

1. A circle of radius 12 cm has its radius decreased by 25%. The percentage of decrease in its area is :

- (1) 25
- (2) 37.5
- (3) 42.25
- (4) 43.75

2. 4 persons work 4 hours per day and complete a job in 4 days. If 8 persons work 8 hours per day, in how many days the job will be completed ?

- (1) 8 days
- (2) 4 days
- (3) 2 days
- (4) 1 day

3. In the geometric series,  $\frac{1}{2}, \frac{1}{4}, \frac{1}{8}, \dots$  the 8<sup>th</sup> term is :

(1)  $\frac{1}{256}$

(2)  $\frac{1}{128}$

(3)  $\frac{1}{64}$

(4)  $\frac{1}{32}$

4. A bag contains 400 coins, consisting of 50p, 10p, 5p coins. The total value of the coins of each kind is the same. The No. of 5p coins is :

- (1) 200
- (2) 250
- (3) 125
- (4) 300

5. If  $a^2 + b^2 = 45$  and  $ab = 18$ , find the value of  $\frac{a}{b} + \frac{b}{a}$

(1) 2

(2) 1

(3)  $\frac{5}{2}$

(4)  $\pm \frac{5}{2}$

6. If the radii of two concentric circles are 15 cm and 13 cm respectively, then area of the circular ring (between the two circles) is :

(1)  $6\frac{1}{2} \text{ cm}^2$

(2)  $12\frac{1}{2} \text{ cm}^2$

(3)  $88 \text{ cm}^2$

(4)  $176 \text{ cm}^2$

7. A car runs at the rate of 15 kmph during the first 30 kms and at 25 kmph during the second 50 kms. What is the average speed for the entire trip ?

(1) 15 kmph

(2) 20 kmph

(3) 25 kmph

(4) 30 kmph

8. A person borrows Rs. 2,500 at 10% simple interest for 2 years and lends this money for the same period at the same rate at compound interest. Then his gain is :
- (1) Rs. 10
  - (2) Rs. 15
  - (3) Rs. 20
  - (4) Rs. 25
9. The cost of petrol per litre is Rs. 20. In the budget the cost is increased by 30%. After a week the revised cost is decreased by 15%. The cost of the petrol per litre at present is :
- (1) Rs. 23
  - (2) Rs. 23.50
  - (3) Rs. 22
  - (4) Rs. 22.10
10. The mean age of a group of 100 children is 10 years and the mean age of 25 of them is 8 years and that of another 65 is 11 years. Then the mean age of the remaining 10 children is :
- (1) 7.5 years
  - (2) 8.0 years
  - (3) 8.5 years
  - (4) 9.0 years
11. A man bought two hens at the same price and sold one at a gain of 20% and other at the loss of 20%. On the whole the man will :
- (1) Gain
  - (2) Lose
  - (3) Neither gain or lose
  - (4) None of these

12. The value of  $1 \cdot 2 + 3 \cdot 4 + 5 \cdot 6 + \dots$  100 terms is:
- 100
  - 50
  - 50
  - None of these
13. The value of  $(\sec A + 1)(\sec A - 1) - \tan^2 A$  is :
- 1
  - 0
  - 1
  - $\frac{1}{2}$
14. If the radius of the sphere is increased by 50%, then the increase in the surface area of the sphere is :
- 100%
  - 125%
  - 150%
  - 200%
15. The sides of a triangle are in the ratio  $\frac{7}{8} : \frac{8}{9} : \frac{9}{10}$  and its perimeter is 104 cm. The length of the longest side is :
- 52 cm
  - 48 cm
  - 32 cm
  - 26 cm
16. Two trains travel in the same direction at 50 km/hr and 32 km/hr

respectively. A man in the slower train observes that the faster train passes him completely in 15 seconds. The length of the faster train, in metres, is :

- (1) 18
- (2) 50
- (3) 75
- (4) 150

17. The diameter of a cone is 1.4 cm. Its slant height is 4.2 cm. Find curved surface area.

- (1)  $9.24 \text{ cm}^2$
- (2)  $2.24 \text{ cm}^2$
- (3)  $8.14 \text{ cm}^2$
- (4)  $6.94 \text{ cm}^2$

