \quad \boxed{B}$

### Section-15 Medium

1.  $\frac{T}{3} \cdot \frac{R}{3}$   
either



Ans. D

2.  $\angle BAC = \angle BCA = 58^\circ$  as  $AB = BC$  so  $\angle ABC = 64^\circ$  then  $AC$  must be greater than  $AB$ . Ans. A

3.  $\frac{a}{a-1} > \frac{a+1}{a}$   $a^2 > a^2 - 1$  so  $\frac{a}{a-1}$  must be greater. Ans. A

4.  $n+b+l = \frac{a+b+c}{a+b+c} = 1 \therefore \arg(n,b,l) = Y_3$  Ans. C

5.  $3^{12x} = 5^{12y} \Rightarrow 9^{6x} = 25^{3y}$  or,  $3^{12x} = 5^{12y} \therefore 12x = 12y \therefore x = y$  C

6.  $f = \frac{1^n 12}{50} \times 200 \quad \frac{Q \cdot A}{(\frac{1}{50})^n} \dots \text{because of fractional square } B < A$   
 $\therefore \frac{1}{4} \text{ to } 48$

Ans. A

7.  $12n - 6 = 6n + 5n + 8$  [External angle = sum of two opp. <sup>internal</sup> angles]  
 $n, n = 14$  Ans. A

8.  $T_1 = 2$   $T_{q+1} = T_2 = \frac{1}{3} T_1 = \frac{1}{3} \cdot 2$ ,  $T_3 = \frac{1}{3} \cdot \frac{1}{3} \cdot 2 \therefore T_5 = \frac{1}{3^4} \cdot 2$   
and  $T_{16} = \frac{1}{3^{15}} \cdot 2 \therefore (3^1)^{T_{16}} = 3^1 \cdot \frac{1}{3^{15}} \cdot 2 = \frac{1}{3^4} \cdot 2 = T_5$   
Ans. C

9.  $B = 1.15$ ; after 1 year,  $B = 1.15 + 1.15 \times \frac{5}{100} = \frac{115.5}{100} \leftarrow$   
which is equal to Sam's new salary. So increase  $= \frac{115.5}{100} \leftarrow S = \frac{15.5}{100}$   
= 15.5%  
Ans. C

10. Checking from option, if  $a+b=3$  then  $(3)^2 - 6 \times 3 + 9 = 9 - 18 + 9 = 0$ . Ans. E

11. From figure height,  $b=2b$  and base  $= 2a+a=3a$   
 $\therefore \text{area} = \frac{1}{2} \times 3a \times 2b = 3ab$ . Ans. C

12. Cumulative frequency = 4, 10, 29, 37, 43, 45, 47  $\therefore \text{Median} = \frac{47/2}{23.5}$   
So median = 17 Ans. C

14. Checking b. i.  $\Rightarrow \frac{13}{(68+141+140+33+28+17+15)} = \frac{13}{240} = 0.05$  (35th term)

by checking similar way we will get five programming language between  $\frac{1}{2}$  to  $\frac{13}{24}$ . Ans. E

15. Checking all language, we get  $\frac{2}{17} \times 100 \approx 12\%$ . for Perl.

16. Total number of job posting between 20,000 and 40,000 are  
 $= 38 + 31 + 27 = 96$  Now,  $\frac{96}{(62+46+38+31+27+15+14)} \times 100 = \frac{96}{233} \times 100$   
 $= 41.2\% > 40\%$ . A correct

So fewer than 20,000 and greater than 40,000 job position percentage will be  $= 100 - 41.2 = 58.8 < 60\%$ . B correct

Job position increase in 2016 to 2017 =  $\frac{1000}{12000} \times 100 = 8.33\%$ . not equal  
 and n on n in 2017 to 2018 =  $\frac{1000}{13000} \times 100 = 7.69\%$ . So C wrong

Ans. A, B CareEng

17. Mean =  $\frac{100}{32} = 12.5$  Now,  $15.2 - 12.5 = 0.56$   $\rightarrow$  stand. deviation  
 $\text{SD} = 5.4$   
 $\therefore 1.5 \text{ SD} = 5.4 \times 1.5 = 8.1$   
 $\therefore \text{the number is } = 12.5 - 8.1 = \boxed{4.4}$  Ans. B

18. Same 17

19.  $-2 \leq a < -1 < b \leq 0 < c \leq 1$  So, a and b must be negative and  $a < b$   
 and c is a positive no.  $a < b < c$   
 and ab is ~~negative~~ positive,  $ac \rightarrow ^{-}$ ,  $bc \rightarrow ^{-}$ ,  
 $(- \times +) \rightarrow ^{+}$  Ans. D

$$\cancel{200} + \cancel{1.5H(x+3)} = 400 \rightarrow \text{for } S \quad \text{or } 4Hx = 800 \therefore Hx = 200$$

$$\text{Now, } \frac{1}{2} \times 1.5H \times (x+2x) = \frac{1.5}{2} \times Hx \times 3x = \frac{4.5}{2} Hx^2$$

$$20. \text{Bottom base} = n \quad \text{for } S \rightarrow \text{top base} = \frac{n}{3} \quad \text{don't top base} = \frac{n}{2}$$

$$\text{For } S \rightarrow \frac{1}{2} H(x+\frac{n}{3}) = 400 \quad n, Hn = 600 \quad \text{for } T = \frac{1}{2} 1.5H \times (x+\frac{n}{2}) = \frac{3}{4} \times 1.5 \times H \times \frac{n}{2}$$

$$\text{Ans. TD} = \frac{3}{4} \times 1.5 \times 600 = 1650$$

## Section-1b (Hard)

1. As length of arc same. So,  $b = \pi R$  here,  $\pi x = 5y$  in,  $\frac{x}{y} = \frac{5}{\pi}$   
 $b/n > 1 \therefore n > y$  Ans. A
2. An one number 25, 50, -25 is also there.  $\therefore \text{Range} = 25 - (-25) = 50$   
Ans. A
3. Acc. Q.  $2\pi r = 45 \therefore b = \frac{\pi r^2}{2}$ . Now,  $\frac{\pi r^2}{2\pi^2} = \frac{\pi r^2}{(\frac{11\pi}{2})^2} = \frac{4}{11} \rightarrow 1$   
Ans. A
4. Least number of patient = 20, So other day's patient are 21, 22, 23 & 24  
Sum =  $20+21+22+23+24 = 110$  Ans. C
5. Acc. to question,  $\sqrt{(7-c)^2 + (5-d)^2} = 2$  or,  $(7-c)^2 + (5-d)^2 = 4$   
or,  $(7-c)^2 = 4 - (5-d)^2$   
if,  $d=5$ ;  $(7-c)^2 = 4 - 0$  or,  $7-c = \pm 2 \therefore c = 9 \text{ or } 5$   
 $\therefore$  2 point  $(9, 5)$  &  $(5, 5)$   
if,  $c=7$  then similarly  $(7, 3), (7, 7)$  total 4 point  
Ans. E
6.  $x^2 = 4 \therefore x = \pm 2, y^2 = 1 \therefore y = \pm 1$   
if  $x=2, y=1$  then  $(x-y)^2 = (2-1)^2 = 1$  Ans. D  
if  $x=-2, y=1$  then  $(-2-1)^2 = (-3)^2 = 9$
7.  $a^2 + b^2 = 100 \rightarrow 8^2 + 6^2 = 100$  again,  $10^2 + 0^2 = 100$   
 $\therefore a+b = 14$   $a+b=10$  Ans. D
8. Let number of each type of box =  $n$  Now,  $\frac{8n}{8n+12n} = \frac{2}{5}$  Ans. B  
 $\therefore 8x8 + 2x12 = 280 \therefore n=14$
9.  $P \propto I^2$  or,  $P = kI^2$  Now,  $P=18, I=3$  so,  $18 = k \times 3^2 \therefore k=2$   
Now, for,  $I=4$   $P=2 \times 4^2 = 32$  Ans. C
10.  $a_2 = -\frac{1}{2}a_1, a_3 = \frac{1}{2}x - \frac{1}{2}a_1 = \frac{1}{4}a_1, a_4 = -\frac{1}{8}a_1$   
as 200th even term which is positive so 10th term positive.  
A. Correct
- as the numbers are in  $+,-,+,-$  sequence so sum can be negative  
B. Incorrect
- again for  $+,-,+,-$ , multiple will negative. So C incorrect  
but  $n \rightarrow +,-,+,-$ ,  $n$  is positive Ans. A

