XAT PAPER: (06-01-2013)

QUANTITATIVE ABILITY

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56. Prof. Mandal walks to the market and comes back in an auto. It takes him 90 minutes to make the round trip. If he takes an auto both ways it takes him 30 minutes. On a Sunday, he decides to walk both ways. How long would it take him?

A. 100 minutes
B. 120 minutes
C. 140 minutes
D. 150 minutes
E. None of the above

57. At the centre of a city's municipal park there is a large circular pool. A fish is released in the water at the edge of the pool. The fish swims north for 300 feet before it hits the edge of the pool. It then turns east and swims for 400 feet before hitting the edge again. What is the area of the pool?

A. 62500 π
B. 125000 π
C. 250000 π
D. 500000 π
E. Cannot be answered from the given data

58. Mr. Mehra is planning for higher education expenses of his two sons aged 15 and 12. He plans to divide Rs 15 lakhs in two equal parts and invest in two different plans such that his sons may have access to Rs 21 lakhs each when they reach the age of 21. He is looking for plans that will give him a simple interest per annum. The rates of interest of the plans for his younger son and his elder son should be

A. 5% and 7.5% respectively
B. 8% and 12% respectively
C. 10% and 15% respectively
D. 15 % and 22.5% respectively
E. 20% and 30% respectively

59. Albela, Bob and Chulbul have to read a document of seventy eight pages and make a presentation next day. They realize that the article is difficult to understand and they would require team work to finish the assignment. Albela can read a page in 2 minutes, Bob in 3 minutes, and Chulbul in 4 minutes. If they divide the article into 3 parts so that all three of them spend the equal amount of time on the article, the number of pages that Bob should read is

A. 24
B. 25
C. 26

D. 27
E. 28

60. The taxis plying in Wasseypur have the following fare structure: Rs 20 for the first two kilometers, Rs 5 for every km in excess of 2 km and up to 10 km, and Rs 8 for every km in excess of 10 km. Bullock carts on the other hand charge Rs 2 per km. Sardar Khan takes a taxi from the Wasseypur railway station to his home. On the way, at a distance of 14 km from the railway station, he meets Faizal Khan, and gets down from the taxi to talk to him. Later he takes a bullock cart to reach his home. He spends a total of Rs 102 to reach his home from the railway station. How far is his home from the railway station?

A. 17
B. 18
C. 19
D. 20
E. 21

61. Consider the expression

$$\frac{(a^2 + a + 1)(b^2 + b + 1)(c^2 + c + 1)(d^2 + d + 1)(e^2 + e + 1)}{abcde}$$

where a, b, c, d and e are positive numbers. The minimum value of the expression is

A. 3
B. 1
C. 10
D. 100
E. 243

62. The mean of six positive integers is 15. The median is 18, and the only mode of the integers is less than 18. The maximum possible value of the largest of the six integers is

A. 26
B. 28
C. 30
D. 32
E. 34

63. Ramesh bought a total of 6 fruits (apples and oranges) from the market. He found that he required one orange less to extract the same quantity of juice as extracted from apples. If Ramesh had used the same number of apples and oranges to make the blend, then which of the following correctly represents the percentage of apple juice in the blend?

A. 25%
B. 33.3%

C. 60%
D. 66.6%
E. None of the above

64. Sara has just joined Facebook. She has 5 friends. Each of her five friends has twenty five friends. It is found that at least two of Sara's friends are connected with each other. On her birthday, Sara decides to invite her friends and the friends of her friends. How many people did she invite for her birthday party?

A. ≥ 105
B. ≤ 123
C. < 125
D. ≥ 100 and ≤ 125
E. ≥ 105 and ≤ 123

65. 70% of the students who joined XLRI last year play football, 75% play cricket, 80% play basketball and 85% play carrom. The minimum percentage of students who play all four games is:

A. 5%
B. 10%
C. 15%
D. 20%
E. None of the above

66. p and q are positive numbers such that $p^q = q^p$, and $q = 9p$. The value of p is

A. $\sqrt{9}$
B. $\sqrt[6]{9}$
C. $\sqrt[9]{9}$
D. $\sqrt[8]{9}$
E. $\sqrt[3]{9}$

67. Ram, Shyam and Hari went out for a 100 km journey. Ram and Hari started the journey in Ram's car at the rate of 25 kmph, while Shyam walked at 5 kmph. After sometime, Hari got off and started walking at the rate of 5kmph and Ram went back to pick up Shyam. All three reached the destination simultaneously. The number of hours required for the trip was:

A. 8
B. 7
C. 6
D. 5
E. 4

68. The central park of the city is 40 metres long and [illegible] wide. The mayor wants to construct two roads of equal width in the park such that the roads intersect each other at right angles and the diagonals of the park are also the diagonals of the small rectangle formed at the intersection of the two roads. Further, the mayor wants that the area of the two roads to be equal to the remaining area of the park. What should be the width of the roads?