18. A cone has a radius of 3 cm and slant height of 5 cm. Its vertical height is :

- (1)  $\sqrt{3^2 + 5^2}$
- (2)  $5^2 - 3^2$
- (3)  $3^2 + 5^2$
- (4)  $\sqrt{5^2 - 3^2}$

19. Simplify  $\frac{19^3 - 15^3}{19^2 + 19 \times 15 + 15^2}$

- (1) 4
- (2) 1
- (3) 13
- (4) 11

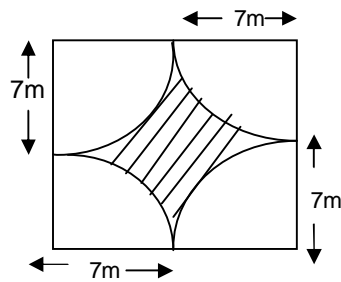
20. If  $x^5 - 9x^2 + 12x - 14$  is divided by  $(x - 3)$ , then the remainder is :

- (1) 1
- (2) 2
- (3) 56
- (4) 184

21. In a right angled triangle, one acute angle is double the other. If the length of the smallest side is  $a$  the length of the hypotenuse is :

- (1)  $\sqrt{5}a$
- (2)  $2a$
- (3)  $2\sqrt{2}a$
- (4)  $(\sqrt{2} + 1)a$

22. The area of the shaded portion in the given figure where the arcs are quadrants of a circle is :



- (1)  $42 \text{ m}^2$
- (2)  $56 \text{ m}^2$
- (3)  $64 \text{ m}^2$
- (4)  $144 \text{ m}^2$

23. A train 540m long is running with a speed of 72 km/hour. The time taken by the train to pass a tunnel 160m long will be :

- (1) 18 seconds
- (2) 27 seconds
- (3) 35 seconds
- (4) 42 seconds

24. A man undertakes to do a certain work in 150 days. He employs 200 workers. He discovers that only a quarter of the work is done in 50 days. In order to complete the work on schedule, he must additionally employ:

- (1) 50 workers
- (2) 100 workers
- (3) 150 workers
- (4) 200 workers

25. If  $x^y = y^x$ ,  $\left[ \frac{x}{y} \right]^{x/y}$  equals :

- (1)  $x^{x/y}$
- (2)  $x^{(x/y) - 1}$
- (3)  $x^{y/x}$
- (4)  $x^{(y/x) - 1}$

26. Which one of the following statements is correct?

- (1)  $9^{60} < 27^{35}$
- (2)  $9^{60} \leq 27^{35}$
- (3)  $9^{60} > 27^{35}$
- (4)  $9^{60} \geq 27^{35}$

27. The value of  $\sin^2 30^\circ \cos^2 45^\circ + 4 \tan^2 30^\circ + \frac{7}{2} \sin^2 90^\circ \cdot 2 \cos^2 90^\circ$  is :

(1)  $\frac{77}{22}$

(2)  $\frac{77}{22}$

(3)  $\frac{77}{22}$

(4)  $\frac{77}{22}$

28. A man jumped at a speed of 5 metres per second from a stationary boat and the boat moved off with the speed of 0.5 metre per second. How many times is the mass of the boat greater than of the man ?

(1) 5.5 times

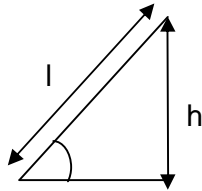
(2) 4.5 times

(3) 2.5 times

(4) 10 times



29. A smooth inclined plane is inclined at an angle with the horizontal as shown in the figure. A body starts from rest and slides down the inclined surface. The time taken by the body to reach the bottom is :



- (1)  $\frac{\sqrt{2h}}{\sqrt{g}}$
- (2)  $\frac{\sqrt{2l}}{\sqrt{g}}$
- (3)  $\frac{1}{\sin} \frac{\sqrt{2h}}{\sqrt{g}}$
- (4)  $\sin \frac{\sqrt{2h}}{\sqrt{g}}$

**Directions (Q.nos. 30 – 36) Read the following information carefully and then answer the questions based on it.**

A sales representative plans to visit each of six companies - M, N, P, Q, R and S exactly once during the course of one day. She is setting up her schedule for the day according to the following conditions.