11.  $3^1=3$ ,  $3^2=9$ ,  $3^3=27$ ,  $3^4=81$ ,  $3^5=243$  after 4th unit digit of 3 remains.  $\therefore 3^{82} = \dots 9$  which gives remainder 4 when divided by 5. Ans. E

13 & 12.  $21 = x + 0.1x + 0.3x \therefore x = \boxed{15}$

14-16. Same in previous section.

17.  $y = -\frac{1}{2}x - \frac{5}{3}$  Now,  $5P-1 = -\frac{1}{2}3P - \frac{5}{3}$

$$\text{or}, 5P + \frac{3P}{2} = 1 - \frac{5}{3}$$

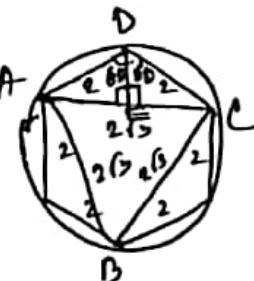
$$\text{or}, \frac{13P}{2} = \frac{-2}{3} \therefore P = -\frac{4}{39} \text{ m. } \boxed{-\frac{4}{39}}$$

18. Taking 2 man from 5 man =  ${}^5C_2$   
and 2 woman from other 3 woman group =  ${}^3C_2$  [as from each group only 1 may select]

$$\therefore \text{Total probability} = \frac{{}^5C_2 \times {}^3C_2}{{}^7C_2} {}^5C_2 \times {}^3C_2$$

$$= 10 \times 3 = 30 \text{ Ans. } \boxed{D}$$

19. Checking options.  $A = \sqrt{(3^4)(5^2)} = \sqrt{81 \times 25} = 9 \times 5 = 45$   
Ans. A

20. 

$AD = DE$  and for hexagon each angle =  $\frac{180(n-2)}{6}$   
 $\therefore \angle ADE = 120^\circ$  and  $\angle ADE = 60^\circ$   
 $\therefore \angle DAЕ = 30^\circ$

$$\text{Now, Con}3D = \frac{AE}{AD} \text{ or, } \frac{\sqrt{3}}{2} = \frac{AE}{AD}$$

$$\therefore AE = \sqrt{3} \therefore AE = 2\sqrt{3}$$

Similarly,  $AB = 2\sqrt{3}$  and  $BC = 2\sqrt{3}$

$$\therefore \text{Perimeter} = 2\sqrt{3} + 2\sqrt{3} + 2\sqrt{3}$$

$$= 6\sqrt{3} \text{ Ans. } \boxed{E}$$

## Section-17 (Research)

1.  $8x+24=5b$ ;  $n=4 \therefore 2x+b=14$  Ans. B

2. Any value (P.int.)  $5^{-n} < 1$  Ans. B

3. Any change of value, smaller one reflects more. So, start price less than belt price. Ans. A

4.  $x = \frac{yc}{yb}$  m,  $x = \frac{a}{c} \times b$  as  $a < c$  and  $b < 1$  so,  $x$  must be less than 1  
and  $y = \frac{cb}{a}$  as  $c > b \therefore a/b > 1$  and  $a < 1 \therefore \frac{1}{a} > 1 \therefore y$  must be greater than 1  
Ans. B

5.  $\frac{1}{n} + \frac{1}{y} = \frac{1}{4}$  let,  $n=8$ ,  $\frac{1}{8} + \frac{1}{y} = \frac{1}{4} \therefore y=8$ ; other values of  $n$ , give other values of  $y$ . Ans. D

6.

7.   
 $AD = 4(DC) \quad \frac{\Delta ABD}{\Delta ABC} = \frac{AD \times BC}{AC \times DC} = \frac{4DC \times BC}{5DC \times DC} = \frac{4}{5} \rightarrow \frac{3}{4}$  Ans. A

8.  $3x + (8-3)y = 3x + 5y$  Ans. D

9. First calculate  $\sigma$  of 2, 4, 6, 8, 10, then check from option.

Such as -  $\mu = \frac{2+4+6+8+10}{5} = 6 \therefore \sigma(S.d) = \sqrt{(6-2)^2 + (6-4)^2 + (6-6)^2 + (6-8)^2 + (6-10)^2}$

option-A  $\rightarrow \mu = 5 \therefore S.d = \sqrt{(5-1)^2 + (5-3)^2 + (5-5)^2 + (5-7)^2 + (5-9)^2} = \sqrt{40}$  A also

Shortcut measure range. Such as  $10-2=8$ ,

option-A  $\rightarrow 6-1=5$  option C  $\rightarrow 11-3=8$  A.

10.   
Now,  $5x + x + \sqrt{3}x + \sqrt{3}x = 135$  m,  $x = 10.21$  Ans. B

11. From Figure,  $\pi r^2 h + \frac{1}{2} 4 \times \frac{1}{3} \pi r^2 + \frac{1}{2} 4 \times \frac{1}{3} \pi r^2 = \pi \times 30^2 \times 150 + \frac{4}{3} \times \pi \times 30^3$   
 $= 53742.85 = 537.43 \text{ cu}$

at 80%. Capacity =  $80 / .86531.43 = 430 \text{ cu}$

$\therefore \text{Price} = 430 \times 0.6 = \$258$  Ans. B

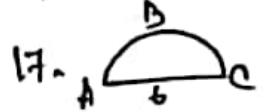
12.  $n=12! = 12 \times 11 \dots \times 3 \times 2 \times 1$  and find factors of optimum then normal calculation.

