XAT 2016

Quantitative Ability

50. In the figure below, AB = AC = CD. If ADB = 20°, what is the value of BAD?
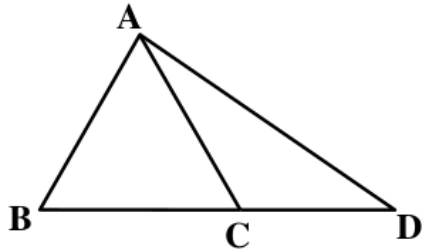

A 40°

B 60°

C 70°

D 120°

E 140°

51. In an amusement park, a visitor gets to ride on three different rides (A, B and C) for free. On a particular day 77 opted for ride A, 55 opted for B and 50 opted for C; 25 visitors opted for both A and C, 22 opted for both A and B, while no visitor opted for both B and C. 40 visitors did not opt for ride A and B, or both. How many visited the amusement park on that day?

A 102

B 115

C 130

D 135

E 150

52. △ABC and △XYZ are equilateral triangles of 54 cm sides. All smaller triangles like △ANM, △OCP, △QPX etc. are also equilateral triangles. Find the area of the shape MNOPQRM.

A
Y M N Z
R O
B Q P C
X
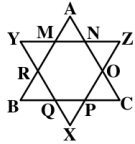
A 243√3 sq. cm.

B 486√3 sq. cm.

C 729√3 sq. cm.

D 4374√3 sq. cm.

E None of the above

53. Akhtar plans to cover a rectangular floor of dimensions 9.5 meters and 11.5 meters using tiles. Two types of square shaped tiles are available in the market. A tile with side 1 meter costs Rs. 100 and a tile with side 0.5 meters costs Rs. 30. The tiles can be cut if required. What will be the minimum cost of covering the entire floor with tiles?

A 10930

B 10900

C 11000

D 10950

E 10430

54. Anita, Biplove, Cheryl, Danish, Emily and Feroze compared their marks among themselves. Anita scored the highest marks, Biplove scored more than Danish. Cheryl scored more than at least two others and Emily had not scored the lowest.
Statement I: Exactly two members scored less than Cheryl.
Statement II: Emily and Feroze scored the same marks.

Which of the following statements would be sufficient to identify the one with the lowest marks?

A Statement I only.

B Statement II only.

C Both Statement I and Statement II are required together.

D Neither Statement I nor Statement II is sufficient.

E Either Statement I or Statement II is sufficient.

55. Rani bought more apples than oranges. She sells apples at Rs. 23 apiece and makes 15% profit. She sells oranges at Rs. 10 apiece and marks 25% profit. If she gets Rs. 653 after selling all the apples and oranges, find her profit percentage.

A   16.8%

B   17.4%

C   17.9%

D   18.5%

E   19.1%

56. Consider the set of numbers $\{1, 3, 3^2, 3^3, \ldots, 3^{100}\}$. The ratio of the last number and the sum of the remaining numbers is closest to:

A   1

B   2

C   3

D   50

E   99

57. f is a function for which f(1)= 1 and f(x) = 2x + f(x - 1) for each natural number x $\geq$ 2. Find f(31)

A   869

B   929

C   951

D   991

E   None of the above

58. Two numbers in the base system B are 2061_B and 601_B. The sum of these two numbers in decimal system is 432. Find the value of 1010_B in decimal system.

A   110

B   120

C   130

D   140

E   150

59. A water tank has M inlet pipes and N outlet pipes. An inlet pipe can fill the tank in 8 hours while an outlet pipe can empty the full tank in 12 hours. If all pipes are left open simultaneously, it takes 6 hours to fill the empty tank. What is the relationship between M and N?

A   M : N = 1 : 1

B   M : N = 2 : 1

C   M : N = 2 : 3

D   M : N = 3 : 2

E   Cannot be determined.