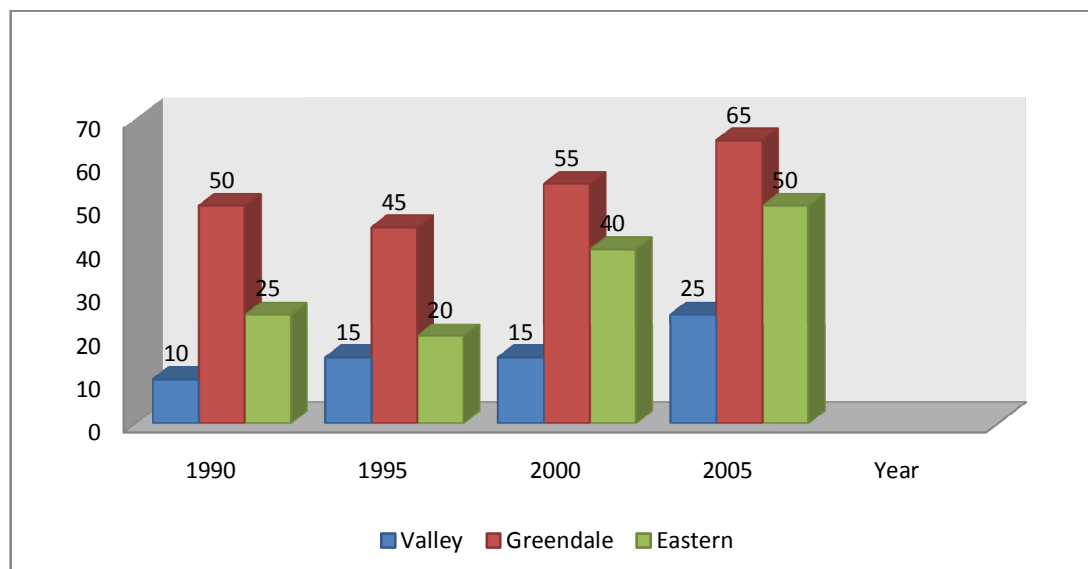
- I. She must visit M before N and before R.
- II. She must visit N before Q.
- III. The 3<sup>rd</sup> company she visit must be P.

30. Which of the following could be the order in which sales representative visits the six companies ?
- (1) M, R, N, Q, P, S
  - (2) M, S, P, N, R, Q
  - (3) P, R, M, N, Q, S
  - (4) P, S, M, R, Q, N
31. Which of the following must be true of the sales representative's schedule for the day ?
- (1) She visits M before Q
  - (2) She visits N before R
  - (3) She visits P before M
  - (4) She visits P before R
32. If the sales representative visits S first, which company must she visit second ?
- (1) M
  - (2) N
  - (3) P
  - (4) Q
33. Which of the following could be true of the sales representative's schedule ?
- (1) She visits M 3<sup>rd</sup>
  - (2) She visits R 6<sup>th</sup>
  - (3) She visits P 1<sup>st</sup>
  - (4) She visits Q 2<sup>nd</sup>
34. If the sales representative visits Q immediately before R and immediately after S, she must visit Q.
- (1) 1<sup>st</sup>
  - (2) 2<sup>nd</sup>
  - (3) 4<sup>th</sup>
  - (4) 5<sup>th</sup>

35. If the sales representative visits S 6<sup>th</sup>, which of the following could be her 1<sup>st</sup> and 2<sup>nd</sup> visits, respectively ?
- (1) M and Q
  - (2) M and R
  - (3) N and M
  - (4) Q and P
36. The sales representative could visit any of the following companies immediately after P except ?
- (1) M
  - (2) N
  - (3) Q
  - (4) R

