DELHI PUBLIC SCHOOL NEWTOWN
SESSION 2020-21
FINAL EXAMINATION (ONLINE)

CLASS: IX **FULL MARKS: 50**
SUBJECT: MATHEMATICS **TIME: 1HOUR 45MINS**

General Instructions:

- **Section I is compulsory.**
- **Answer any four questions from Section II.**
- **This paper consists of three printed pages.**
- **All questions are compulsory.**
- **Copy the question number carefully before answering the questions.**

SECTION- I (10 MARKS)

1.

a) If $a + \frac{1}{a} = p$ and $a \neq 0$; then show that $a^3 + \frac{1}{a^3} = p(p^2 - 3)$ **[3]**

b) ₹ 6000 amounts ₹ 7526.40 to for 2 years at a certain rate of interest compounded annually. Find the rate of interest. **[3]**

c) Draw a frequency polygon from the following frequency distribution:

C.I	10-20	20-30	30-40	40-50	50-60	60-70
f	4	8	12	10	7	4

[4]

SECTION – II (40 MARKS)

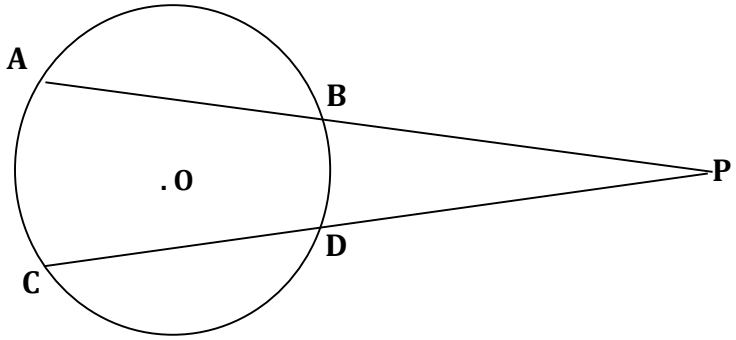
2.

a) Factorize
$(1 - a^2)(1 - b^2) + 4ab$ **[3]**

b) The lengths of the sides of a triangle are in the ratio 3:4:5 and its perimeter is 144 cm. Find the area of the triangle. **[3]**

c) AB and CD are two equal chords of a circle with centre O. If AB and CD on being produced, meet at a point P outside the circle, prove that

a) PA = PC b) PB = PD [4]



3.

a) A paper in the form of a rectangle UVWX in which UV= 30 cm and VW = 14 cm . A semi- circular portion with VW as diameter is cut off . Find the area of the remaining part.

[3]

b) Solve

$2^{2x+3} - 9 \times 2^x + 1 = 0$ **[3]**

c) ABCD is a parallelogram in which AP and CQ are perpendiculars from vertices A and C respectively on diagonal BD. Prove that

(i) ΔAPB is congruent to ΔCQD

(ii) AP = CQ [4]

4.

a) In a ΔABC, ∠B= 90° and D is the midpoint of BC. AD is joined. Prove that

$BC^2 = 4 (AD^2 - AB^2)$ **[3]**

b) Mean of 21 observations is 250. If one observation is excluded, the mean of remaining observations is 248. Find the value of the excluded observation. [3]

c) A and B can do a piece of work together in 15 days. If one day's work of A be $1\frac{1}{2}$ times one day's work of B, find how many days will each take to finish the work alone.

[4]

5.

a) **If 5tanA= 4, find the value of** $\frac{8sinA-3CosA}{8sinA+2CosA}$ **[3]**

b) **If a point A (0,2) is equidistant from the points B (3,p) and C (p, 5), then find the value of p. [3]**

c) **Rationalise the denominator of:**

[4]

$$\frac{1}{\sqrt{3}+\sqrt{2}-1}$$

6.

a) **A rectangular tank is 25m long and 9.5m deep. If 600 cubic metres of water be drawn off the tank, the level of water in the tank goes down by 1.5 m. Calculate:**
i)The width of the tank ii) The total volume of water which the tank can hold.

[3]

b) **Find the value of:**
(sin60° ÷ cos²45) - 3 tan 30° + 5cos 90° - (tan25° ÷ cot 65°) [3]

c) **Show that the quadrilateral formed by joining the mid-points of the pair of adjacent sides of a rhombus is a rectangle. [4]**