60. Company ABC starts an educational program in collaboration with Institute XYZ. As per the agreement, ABC and XYZ will share profit in 60 : 40 ratio. The initial investment of Rs.100,000 on infrastructure is borne entirely by ABC whereas the running cost of Rs. 400 per student is borne by XYZ. If each student pays Rs. 2000 for the program find the minimum number of students required to make the program profitable, assuming ABC wants to recover its investment in the very first year and the program has no seat limits.
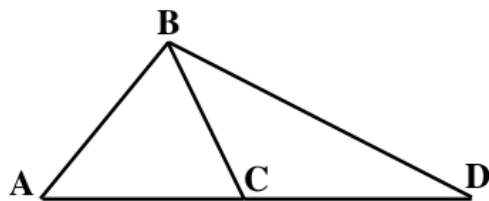
A   63

B   84

C   105

D   157

E   167

61. Study the figure below and answer the question:

Four persons walk from Point A to Point D following different routes. The one following ABCD takes 70 minutes. Another person takes 45 minutes following ABD. The third person takes 30 minutes following route ACD. The last person takes 65 minutes following route ACBD. IF all were to walk at the same speed, how long will it take to go from point B to point C?

A   10 min.

B   20 min.

C   30 min.

D   40 min.

E   Cannot be answered as the angles are unknown.

62. Each day on Planet M is 10 hours, each hour 60 minutes and each minute 40 seconds. The inhabitants of Planet M use 10 hour analog clock with an hour hand, a minute hand and a second hand. If one such clock shows 3 hours 42 minutes and 20 seconds in a mirror what will be the time in Planet M exactly after 5 minutes?

A   6 hours 18 minutes 20 seconds

B   6 hours 22 minutes 20 seconds

C   6 hours 23 minutes 20 seconds

D   7 hours 17 minutes 20 seconds

E   7 hours 23 minutes 20 seconds

63. a, b, c are integers, |a| ≠ |b| ≠|c| and -10 ≤ a, b, c ≤ 10. What will be the maximum possible value of [abc - (a + b + c)]?

A   524

B   693

C   731

D   970

E   None of the above

64. A square piece of paper is folded three times along its diagonal to get an isosceles triangle whose equal sides are 10 cm. What is the area of the unfolded original piece of paper?

A   400 sq. cm.

B   800 sq. cm.

C 800√2 sq. cm.

D 1600 sq. cm.

E Insufficient data to answer

65. The difference between the area of the circumscribed circle and the area of the inscribed circle of an equilateral triangle is 2156 sq. cm. What is the area of the equilateral triangle?

A 686√3

B 1000

C 961√2

D 650√3

E None of the above

66. A person standing on the ground at point A saw an object at point B on the ground at a distance of 600 meters. The object started flying towards him at an angle of 30° with the ground. The person saw the object for the second time at point C flying at 30° angle with him. At point C, the object changed direction and continued flying upwards. The person saw the object for the third time when the object was directly above him. The object was flying at a constant speed of 10 kmph.
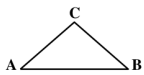
Find the angle at which the object was flying after the person saw it for the second time. You may use additional statement(s) if required.
Statement I: After changing direction the object took 3 more minutes than it had taken before.
Statement II: After changing direction the object travelled an additional 200√3 meters.

Which of the following is the correct option?

A Statement I alone is sufficient to find the angle but statement II is not.

B Statement II alone is sufficient to find the angle but statement I is not.

C Statement I and Statement II are consistent with each other.

D Statement I and Statement II are inconsistent with each other.

E Neither Statement I nor Statement II is sufficient to find the angle.

67. For two positive integers a and b, if $(a+b)^{(a+b)}$ is divisible by 500, then the least possible value of a   b is:

    ×

  A 8

  B 9

  C 10

  D 12

  E None of the above

68. Pradeep could either walk or drive to office. The time taken to walk to the office is 8 times the driving time. One day, his wife took the car making him walk to office. After walking 1km, he reached a temple when his wife called to say that he can now take the car. Pradeep figure that continuing to walk to the office will take as long as walking back home and then driving to the office. Calculate the distance between the temple and the office.

  A 1

  B 7/3

  C 9/7

  D 16/7

  E 16/9

69. If a, b and c are 3 consecutive integers between -10 to +10 (both inclusive), how many integer values are possible for the expression?
$\frac{a^3+b^3+c^3+3abc}{(a+b+c)^2}=?$

  A 0

  B 1

  C 2

  D 3

  E 4

70. In the figure below, two circular curves y and x create 60° and 90° angles with their respective centres. If the length of the bottom curve Y is 10π , find the length of the other curve.