**Questions 37- 42 are based on the following graph.**

**Enrolment at Three Community Colleges , 1990-2005 (in hundreds)**

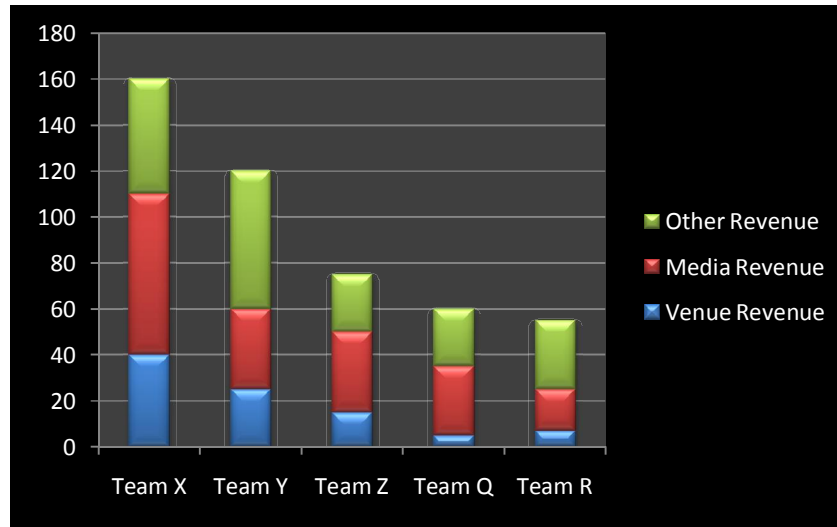


37. For the year in which the ratio was the highest, what was the ratio of the enrolment at Greendale to the enrolment at valley ?
- (1) 6:1
  - (2) 5:1
  - (3) 4:1
  - (4) 3:1

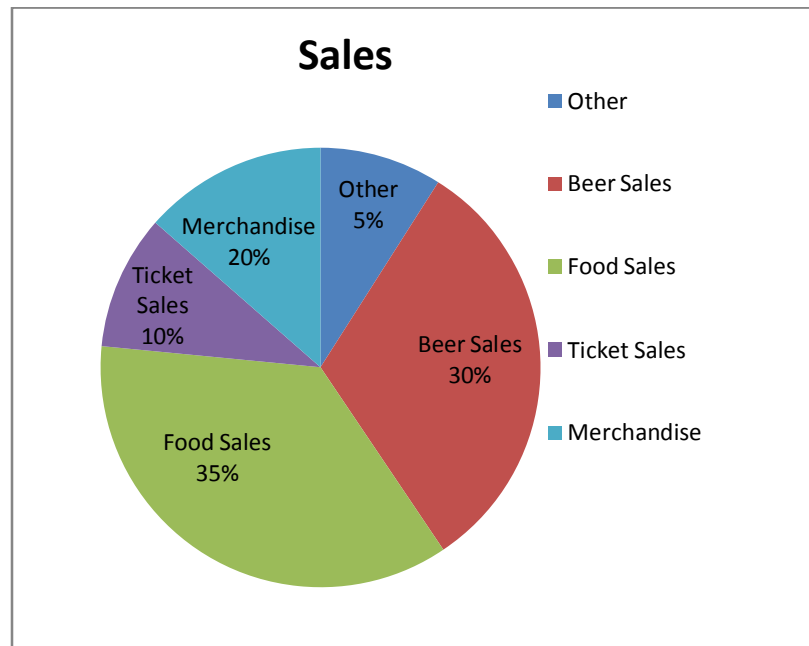
38. What was the total enrolment (in hundreds) for the three colleges in 2000?
- (1) 110
  - (2) 125
  - (3) 135
  - (4) 140
39. Which college showed the greatest increase in number of students enrolled in a 5-year span over the years 1990-2005, inclusive, and when ?
- (1) Valley between 2000 and 2005
  - (2) Greendale between 1995 and 2000
  - (3) Greendale between 2000 and 2005
  - (4) Eastern between 1995 and 2000
40. Total expenses at all three colleges have risen the same percent between 2000 and 2005 as the percent increase in enrolment. By approximately what percent have expenses increased ?
- (1) 10%
  - (2) 21%
  - (3) 27%
  - (4) 36%
41. To the nearest hundred, what was the average (arithmetic mean) enrolment in 1995 of the three colleges ?
- (1) 1,000
  - (2) 1,500
  - (3) 2,700
  - (4) 80,000
42. The projected enrolment at Eastern in the next academic year is 6,200 students. What percent increase will that be over the enrolment in 2005?
- (1) 12%
  - (2) 15%
  - (3) 18%
  - (4) 24%

