PRELIMINARY INTERVIEW BOARD

TERRITORIAL ARMY COMMISSION : 28 JULY 2019

PAPER-1: REASONING & ELEMENTARY MATHEMATICS

A1

Max Time : 2 Hours **Max Marks : 100**

Roll No……..

(Please Read The Instructions Carefully)

INSTRUCTIONS

1. Paper 1 has two parts: Part I & Part II
   (a) Part I : Reasoning (50 marks)
   (b) Part II: Elementary Mathematics (50 marks)
2. Each section carries 50 objectives type of questions.
3. There will be four possible answers to every question. Candidates are required to fill correct answer in the OMR sheet with Black ball pen.
4. For each correct answer, 1 mark will be granted and 0.33 mark will be deducted for every wrong answer.
5. If a candidate gives more than one answer, it will be treated as a wrong answer and 0.33 mark will be deducted. There will be no penalty for questions left unanswered.
6. Candidates should not mark in the question paper. They can use blank pages provided in the question paper for rough work.
7. To be eligible to qualify, a candidate must obtain minimum 40% marks each in Part I & II separately and a minimum of 50% aggregate in total.

PART-1 : REASONING

Direction In each of the following question a number of series is given with one term missing. Choose the correct alternative that will continue the same pattern.

Q1. 2, 3, 5, 7, 11, ___, 17
(a) 12 **(b) 13** (c) 14 (d) 15

Q2. 23, 48, 99, 203, 413 ___
(a) 927 **(b) 837** (c) 937 (d) 437

Q3. 225, 336, 447, 558, ___ 7710
(a) 690 (b) 660 (c) 689 **(d) 669**

Q4. ABC, CAE, EZG, ___ , LXK
(a) HUL (b) FAH **(c) GYI** (d) FYH

Q5. ___ ___ G ___ C ___ G K ___ P G ___
(a) K C P C P K **(b) C P K P C K** (c) P K C P K P (d) C P P K C P

Direction Choose the correct alternative which shows the same relationship.

Q6. Menu : Food : : Catalogue : ?
(a) Rack (b) Newspaper (c) Library (**d) Books**

Q7. 42 : 56 : : 110 : ?
(a) 182 **(b) 132** (c) 136 (d) 156

Direction Choose the odd one out in question 8 to 11.

Q8. Find the odd one out.
Arrow, Axe, Knife, Sword
(a) Arrow (b) Axe (c) Knife (d) Sword

Q9. Find the odd one out.
Bake, Peel, Fry, Boil
(a) Bake **(b) Peel** (c) Fry (d) Boil

Q10. Find the odd one out.
MONDAY, TUESDAY, FRIDAY, SUNDAY
(a) MONDAY **(b) TUESDAY** (c) FRIDAY (d) SUNDAY

Q11. Find the odd one out.
Ear, Lung, Eye, Heart, Kidney
(a) Ear (b) Lung (c) Eye **(d) Heart**

Q12. If $\sqrt{AFI} : 13 :: \sqrt{DDA} : ?$
(a) 12 (b) 22 **(c) 21** (d) 24

Q13. If white is called blue, blue is called red, red is called yellow, yellow is called green, green is called black, black is called violet and violet is called orange, what would be the colour of human blood?
(a) Red (b) Green **(c) Yellow** (d) Violet

Q14. In a certain code language, '324' means 'Light is bright', '629' means 'Girl is beautiful' and '4758' means 'I prefer bright colours', which digit means 'Light' in the language?
(a) **3** (b) 2 (c) 4 (d) 7

Q15. A clock is so placed that at 12 noon its minute hand points toward North-east. In which direction does its hour hand point at 1.30 PM?
(a) North (b) South **(c) East** (d) West

Q16. In a class of 60, the number of girls are twice that of boys. Kamal ranked seventeenth from the top. If there are nine girls ahead of Kamal, how many boys are behind him in rank?
(a) 3 (b) 7 **(c) 12** (d) 23

Q17. In a row of girls facing North, Reena is 10th to the left of Pallavi, who is 21st from the right end. If Malini who is 17th from left end, is fourth to the right of Reena, how many girls are there in the row?
(a) 37 **(b) 43** (c) 44 (d) 16

Q18. A is father of C and D is the son of B. E is the brother of A, C is the sister of D, how is B related to E ?
(a) Daughter (b) Brother-in-law (c) Husband **(d) Sister-in-law**