13.  $800x + 200y = 98400$  and  $x \times 95 + y \times 200 = 10560$   
or,  $2x + 5y = 246$  — (i)  $19x + 40y = 2112$  — (ii)

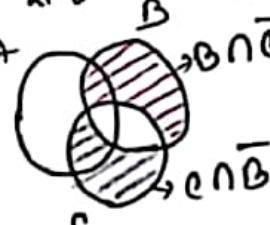
Solving (i) & (ii)  $x = 48$  and  $y = 30$

i.e. total number of units,  $x+y = 48+30 = \boxed{78}$

14-16 - Same solved in previous

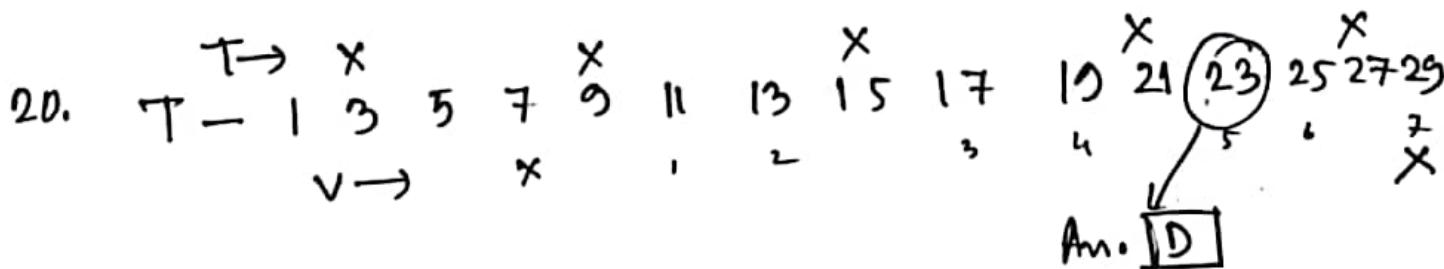
17.   $\frac{\pi r^2}{2} = 6\pi$  area of semicircle  $\text{diam. } 6\pi - 12 \approx \boxed{7}$

18.  $0.6 \times 0.6 \times (1-0.6) + \underbrace{0.6 \times 0.6 \times 0.6}_{3 \text{ times}} = \frac{81}{125} \rightarrow \boxed{E}$

19.   $\therefore A \cap (B \cap C) \neq A \cap B$



Ans.  $\boxed{A}$



## Section-18

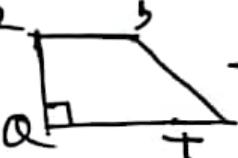
1) Let,  $a=4, b=3$  then,  $\sqrt{2^2+3^2}=5$  and  $\sqrt{(4)^2}+\sqrt{(3)^2}=4+3=7$

$$2) \frac{5! \times 7}{6! \times 8} = \frac{5! \times 7}{6 \cdot 5! \times 8} = \frac{1}{6} \times \frac{7}{8} \xrightarrow{\text{Ans. B}} \text{is less than } 1 \text{ so B must be greater}$$

$$3) \text{Light-hour} = \frac{3 \times 10^8 \times 3600}{1000} \text{ Km} = 1.08 \times 10^9 \text{ Km} < 10^{10} \text{ m.} \boxed{B}$$

4) if  $y=2$  then  $2+5>x$  so  $x$  may be 6.

$$\text{So, Q.A} \quad \frac{Q.A}{2+2=4} \quad \frac{Q.B}{6-2=4} \quad \text{both equal. again } x \text{ could be } 2 \\ \therefore 2+2=4 \quad 2-2=0 \quad B < A \quad \text{Ans. D}$$

5)  → This is the figure according to description.  
From figure, it is clearly visible  $5 > QR$   
Ans.  $\boxed{B}$

$\text{Q. A}$ $\mu = \frac{45+64+83+53}{4}$ $= \frac{245}{4}$	$\text{Q. B}$ $\mu = \frac{55+81+47+62}{4}$ $= \frac{245}{4}$	Noneed
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$$\text{Here Range} = 83 - 45 = 38$$

$$\text{Range} = 81 - 47 = 34$$

So, for Quantity B, numbers are more concentrated than B. So standard deviation of A must be greater.

Ans.  $\boxed{A}$

$$7. \frac{\sqrt{5}}{27} x^2 = n \text{ or, } x(\frac{5}{27}x-1)=0 \quad \therefore x=0 \text{ or, } x=\sqrt[3]{\frac{27}{5}} \\ \text{as, } x>0, \text{ so } x \neq 0 \quad \text{so, } x=\sqrt[3]{\frac{27}{5}} > 5 \text{ m.} \boxed{A}$$

### 8. Quant. A

$$\text{Area} = \pi r^2$$

$$\text{if } \pi=2; \pi(2)^2=4\pi$$

$$\text{if } \pi=1/2; \pi(1/2)^2=\frac{1}{4}\pi$$

### Quant. B

$$\text{Area} = \pi(r^2)^2 = \pi r^4$$

$$= \pi(2)^4 = 16\pi$$

$$= \pi(\frac{1}{2})^4 = \frac{1}{16}\pi$$

$B > A$

$A > B$

Ans.  $\boxed{D}$

9. Checking time per day =  $45 \times \frac{24}{3} = 360$  min  $\therefore$  Total day =  $\frac{180}{6} = 30$  days  
 Ans. D

10. Profit  $\rightarrow$  250 550 150 100 300; by order  $\rightarrow$  100 150  $\frac{250}{M}$  300 550  
 Ans. C

11. digit 6 is in 0.01 position, multiplying by 1000, we will get tenth position in which 7 lies. (1375.2648). Ans. E

12. As BC is tangent to  $\odot C$   $\angle BC$  and  $BA=4$   $\therefore OB=OC+BA=6+4=10$   
 Now,  $OC^2 + OB^2 = OB^2$  my  $6^2 + BC^2 = 10^2 \therefore BC=8$   
 $\therefore \text{Area} = \frac{1}{2} \times 8 \times 6 = 24$  Ans. A

13.  $b = 0.92\pi$   $\therefore x = \frac{60 \times 25}{23}$  Now,  $\frac{\frac{60 \times 25}{23} - 60}{60} \times 100 = \frac{200}{23} = 8.6 \approx 9\%$   
Q1.

14-16. Done in Previous section.

17.  $3^n + 3^{n-1} + 3^{n-2} = 9^{n-2}$  or,  $3 \cdot 3^n = 3^{n-2}$  or,  $3^{1+n} = 3^{2(n-2)}$  or,  $1+n = 2n-2 \therefore n = 5$

18. Let sum of other 5 ~~digit~~ <sup>number</sup> =  $x$   $\therefore 15 \times 2.8 + x = 20 \times M$   
 or,  $M = \frac{42+x}{20}$  if  $x = 1+1+1+1 = 5$  then  $M = 2.35$   
 and if  $x = 5+5+5+5+5 = 25$  then  $M = 3.35$   
 i.e.  $2.35 \leq M \leq 3.35$

19. Checking option. A  $\rightarrow 10 \times 10 + 20 \times 21 + 20 \times 9 + 20 \times 3 + 20 \times 3 = 910 < 1500 \rightarrow$   
 B  $\rightarrow 910 / 48 < 25 \rightarrow X$

C  $\rightarrow$  Range  $\rightarrow 99 - 0 = 99 > 60 \quad \checkmark$

Ans. C

20.  $x \square 3 = 18 \therefore 12 \times 1 (3+3) = 18 \therefore x = 4$  in. E

Q.