A   15π/√2

B   20π√2/3

C   60π/√2

D   20π/3

E 15π

71. ABCD is a quadrilateral such that AD = 9 cm, BC = 13 cm and ⌊DAB = ⌊BCD = 90°. P and Q are two points on AB and CD respectively, such that DQ : BP = 1 : 2 and DQ is an integer. How many values can DQ take, for which the maximum possible area of the quadrilateral PBQD is 150 sq.cm?

A   14

B   12

C   10

D   9

E   8

Instructions [72 - 74]

Study the data given in the table below and answer the question that follow:

Region \ Shop Type	North	East	West	South	All India
Grocers	34.7	32	32.2	30.2	32.4
Pan Bidi	7.1	21.2	13.1	19.1	14.6
Food Shops	11.8	7.9	14.8	12	11.6
General stores	12.4	9.1	12	6.6	10.1
Electrical Hardware	8.3	5.6	7.7	5.7	6.7
Chemists	6	5.8	5	5.7	5.7
Cosmetic Stores	3.8	3.6	3.3	3.9	3.7
Others	15.8	14.8	12	16.8	15.2
Total	100	100	100	100	100

All figures are in percentage

Based on survey of 'shop types' Kamath categorized Indian states into four geographical regions as shown in the table above. His boss felt that the categorization was inadequate since important labels were missing. Kamath argued that no further labels are required to interpret the data.

72. A consultant observing the data made the following two inferences:
Inference I: The number of Grocers per-thousand-population is the highest in North India.
Inference II: The number of Cosmetic per-thousand-population is the highest in South India.

Which of following options is DEFINITELY correct?

A Inference I alone is correct.

B Inference II alone is correct.

C Either of the inferences is correct.

D Neither of the inference is correct.

E Inference I will be correct only if inference II is correct.

73. The average size of Food Shops in East India was twice that of Food Shops in West India. Which of the following cannot be inferred from the above data?

A As far as 'Food Shops' are concerned, customers in East India prefer spatial surroundings compared to customers in the West India.

B As far as 'Food Shops' are concerned, Rentals are very high in West India compared to East India.

C The ratio of customers buying from 'Food Shops' in East India to customers buying from 'Food Shops' in West India is 15.8 : 11.8.

D There are740 'Food Shops' in West India.

E There are 240 'Food Shops' in South India.

74. Bala collected the same data five years after Kamath, using the same categorization.
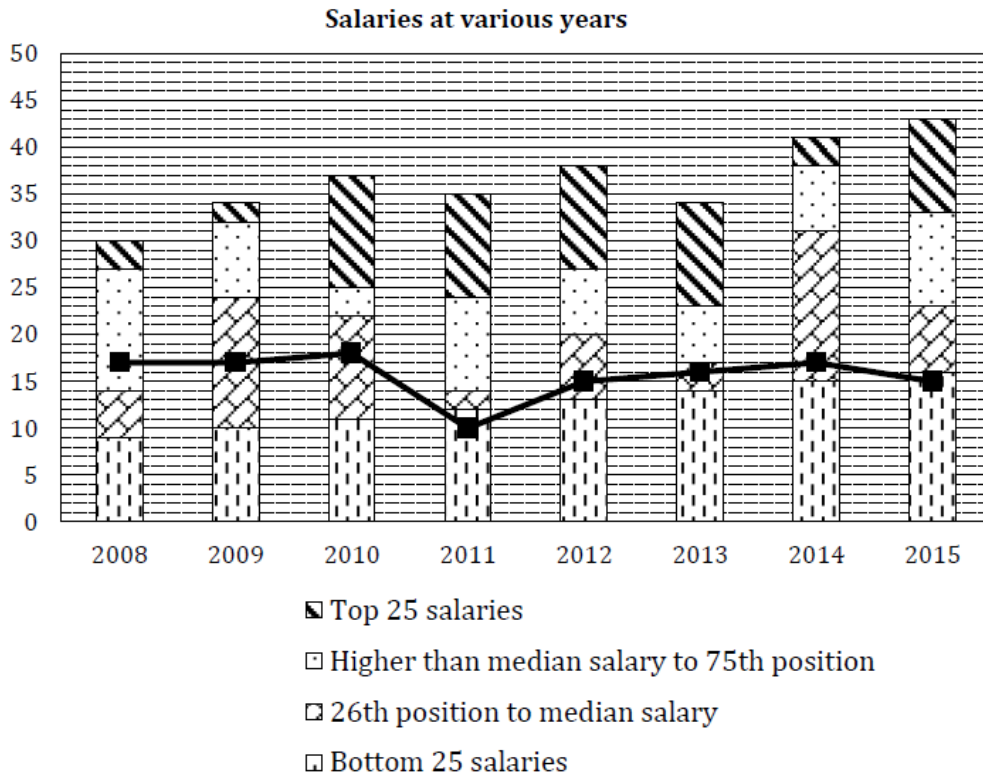
Which of the following statements can DEFINITELY be concluded?