Q19. B is the husband of P. Q is the only grandson of E, who is the wife of D and mother-in-law of P. How is B related to D?
(a) Nephew (b) Cousin (c) Son-in-law **(d) Son**

Q20. Pointing to Kapil, Shilpa said, "His mother's brother is the father of my son Ashish." How is Kapil related to Shilpa?
(a) Sister-in-law **(b) Nephew** (c) Niece (d) Aunt

Q21. A family has a man, his wife, their four sons and their wives. The family of every son also has 3 sons and one daughter. Find out the total number of male members in the whole family?
(a) 4 (b) 8 (c) 12 **(d) 17**

Q22. In certain Code DELHI is coded as 73541 and CALCUTTA as 82589662, how can CALICUT be coded ?
(a) 5279431 (b) 5978213 **(c) 8251896** (d) 8543691

Q23. If ACNE can be coded as 3-7-29-11, then BOIL will be coded as ?
(a) 5-29-19-27 (b) 5-29-19-25 (c) 5-31-21-25 **(d) 5-31-19-25**

Q24. A, B, C, D and E are five friends. A is shorter than B but taller than E. C is the tallest. D is shorter than B and taller than A. Who has two persons taller and two persons shorter than him/ her ?
(a) A (b) B (c) C **(d) D**

Q25. If × means –, + means ÷ , - means × and ÷ means + than
15 - 2 ÷ 900 + 90 × 100 = ?
(a) 190 (b) 180 (c) 90 **(d) -60**

Q26. If 'a' means 'plus', 'b' means 'minus', 'c' means 'multiplied by' and 'd' means 'divided by' then
18 c 14 a 6 b 16 d 4 = ?
(a) 63 **(b) 254** (c) 288 (d) 1208

Direction Consider the given statements to be true and decide which of the given conclusion/assumptions can definitely be drawn from the given statement.

Q27. Statements
(a) All goats are cows. (b) All cows are animals.

Conclusion
(I) All goats are animals. (II) All animals are goats.
(a) **Only conclusion I follows.** (b) Only conclusion II follows.
(c) Both conclusion I and II follows. (d) Neither conclusion I nor II follows.

Q28. Statements
(a) Some cats are dogs. (b) No dog is a toy.

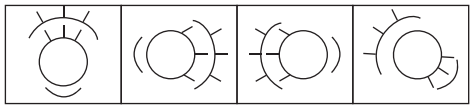
Conclusion
(I) Some dogs are cats. (II) Some toys are cats.
(III) Some cats are not toys. (IV) All toys are cats.

(a) Only conclusion I and III follows. (b) Only conclusion II and III follows.
(c) Only conclusion I and II follows. (d) Only conclusion I follows.

Q29. 1.12.91 is the first Sunday. Which is the fourth Tuesday of December 91?
(a) 17.12.91 **(b) 24.12.91** (c) 26.12.91 (d) 31.12.91

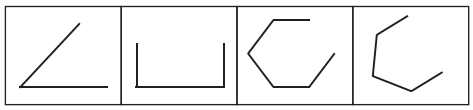
Direction Each of the following problems (Q30 and 32), contains 4 figures marked (a), (b), (c), (d). Find the odd figure.

Q30.



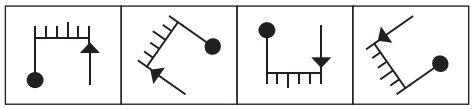
(a) (b) (c) **(d)**

Q31.



(a) (b) (c) **(d)**

Q32.



(a) (b) (c) (d)

Direction Each of the problems (Q 33 to 36), contains four figures marked as (A), (B), (C), (D) and answer figures marked as (a), (b), (c) and (d). Select a figure from amongst the answer figures which will continue in the same series as given in the problem figure.

Q33. Find out the next figure

(A) (B) (C) (D) ? (a) **(b)** (c) (d)

Q34. Find out the next figure

(A) (B) (C) (D) ? (a) (b) (c) **(d)**

Q35. Find out the next figure

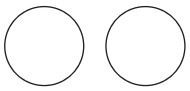
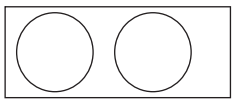
(A) (B) (C) (D) ? (a) (b) (c) **(d)**

Q36. What number must be added to 6, 16 and 8 to get an average of 13?
(a) **22** (b) 25 (c) 20 (d) 18

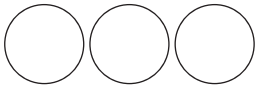
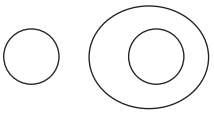
Q37. 10 cats caught 10 rats in 10 seconds. How many cats are required to catch 100 rats in 100 seconds?
(a) 100 **(b) 10** (c) 20 (d) 50

Q38. Find the pair where relationship does not exist?
(a) Spoon, Water (b) Glass, Juice (c) Cup, Tea (d) Knife, Fruit

Q39. Which diagram depicts the correct relationship between Army, Navy and Air Force?