A. 10 metres
B. 12.5 metres
C. 14 metres
D. 15 metres
E. 16 metres

69. In a square PQRS, A and B are two points on PS and SR such that PA = 2AS, and RB = 2BS. If PQ = 6, the area of the triangle ABQ is (is it a repeat)

A. 6
B. 8
C. 10
D. 12
E. 14

70. How many whole numbers between 100 and 800 contain the digit 2?

A. 200
B. 214
C. 220
D. 240
E. 248

71. p, q and r are three non-negative integers such that p + q + r = 10. The maximum value of pq + qr + pr + pqr is

A. ≥40 and <50
B. ≥50 and <60
C. ≥60 and <70
D. ≥70 and <80
E. ≥80 and <90

72. A number is *interesting* if on adding the sum of the digits of the number and the product of the digits of the number, the result is equal to the number. What fraction of numbers between 10 and 100 (both 10 and 100 included) is *interesting*?

A. 0.1
B. 0.11
C. 0.16
D. 0.22

E. None of the above

Answer Questions 73 and 74 from the data given below:

73. Arun has to go to the country of Ten to work on a series of tasks for which he must get a permit from the Government of Ten. Once the permit is issued, Arun can enter the country within ten days of the date of issuance of the permit. Once Arun enters Ten, he can stay for a maximum of ten days. Each of the tasks has a priority, and takes a certain number of days to complete. Arun cannot work on more than one task at a time. The following table gives the details of the priority and the number of days required for each task.

Task	Priority	Number of Days Required
T1	1	3
T2	2	5
T3	5	3
T4	3	4
T5	4	2

Arun's first priority is to complete as many tasks as possible, and then try to complete the higher priority tasks. His last priority is to go back as soon as possible. The tasks that Arun should try to complete are:

A. T1 and T2
B. T1, T2 and T5
C. T1, T4 and T5
D. T1, T2 and T4
E. T1, T3 and T4

74. However, Arun's manager has told him to do some background research on the tasks before leaving for Ten. At the same time, there is no guarantee that the Government of Ten will give the permit to Arun. Background research involves substantial costs, and therefore Arun has decided that he will not start his background research without getting the permit.

The following table gives the details of the priority, the number of days required for each task and the number of days required for background research on each task.

Task	Priority	Number of Days Required	No. of Days Required for Background Research
T1	1	3	3
T2	2	5	5
T3	5	3	2
T4	3	4	2
T5	4	2	3

Arun's first priority is to complete as many tasks as possible, and then try to complete the higher priority tasks. His last priority is to go back as soon as possible within ten days.

The tasks that Arun should try to complete are:

A. T1, T2 and T3
B. T1, T2 and T5
C. T1, T2 and T4
D. T1, T3 and T4
E. T1, T4 and T5

75. The radius of a circle with centre O is $\sqrt{50}$ cm. A and C are two points on the circle, and B is a point inside the circle. The length of AB is 6 cm, and the length of BC is 2 cm. The angle ABC is a right angle. Find the square of the distance OB.

A. 26
B. 25
C. 24
D. 23
E. 22

76. Six playing cards are lying face down on a table, two of them are kings. Two cards are drawn at random. Let a denote the probability that at least one of the cards drawn is a king, and b denote the probability of not drawing a king. The ratio a/b is

A. ≥ 0.25 and < 0.5
B. ≥ 0.5 and < 0.75
C. ≥ 0.75 and < 1.0
D. ≥ 1.0 and < 1.25
E. ≥ 1.25

77. Consider the expression: $(xxx)_b = x^3$, where b is the base, and x is any digit of base b. Find the value of b:

A. 5
B. 6
C. 7
D. 8
E. None of the above

78. Consider a function $f(x) = x^4 + x^3 + x^2 + x + 1$, where x is a positive integer greater than 1. What will be the remainder if $f(x^5)$ is divided by $f(x)$?

A. 1

B. 4
C. 5
D. a monomial in x
E. a polynomial in x

79. In the country of Four, there are four cities, A, B, C and D. B is to the East of A, C is to the South of B, D is to the West of C, and A is to the North of D. The Government of Four is planning to connect these four cities by road such that it is possible for a person to go from a city to any of the other three cities. At the same time, the Government wants to ensure that the total road length is minimum. The distances between A to B, B to C, C to D and D to A are all equal to 10 km. What should be the total length of the road?