2.

$$2+4+6+\dots+50 = 25 \text{ and } 1+3+5+\dots+49 = 25$$

$$X = \frac{25}{2} [2 \times 2 + (25-1) \times 2] \quad Y = \frac{25}{2} [2 \times 2 + (25-1) \times 2]$$

$$X = 25 \times 25 \quad \therefore Y = 25 \times 25$$

$$\therefore X-Y = 25 \times 25 - 25 \times 25 = 25(26-25) = 25 \quad \text{Ans. C}$$

3.  $y = 2x+1$  after 10% off  $x \quad y = 2 \times 1.1x + 1 = 2.2x + 1$

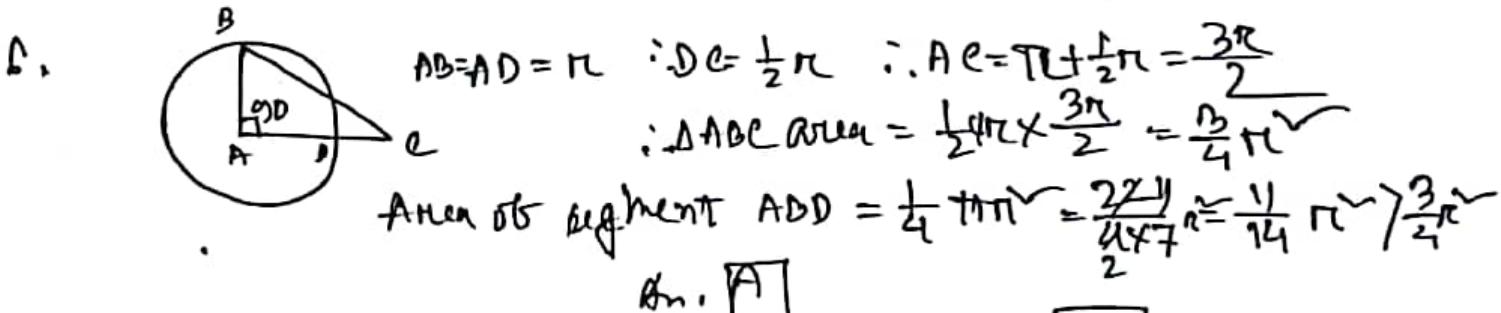
$$\therefore \text{Percent increase of } y = \frac{0.2x}{2.2x+1} < \frac{0.2x}{2.2x} \text{ as } \frac{0.2x}{2.2x} = \frac{1}{10}$$

Ans. B

3. Only per hour rate given, but to find total production needed total time which is missing. Ans. D

4.  $(3n+2) \rightarrow \text{positive} \quad \therefore n=2 \quad (3n+2) \rightarrow \text{negative} \quad \therefore n=-2$   
Ans. D

5.  $\alpha((75+y)+(15-y)) = \alpha(75+y+15-y) = 90\alpha \quad \therefore \alpha = 10 \text{ but}$   
there is no information about  $y$ . Ans. D



7. From figure,  $n^2 + n^2 = (2n)^2 = 4n^2 \quad \text{Ans. C}$

8.  $1.20 \text{ USD} = 1.20 \times 1.25 \text{ Canadian dollar} \quad \therefore \frac{3.785 \text{ L purchased in 1.20 \times 1.25}}{1 \text{ L}} = \frac{1.20 \times 1.25}{3.785}$

Ans. B

$$9. n(M \cup N \cup P) = n(\cancel{M \cap N \cap P}) + n(M) + n(N) + n(P) - n(M \cap N) - n(N \cap P) - n(M \cap P) + n(M \cap N \cap P) \rightarrow 0$$

$$= 80 + 100 + 90 - 28 - 23 - 25 = 174$$

$$\therefore \text{No trapping} = 200 - 174 = 6 \quad \text{Ans. A}$$

10. Square MNOP . Side =  $(12)^2$  and  $\frac{9n^2}{n^2} = \frac{(3n)^2}{(3)^2} = \frac{(9n)^2}{(3n)^2}$   
 $\therefore \text{Each area} = 9 \times 3 = 27 \quad \text{TC}$



11.  $y = (n+2)^{\vee} - 5 \therefore n+2=0 \therefore n=-2$  So  $x$  must be left side  
or  $y$ -axis. An. [C]

12.  $k$  and  $m$  negative so,  $m-p \rightarrow$  negative  
 $p$ -positive  $\therefore (k_1) (p+1) \rightarrow$  positive = negative  
so  $kmp$  negative An. [C]

13.  $\frac{k+p}{7+n}$  for  $\exists$   $\rightarrow \frac{5}{7}, \frac{10}{14}, \frac{15}{21}, \frac{20}{28}, \frac{25}{35}, \frac{30}{40}$   
 $\frac{25}{35} \downarrow$   
 $\frac{30}{40} \downarrow$   
An. [A]  $\rightarrow$  2m

14.  $10.5 - 2.9 = 7.6$  An. [C]

15.  $10.8 \times \frac{84}{100} \times \frac{84}{100} \rightarrow$  as 16% decrease  $= (0.85)^2 \times (10^8)$  [D]

16.  $g = 0.38n \therefore n = 21.05 \approx 21$  [TE]

17.  $(12-4)^{\vee} = 8^{\vee} = 64$  and  $(8-6)^{\vee} = 4$   
 $\therefore \text{Range} = 64 - 4 = 60$  [B]

18.  $0.90 \times 0.01 + 0.90 \times 0.1 + 0.90 \times 0.05 = 0.8090$

19. boy  $S = \{AB \cup CD\}^{\vee} n=4$  Subsets,  $\{AB\} \{AC\} \dots$

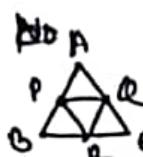
An. [A]

(one is prime)

20. boy 7 girl, let  $g=2$   $b=3$   $g+b=5$  adding two number  
 $g=2$   $b=5$   $g+b=7$  and get the sum as prime  
 $g=1$   $b=2$   $g+b=3$  number, one of the  
number must be 2

An. [A] [B] [D]