(a)  (b)  **(c)**  (d) 

Q40. Which diagram depicts the correct relationship?
Godavari, Brahamputra, Majauli

(a)  (b)  (c)  **(d)** 

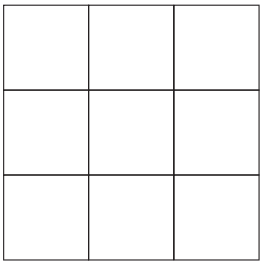
Direction.

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26

Q41. Find the letters?
COMPUTER : FQPRXVHT : : LANGUAGE : ?
(a) OXPIXDIG (b) OCQICYIG **(c) OCQIXCJG** (d) OCIXCIG

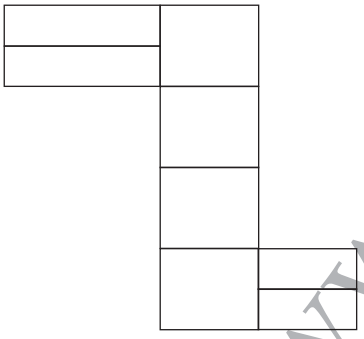
Direction Study the figure and answer Q no. 42 and 43.

Q42. How many maximum squares are in the following figure?



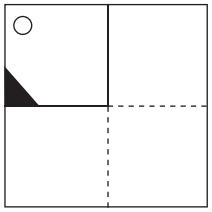
(a) 9 (b) 10 (c) 13 **(d) 14**

Q43. Count the number of rectangles in the figure.



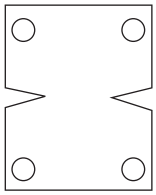
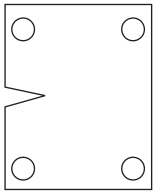
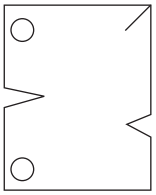
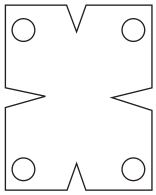
(a) 8 (b) 17 **(c) 18** (d) 19

Q44. A square sheet is folded along dotted lines and holes/ cuts are made as shown. ○ is hole  is cut. Choose the diagram that depicts how would paper look when unfolded completely?



Depicts Hole ○

Depicts Cut 

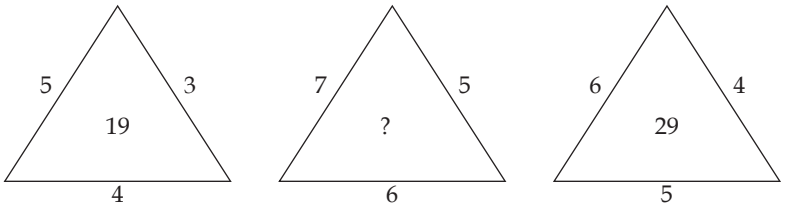
(a)  (b)  (c)  (d) 

Q45. Fill up the missing number.

1	2	3
11	7	5
120	45	?

(a) 15 **(b) 16** (c) 17 (d) 18

Q46. Find the missing number.



(a) 25 (b) 37 **(c) 41** (d) 47

Q47. Find the missing number

12	6	3
16	8	4
128	?	2

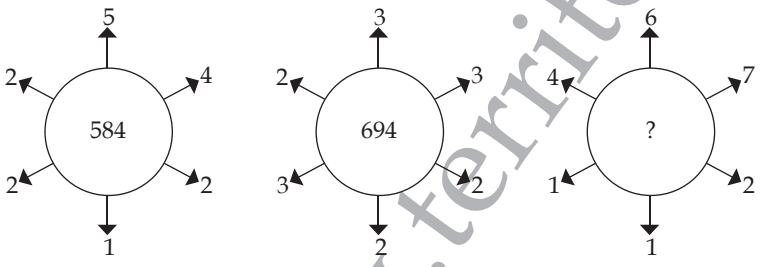
(a) 64 (b) 130 **(c) 16** (d) 256

Q48. Fill up the missing letter and number.

