

SATHYABAMA
INSTITUTE OF SCIENCE AND TECHNOLOGY
Department of Mathematics

**Five-Day Workshop on Quantitative
Aptitude Training for
CSIR-NET / SET / GATE
Registration Form
(Use Capital Letters only)**

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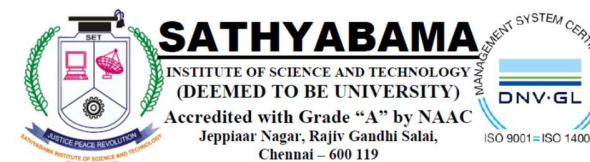
Date:

Place:

Signature

Details of Schedule for Five Day Programme

Day	Session-I 08:00 – 10:00	Session-II 10:30 – 12:00	Session-III 01:00 – 02:45
I	Time and Distance Time and Work		June 2018
II	Percentage, Profit and Loss Simple Equations		December 2017
III	Ratio, Proportions and Variations Numbers		June 2017
IV	Permutation, Combination and Probability Geometry and Mensuration		December 2016
V	Clocks, Calendars and Cubes Logical Reasoning.		June 2016



**Five-Day Workshop on
Quantitative Aptitude Training for
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**NOVEMBER 20 -24
2018**



Conducted By
Department of Mathematics
Sathyabma Institute of Science & Techonology

About SIST

Sathyabama Institute of Science and Technology (A Christian Minority Institution) formerly known as Sathyabama Engineering College was established in 1987 by Dr. Jeppiaar. It is a premier institute imparting knowledge in the areas of engineering, science, technology and education. The institution's progress and contribution to the field of technical education for over two decades resulted in granting Deemed University status on 16th July, 2001. The University has been awarded as Category "A" University by Ministry of Human Resources Development (MHRD), Government of India and accredited by NAAC with Grade "A" in the year 2017, certified with DNV-GL ISO 9001 standard and offering exemplary education from last 29 years. Untiring efforts of staff, students, management and positive academic ambience prevailed in the campus had made University to be ranked as 2nd among Private Universities in Tamilnadu by National Institutional Ranking Framework, Ministry of Human Resource Development, Government of India. University also declared as one among the top 31 deemed to be Universities by the Times Higher Education Ranking.

About the Department

Department of Mathematics was established in the year 1988. Over the years, the Department of Mathematics has seen its expansion not only in academics but also in research. The Department has 39 dedicated faculty members with 20 doctorates and 32 scholars pursuing research under the department. The department offers B.Sc., M.Sc., and M.Phil. in mathematics. The department periodically conducts Talent search programmes for school and college students, National and International symposium, workshop and conferences.

About the Programme

CSIR-NET is conducted by Council of Scientific and Industrial Research with the objective to determine the eligibility of the candidates for Research and Teaching. Exams conducted by CSIR are in the areas Chemical Sciences, Earth Sciences, Atmospheric Sciences, Ocean Sciences, Planetary Sciences, Life Sciences, Mathematical Sciences, and Physical Sciences. There are three parts in the CSIR question paper. Parts A, B and C. Part A is common to all subjects. This part contains questions related to General Aptitude with emphasis on logical reasoning, graphical analysis, numerical ability, quantitative comparison, puzzles, series formation and analytics etc. In view of increasing demand for CSIR-NET / SET qualification for both research and lecturer ship in the field of sciences, the department had initiated to conduct, a Five-Day Workshop on Quantitative Aptitude Training for CSIR-NET / SET / GATE."

Who can attend the Programme?

Post graduate students, faculty members from all of the above mentioned streams, those who are preparing for competitive exams that comprise aptitude test and all other CSIR-NET / SET aspirants are invited to attend the programme.

About the Resource persons

The resource persons of this programme have vast experience in the field of mathematics and aptitude training at college level and also having experience in various training institutes like T.I.M.E, IMS, Career Launcher etc. in training students for various competitive exams conducted all over India.