Section - 2D

1.  $a+b=5$ ;  $(a+\frac{b}{2}) + (\frac{a}{2}+b) = a+b + \frac{a+b}{2} = 5 + \frac{5}{2} = 5 + 1.25 = 6.25$  Ans. [A]
2. One line may pass or many not pass. Ans. [D]
3. If  $K=\frac{1}{2}$  then  $K \times K = \frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$  Ans. [A]
4.  $y = \frac{1}{2}x + 10$  as  $b(x,y) \rightarrow x < 50$  So,  $x$  may be  $2, 4, \dots, 48 = 24$  for which  $y$  must integer, so  $x=25$  for which  $y$  is not integer.
5.  $S = \frac{n}{2} [2a + (n-1)d]$  or,  $20200 = \frac{101}{2} [2a + [101-1] \times 2]$   
 $\therefore a = 100$  and avg  $= \frac{20200}{101} = 200$   
 and Median  $\rightarrow 101/2 \Rightarrow 51^{\text{th}}$  number and the Median is  $= \frac{100 + 50 \times 2}{2} = 200$
6. Let total cookies =  $n$  Ans. [C]  
 $n = \frac{1}{6}m$   $T = (1 - \frac{1}{6}) \times \frac{1}{7} = \frac{5}{42}$  Not eaten by M&T  $= 1 - \frac{1}{6} - \frac{5}{42} = \frac{5}{7}$  Ans. [C]
7.  ABE equilateral, so sum of two angles  $= 60 + 60 = 120$   
 as there is not enough information about PQR. So Ans. [D]
8.  $3^n$ , let  $n=1$ ,  $3^1 = 81/10 \rightarrow$  remainder 1 Ans. [C]
9.  $7, 8, 9 \rightarrow 789 + 798 + 879 + 897 + 987 + 978 = 5328$  Ans. [5328]
10.  $(x-b)^{v+1} \rightarrow$  for any number of  $b$  positive or negative  $(x-b)^{v+1}$  must be positive. Ans. [E] Core Eng
11. Executive, E' = 40E, Non executive, NE = 45 NE  
 $\therefore \frac{40E + 45NE}{E+NE} = 42$  or,  $3NE = 2E$  So, E to NE 3 to 2  
 Ans. [C]
12. if  $4 \times 1 + 10 \times 4 + 2 \times 3 = 50$  [By trial and error]  
 $\downarrow$   
 So maximum 4 Ans. [4]
13. Cost per widget =  $\frac{4290}{3000} = \frac{7}{5}$  and Sale =  $2 \cdot 10 = \frac{21}{10}$   
 $\therefore \text{Profit} = \frac{21}{10} - \frac{7}{5} = \frac{21-14}{10} = \frac{7}{10} = 0.7$
14.  $60 \times 1000000 \times \frac{14.9}{14.9+10} = 60000000 = 6 \text{ million}$  Ans. [C]
15. From figure, for UK & Japan less than 15%. Ans. [C]
- $\frac{100}{1000} \times 100 = 10\%$        $\frac{37.5}{100} \times 100 = 37.5\%$ .

$$16. \frac{150}{175} = \frac{18}{7} \approx 2.5 \therefore 5-102 \text{ Ans. } \boxed{E}$$

H. 

As AC diameter, so  $\alpha$  must be  $90^\circ$   
 and  $2y + y = 180 \therefore y = 60^\circ$   
 $\therefore \alpha + y = 90^\circ + 60^\circ = 150^\circ$

$$18. \text{ Let the numbers } n, n+2, n+4 \quad (\text{as } n \text{ odd so } n+2 \text{ and } n+4 \text{ even})$$

$$\therefore K = n+n+2+n+4 = 3n+6$$

Sum of three consecutive numbers follows  $2(n+4)$

$$= n+6 + n+8 + n+10$$

$$= 3n+6+18 = K+18 \quad \text{Ans. } \boxed{E}$$

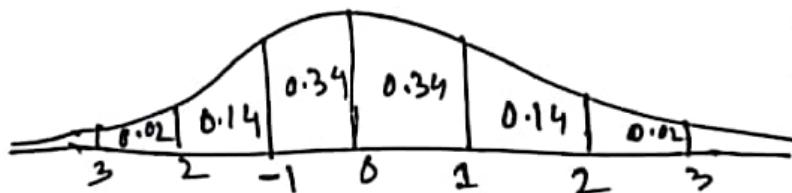
$$19. 2^n - 1 \rightarrow n=1 \quad 2^1 - 1 = 1 \rightarrow A$$

$$n=2 \quad 2^2 - 1 = 3 \rightarrow B$$

$$n=3 \quad 2^3 - 1 = 7 \rightarrow D \quad \therefore \text{Ans. } \boxed{E}$$

$$n=4 \quad 2^4 - 1 = 15 \rightarrow C$$

20.



CareEng

$$M+3S = 30+3 \times 10 = 60 \quad \text{Range may be } = 60 \quad A \rightarrow X$$

$$M-3S = 30-3 \times 10 = 0 \quad B \rightarrow X$$

Half of the phone call  $\rightarrow 30 + \frac{1}{2}60 = 35$

$$35 = 30 + 10/2 = 30 + M + \frac{1}{2}60 \quad C \rightarrow \checkmark$$

Ans.

## Section-23 Hard

1.   $n^{100}, n^{\sqrt{1}} \cdot n^{\sqrt{1}} = 6^n$  m,  $n^{\sqrt{1}} = 18$  ; Ans. D

2.  $\frac{1}{2}n+b=14 \therefore n=16$  and  $\sqrt{w}-3=1$  on,  $w=16$  Ans. C

3.  $\Delta ABE + \Delta DCE = \frac{1}{2}AB \times BE + \frac{1}{2}DC \times EC = \frac{1}{2}AB \times BE + \frac{1}{2}AB \times EC = \frac{1}{2}AB(BE+EC)$   
 $= \frac{1}{2}AB \times AD$   
 Ans. C  $= \Delta AED$

4. Let,  $a=1$   $b=2 \therefore a^b = 1^2 = 1$  and  $b^a = 2^1 = 2 \therefore B > A$

again,  $a=4$   $b=5$   $\therefore a^b = 4^5 = 1024$  and  $b^a = 5^4 = 625 \quad A > B$  Ans. D

5. Same previous

6.  $x, y$  and  $z$  are consecutive integers but positive or negative not clarified. So we will get too many options. (you may check with value)

A. D  
 7.  $\frac{a+b+c+d+e+f}{6} = x \therefore a+b+c+d+e+f = 6x$  (i) and  $\frac{c+d+e+f}{4} = x$  on,  $c+d+e+f = 4x$   
 $(i)-(ii) \Rightarrow a+b=2x$  Ans. C

8. If thumbtack at  $d$  dollars  
 $\therefore t+2500 = \frac{d(t+2500)}{t} = \frac{4t+2500d}{t}$  m. E

10. According to Question,  $\frac{1}{T} + \frac{1}{3T} = 1$  let H take H hours is.  
 $\therefore \frac{H}{T} + \frac{H}{3T} = 1$  on,  $H(\frac{1}{T} + \frac{1}{3T}) = 1$  on,  $H = \frac{3T}{4}$  m. D

10. Density =  $\frac{17}{\frac{20 \times 5 \times 6}{12 \times 12 \times 12}} = 51 \approx 50$  D

11.  $32A = 32 \times 5$  as  $2^5 = 32$   
 $= \boxed{160}$

12. An Avg is 22  $\therefore$  Sum of 10 numbers =  $22 \times 10 = 220$   
 and  $n = 8$  m  $= 20 \times 8 = \frac{160}{60}$

So sum of lowest and greatest number,  $x+y = 60$   
 and range is  $\frac{x-y}{2m} = \frac{50}{110} \therefore m = 55$   
 Ans. E

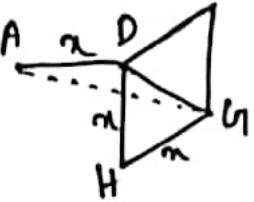
13. Let,  $2\pi r_1 = 100 \text{ m}$   $\therefore r_1 = 50$   $\therefore \text{Width (minimum)} = 50 - 60/2 = 20$   
 and  $2\pi r_2 = 200 \text{ m}$   $\therefore r_2 = 100$   $\therefore \text{Width (maximum)} = 100 - 60/2 = 70$   
 $20 < \text{Walkway} < 70$   $\therefore \text{Ans. } 30, 60$  A, B

14. Thom-table only A and C where  $\frac{6.4}{5} > 1, \frac{9.6}{8} > 1$  To decide quickly  
 ~~$\frac{6.4}{5} > \frac{9.6}{8}$~~   $51.2 > 48$   
 $\therefore 6.4/5 > 9.6/8$

15.  $\frac{31-22.5}{22.5} \times 100 = \frac{8.5}{22.5} \times 100 = 37.78\%$ ,  $\approx 38\%$ . Ans. E

16.  $n(C) = 27, n(D) = 28, n(E) = 17, n(C \cup D) = 10 + 2 = 12, n(C \cup E) = 5 + 2 = 7$   
 $n(E \cup D) = 7 + 2 = 9$  and  $n(C \cap D \cap E) = 2$   
 $\therefore n(C \cup D \cup E) = n(C) + n(D) + n(E) - n(C \cup D) - n(D \cup E) - n(C \cup E) + n(C \cap D \cap E)$   
 $= 28 + 17 + 12 - 9 - 7 + 2 = 46$  Ans. C

17.