**Questions 43- 46 refer to the following graphs.**

**Team Revenues for 1997**  
**( millions of dollars)**



**Percentage of Venue**  
**Revenues for Team X, 1997**



43. For the team with the median amount of venue revenue for 1997, media revenue represented approximately what percent of that team's total revenue for that year ?

- (1) 25%
- (2) 30%
- (3) 45%
- (4) 70%

44. Of the following which is greatest than the amount of revenue, in millions of dollars, earned by Team X through food sales in 1997 ?

- (1) 7
- (2) 10
- (3) 14
- (4) 18

45. In 1997, which team had media revenues less than \$25 million ?

- (1) Team X
- (2) Team Y
- (3) Team Z
- (4) Team R

46. If Team Y earned total revenues of at least \$150 million in 1998, then Team Y's total revenue could have increased by what percent from 1997 to 1998?

- (1) 25%
- (2) 16%
- (3) 14%
- (4) 12%

47. The only test scores for the students in a certain class are 44, 30, 42, 30, x, 44 and 30. If x equals one of the other scores and is a multiple of 5, what is the mode for the class ?

- (1) 5
- (2) 6
- (3) 15
- (4) 30

48. If half the range of the increasing sequence { 11, A, 23, B, C, 68, 73 } is equal to its median, what is the median of the sequence ?

- (1) 23
- (2) 31
- (3) 33
- (4) 41

49. If the average (arithmetic mean) of  $x+1$ ,  $x+2$ , and  $x+3$  is 0, then  $x =$

- (1) - 2
- (2) - 1
- (3) 0
- (4) 1

**Directions: (Q.Nos. 50 - 55)** Each of these questions has a statement followed by two conclusions I and II. Consider the statements and the following conclusions. Decide which of the conclusions follows from the statement.

**Give answer :**

- (1) If Conclusion I follows
- (2) If Conclusion II follows
- (3) If either Conclusion I and II follows
- (4) If neither Conclusion I nor II follows

50. **Statement :** A man must be wise to be a good wrangler. Good wranglers are talkative and boring.

**Conclusions:** I. All the wise - persons are boring.  
II. All the wise . persons are good wranglers.

51. **Statement :** Fortune favours the brave.

**Conclusions:** I. Risks are necessary for success.  
II. Cowards die many times before their death.

52. **Statement :** Morning walks are good for health.

**Conclusions:** I. All healthy people go for morning walks.  
II. Evening walks are harmful.

53. **Statement :** The best way to escape from a problem is to solve it.  
**Conclusions:** I. Your life will be dull if you don't face a problem.  
II. To escape from problems, you should always have some solutions with you.
54. **Statement :** The best evidence of India's glorious past is the growing popularity of Ayurvedic medicines in the West.  
**Conclusions:** I. Ayurvedic medicines are not popular in India.  
II. Allopathic medicines are more popular in India.
55. **Statement :** Sun is the source of light.  
**Conclusions:** I. Moon is not the source of light.  
II. Light has only one source.

**Directions (Q.nos. 56 – 57)** In each of these questions, two Statements I and II are given. These may have a cause and effect relationship or may have independent causes or be the effects of independent causes.

**Give Answers:**

- (1) if Statement I is the cause and Statement II is its effect.  
(2) if Statement II is the cause and Statement I is its effect.  
(3) if both Statements I and II are effects of independent causes.  
(4) if both Statements I and II are effects of some common cause.
56. I. The prices of petroleum products dropped marginally last week.  
II. The State Government reduced the tax on petroleum products last week.
57. I. Many people visited the religious place during the weekend.  
II. Few people visited the religious place during the week days.