A In the last four years the number of Electrical hardware shop types has increased in North India.

B In the last four years the number of Grocers shop types has increased in South India.

C For the last four years in All India the number of Chemists shop types has remained constant.

D In the four years in East India the number of 'other' shop type has decreased.

E As per the new survey conducted Pan Bidi shops in East India are next only to Grocers.

Instructions [75 - 78]

Study the graph below and answer the questions that follow:

This graph depicts the last eight years' annual salaries (in Rs. lacs.) offered to student during campus placement. Every year 100 students go through placement process. However, at least one of them fails to get placed. The salaries of all unplaced students are marked zero and represented in the graph.

Salaries at various years

Legend:
- ▨ Top 25 salaries
- ⊡ Higher than median salary to 75th position
- ▨ 26th position to median salary
- ▨ Bottom 25 salaries

The bold line in the graph presents Mean salaries at various years.

75. In which year were a maximum number of students offered salaries between Rs. 20 to Rs.30 lacs(both inclusive)?

   A 2008

   B 2009

   C 2010

   D 2012

   E Cannot be determined

76. Identify the years in which the annual median salary is higher by at least 60% than the average salary of the preceding year?

A 2009, 2010

B 2012, 2014

C 2009, 2010, 2012

D 2009, 2012, 2014

E 2009, 2010, 2012, 2014

77. Identify the number of years in which the difference between the average salaries of the top 25% and the bottom 25% is more than Rs. 20 lacs:

A 0

B 1

C 2

D 3

E None of the above options

78. If the average salary is computed excluding students with no offers, in how many years will the new average salary be greater than the existing median salary? Refer the table below for number of students without offers.

Years	2008	2009	2010	2011	2012	2013	2014	2015
Number without job offers	9	5	20	2	2	4	15	2

A 3

B 4

C 5

D 6

E Cannot be solved without additional information.

Answers

Explanations

50.**D**
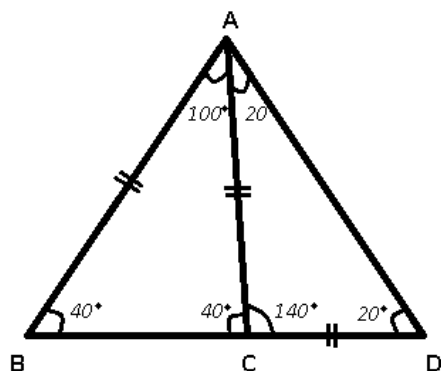
AB = AC = CD, => $\angle CAD = \angle CDA = 20°$

and $\angle ABC = \angle ACB$

In $\triangle$ ACD

=> $\angle ACD + \angle CAD + \angle CDA = 180°$

=> $\angle ACD = 180° - 20° - 20° = 140°$

=> $\angle ACB = 180° - 140° = 40° = \angle ABC$

Similarly, In $\triangle$ ABC

=> $\angle BAC = 180° - 40° - 40° = 100°$

$\therefore \angle BAD = 100° + 20° = 120°$

51.**E**
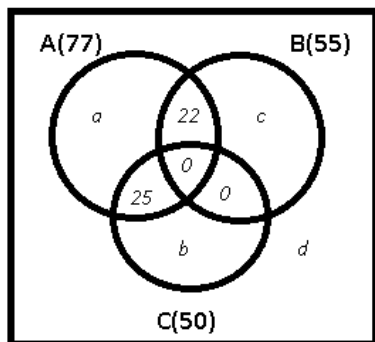
From the figure, $a + 22 + 25 = 77$