Resource Persons and Course Coordinators

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Assistant Professor, Department of Mathematics
Sathyabama Institute of Science & Technology
Mobile: 9790786329

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Assistant Professor, Department of Mathematics
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Registration and Course Fee

For persons from industry
For Faculty members
For Students

Mode of Payment

Interested participants can directly contact the organising secretary or the course coordinators and register by paying suitable course fee by cash.

ORGANISING SECRETARY

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SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with Grade “A” by NAAC

**Jeppiaar Nagar, Rajiv Gandhi Salai,
Chennai – 600 119**



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Simple equations, Ratio proportions and Variations

1. The ratio of present ages of a father and a son is 5:1. Ten years hence it becomes 5:2. Find the present ages of the father and son.
2. Sum of the digits of a two digit number is 9. If a number formed by reversing the digits is subtracted from this number, then the result is 63. Find the number.
3. A fraction becomes $\frac{2}{3}$, if 1 is subtracted from the numerator and 3 from the denominator. It becomes $\frac{2}{3}$, if 3 is added to the numerator and 4 is added to the denominator. Find the fraction.
4. Aravind says to Babu “ I am thrice as old as you were, when I was as old as you are now”. It is also known that the sum of their present ages is 80 years. Find the difference between their ages.
5. The average age of a husband and wife at the time of birth of twins is 32 years. When the twins attain their mother’s present the average age of the entire family becomes 40. Find the father’s age at the time when twins attains mother’s present age.
6. Certain number of eggs are distributed among four boys in the following manner. First boy gets half an egg more than half of the total number of eggs. Second person gets half an egg more than half of the remaining number of eggs, and so on. Finally one egg is left undistributed. Find the total number of eggs initially.
7. Praveen has Rs.19 with him which is sufficient to buy 1 apple 2 banana 3 oranges. Instead if he wants to buy 3 apple 2 banana 1 orange, how much more or less he has to pay if the cost of 20 apple 20 banana 20 oranges cost Rs.220?
8. If $a : b = 3 : 4$ then find 1. $\frac{4a+6b}{7b-3a}$ 2. $\frac{5a^2+6b^2}{b^2-a^2}$ 3. $\frac{3ab+5a}{5ab-2b}$
9. The incomes of A and B are in the ratio 4: 5. Their expenditures are in the ratio 3 : 4. If each of them saves Rs.5000 each then find their income of A and B.
10. The ratios of number of boys to that of number of girls in a class is 7 : 3. It becomes 1 : 1 if 12 boys leave the class and 12 girls join the class. Find the strength of the class initially.
11. solve : $\frac{x^3-6x+24}{x-4} = \frac{x^3-12x+6}{2x-1}$
12. Ages of three brothers are in continued proportion. If the eldest brother is five years elder than the youngest one and three years elder than middle one. Find the individual ages of each brother.
13. A precious stone worth Rs.10872 fell and broke into three pieces, the weights of which are proportional to the square of weight. Find the loss in the value caused by the breakage.
14. The ratio of total income to that of total expenditure of A and B are in the ratio 22 : 17. The ratio of their incomes is 6 : 5 and that of their expenditures is 10 : 7. Find the ratio of their savings.
15. 14100 is divided in to three parts such that 3 times first part is equal to 4 times the second part, which is equal to 5 times the third part. Find the values of each parts.