A. 26.64 km
B. 27.32 km
C. 28.30 km
D. 30 km
E. 36 km

80. Please read the following sentences carefully:

I – 103 and 7 are the only prime factors of 1000027

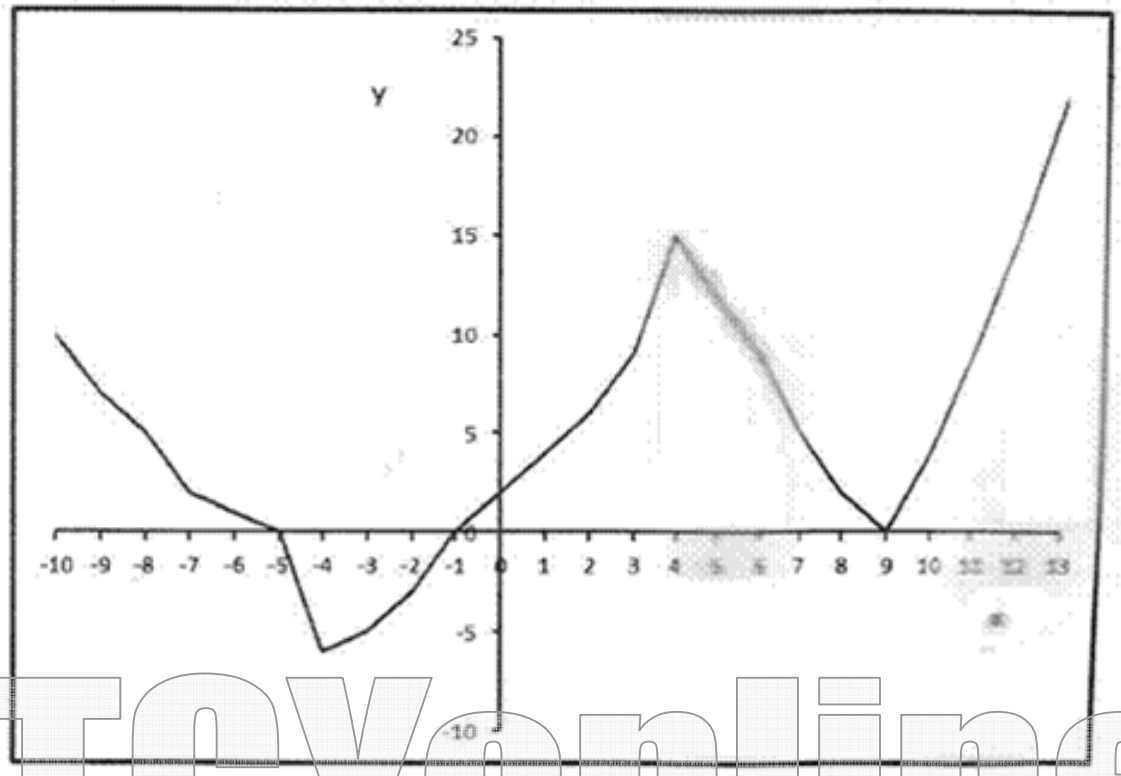
II - $\sqrt[6]{6!} > \sqrt[7]{7!}$

III – If I travel one half of my journey at an average speed of x km/h, it will be impossible for me to attain an average speed of 2x km/h for the entire journey.

A. All the statements are correct
B. Only Statement II is correct
C. Only Statement III is correct
D. Both statements I and II are correct
E. Both statements I and III are correct