=> $a = 77 - 47 = 30$

Similarly, $c = 55 - 22 = 33$

and $b = 50 - 25 = 25$

It is given that 40 visitors did not opt for ride A and B, or both

=> $b + d = 40$

=> $d = 40 - 25 = 15$

∴ Total number of people who visited with the entry pass on that day

= $a + b + c + d + 22 + 25$

= $30 + 25 + 33 + 15 + 47 = 150$

52. **B**

AB = 54 cm and △ANM , △OCP , △OPX are equilateral triangles.

=> MN = MR = NO = OP = PQ = QR = $\frac{54}{3} = 18$ cm

Thus, MNOPQRM is a regular hexagon with side 18 cm

∴ Area of MNOPQRM = $\frac{3\sqrt{3}}{2}(side)^2$

= $\frac{3\sqrt{3}}{2} \times 18^2 = 486\sqrt{3}cm^2$

53. **A**

Area of rectangular floor = 9.5×11.5

= $109.25m^2$

Now, cost of covering $109m^2$ (with 1x1 tiles) = 109×100 = Rs. 10,900

Cost of covering $0.25m^2$ (with 0.5 m square tile) = Rs. 30

∴ Total cost = $10,900 + 30 = Rs. 10,930$

54. **B**

Let A,B,C,D,E,F represents Anita, Biplove, Cheryl, Danish, Emily and Feroze respectively.

Statement I : It is not sufficient as nothing is mentioned about D and F.

Statement II : E = F, thus E and F cannot score the lowest.

Also, C scored higher than at least 2 and B scored more than D while A scored the highest.

The only person left with the lowest marks can be D.

Thus, statement II alone is sufficient.

55. B

Let number of apples = x and oranges = y

=> $23x + 10y = 653 \quad (x > y)$

Since, 653 has last digit 3, which is possible when 23 is multiplies by 1,11,21,31 and so on.

Also, $x > y$ => $x = 21$ and $y = 17$

=> C.P. of 1 apple = $\frac{100}{115} \times 23 = 20$

C.P. of 1 orange = $\frac{100}{125} \times 10 = 8$

=> Total C.P. = $(21 \times 20) + (17 \times 8) = 420 + 136 = 556$

∴ Profit % = $\frac{653-556}{556} \times 100 = 17.4\%$

56. B

Set : $\{1, 3, 3^2, 3^2, \ldots \ldots, 3^{100}\}$

Clearly, this set is a G.P. with common ratio, $r = 3$

Sum of G.P. = $\frac{a(r^n-1)}{r-1}$

Number of terms = 101

Last term = 3^{100}

Sum of remaining terms = $\frac{1(3^{100}-1)}{3-1}$

= $\frac{3^{100}-1}{2}$

∴ Required ratio = $\frac{3^{100}}{\frac{3^{100}-1}{2}}$

= $\frac{3^{100} \times 2}{3^{100}-1}$

$\approx \frac{3^{100} \times 2}{3^{100}} = 2$

57. D

Expression : $f(x) = 2x + f(x-1)$ and $f(1) = 1$

Putting, $x = 2$

=> $f(2) = 2 \times 2 + f(1) = 4 + 1 = 5$

and $f(3) = 2 \times 3 + f(2) = 6 + 5 = 11$

Similarly, $f(4) = 2 \times 4 + f(3) = 8 + 11 = 19$

The pattern followed is : $f(n) = n^2 + (n-1)$

Now, $n = 31$

∴ $f(31) = 31^2 + (31-1) = 961 + 30 = 991$

58. C

Converting numbers in decimal system

=> $2061_B = 2B^3 + 6B + 1$

and $601_B = 6B^2 + 1$

Acc. to ques, => $2B^3 + 6B + 1 + 6B^2 + 1 = 432$

Solving above equation, we get : $B = 5$

$\therefore 1010_5$ in decimal system = $1(5)^3 + 1(5) = 130$

Note :- This question is technically wrong as we cannot have digit 6 in Base 5.