A2	C4	E6
G3	I5	?
M5	O9	Q14

(a) L10 (b) K15 (c) J15 **(d) K8**

Q49. Fill up the missing number.



(a) 937 (b) 824 (c) 769 **(d) 678**

Q50. From a meaningful word and answer as per given code.

D O R E K B A Y
1 2 3 4 5 6 7 8

(a) 5 4 3 6 7 8 2 1 (b) 5 4 8 2 6 7 3 1 **(c) 5 4 8 6 2 7 3 1** (d) 5 4 8 6 2 7 1 3

PART-II : ELEMENTARY MATHEMATICS

Q51. Insert two rational numbers between 3/5 and 2/3.

(a) $\frac{21}{10}, \frac{10}{15}$ (b) $\frac{15}{20}, \frac{11}{12}$ **(c)** $\frac{\mathbf{19}}{\mathbf{30}}, \frac{\mathbf{37}}{\mathbf{60}}$ (d) $\frac{41}{20}, \frac{16}{25}$

Q52. The rational number lying between $\sqrt{2}$ and $\sqrt{3}$ is

(a) $\frac{49}{28}$ **(b)** $\frac{\mathbf{56}}{\mathbf{35}}$ (c) $\frac{63}{45}$ (d) $\frac{85}{66}$

Q53. Find the value of :-

$$\frac{5.49 \times 5.49 \times 5.49 - 1.49 \times 1.49 \times 1.49}{5.49 \times 5.49 + 5.49 \times 1.49 + 1.49 \times 1.49}$$

(a) 2 **(b) 4** (c) 6 (d) 8

Q54. The numbers X, X + 2, x + 4 are all prime numbers. What is the value of x ?

(a) **3** (b) 2 (c) 11 (d) 17

Q55. How many factors of $2^5 \times 3^6$ are perfect squares?

(a) 9 **(b) 12** (c) 18 (d) 4

Q56. If $\sqrt[3]{\frac{x}{27}} = \frac{5}{3}$ than value of x is

(a) **125** (b) 25 (c) 27 (d) 9

Q57. If sum of five consecutive integers is 'S', then largest of these integers in terms of S will be :-

(a) $\frac{S - 10}{5}$ (b) $\frac{S + 4}{4}$ (c) $\frac{S + 5}{4}$ **(d)** $\frac{\mathbf{S + 10}}{\mathbf{5}}$

Q58. A number is an much greater than 36 as is less than 86. Find the number.

(a) **61** (b) 71 (c) 81 (d) 51

Q59. The LCM of two numbers is 90 times their HCF. The sum of LCM and HCF is 1456. If one of the number is 160, then what is the other number?

(a) 120 (b) 136 **(c) 144** (d) 184

Q60. Find the square root of

$$\frac{0.324 \times 0.64 \times 129.6}{0.729 \times 1.024 \times 36}$$

(a) 4 (b) 3 (c) 2 **(d) 1**

Q61. The duplicate ratio of $2\sqrt{2} : 3\sqrt{5}$ is?

(a) 4 : 9 **(b) 8 : 45** (c) 2 : 3 (d) 6 : 45

Q62. Find out the value of x if $\log_x 4 + \log_x 16 + \log_x 64 = 12$

(a) 1 **(b) 2** (c) 7 (d) 54

Q63. If (a – b) : (a + b) = 1 : 5 ?
Then what is $(a^2 - b^2) : (a^2 + b^2)$ equal to

(a) 6 : 13 (b) 4 : 13 **(c) 5 : 13** (d) 8 : 13

Q64. Find the value of x and y in the equation

$$\frac{3x - y + 1}{3} = \frac{2x + y + 2}{5} = \frac{3x + 2y + 1}{6}$$

(a) x = 2, y = 1 **(b) x = 1, y = 1** (c) x = –1, y = –1 (d) x = 2, y = 1

Q65. Three traffic lights change after 36 seconds, 42 seconds and 72 seconds respectively. If they are switched on now, after how much time will they blink together ?

(a) **8 min 24 sec** (b) 8 min 4 sec (c) 8 min 44 sec (d) 8 min 54 sec

Q66. The age of x is six times that of y. After 4 years, x is 4 times elder of y. What is the present age of y ?

(a) 4 years (b) 5 years **(c) 6 years** (d) 7 years

Q67. One year ago ratio of age of Rohit and Sahil was 6 : 7, their ratio four years from now will be 7 : 8. How old is Sahil ?