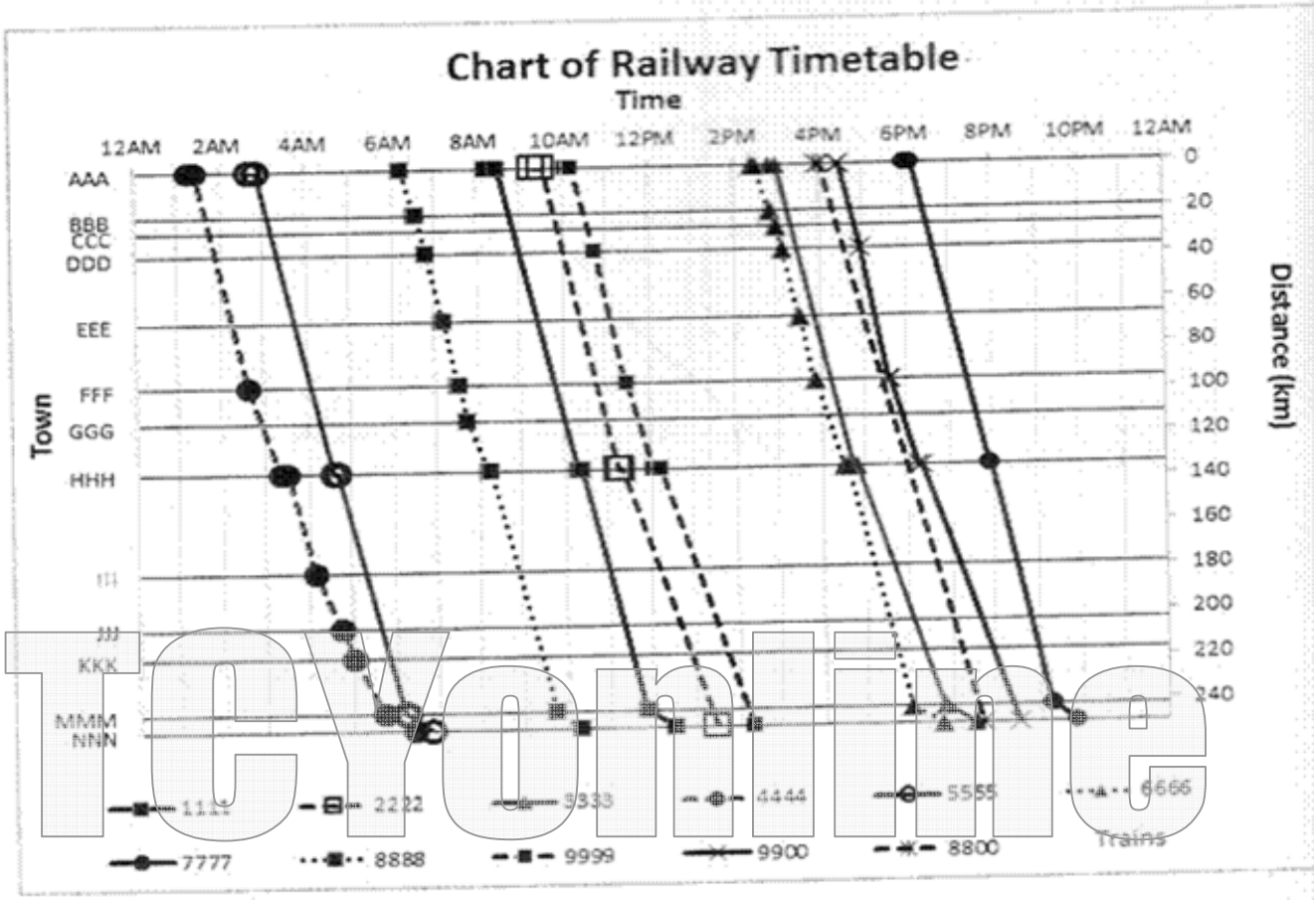
81. The figure below shows the graph of a function f(x). How many solutions does the equation f(f(x)) = 15 have?

A. 5
B. 6
C. 7
D. 8
E. Cannot be determined from the given graph



Answer question nos. 82 – 84 based on the following information:

Analyse the railway train chart below:



82. Which is the fastest train between HHH and NNN?

A. 1111
B. 2222
C. 4444
D. 7777
E. 9999

83. Which is the fastest train between AAA and NNN?

A. 8800
B. 8888
C. 6666
D. 4444
E. 3333

84. If you have to travel from AAA and reach HHH at around 9:00 AM, and then further travel to NNN at around 6:00 PM, which is the best combination of trains for you?

A. 1111 and 8800
B. 1111 and 9900
C. 8888 and 7777
D. 8888 and 8800
E. 8888 and 9900

Answer question nos. 85 – 88 based on the following information:

Data on an ongoing football league of a country is given below. 20 teams are playing in the league. The rules of the league are as follows:

1. Each team plays all the other teams twice, once in its home ground, and once in the opponent's home ground. These matches are known as the "Home" match and the "Away" match respectively.

2. A win results in 3 points, a draw in 1 point, and a loss in 0 point for the team.

3. The number of goals a team scores is termed as "Goals For" and the number of goals it concedes is termed as "Goals Against". We get the "Goal Difference" by subtracting "Goals Against" from "Goals For".