$DH^{\vee} + HB^{\vee} = DB^{\vee}$  or,  $n^{\vee} + n^{\vee} = DB^{\vee}$  or,  $DB^{\vee} = 2n^{\vee}$   
 $AD^{\vee} + DH^{\vee} = AB^{\vee}$  or,  $n^{\vee} + 2n^{\vee} = 10.39^{\vee}$   
 $\therefore n \approx 6$

18. Same Previous Ans. A

19.  $4^1 = 4, 4^2 = 16, 4^3 = 64, 4^4 = 256 \quad \therefore 4^{32} = \dots 6$   
 $3^1 = 3, 3^2 = 9, 3^3 = 27, 3^4 = 81 \quad \therefore 3^{32} = \dots 1$  Ans. 5

20. 

So, Both occur =  $0.58$  Ans. A

## Question-22 (Medium)

1.  $-1 < n < 2$  and  $-2 < m < 1$   $\rightarrow$  1, 0, 1 satisfy  $\therefore |m| < 2$  Ans. [B]

2.  $\Delta PQR = \frac{1}{2} PR \times QR \sin \theta = \frac{1}{2} R^2 \times h = \Delta ABC$  Ans. [C]

3.  $n=1, (-1)^n (-1)^{n+1} = 1$ ;  $n=-1$  also  $= 1$  Ans. [C]

4.  $\frac{2}{n} = \frac{y}{2} \therefore ny = 4$ ;  $n \rightarrow \frac{1}{2}, y = 8$  or,  $x = 8, y = \frac{1}{2}$  [D]

5. Let,  $y$  money invested at 3% interest and amount of interest =  $x$

$$\therefore x = y \times \frac{3}{100} - 1) \text{ and } 16 - x = (400 - y) \frac{5}{100} \text{ or, } x = 6$$

from (1),  $y = 200 \therefore$  Ans. [C]

6.  $\sqrt{n} = x \therefore n = \sqrt{n} \times \sqrt{n} \therefore \text{diagonal} = \sqrt{2} n = \sqrt{2} \sqrt{n} n > 2n$  Ans. [A]

7.  $5p_3 = 60$  [C]

8. If,  $m=10 R=2$  Ans. [D]  
If,  $m=45 R=1$

9. Confusion may arise for B & E.  $B \rightarrow \frac{97}{98} \left[ \frac{97}{98} \times \frac{96}{97} \right] E < B$   
 $E \rightarrow \frac{96}{97}$  Ans. [E]

10.  $\frac{x+x+2+x+4}{3} = 11$  or,  $3x+6 = 33 \therefore x=9$   
 $\therefore 9+8+7+6 \rightarrow 9+7 = 16$  Ans. [A]

11.  $w = \frac{2x}{x+y}$  and,  $z = \frac{x}{y} w = \frac{2}{2+z}$  [D]

12. odd  $\times$  odd = odd  $\therefore \frac{3c_2}{5c_2} = \frac{3}{10}$  [E]

13. Cost price =  $100 \times 6 = 600$  sell price =  $20 \times 30 + 30 \times 50 + 40 \times 60 + 100 = 3900$   
avg. =  $\frac{3900}{100} = 39$

$$14. 1600 \times \frac{11}{100} = 656 \therefore \text{not actually increase} \therefore 656 \times \frac{25}{100} = 164$$

An. [A]

$$15. \text{Calculating from table} \rightarrow 160, 192, 240, \underline{288}, 368, 656, 768$$

M      m. [E]

$$16. \text{Trim advertising and marketing} = 1600 \times \frac{12}{100} = 192$$

$$\text{Consolidate debt} = 1600 \times \frac{15}{100} = 240$$

$$\therefore \frac{240-192}{240} \times 100 = \frac{48}{240} \times 100 = \boxed{20\%}$$

$$17. \Delta ABC \text{ and } \Delta AED \text{ Congruent} \therefore AC = AD \therefore \angle ACD = \angle ADC = 4$$
$$\therefore \angle CAD = 180 - 4 - 4 = 180 - 2y = 180 - 126 = 54$$

$$\text{again, } \angle EAB = 90$$

$$\therefore \angle BAC + \angle CAD + \angle DAE = 90 \text{ or, } \angle BAC + \angle CAD + \angle BAC - 90 [\because BC =]$$
$$\text{or, } 90 - x + 54 + 90 - x = 90 \text{ or, } 2x = 144 \therefore x = 72 \text{ An. } \boxed{72}$$

$$18. \text{a) } 1+7+14+21; \therefore 63 \times 7 = 441 \quad [\text{as after 1st term, add with each term}]$$

and now and total  $441 + \frac{4}{1 \text{st term}} = 445$

An. [C]

$$19. \text{Area of each panel in yard} = \frac{4 \times 7.5}{3 \times 3} = \frac{10}{3}$$

$$\therefore \text{total area} = \frac{10}{3} \times 60 = 200 \text{ m. } \boxed{A}$$

20. As range and greatest measurement given, no least of the 120 measurement can be calculated. [A] ✓

Not enough information to get Median [B] ✗

As each of the value not given, so Std. Dev. cannot be calculated [C] ✗

As average given no sum must be calculated [D] ✓

An. [A] [D]

1. Let, A=15, B=20 if we subtract 5 from each and calculate percentage of decrease. In A  $\rightarrow \frac{5}{15} \times 100 = 33.33\%$ ,  
In B  $\rightarrow \frac{5}{20} \times 100 = 25\%$ .

This is not part of the math. This is for to show that decrease same value from fewer one gives more percentage.

An. A

2. Range for Quantity A  $\rightarrow 83 - 45 = 38$  and for Quant B  $= 81 - 47 = 34$   
An. A as Range increase S.d. increases.

