Mathematics – Mock Test Paper

Time : 3 hrs **Max. Marks : 80**

General Instructions

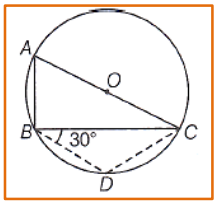
1. All questions are compulsory.
2. The question paper consists of 28 questions divided into five sections A, B, C and D. **Section A** comprises of 4 questions of 1 mark each, **Section B** comprises of 6 questions of 2 marks each, **Section C** comprises of 8 questions of 3 marks each and **Section D** comprises of 10 questions of 4 marks each.
3. 10 marks questions from open text theme.
4. There is no overall choice.
5. Use of calculator is not permitted.

Section A

1. Find the mean of the first six multiples of 3.

2. Find the median of following numbers
15, 6, 16, 8, 22, 21, 9, 18, 27.

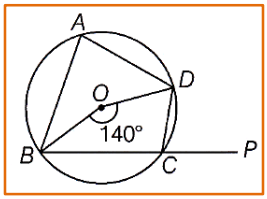
3. In the given figure, BD = DC and ∠DBC = 30°. Find the measure of ∠BAC, if O is centre of the circle.



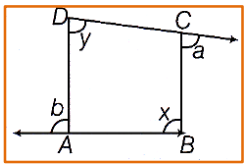
4. Find the height of a cone whose diameter is 30 m and slant height is 25 m.

Section B

5. In the given figure, O is the centre of the circle. The angle subtended by the arc BCD at the centre is 140°. BC is produced to P. determine ∠BAD and ∠DCB.



6. The sides BA and DC of a quadrilateral ABCD are produced as shown in the figure. Prove that $a + b = x + y$.



7. If a diameter of a circle bisects each of the two chords of a circle, then prove that the chords are parallel.

8. A solid right circular cone or radius 4 cm and height 7 cm is melted to form a sphere. Find the radius of sphere.

9. Following table shows the marks scored by a group of 90 students in a Mathematics test of 100 marks.

Marks	0-20	20-30	30-40	40-50	50-60	60-70	70-100
Number of students							

Find the probability that a student obtained

(i) Less than 20% marks.

(ii) 60 or more marks.

10. In a cricket match, a batsman hits a boundary 8 times out of 40 balls he plays. Find the probability that, he did not hit a boundary.

Section C

11. If $x_1, x_2, \ldots, x_n$ are n values in a variable x such that $\sum_{i=1}^{n}(x_i - 2) = 110$ and $\sum_{i=1}^{n}(x_i - 5) = 20$.

Find the value of n and its mean.

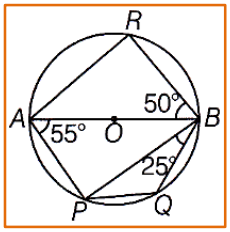
12. The mean monthly salary of 10 members of a group is ₹ 1445, one more member whose monthly salary is ₹ 1500 has joined the group. Find the mean monthly salary of 11 members of the group.

13. Prove that that area of an equilateral triangle is equal to $\frac{\sqrt{3}}{4}a^2$, where a is the side of the triangle.

14. If a line is drawn parallel to base of isosceles triangle to intersect its equal sides, then prove that quadrilateral so formed is cyclic.

15. Prove that the diagonals of a parallelogram bisect each other.

16. In the given figure, AB is a diameter of a circle with centre O. If ∠PAB = 55°, ∠PBQ = 25° and ∠ABR = 50°, then find ∠PBA, ∠BPQ and ∠BAR.



17. Two circles of radii 10 cm and 8 cm intersect and the length of the common chord is 12 cm. Find the distance between their centres.

18. A solid right circular cylinder of radius 8 cm and height 3 times that of cylinder. Find the curved surface area of the cone.

Section D

19. 70 students from a locality use different modes of transport to go to school as given below:

Mode of transport	Car	Bus	Moped	Bicycle	Rickshaw
Number of students	4	27	11	20	8

(i) Draw the bar graph of the above data.

(ii) Identify the value being reflected by more number of people using bicycle as compared to car and moped.

20. Draw a histogram to represent the following frequency distribution.

Class interval	10-15	15-20	20-30	30-50	50-80
Frequency	6	10	10	8	18

21. In a ΔABC, find the measures of the angles of the triangle formed by joining the mid-points of the sides of the triangle.

22. ABCD is a cyclic quadrilateral whose diagonals AC and BD intersect at P. If AB = DC, then prove that

(i) ΔPAB ≅ ΔPDC.

(ii) PA = PD and PC = PB.

(iii) AD || BC.

23. Construct a ΔABC, in which BC = 3.8 cm, ∠B = 45° and AB + AC = 6.8 cm.

24. If ABC is an isosceles triangle with AB = AC and D, E and F are the mid-points of BC, CA and AB respectively, then show that AD ⊥ EF and AD is bisected by FE.

25. A solid cylinder has total surface area of 462 sq cm. Its curved surface area is one-third of its total surface area. Find the volume of the cylinder. (Take $\pi = \frac{22}{7}$)

26. The difference between outside the inside surfaces of a cylindrical metallic pipe 14 cm long is 44 cm^2. If the pipe is made of 99 cu cm of metal. Find the outer and inner radii of the pipe.

27. Water flows in a tank 150 m × 100 m at the base through a pipe whose cross-section is 2 dm × 1.5 dm at the speed of 15 km/h. In what time, will the water be 3 m deep?

28. A recent survey found that the age of workers in a factory as follows:

Age (in yr)	20-29	30-39	40-49	50-59	60 and above
Number of workers	38	27	86	46	3

If a person is selected at random, then find the probability that the person is

(i) 40 yr or more.

(ii) Under 40 yr.

(iii) Having age from 30-39 yr.