**Directions (Q.nos. 58 – 62)** Two statements are given below followed by two Conclusions I and II. You have to consider the two statements to be true even if they seem to be at variance with commonly known facts. You have to decide which of the conclusions, if any, follows from the given statements.

**Give Answer:**

- (1) Only I follows
- (2) Only II follows
- (3) Both I and II follow
- (4) Neither I nor II follows.

58. **Statement :** Some books are magazines.  
Some magazines are novels.  
**Conclusions:** I. Some books are novels.  
II. Some novels are magazines.
59. **Statement :** All good hockey players are in the Indian hockey team.  
~~X~~q is not a good hockey player.  
**Conclusions:** I. ~~X~~q is not in the Indian Hockey Team.  
II. ~~X~~q wants to be in the Indian Hockey Team.
60. **Statement :** Some scales are pencils.  
Some erasers are pencils.  
**Conclusions:** I. Some pencils are erasers.  
II. Some pencils are scales.
61. **Statement :** Some chairs are made up of wood.  
Some tables are made up of wood.  
**Conclusions:** I. All wooden things are either chairs or tables.  
II. Some chairs are tables.
62. **Statement :** Some scooters are trucks.  
All trucks are trains.  
**Conclusions:** I. Some scooters are trains.  
II. No truck is a scooter.

63. Pick the odd one out:

- (1) Nitroglycerine
- (2) Dynamite
- (3) TNT
- (4) DDT

64. Soda ash is :

- (1)  $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$
- (2)  $\text{NaOH}$
- (3)  $\text{Na}_2\text{CO}_3$
- (4)  $\text{NaHCO}_3$

65. Sodium is kept in kerosene because :

- (1) it is then kept fresh.
- (2) it tends to tarnish in air.
- (3) it is then saved from evaporation.
- (4) it starts burning in air.

66. Solder is an alloy of :

- (1) tin and lead
- (2) tin and zinc
- (3) zinc and lead
- (4) zinc and copper

67. The commercial name for calcium hydride is :

- (1) Lime
- (2) Hydrolith
- (3) Slaked lime
- (4) Calgon

68. Malaria is a disease which affects the :

- (1) Heart
- (2) Lungs
- (3) Spleen
- (4) Kidney

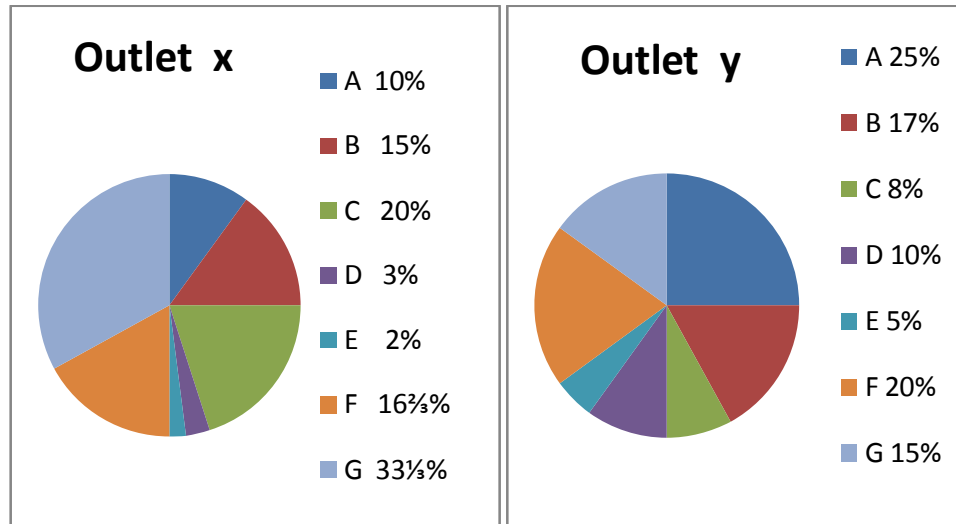
69. B.C.G. vaccine is used against :