(a) 40 (b) 39 (c) 37 **(d) 36**

Q68. A fraction becomes 2/3 if 1 is added to both its numerator and denominator. Same faction become 1/2 if 1 subtracted both from its numerator; and denominator. The fraction is

(a) 4/7 (b) 3/4 **(c) 3/5** (d) 8/9

Q69. A man sold two houses for ₹ 29,700,each. On one he incurred loss of 10%, while on other he gained 10%. The transaction gives:-
(a) Profit (b) Neither profit nor loss **(c) Loss** (d) Insufficient data

Q70. The income of A & B are in the ratio of 4 : 3 and their annual expenses are in the ratio of 3 : 2. If each saves ₹ 60,000. Find A's income?
(a) **₹ 2,40,000** (b) ₹ 72,000 (c) ₹ 19,200 (d) ₹ 48,000

Q71. How long will it take for a boy to run around a square field of area 25 hectare at the speed of 10 km/h?
(a) **12 min** (b) 14 min (c) 10 min (d) 8 min

Q72. If the price of the cooking gas rises by 15%, by what %, should family reduce its consumption so as not to exceed the budget on cooking?
(a) $12\frac{1}{23}\%$ **(b)** $\mathbf{13\frac{1}{23}\%}$ (c) $14\frac{1}{24}\%$ (d) None of the above

Q73. Population of a city in 2004 was 10,00,000. If in 2005, there is an increment of 15% in 2006 there is a decrease of 35% and in 2007, there is an increase of 45%. Then find out the population of the city at the end of year 2007?
(a) 10,80,000 **(b) 10,83,875** (c) 10,84,874 (d) 11,75,045

Q74. A sum of money becomes 3 times in 5 years at simple interest. In how many years will the same sum become 6 times at the same rate of simple interest?
(a) 10 years (b) 12 years **(c) 12.5 years** (d) 10.5 years

Q75. A sum of money on compound interest amount to ₹ 9680 in 2 years and ₹ 10648 in 3 years. What is the rate of interest per annum?
(a) 5% **(b) 10%** (c) 15% (d) 20%

Q76. Two numbers are less than third number by 30% and 37% respectively. The percentage by which second number is less than first is
(a) **10%** (b) 70% (c) 4% (d) 3%

Q77. In a town of 3600 people, 8/9th population is men, 10% are married. Find the % of unmarried women?
(a) 24% **(b) 20%** (c) 25% (d) 30%

Q78. Boating at 6/7th of regular speed in a lake, the tourist got late by 30 min? How much time will it take when boating is at usual speed?
(a) 2 hr **(b) 3 hr** (c) 1.5 hr (d) None

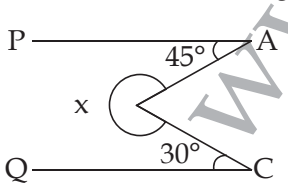
Q79. A rectangle field of length 242 m has an area of 4840 m2. What will be the cost of fencing its perimeter if cost of fencing is 50 paise/meter?
(a) **₹ 262** (b) ₹ 270 (c) ₹ 320 (d) ₹ 258

Q80. The area of four walls of a room is 660 m^2 and length is twice the width, ht being 11 m. Find area of ceiling?
(a) **200** (b) 190 (c) 210 (d) 220

Q81. Ratio of two complementary angles is 1 : 5. What is the difference between them?
(a) **60°** (b) 90° (c) 120° (d) 160°

Q82. If a man travels with a speed of 2/5 times of his original speed and he reached his office 15 minutes late to the fixed time, then the time taken with his original speed will be?
(a) **10 min** (b) 15 min (c) 20 min (d) 25 min

Q83. Find the value of x in the given figure where PA is parallel to QC



(a) 75° (b) 185° **(c) 285°** (d) 245°

Q84. The speed of boat upstream and speed of boat down stream are 7km/h and 13km/h respectively. What is the speed of stream and speed of boat in still water?
(a) **10 km/h and 3km/h** (b) 15 km/h and 9km/h (c) 20 km/h and 6km/h (d) 40 km/h and 12km/h

Q85. Ajay can do a piece of work in 10 days and Harshal can do same work in 12 days. They started working together but Ajay left the work 2 days before completion of work, then time taken to complete the work?
(a) $\mathbf{6\frac{6}{11}}$ **days** (b) $5\frac{3}{10}$ days (c) $4\frac{3}{2}$ days (d) $7\frac{2}{5}$ days

Q86. If 3 men or 4 women can plough a field in 43 days, how long 7 men and 5 women take to plough it?
(a) 3 days (b) 7 days **(c) 12 days** (d) 15 days

Q87. A can do a piece of work in 70 days and B is 40% more efficient than A. The number of days taken by B to do the same work will be?