3.  $5 = -t \therefore -5^3 = -P$  An. C

4. Five pairs of face coincidences minimize  $4 \times 2 = 8$  Surface.

Now,  $a^3 = 27 \therefore a = 3$ ; Now;  $5 \times 6a^2 - 8a^2 = 270 - 72 = 198$  An. E

5. From Question  $h(x) = 1 - x + 1 \therefore h(1.5) = 1 + 1 = 2$  [by less of equal]  
 $h(1.75) = 1 + 1 = 2$  [ " ]  
An. C

6.  $\triangle PQR$  is an isosceles triangle but which two sides are equal isn't identified. An. D

7.  $180 = 24000 \times \frac{n}{100} \times \frac{1}{12} \therefore n = 9\%$  D

8. Same 7

9. Let, Usual fee = 100  $\therefore$  1st Party fee = 87.5 and 2nd Party fee at 20% increase  $= 87.5 \times \frac{120}{100} = 105 \therefore 5\%$  increase from usual fee

10.  $\downarrow \begin{matrix} 18 \\ 18 \end{matrix} \rightarrow \begin{matrix} 81 \\ 81 \end{matrix}$   $\rightarrow$  Both divided by 9

$$\begin{array}{ccc} 27 & 72 & \rightarrow \\ 36 & 63 & \rightarrow \\ 54 & 45 & \rightarrow \\ 72 & 99 & \rightarrow \end{array} \quad \begin{array}{c} \text{---} \\ \text{---} \\ \text{---} \\ \text{---} \end{array} \quad \therefore 1, 2, 3, 4, 5, 6, 7, 8, 9 \rightarrow \text{total 9 integers.}$$

9

11. No option should be answer.

12. don't want value of  $m$ , let numbers 56 and other numbers 61 and  $M=60$   
 $\therefore m = \frac{56 \times 2 + 61 \times 2 + 60}{5} = 58.8 \quad \therefore \text{Ans. } \boxed{E}$

13. Median =  $12.5 + 3.5 \rightarrow 14.2 \quad \therefore \boxed{18}$   
 $\downarrow \quad \downarrow \quad \downarrow$   
 $6 \quad 6 \quad 11$

14. player A  $\rightarrow (8+3) \times 1 + (7+8) \times 2 + 4 \times 3 = 53$   
 player B  $\rightarrow (7+13) \times 1 + (2+18) \times 2 + 8 \times 4 = 54 \quad \therefore \text{Ans. } \boxed{54 - 53 = 1}$

15.  $(8-4) + (7-4) = 7 \quad \text{Ans. } \boxed{A}$

16.  $\frac{7 \times 3 + 3 \times 4 + 2 \times 5 + 8 \times 6 + 8 \times 7}{7+3+2+8+8} = 147/28 = 5.25 \quad \text{Ans. } \boxed{C}$

	P	N.P
19th century	400	
20th century	140	$210 - 60\% \text{ total}$ <span style="border: 1px solid black; padding: 2px;">350</span>
	800	700

18.  $\frac{n(n+1)}{2}/m = K \quad \therefore n+1 = 2K \therefore n = 2K-1$ ; putting it on  $\frac{(2K-1)(2K+1+1)}{2} = 2K^2-K$   
2K<sup>2</sup>-K D

19.  $2n+10.6 \times 2 + 1.4 \times 2 = 30.4 \quad \therefore n = 7.7$   
 $\therefore \text{Area} = 7.7 \times 10.6 - 2.5 \times 2.5 = 78.12 \text{ cm}^2$   
 $= 78.12 \times 1.5 \times 1.5 \text{ m}^2$   
 $= 175.77$   
 $\approx 176 \text{ m}^2$

20. 1500 will divide  $5^1, 5^2, 5^3 \therefore a=3$

and greatest of  $3^b$  are 33, 333, 333  $\rightarrow b=1$

A.  $a \times b = 3 \times 1 = 3 \quad \checkmark$

B.  $a = 3b \quad 3 = 3 \times 1 \quad \checkmark$

C.  $2 \times 3 > 5 \times 1 \quad \checkmark$

A B C

## Section-04 Research

1. Max value of  $x = 6$ ,  $\therefore$  Quant. A =  $6 - 2 = 4$  Ans. [B]

2. Original price not given. Ans. [D]

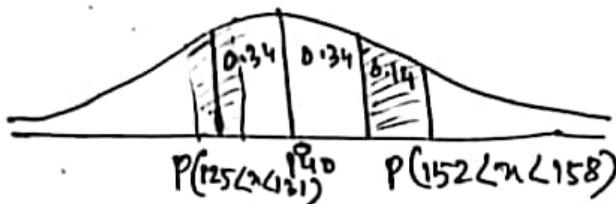
3. Factors of 30 =  $2 \times 3 \times 5$  - all are prime numbers and product = 30  
and sum = 10 Ans. [A]

4.  $3^x 3^y = 1 \Rightarrow 3^{x+y} = 3^0 \therefore x+y=0$  Ans. [B]

5.  $A > 13 > 11 \therefore A > 11$  Ans. [A]

6. Factors of 30 =  $2 \times 3 \times 5 \times 10 \times 15 \times 30$  least possible value =  $5 \times 6 = 30$   
 $\therefore 5+6=11$   
Ans. [B]

7.  $M = 140 \quad M + 15\%d = 140 + 15 = 152$



$\therefore$  Quant A > Quant B

8.  $P = j + 5000$ . Ans. &  $P + j = \$35000$  or,  $j + 5000 + j = 35000$   
 $\therefore j = 15000$   
 $\therefore \frac{15000}{35000} = \frac{3}{7}$  Ans. [C]

9. According to question, 0.36b is Caffeinated tea, again 0.6t Caffeinated tea  
 $\therefore 0.36b = 0.6t \therefore t = 0.6b = 60\% \text{ of } b \therefore \text{Coffee} = (100-t)b = 40\% \text{ of } b$   
Ans. [C]

10. Contains integers from 1 to 99 and other two number C and d.  
 $C+d=100$  and  $Cd < 0$  so, C and d must be negative and C and one of them  
must be greater than 100 [such as  $101 + (-1) = 100$ .]  
[This could be  $200 + (-100) = 100$ ]  
If this, then range  $200 - (-100) = 300$ . Option C  
then invalid. Also justify range  $> 100$ ]

Ans.  $\bar{C} 1 \rightarrow 99 \uparrow$  and  $\bar{d} 1 \rightarrow 99 \downarrow$ , so C and whatever the  
value, there are symmetric, thus Median = Avg.  $\rightarrow$  ✓  
Ans. [A, B]

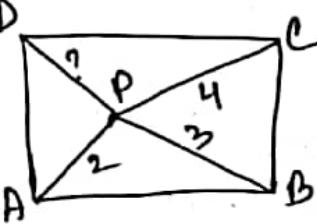
10. Let  $x$  full-time students and  $y$  part-time students  
 $\therefore \frac{3x}{16} = \frac{5}{12} \Rightarrow x = \frac{20}{9}y$ ; And  $\frac{2x+4y}{16} = 15 \Rightarrow \frac{20}{9}y + 4y = 15 \Rightarrow \frac{58}{9}y = 15 \Rightarrow y = \frac{135}{58}$  [A]

11. Equation of tangent. Formula based less important.

13. First number is 22, for which  $22/5$  remainder 2 and  $22/6$  remainder 4  
So the least common factor of 5 & 6 = 30 So possible numbers =  $30x+2$   
if  $x=12$ ; Number  $= 30 \times 12 + 2 = 52 < 60$  so Number  $= 30 \times 2 + 22 = 82 > 60$   
 $\therefore 82/7 = \text{Remainder } 5$  Ans. [5]

14. -16 → Same Previous

15. M of 140-a, 140, 160, 160+a → 150  $\therefore 5d = \sqrt{(140-a-150)^2 + \dots}$  From given formulae  
or,  $5D = \dots$   
or,  $a^2 + 2ba - 4800 = 0 \therefore a = 60, -80$   
Ans. [60]