Percentages Profit and Loss, Numbers

1. Price of a commodity goes up by 25%. By what percent should the consumption be reduced so that the expenditure remains the same.
2. (i) A's salary 10% more than that of B. By what percent B's salary is less than that of A
(ii) A's salary 10% less than that of B. By what percent B's salary is more than that of A
3. The price of a product is reduced by 30%. By what percentage should it be increased to make is 100%.
4. Length of a rectangle is increased by 20% and its breadth decreased by 10%. By what percentage the area of the rectangle increased or decreased.
5. Raju scored 40% of the total marks which is 35 less than that of the pass marks while Sujit scored 60% of the total which is 85 marks more than that of the pass marks. Find the total marks and pass marks.
6. By selling an article at two-thirds of its original selling price one gets a loss of 20%. Find the actual profit percentages.
7. By selling 25 chairs one gets a profit of cost price of 10 chairs. Find the profit percentage.
8. By selling 30 chairs one gets a profit of selling price of 5 chairs. Find the profit percentage.
9. Instead of selling an article at Rs.600, if it is sold at Rs.750 one would have got a profit of 50% more. Find the cost price and the original profit percentage.
10. A product is marked up by certain percentage over cost price. A discount of 40% is then given so that a loss of 4% incurred. By what % it is marked up?
11. Find the number of zeros at the end of 500!
12. Find the largest 4 digit number which when divided by 5, 6, 7 and 9 leaves a remainder of 4, 5, 6 and 8 respectively in each case.
13. Find the remainder when 2^{10692} is divided by 15.
14. Find the remainder when $(6!)^{1333}$ is divided by 13
15. Find the least number which when divided successively by 6, 8 and 3 leaves the respective remainders as 3, 5 and 2.
16. Find the three digit number whose value is equal to that of sum of factorials of its digits. How many such numbers exist?
17. HCF of two numbers is 5. Their product is 750. Find how many such pairs are possible
18. Find how many number of numbers are there up to 96 which are co prime to 96
19. Find the divisibility rules of 7,13,17,19,23,29.
20. (i) $17^{31} + 19^{31}$ is definitely divisible by which of the following numbers
1) 32 2) 35 3) 36 4) None of these
(ii) $53^{45} - 21^{45}$ is definitely divisible by which of the following numbers
1) 32 2) 35 3) 36 4) None of these

Averages Quadratic Equations and Progressions

1. Find the average of all multiple of 7 in between 200 and 500.
2. Average age of 5 persons is 25. If the eldest person was replaced by a younger one the average reduces by 2 years. What is the age the eldest person?
3. Average of 11 distinct positive integers is 21. If the average of the first 6 is 23 and the average of the last six is 22. find the sixth integer
4. The average age of a group of 4 friends is 34 years. If one person joins this group, the average age of the new group increases by two years. Find the age of the person who joins the group
5. A boxer scores on the average 21 points in the first four rounds. He scores on an average of 23 points in the last four rounds. If there are totally five rounds, find his score in the last round if his first round score is 20 points.
6. Average marks of a class is 36. If six of the students who scored zero are excluded from the calculation of average then the average goes up by 2.4 marks. Find the number of students in the class initially.
7. A vessel contains milk and water in the ratio 3 : 1. Certain proportion of the mixture is removed and replaced by water, then the ratio of milk to water becomes 1 : 1. what proportion of the mixture is removed and replaced by water.
8. Just before the match of a season the total runs of Sachin Tendulkar for the season added up to 1200. In his last match, he scored 20 runs and his average (total runs/total matches) remained unchanged. Find the number of matches that he played in all.
9. Two vessels contain alcohol and water in the ratio 3:4 and 65:79. in what ratio should the solution in the first vessel be mixed with the solution in the second, so as to get a solution with alcohol and water in the ratio 4:5.
10. Both A and B while trying to solve a Quadratic equation, A copied the coefficient of x wrongly and got the roots of the equation as 12 and 6, B copied the constant term wrongly and got the root as 1 and 26. find the roots of the correct equation.
11. Ravi bought certain number of calculator for Rs.2800. If price of each calculator increases by Rs.60 then for the same amount he can buy 6 calculators less. Find the price of calculators before the increase.
12. Fifth term of an A.P. is 7. Find the sum upto first nine terms of the same A.P.
13. The ratio of sum of n terms of two different A.P.s is given by $\frac{13n+23}{7n+17}$. Find the ratio of their 11th terms.
14. a, b, c are in A.P. b, c, d are in G.P. and c, d, e are in H.P then a, c, e are in which Progression.
15. Sum of three numbers which are in G.P is 39. Their product is 729. Find the numbers
16. If 12th term of an A.P. is 25 and 25th term of the same A.P. is 12. Find the 37th term of that A.P.
17. If in an infinite Geometric Progression any term is 4 times sum of all its succeeding terms. Find the common ratio.