(a) 40 days (b) 60 days **(c) 50 days** (d) 45 days

Q88. A wooden box measures 10 cm by 6 cm by 5 cm. Thickness of wood is 2 cm. Find the volume of wood required to make the box.

(a) 206 cm^3 (b) 207 cm^3 (c) 204 cm^3 **(d) 288 cm^3**

Q89. What is the value of $\frac{\tan A - \sin A}{\sin^3 A}$

(a) $\frac{\sec A}{1-\cos A}$ (b) $\frac{\sec A}{1+\cos^2 A}$ **(c) $\frac{\sec A}{1+\cos A}$** (d) None of these

Q90. The length of a pendulum is 60 cm. The angle through which it swings when its tip describes an arc of length 16.5 cm will be

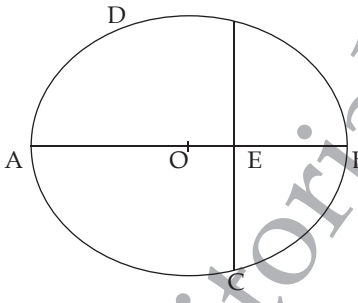
(a) 15° 30' **(b) 15° 45'** (c) 16° 15' (d) 16° 45'

Q91. Find the value of .

$$\frac{\sin\theta}{\cos(90°+\theta)} + \frac{\sin\theta}{\sin(180°+\theta)} + \frac{\tan(90°+\theta)}{\cot\theta}$$

(a) 0 (b) –1 **(c) –3** (d) 2

Q92. In the given figure, O is the centre of a circle and diameter AB bisects and chord CD at a point E such that CE = ED = 8 cm and EB = 4 cm. The radius of circle is



(a) **10 cm** (b) 12 cm (c) 6 cm (d) 8 cm

Q93. In a triangle ABC, if cos A = cos B × cos C, What is the value of tan A – tan B – tan C .

(a) – 1 **(b) 0** (c) 1 + tan A + tan B + tan C (d) tan A tan B tan C – 1

Q94. An aeroplane flying at a height of 300 m above the ground passes vertically above a plane at an instant when the angle of elevation of two planes from the same point on the ground are 60° and 45° respectively. What is the height of lower plane from ground ?

(a) 500 m **(b) 100 $\sqrt{3}$ m** (c) 500 $\sqrt{3}$ m (d) 15 ($\sqrt{3}$ + 1) m

Q95. The mean of 20 observations is 15. On checking it was found that two observations were wrongly copied as 3 and 6. If wrong observation are replaced by correct values 8 and 4, then the correct mean is?

(a) 15 **(b) 15.15** (c) 15.35 (d) 16

Q96. Two poles of equal height are standing opposite to each other on either side of a road which is 100m wide from a point between them on ground. The angle of elevation of tops of poles are 30° and 60°. The height of each pole in metres will be?

(a) **25$\sqrt{3}$** (b) 20$\sqrt{3}$ (c) 28$\sqrt{3}$ (d) 30$\sqrt{3}$

Q97. An electric pump can fill a tank in 3 hours. Because of a leak in tank it took 3.5 hours to fill the tank. If tank is full, how much time will it take for leak to empty it?

(a) 25 hrs (b) 19 hrs (c) 20 hrs **(d) 21 hrs**

Q98. A spherical ball of radius 3 cm is melted and recast into three spherical balls of radius 1.5 cm and 2 cm and X cm. Find the value of X.

(a) 5 cm **(b) 2.5 cm** (c) 3 cm (d) 2.25 cm

Q99. Circumference of the base of a 9 m high conical tent is 44 m. Find the vol of air contained in it.

(a) 430 cm^3 **(b) 462 cm^3** (c) 472 cm^3 (d) 492 cm^3

Q100. The average marks obtained by the students in a class are 43. If the average marks obtained by 25 boys are 40 and average marks obtained by the girl students are 48, then what is the number of girl students in the class?

(a) 20 (b) 25 **(c) 15** (d) 10

ANSWERS ARE BOLD