- (1) T.B.
- (2) Leprosy
- (3) Food poisoning
- (4) AIDS

70. The first person to see a cell under microscope was :

- (1) Robert Hooke
- (2) A.V. Leeuwenhoek
- (3) T.Schwan
- (4) M.Schleiden

**Directions (Q.nos. 71 to 73). The following Pie charts give details about the sales percentage (by volume) of mobiles of seven different models of a mobile company in two outlets x and y. Assume that the two outlets sell only these models.**



71. Which of the following combinations of models constitute 60% of the sales of all the models sold in each outlet ?

- (1) A,B,C,D
- (2) B,C,F
- (3) F,G,D,E
- (4) A,G,F

72. If equal number of mobiles are sold in both the outlets, the number of mobiles of which model sold in outlet x, when combined with that of mobiles of model D sold in outlet y, constitute 6% of the total number of mobiles sold in both the outlets ?

- (1) A
- (2) B
- (3) D
- (4) E

73. If the total number of mobiles sold in outlet y is double that in outlet x, then the maximum total number of mobiles sold in both the outlets are of which model ?

- (1) A
- (2) G
- (3) F
- (4) B

74. If  $\alpha$  and  $\beta$  are the roots of equation  $x^3 - bx + c = 0$ , then the value of  $\alpha^3 + \beta^3$  is:

- (1)  $b^3$
- (2)  $c^3$
- (3)  $b^3 - c^3$
- (4)  $b^3 - 3bc$

75. Find the missing number out of the given options:

$a = 12(175) 15$ ,  $b = 14(219) 16$  and  $c = 17( ? ) 14$

- (1) 430
- (2) 233
- (3) 218
- (4) 225

76. At what time between 4 O'clock and 5 O'clock will hands of a clock be together ?

- (1)  $24\frac{12}{11}$  min past 4
- (2)  $23\frac{12}{11}$  min past 4
- (3)  $21\frac{12}{11}$  min past 4
- (4)  $21\frac{12}{11}$  min past 4

77. If 1<sup>st</sup> day of a year which is not a leap year is Friday. Then find the last day of that year :

- (1) Sunday
- (2) Friday
- (3) Monday
- (4) Wednesday

78. If 15<sup>th</sup> August, 2011 was Tuesday, then what day of the week was it on 17<sup>th</sup> September, 2011 ?

- (1) Thursday
- (2) Friday
- (3) Saturday
- (4) Sunday

The following table gives the Percentage marks secured by 5 students in 6 different subjects in an examination. The numbers in the brackets give the maximum marks.

Answer the questions given below (Q.nos. 79 to 82)

Subject	Hindi	English	Physics	Chemistry	Maths	Biology
Maximum Marks	(100)	(100)	(150)	(150)	(200)	(125)
Students						
A	40	50	60	48	55	60
B	50	75	80	76	70	40
C	75	80	70	54	80	64
D	30	50	82	72	62	52
E	85	70	54	61	58	72

79. The average percentage score of B in all the subjects is nearly :

- (1) 60
- (2) 68
- (3) 87
- (4) 71

80. When was the aggregate of marks obtained by student D in all the subjects?

- (1) 500
- (2) 348
- (3) 550
- (4) 519

81. In which subject the overall percentage score is best ?

- (1) English
- (2) Physics
- (3) Chemistry
- (4) Maths

82. The number of students who have not scored atleast 50% in all the subjects is ?

- (1) 4
- (2) 3
- (3) 2
- (4) 1

83. If  $X \text{ } Y$  means  $X$  is the wife of  $Y$ ,  $X \$ Y$  means  $X$  is the son of  $Y$  and  $X \text{ } Y$  means  $X$  is the sister of  $Y$ , which of the following would mean that  $A$  is the daughter of  $B$  ?