Time and Distance and Time and Work

1. Walking at $\frac{4}{5}$ th of his usual speed, a man reaches his office, 15 minutes late. Find the usual time for reaching the office.
2. A person covered certain distance from A to B at the rate of 40 kmph and came back from B to A at the rate of 60 kmph. Find the average speed for the entire journey.
3. A person covered certain distance between two points P and Q on time traveling at the rate of 30 kmph. If the person gets delayed at P and leaves P 14 mins late but reaches Q on time traveling at a speed of 45 kmph, find the distance PQ.
4. A train traveling at 45 kmph overtakes a cyclist traveling in the same direction and crosses him completely in 15 seconds. It crosses the same person if he is coming from the opposite direction in 10 seconds. Find the length of the train and speed of the man.
5. Two trains whose respective lengths are 230m and 190m cross each other completely in 21 seconds if they are traveling in opposite direction and in 42 seconds if they are traveling in the same direction. Find the speeds of the two trains.
6. A train without any halt travels at an average speed of 50 kmph. The average speed of the train falls down to 45 kmph if the halts also are taken into account. What is average halting time per hour of journey?
7. A boat can downstream at 10 kmph and upstream at 6 kmph. Find the boat's speed in still water and speed of the water current.
8. A boat is traveling in a river where the water is flowing at a speed of 5 kmph. The boat, in the time it takes to cover certain distance against the current, covers 3 times the distance with the current. Find the speed of the boat.
9. A and B walk around a circular path measuring 1190m. A walks at a speed of 170 m/mins and B at 70 m/mins. If they start at the same time and walk in the same direction, (1) when will they be together again, (2) when will they first be together again at the starting point?
10. A, B and C running around a circular track 3900mts long in the same direction with respective speeds of 150 m/mins, 180 m/mins and 200 m/mins starting at the same point at the same time. How much time after the start will they be together (1) again first (2) first at the starting point
11. A can do a piece of work in 12 days and B can do the same work in 24 days. In how many days can they together complete $\frac{7}{8}$ th of the work?
12. A and B can complete a work, each working alone, in 10 and 15 days respectively. A started the work and after a few days B joined them and the work was completed totally in 8 days from the beginning. After how many days did B join A?
13. 10 men and 5 women can complete a job in 6 days. The same work can be done by 11 men and 8 women in 5 days. In how many days can 25 women do the same work?
14. Three taps A, B, C can individually fill up a tank in 6, 9 and 12 hours respectively. If A and B are opened at 8 A.M and C at 9 A.M. at what time will the tank be full?
15. Two taps can each fill a tank in 10 and 15 minutes respectively. Both were opened simultaneously and at the time the tank was supposed to be full, it was found that the drain pipe was also open. It was then closed and the tank became full in another 2 minutes. In how many minutes will the drain pipe alone empty the tank?

Permutations and Combinations

1. In how many ways 5 boys and 3 girls can be arranged in row such that (1) each girl is placed in between two boys (2) no two girls are together (3) no two boys are together.
 2. In how many ways can the letters of the “ASSASSINATION” be arranged taking all together.
 3. In how many ways six articles can be arranged in a row such that a particular type of two articles are always (1) together (2) Never together
 4. In how many ways a telephone number of 6 digits can be formed such that first number is 2 and the last number is 8 with (1) each number is to occur once (2) each number can occur any number of times
 5. Find the sum of all the four digit number that can be formed using the digits 2,3,4 and 5 without repetition
 6. How many four digit numbers can be formed using integers from 0 to 7 if no digit is to occur more than once in each number? How many of these numbers are divisible by 5.
 7. In how many ways can four men and four women sit around a circular table so that no two men are together?
 8. In how many ways can 12 different books be divided equally (1) among 4 boys and (2) into four parcels.
 9. In how many ways can a person invite at least one of his 8 friends?
 10. In how many ways a committee of 6 can be formed out of 8 boys and 4 girls such that (1)committee has 2 girls (2) at least 2 girls
 11. There are 12 points of which 4 are collinear. How many (1) straight lines and (2)Triangles can be formed using these 12 points
 12. Find the number of squares that can be identified in a chess board of dimension 8×8 .
 13. If the letters of the word ‘TEAR’ is arranged in the alphabetical order. Find the rank of the word ‘RATE’
 14. In how many ways 2 cards can be picked out of 52 well shuffled cards such that they are either kings or jacks.
 15. In how many ways 20 chocolates be distributed among 5 children
-

