

# RISE OF NATION ACADEMY

Subject:- Mathematics (SET-E)  
MOCK TEST

Min. Marks:- 20

Time:- 2  
Max. Marks:- 40

## General Instructions :

1. The question paper consists of 14 questions divided into 3 sections A, B, C.
2. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
3. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
4. Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study based questions.

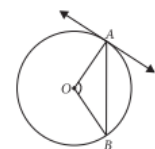
### SECTION-A

1. If  $x = 2$  and  $x = 3$  are roots of the equation  $3x^2 - 2kx + 2m = 0$ , then find the value of  $k$  and  $m$ .
2. If  $a, b, c$  are in A.P, prove that  $a^2 + c^2 - 2bc = 2a(b - c)$ .

OR

If  $a, 2(a + 5)$  and  $2(4a - 5)$  are in A.P, then find the value of  $a$ .

3. A polygon of  $n$  sides has  $\frac{n(n-3)}{2}$  diagonals. How many sides a polygon has with 54 diagonals?
4. In the given figure,  $O$  is the centre of a circle,  $AB$  is a chord and  $AT$  is the tangent at  $A$ . If  $\angle AOB = 100^\circ$ , then find the value of  $\angle BAT$ .
5. Two cubes, each of side 4 cm are joined end to end. Find the surface area of the resulting cuboid.
6. If mean of 5 observations  $x, x + 3, x + 6, x + 9$  and  $x + 12$  is 11, then find the value of  $x$ .



### SECTION - B

7. Draw two concentric circles of radii 2 cm and 5 cm. Taking a point on outer circle, construct the pair of tangents to the other. Also, measure the length of a tangent.
8. If mode of the following series is 54, then find the value of  $f$ .

Class-interval	0-15	15-30	30-45	45-60	60-75	75-90
Frequency	3	5	$f$	16	12	7

9. An observer, 1.8 m tall is 40.2 m away from a 42 m high tower. Determine the angle of elevation of the top of the tower from his eye.

OR

From the top of a tower 50 m high, the angle of depression of the top of a pole is  $45^\circ$  and from the foot of the pole, the angle of elevation of the top of the tower is  $60^\circ$ . Find the height of the pole if the pole and tower stand on the same plane.

10. If the median of the distribution given below is 27. Find the value of  $x$  and  $y$ .

Class-interval	0-10	10-20	20-30	30-40	40-50	50-60	Total
Frequency	5	$x$	20	14	$y$	8	68

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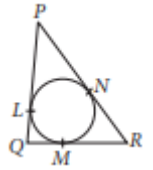
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## SECTION - C

11. In the given figure, a circle is inscribed in a triangle  $PQR$  with  $PQ = 10$  cm,  $QR = 8$  cm and  $PR = 12$  cm. Find the lengths  $QM$ ,  $RN$  and  $PL$ .



12. A cylindrical tub, whose diameter is 12 cm and height 15 cm is full of ice-cream. The whole ice-cream is to be divided into 10 children in equal ice-cream cones, with conical base surmounted by hemispherical top. If the height of conical portion is twice the diameter of base, find the diameter of conical part of ice-cream cone.
13. Jack is much worried about his upcoming assessment on A.P. He was vigorously practicing for the exam but unable to solve some questions. One of these questions is as shown below.  
If the 3<sup>rd</sup> and the 9<sup>th</sup> terms of an A.P. are 4 and  $-8$  respectively, then help Jack in solving the problem.

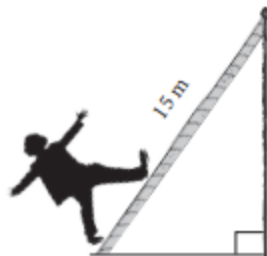
- (i) Which term of the A.P. is  $-160$ ?  
(ii) What is the 75<sup>th</sup> term of the A.P.?



14. A circus artist is climbing through a 15 m long rope which is highly stretched and tied from the top of a vertical pole to the ground as shown below.

Based on the above information, answer the following questions.

- (i) Find the height of the pole, if angle made by rope to the ground level is  $45^\circ$ .  
(ii) If the angle made by the rope to the ground level is  $45^\circ$ , then find the distance between artist and pole at ground level.



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