59. **E**

M inlet pipe can fill $\left(\frac{M}{8}\right)^{th}$ part of the tank in 1 hour.

Similarly, N outlet pipes can empty $\left(\frac{N}{12}\right)^{th}$ part of the tank in 1 hour.

=> $\frac{M}{8} - \frac{N}{12} = \frac{1}{6}$

=> $6M - 4N = 8$

=> $M = \frac{4+2N}{3}$

If, N = 1, => M = 2 => $M : N = 2 : 1$

If, N = 4, => M = 4 => $M : N = 1 : 1$

Thus, Ans - (E)

60. **C**

XYZ running cost = Rs 400/student

Each student pays Rs 2000

Profit = 2000 - 400 = 1600

ABC receives 60% of profit, i.e. 1600*0.6 = Rs 960

XYZ begins to make profit from first student itself.

For ABC to recover its investment, number of students should be 100000/960 = 104.16

Therefore, partnership needs at least 105 students to reach break even point.

The answer is option C.

61. **C**

AB + BC + CD = 70 -----------(i)

AB + BD = 45 ----------------(ii)

AC + CD = 30 ----------------(iii)

AC + CB + BD = 65 -----------(iv)

Adding (i) & (iv)

=> AB + BC + CD + AC + CB + BD = 70 + 65

(AB + BD) + 2 BC + (AC + CD) = 135

From (ii) & (iii)

=> 45 + 2 BC + 30 = 135

=> 2 BC = 135 - 75 = 60

=> BC = $\frac{60}{2} = 30$ min

62.**B**

10 hour analog clock is used.

Time in mirror = 3 hours 42 minutes and 20 seconds

=> Actual time = 10 - (3 hrs 42 min 20 sec)

= 6 hrs 17 min 20 sec

∴ Time after 5 minutes = 6 hrs 22 min 20 sec

63.**C**

$|a| \neq |b| \neq |c|$ and -10 ≤ a, b, c ≤ 10

Expression : $[abc - (a + b + c)]$

For maximum value, two of a,b and c should be negative, as all three negative will make abc negative.

Thus, max value will occur if $a = -10, b = -9, c = 8$

=> Max value = $[(-10 \times -9 \times 8) - (-10 - 9 + 8)]$

= $720 + 11 = 731$

64.**A**

When a square sheet is folded in half, its area is also halved. Now, an isosceles right triangle is formed after folded. For 2nd & 3rd folds, again areas halved each time and isosceles right triangle is formed

Equal sides = 10 cm

Area of last such triangle = $\frac{1}{2} \times 10 \times 10 = 50 cm^2$

∴ Area of original square = $50 \times 2 \times 2 \times 2$

= $400 cm^2$

65.**A**

Let radius of incircle = r, => Radius of circumcircle = $2r$

Difference in area = $\pi[(2r)^2 - (r)^2] = 2156$

=> $3 \times \frac{22}{7} \times r^2 = 2156$

=> $r^2 = \frac{2156 \times 7}{66}$

=> $r = \sqrt{\frac{686}{3}}$

Now, height of equilateral triangle = $3r = \frac{\sqrt{3}}{2}a$ (where a is side of triangle)

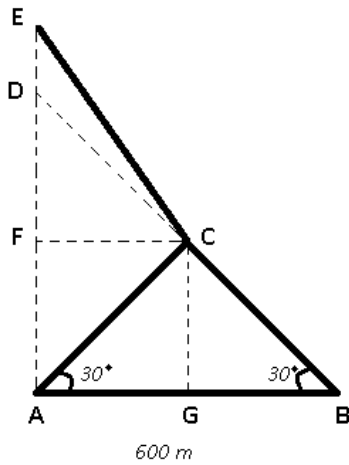=> $3 \times \sqrt{\frac{686}{3}} = \frac{\sqrt{3}}{2}a$

=> $a = 2\sqrt{686}$

∴ Area of triangle = $\frac{\sqrt{3}}{4}a^2$

= $\frac{\sqrt{3}}{4} \times 4 \times 686 = 686\sqrt{3} cm^2$

66.**D**

If the object does not change direction at point C then it will be at D above the person. But since it is given that object changed direction and continued flying upwards, thus object would reach point E.