- (1)  $A \$ C \text{ } D \text{ } B$
- (2)  $A \text{ } C \$ D \text{ } B$
- (3)  $A \text{ } C \text{ } D \$ B$
- (4)  $A \text{ } C \$ D \text{ } B$

84. If  $A(x,y) = x + y$ ;  $M(x,y) = x * y$ ; and  $S(x,y) = x . y$  then find the value of  $M(A(S(x,y), M(y,z)), S(A(x,z), S(z,y)))$  when  $x = 2$ ,  $y = 3$  and  $z = 5$  is

- (1) 112
- (2) 98
- (3) 70
- (4) 105

85. When it is 1 p.m. in London, England, the time in Delhi is 7.30 a.m. the same day. Raji Caught a flight from London to Delhi at 10 a.m. London time. The flying time of her flight is 13 hours. What time was it in Delhi when Raji arrived.

- (1) 8.30 p.m.
- (2) 3.30 a.m.
- (3) 4.30 a.m.
- (4) 5.30 p.m.

86. Normal body mass index is :

- (1) 18.5-24.99
- (2) 15-18
- (3) 25-29.99
- (4) Greater than 30

87. A vaccine for Rabies was first developed by :

- (1) Louis Pasteur
- (2) Robert Koch
- (3) Edward Jenner
- (4) Landsteiner

88. If  $\pm\text{LBBIHOD}$  qmeans  $\pm\text{MACHINE}$  qthen  $\pm\text{RVBDDTRGTM}$  qmeans :

- (1) SWCEEUSHUN
- (2) SUCESSFULL
- (3) SUCCESSFUL
- (4) SUCCESFULL

89. Complete the series 1, 5, 14, 39, 88, \_\_\_\_\_.

- (1) 257
- (2) 169
- (3) 209
- (4) 188



90. Amongst five friends Latha, Alka, Rani, Siri and Manasi. Latha is older than only three of her friends. Alka is younger to Siri and Latha. Rani is older than only Manasi. Who amongst them is the youngest ?

- (1) Siri
- (2) Latha
- (3) Alka
- (4) Manasi

91. A moderator is used in nuclear reactor in order to :

- (1) Increase the number of neutrons
- (2) Decrease the number of neutrons
- (3) Slow down the fast neutrons
- (4) Absorb the fission fragments

92. According to Heisenberg uncertainty principle, it is impossible to know precisely the position and \_\_\_\_\_ of an electron simultaneously.

- (1) Energy
- (2) Mass
- (3) Momentum
- (4) Wavelength

93. Which of the following methods of heating is not dependent on the frequency of supply ?

- (1) Induction heating
- (2) Dielectric heating
- (3) Electric resistance heating
- (4) All of the above

94. According to de Broglie hypothesis, waves behave as particles and particles behave as waves. Which one of the following phenomena proves that wave behaves as particle ?

- (1) Proton scattering
- (2) Black body distribution
- (3) Electron diffraction
- (4) Compton scattering

95. During formation of mirage, light suffers \_\_\_\_\_

- (1) Only reflection
- (2) Only refraction
- (3) Refraction as well as total internal reflection
- (4) Dispersion as well as total internal reflection

96. The speed of sound changes when it moves in different media. The correct sequence of materials that corresponds to increasing sound velocity is :

- (1) Air, Water, Iron bar
- (2) Water, Air, Iron bar
- (3) Iron bar, Air, Water
- (4) Iron bar, Water, Air

97. A water heater with power consumption of 1500 watt / hour is used for 10 days at the rate of 5 hours per day. If the cost per kilowatt-hour is Rs. 6, then the total cost in rupees for the above usage is :

- (1) 180
- (2) 350
- (3) 450
- (4) 125

98. A positive point charge is kept fixed at 10 m West of a point A while an equal negative point charge is kept fixed at 10 m East of A. If another positive charge is released from rest at 20 m North of A, then this charge moves relative to A in the direction of :

- (1) North
- (2) South
- (3) East
- (4) West

99. Indigenously developed Rotavac is a breakthrough in dealing with :

- (1) Childhood diarrhoea
- (2) Heat in computing device
- (3) Watermark in Paintings
- (4) Extreme cold and climatic conditions

100. Moore's law is concerned with :

- (1) Doubling of number of transistors integrated on a chip.
- (2) Impact of capital assets during recession
- (3) Fatigue in sportsperson during peak performance
- (4) Counting cells using haemocytometer.