16.   
Using formula,  $PA^2 + PC^2 = PB^2 + PD^2$   
 $2^2 + 4^2 = 3^2 + PD^2$   
 $\therefore PD = \sqrt{11}$  Ans. [A]

17.  $S = 210 = \frac{n}{2}[2a + (n-1)d]$  or,  $210 = \frac{10}{2}[2a + (10-1)d]$   
 $2a + 9d = 42 \quad \text{(i)}$

and  $S = 820 = \frac{20}{2}[2a + (20-1)d] \Rightarrow 2a + 19d = 82 \quad \text{(ii)}$

Solving (i) & (ii)  $\Rightarrow d = 4$  Ans. [A]

18. According to Question,  $x+x+20=y+y+8 \therefore x = y-6$

Area of (equilateral) Parallelogram  $= \frac{1}{2} d_1 \times d_2$  (diagonal)

$$\begin{aligned} \frac{1}{2} y(y+8) - \frac{1}{2} x(x+20) &= \frac{1}{2} (y^2 + 8y - x^2 - 20x) \\ &= \frac{1}{2} (y^2 + 8y - (y-6)^2 - 20(y-6)) \end{aligned}$$

$$= 112$$

Ans. [D]

25 Research

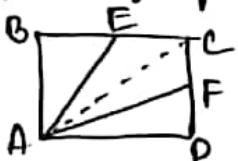
1. January =  $\$5000 \times 0.06 = \$300$ ; February =  $\$6000 \times 0.07 = \$420$   
 Difference =  $\$600 - \$420 = \$180$  Ans. [C]

2. Minimum dimension  $\rightarrow 5, 5, 9 \rightarrow 5+5+9 = 19$  Ans. [D]  
 $8, 11, 9, 15 \rightarrow 8+11+15 = 34$

3. If  $x=-1$   $y=1 \therefore (-1)^4 = 1 = 1^4$  Ans. [D]  
 and  $x=1$   $y=-1 \therefore 1^4 = 1 = (-1)^4$

4. Quant A  $\rightarrow (0+1) \times 2 = (3 \times 0 + 2 \times 1) \times 2 = 2 \times 2 = 3 \times 2 + 2 \times 2 = 10$   
 $0 \cdot (1+2) = (3 \times 0 + 2 \times (1+2)) = 2(3+2+2) = 14$  Ans. [B]

5. Area of quadrilateral AECF =  $\Delta AEE + \Delta AFC$



$$\begin{aligned} &= \frac{1}{2} \Delta ABE + \frac{1}{2} \Delta ACD \\ &= \frac{1}{2} \Delta ABC + \frac{1}{2} \cancel{\Delta ADE} \cancel{\Delta ACD} \\ &= \frac{1}{2} (\Delta ABE + \Delta ACD) \\ &= \frac{1}{2} (\text{Area } ABD) \end{aligned}$$

Ans. [C]

6. Last term of the sequence =  $a n^{100-1} = a n^{99}$

and sum of  $n$  terms  $S = a \frac{n^2-1}{n-1}$  as  $n > 2 \because n-1 \geq 1$   
 and given  $n$  is prime.

$$\therefore a \frac{n^{99}-1}{n-1} > a n^{99}$$

Ans. [B]

7. 31  $\rightarrow$  Prime number      97  $\rightarrow$  Prime number      Range = 97 - 31 = 66  
 33  $\rightarrow$  odd number      99  $\rightarrow$  odd number       $= 99 - 33 = 66$

8.  $4y < 12-3x$  if  $x=1$   $y < 2.5$   $\therefore y = 1, 2$  (1, 2)  
 $x=2$   $y < 1.5$   $y = 1$  (2, 1) = 3 non.  
 Ans. [C]

9.  $A = \{1, 4, 7, 9, 11\} \rightarrow n \rightarrow (1, 4)$  and  $B \rightarrow \{4, 7, 9, 11\}$  exactly one not in B  
 Ans. [A, D]

10. Normal calculation =  $18 \frac{1}{7}$  [D]

$$11. 77 + 2.5 \times 8 = 97 \quad \boxed{E}$$

12. Let, Probability of selecting green ball =  $y$  = selecting blue ball  
 $\therefore x + y + y = 1 \quad \therefore y = \frac{1}{2} \quad \text{Ans. } \boxed{E}$

$$13. 15^{\vee} = 12^{\vee} + 3^{\vee} \quad \because m = 9 \quad \therefore \text{Area} = \frac{1}{2} \times 12 \times 9 = 54$$

and  $16.25^{\vee} = 15^{\vee} + x^{\vee} \quad \therefore \text{Area} = 47 \quad \text{Ans. } 54 - 47 = 7 \quad \text{Ans. } \boxed{F}$

$$14. 1000 \times 10^3 = 1.00 \times 10^{2006 \text{ parts}} \quad \therefore m = 1010266 > 500000$$

Check similar way and Ans.  $\boxed{B}$

$$15. D \rightarrow 2007 \text{ flights } 5000 \quad \begin{array}{c} 80\% \text{ on time} \\ 4000 \\ 10\% \text{ not on time} 1000 \end{array}$$

$$\text{avg} = \frac{436000}{5000} = 87.2$$

Now,  $\frac{\text{Passenger}}{\text{Flight not on time}} = 87.2 \quad \therefore \text{Passenger} = 87.2 \times 1000 = 87200 \approx 87000 \text{ Ans. } \boxed{E}$

$$16. \frac{404000}{1.52} = 265780 \approx 266,000 \quad \text{Ans. } \boxed{D}$$

17. Ratio will be same  $\boxed{24/50}$  Check it by an example.   
 $3, 4, 5, 6, 7, 8, 9 \rightarrow \text{Range} = 6$  | multiply by 2 then  $(\frac{12}{5}) 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12$   
 $\therefore \text{Range} = 12 - 1 = 11 \quad \text{and int. Q.} = 11 - 3 = 8$   
 $\therefore \text{Ratio} = \frac{8}{12} = \frac{2}{3}$ .

$$18. S = vt, v = 1 \text{ km} \quad v = 4 \text{ cm} = 4 \times 10^{-2} \text{ m} \quad 4 \times 10^{-5} \text{ km} = \cancel{0.00004} \text{ km}$$

$$\therefore t = \frac{1}{4 \times 10^{-5}} \quad \therefore t = 6.94 \text{ hr}$$

$$1 = 4 \times 10^{-5} \times t \quad \text{or, } t = \frac{1}{4 \times 10^{-5}} \text{ hr} \rightarrow t = 6.94 \text{ hr} \approx \boxed{7 \text{ hr}}$$

19. L.C.F. of 10 & 15 = 45  $\rightarrow$  1st customer gets both drink & pizza, then 2nd customer gets both again  $12 \times 15 = 180$   $\rightarrow$  <sup>salad served</sup>  $= 180 \times 2 = 360$ , at least 20 customer.

Ans.  $\boxed{C}$

$$20. \text{From figure, } -7 \leq x \leq -1 \quad \text{Now, } F \rightarrow |x+4| \leq 3$$

$$\text{or, } -3 \leq x+4 \leq 3 \quad \text{or, } -3-4 \leq x+4-4 \quad \therefore -7 \leq x \leq -1$$

Ans.  $\boxed{D}$