

ATULYA INSTITUTE

CLASS: X

F.M. 30 Marks

TIME: 1 hr 15 mins

SUBJECT: Mathematics

DATE: _____

Instructions to the candidates:

1. Read the question paper carefully.
2. The time at the head of the paper is the time allotted for writing the answer.
3. The intended marks are allotted for the question or part of questions are given in brackets ().
4. Do not copy the question, write answer with correct question number.

TOPICS COVERED:

1. *Arithmetic Progressions*
2. *Statistics*

SECTION - A [2 x 4 = 8 Marks]

Q1. Find the value of $a_{25} - a_{15}$ for the AP: 6, 9, 12, 15,

Q2. If 7 times the seventh term of the AP is equal to 5 times the fifth term, then find the value of its 12th term.

Q3. Mrs. Garg recorded the marks obtained by her students in the following table. She calculated the modal marks of the students of the class as 45. While printing the data, a blank was left. Find the missing frequency in the table given below:

| | | | | | |
|--------------------|--------|---------|---------|---------|----------|
| Marks Obtained | 0 - 20 | 20 - 40 | 40 - 60 | 60 - 80 | 80 - 100 |
| Number of Students | 5 | 10 | ---- | 6 | 3 |

Q4. For the following distribution, find the sum of the lower limits of the median and modal class:

| | | | | | |
|-----------|-------|--------|---------|---------|---------|
| Class | 0 - 5 | 5 - 10 | 10 - 15 | 15 - 20 | 20 - 25 |
| Frequency | 10 | 15 | 12 | 20 | 9 |

P.T.O.

SECTION - B [4 x 3 = 12 Marks]

Q5. The school auditorium was to be constructed to accommodate at least 1500 people. The chairs are to be placed in concentric circular arrangement in such a way that each succeeding circular row has 10 seats more than the previous one.



- (i) If the first circular row has 30 seats, how many seats will be there in the 10th row?
- (ii) For 1500 seats in the auditorium, how many rows need to be there?
- (iii) If 1500 seats are to be arranged in the auditorium, how many seats are still left to be put after the 10th row?
- (iv) If there were 17 rows in the auditorium, how many seats will be there in the middle row?

Q6. The distribution given below shows the runs scored by batsmen in one-day cricket matches. Find the mean number of runs.

| Runs Scored | 0 - 40 | 40 - 80 | 80 - 120 | 120 - 160 | 160 - 200 |
|-------------------|--------|---------|----------|-----------|-----------|
| Number of batsmen | 12 | 20 | 35 | 30 | 23 |

Q7. Following is the distribution of the long jump competition in which 250 students participated. Find the median distance jumped by the students. Interpret the median.

| Distance (in m) | 0 - 1 | 1 - 2 | 2 - 3 | 3 - 4 | 4 - 5 |
|--------------------|-------|-------|-------|-------|-------|
| Number of Students | 40 | 80 | 62 | 38 | 30 |

SECTION - C [5 x 2 = 10 Marks]

Q8. The median of the following data is 525. Find the values of x and y, if the total frequency is 100:

| Class Interval | 0 - 100 | 100 - 200 | 200 - 300 | 300 - 400 | 400 - 500 | 500 - 600 | 600 - 700 | 700 - 800 | 800 - 900 | 900 - 1000 |
|----------------|---------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| Frequency | 2 | 5 | x | 12 | 17 | 20 | y | 9 | 7 | 4 |

Q9. Case Study Question - Push-ups are a fast and effective exercise for building strength. These are helpful in almost all sports including athletics. While the push-up primarily targets the muscles of the chest, arms, and shoulders, support required from other muscles helps in toning up the whole body.



Nitesh wants to participate in the push-up challenge. He can currently make 3000 push-ups in one hour. But he wants to achieve a target of 3900 push-ups in 1 hour for which he practices regularly. With each day of practice, he is able to make 5 more push-ups in one hour as compared to the previous day. If on first day of practice he makes 3000 push-ups and continues to practice regularly till his target is achieved. Keeping the above situation in mind answer the following questions:

- (i) Form an A.P representing the number of push-ups per day and hence find the minimum number of days he needs to practice before the day his goal is accomplished?
- (ii) Find the total number of push-ups performed by Nitesh up to the day his goal is achieved.

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