The ranking of the teams is decided on the total points. If two teams are tied on their total points, the team which has a higher Goal Difference gets the higher rank. If the tie cannot be resolved on Goal Difference, Goals For is checked followed by Goals Against. If the tie persists, the teams are ranked in the ascending order of their names.

Table 1 provides data on the current top 13 teams based on the overall situation, i.e., by taking into account both home matches and away matches of each team.

Table 2 provides data on the current top 13 teams based on home matches only.

Chart 1 provides a plot of the goal difference of each of the 13 teams based on the overall situation.

Overall				
Team	M	W	D	GF
CH	3	3	0	8
SW	3	2	1	10
WB	3	2	1	6
MC	3	2	1	8
MU	3	2	0	6
WH	3	2	0	4
EV	3	2	0	4
AS	3	1	2	2
WG	3	1	1	4
NC	3	1	1	3
FU	3	1	0	7
ST	3	0	3	3
SU	2	0	2	2

Table 1

Home					
Team	M	W	D	GF	GA
WB	2	2	0	5	0
WH	2	2	0	4	0
CH	2	2	0	6	2
MC	2	2	0	6	3
SW	2	1	1	5	2
NC	2	1	1	3	2
FU	1	1	0	5	0
EV	1	1	0	1	0
MU	1	1	0	3	2
TOT	2	0	2	2	2
NW	1	0	1	1	1
AS	1	0	1	0	0
ST	1	0	1	0	0

Table 2

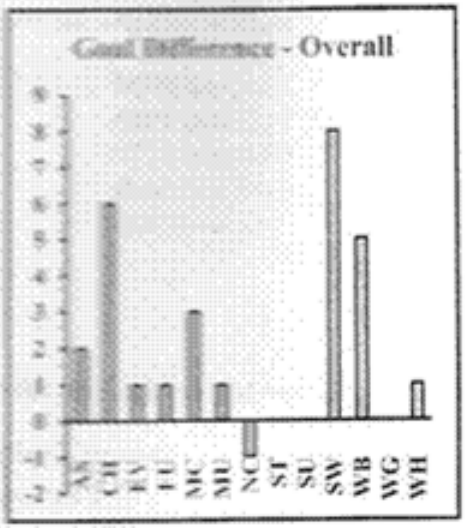


Chart 1

85. Considering away matches only, which of the following teams is the second ranking team?

A. AS
B. CH
C. WG
D. SW
E. WB

86. Considering away matches only, the least number of teams with either 0 or 1 point is:

A. 2
B. 3
C. 4
D. 5
E. 6

87. Let us define a term *pos* as the difference between "home rank" and "away rank". Which of the following has the maximum value of *pos*?

A. AS
B. WB
C. WH
D. MC

E. SW

88. How many unique values of goal difference are there for away matches?

A. 5
B. 6
C. ≥ 6
D. ≥ 6 and ≤ 13
E. ≥ 6 and ≤ 14

Answer question nos. 89 – 91 based on the following information:

Given below are a few data points on the Indian economy from 2005 to 2010:

Indicator	Unit	2005	2006	2007	2008	2009	2010
GDP, current prices	Rs Billions	35662.2	41159.73	47675.86	54470.27	60712.76	73555.34
GDP per capita, current prices	Rs	32128.1	36553.93	41747.69	47038.23	51714.45	61784
Gross national savings Percent of GDP	%	32.88	34.28	36.65	32.17	35.08	32.14
Inflation, average consumer prices Index	Index	115.67	122.92	130.75	141.67	157.08	175.92
Volume of imports of goods and services	% change	17.99	9.438	16.3	10.84	8.321	16.49
Volume of exports of goods and services	% change	18.88	13.83	17.13	10.63	0.813	21.86
Unemployment rate	%	9.2	8.9	7.8	7.2	6.8	7.32
Current account balance Percent of GDP	%	-1.272	-1.024	-0.701	-2.475	-2.066	-3.268

*Per capita GDP is arrived by dividing GDP by population.

89. What is the ratio of the current account balance in 2010 to the current account balance in 2005?

A. 0.35
B. 4.56
C. 5.01
D. 2.57

E. 5.30

90. Read the statements given below:

1. Exports were more than imports in 2006

2. Imports were more than exports in 2009

3. Exports increased at faster rate than imports during the period 2005 to 2010

Which of the above statements is necessarily true?

A. 1 and 2
B. 1, 2 and 3
C. 3 only
D. 2 only
E. 1 only

91. What was the approximate number of unemployed persons in 2006?

A. 100 million
B. 102 million
C. 98 million
D. 105 million
E. 104 million