Probability

1. What is the probability of drawing 3 white and 4 green balls from a bag containing 5 white and 6 green balls if 7 balls are drawn simultaneously at random?
2. Find the probability of throwing 22 or more in one throw with 4 dice
3. If from a pack, four cards are drawn find the chance that they will be four honours of the same suit.
4. Find the probility of two red balls in succession from a bag containing 4 red and 5 black balls when the ball that is drawn first is (1) Replaced (2) Not replaced
5. Probability that A,B and C can solve a problem are respectively $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$. If all the three try the problem simultaneously find the probability that(1)the problem is solved (2) exactly one of them solves the problem.

Clocks Calendars Cubes

1. Find the angle between the minute hand and hour hand at the following times

- (1) 5.40 (2) 3.30 (3) 10.50 (4) 1.40

2. At what time between 4 and 5 O'clock the angle between the minute hand and hour hand is 100 degrees.

3. How many times a day do the minute hand and hour hand

- (1) meet at right angle (2) lie on the same straight line

4. Ajay goes out of a hall between 3 and 4 pm and comes back between 6 to 7 pm of the same day and found that the positions of the minute hand and hour hand were exchanged. Find (i) The time out (ii) Time in (iii) Duration of time in and time out.

5. 24th March , 2007 is Saturday find which day of the week would be

- (1) 17th April 2007 (2) 21st November 2007 (3) 31st October 2011
(4) 5th august 2405 (5) 26th February 5005 (6) 29th February 3000

6. What is maximum number of pieces in to which a cube can be cut into by

- (i) Applying 3 cuts (ii) Applying 14 cuts
(iii) Applying 21 cuts (iv) Applying 23 cuts

7. What is the minimum number of cuts required to make a cube into the following number of equal pieces

- (1) 27 pieces (2) 150 pieces (3) 216 pieces (4) 96 pieces



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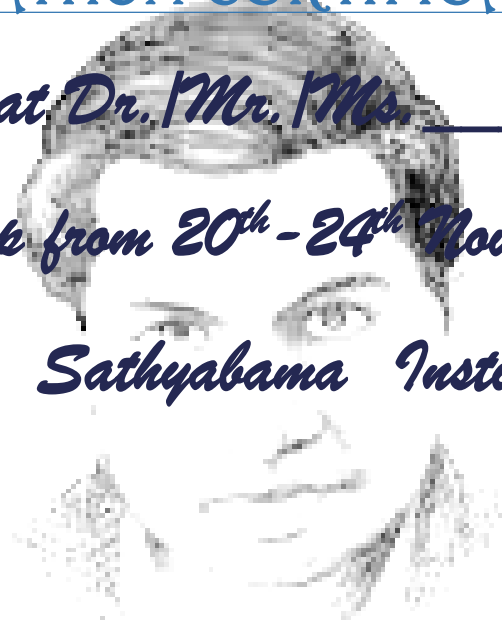


FIVE-DAY WORKSHOP ON QUANTITATIVE APTITUDE TRAINING FOR CSIR - NET / SET

PARTICIPATION CERTIFICATE

This is to certify that Dr./Mr./Ms. _____

*participated in the five day workshop from 20th - 24th November, 2018 conducted
by Department of Mathematics, Sathyabama Institute of Science and
Technology, Chennai-600119.*



Dean
(Science and Humanities)

Convener &
Head of the Department
(Mathematics)

Co-Ordinators

LIST OF PARTICIPANTS

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34	Dr. Godwin Premi	Assistant Professor	SIST
35	Dr. Suji Helen	Assistant Professor	SIST
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