△ ABC is isosceles triangle (∵ $\angle CAG = \angle ABC$)

=> CG is perpendicular bisector to AB => BG = 300 m

In △ BCG

=> $cos30 = \frac{BG}{BC}$

=> $\frac{\sqrt{3}}{2} = \frac{300}{BC}$

=> $BC = \frac{600}{\sqrt{3}} = 200\sqrt{3}$

Now, according to statement I, time can increase only when the angle with ground level will increase.

But, according to statement II, if CD = $200\sqrt{3}$ (= BC), then at constant speed, it will not take any additional time and thus there should not be any increase in angle.

But in first statement direction has been changed whereas in second statement direction has not been changed.

So both the statements are inconsistent with each other.

67. **B**

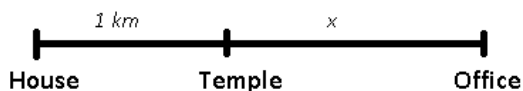If $(a + b)^{(a+b)}$ is divisible by 500,

$500 = 2^2 \times 5^3$

=> Least value of $a + b = 2 \times 5 = 10$

For least a and b, let $a = 1$

=> $b = 10 - 1 = 9$

∴ Min $(a \times b) = 1 \times 9 = 9$

68. **C**

Let walking speed = a

=> Driving speed = $8a$

Let the distance between temple and office = x

Acc. to ques,

=> $\frac{x}{a} = \frac{1}{a} + \frac{x+1}{8a}$

=> $8x = 8 + x + 1$

=> $x = \frac{9}{7}$

69. **C**

Since a,b,c are consecutive integers

=> $a = b - 1$ and $c = b + 1$

Expression : $\frac{a^3 + b^3 + c^3 + 3abc}{(a+b+c)^2}$

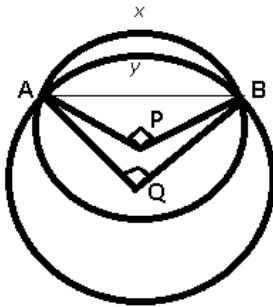= $\frac{(b-1)^3 + b^3 + (b+1)^3 + 3(b-1)b(b+1)}{(b-1+b+b+1)^2}$

= $\frac{b^3 + 3b + b^3 + b^3 + 3b + 3b^3 - 3b}{9b^2}$

= $\frac{6b^3 + 3b}{9b^2} = \frac{2b^2 + 1}{3b}$

Putting different values of b from - 10 to 10, we can verify that only - 1 and 1 satisfies to get integer values for the expression.

Ans - (C)

70. **A**

Let P and Q be the centres of the circles with arcs x and y respectively.

Thus, $\angle APB = 90$ and $\angle AQB = 60$

Also, length of arc $y = 10\pi$ cm

=> $\frac{\theta}{360} \times 2\pi r = 10\pi$

=> $\frac{1}{6} \times 2 \times r = 10$

=> $r = AQ = 10 \times 3 = 30$ cm

=> AB = 30 (∵ △ AQB is equilateral triangle)

Also, △ APB is right isosceles triangle, => $AP = \frac{30}{\sqrt{2}}$

∴ Arc length = $x = \frac{90}{360} \times 2\pi \times \frac{30}{\sqrt{2}}$

= $\frac{15\pi}{\sqrt{2}}$

71. **D**
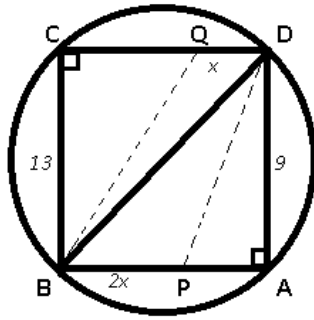
Let $DQ = x$, => $BP = 2x$

Acc. to ques,

=> $ar(\triangle BPD) + ar(\triangle BQD) \leq ar(PBQD)$

=> $(\frac{1}{2} \times AD \times BP) + (\frac{1}{2} \times BC \times QD) \leq 150$

=> $(\frac{1}{2} \times 9 \times 2x) + (\frac{1}{2} \times 13 \times x) \leq 150$

=> $31x \leq 300$ => $x \leq \frac{300}{31}$

=> $x \leq 9.68$

Thus, for x to be an integer and positive, 9 different values (1 to 9) are possible.

72. D
Since the population of the different areas is unknown, None of the two statements can be inferred.
Hence D is the correct answer.

73. C
Since there is no data available about the population of the different areas, all the other options except C can be inferred. Option C cannot be inferred as it talks about the ratio of the customers.
Hence C is the correct answer.

74. E
Option A,B ,C,D talk about the increase or decrease in the number of shops with respect to each other. Since the total number of shops can be different in two different years, hence they cannot be definitely concluded.

Option E compares the numbers of shops of two types in the same year. Since the percentage is given and total number of shops is same, hence E can be concluded. Hence E is the correct answer.

75. E
Let's tabulate the information given in the graph,

Salary range/ Year	2008	2009	2010	2011	2012	2013	2014	2015
0-25	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16
26-50	9-14	10-24	11-22	12-14	13-20	14-16	15-31	16-23
51-75	14-27	24-32	22-25	14-24	20-27	16-23	31-38	23-33
76-100	27-30	32-35	25-37	24-37	27-34	23-33	38-41	33-43

For a salary range we can get the highest and the lowest value of the range but cannot get the distribution of individual student.

In the year 2008 we have a complete salary range(76-100) inside it and some students of the range 51-75.

In the year 2009 some students of the range 51-75 and some students of the range 75-100.

In the year 2010 some students of the range 51-75 and some students of the range 75-100.

In the year 2012 we have a complete salary range 51-75 inside it and some students of the range (76-100) .

Since we cannot determine the exact students and cannot infer a particular year, Hence answer is E i.e cannot be determined.

76. **B**

Let's tabulate the information given in the graph,

Salary range/ Year	2008	2009	2010	2011	2012	2013	2014	2015
0-25	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16
26-50	9-14	10-24	11-22	12-14	13-20	14-16	15-31	16-23
51-75	14-27	24-32	22-25	14-24	20-27	16-23	31-38	23-33
76-100	27-30	32-35	25-37	24-37	27-34	23-33	38-41	33-43

In all the options since 2009 is given

Lets check if 2009 is satisfying the given criteria

Median salary of 2009 = 24 l

Avg salary of 2008 = 16 l

So Median salary of 2009 is between 40 to 50% higher than 2008 avg salary.

Hence options 1,3,4,5 can be negated .

Option B is the correct answer

77. **E**

Let's tabulate the information given in the graph,

Salary range/ Year	2008	2009	2010	2011	2012	2013	2014	2015
0-25	1-9	1-10	1-11	1-12	1-13	1-14	1-15	1-16
26-50	9-14	10-24	11-22	12-14	13-20	14-16	15-31	16-23
51-75	14-27	24-32	22-25	14-24	20-27	16-23	31-38	23-33
76-100	27-30	32-35	25-37	24-37	27-34	23-33	38-41	33-43

The number of years cannot be calculated with precision as the distribution pattern is unknown .

Hence E is the correct answer

78. **A**

Let's tabulate the information given in the graph,

Year	No of students without job offers	Median salary	Mean salary	Mean salary of job offered students
2008	9	14	16	18
2009	5	24	16	17
2010	20	22	19	23.75
2011	2	14	10	10.2
2012	2	20	15	15.3
2013	4	16	16	16.66
2014	15	31	17	20
2015	2	22	15	15.3

It is clear from the table that the mean salary after discarding the unemployed students is greater than the mean salary for the years 2008,2010,2013

Hence A is the correct answer.