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LUCKNOW REGION
PRE-BOARD-1 EXAMINATION

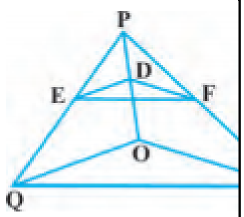
Class- X Time: 3 Hrs Sub- Maths BASIC (241) M.M :80

GENERAL INSTRUCTIONS:

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with subparts of the values of 1, 1 and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks questions of Section E.
8. Draw neat figures wherever required. Take π =22/7 wherever required if not stated.

	SECTION A	
SN	Section A consists of 20 questions of 1 mark each.	MARKS
1	Which of the following is not irrational? (A) $(3 + \sqrt{7})$ (B) $(3 - \sqrt{7})$ (C) $(3 + \sqrt{7})(3 - \sqrt{7})$ (D) $3\sqrt{7}$	1
2	The product of a non-zero rational and an irrational number is (A) always rational (B) rational or irrational (C) always irrational (D) zero	1
3	The number of zeroes, the polynomial $p(x) = (x - 2)^2 - 4$ can have, is (A)1 (B) 2 (C) 3 (D) 0	1
4	If a pair of linear equations is consistent, then the lines will be (A) parallel (B) always coincident (C) intersecting or coincident (D) always intersecting	1
5	$(\sec A + \tan A)(1 - \sin A) =$ (A) sec A (B) sin A (C) cosec A (D) cos A	1
6	The roots of quadratic equation $2x^2 + x + 4 = 0$ are: (A) Positive and negative (B) Both Positive (C) Both Negative (D) No real roots	1
7	The distance of the point P(–6, 8) from the origin is (A) 10 units (B) $2\sqrt{7}$ units (C) 8 units (D) 6 units	1
8	The fourth vertex D of a parallelogram ABCD whose three vertices are A(–2, 3), B(6, 7) and C(8, 3) is (A) (0, 1) (B) (0, –1) (C) (–1, 0) (D) (1, 0)	1
9	A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at a point Q so that OQ = 12 cm. Length PQ is : (A) 12 cm (B) 13 cm (C) 8.5 cm (D) $\sqrt{119}$ cm	1

10	D and E are the midpoints of side AB and AC of a triangle ABC, respectively and BC = 6 cm. If DE ‖ BC, then the length (in cm) of DE is: (A) 2.5 (B) 3 (C) 5 (D) 6	1
11	If triangles ABC and DEF are similar and AB=4 cm, DE=6 cm, EF=9 cm and FD=12 cm, the perimeter of triangle ABC is: (A) 22 cm (B) 20 cm (C) 21 cm (D) 18 cm	1
12	A girl calculates that the probability of her winning the first prize in a lottery is 0.08. If 6000 tickets are sold, how many tickets has she bought? (A) 40 (B) 240 (C) 480 (D) 750	1
13	For a frequency distribution, mean, median and mode are connected by the relation (a) mode = 3mean – 2median (b) mode = 2median – 3mean (c) mode = 3median – 2mean (d) mode = 3median + 2mean	1
14	The minute hand of a clock is 7 cm long. Find the area of the face of the clock described by minute hand in 15 minutes. (a) 154 Sq cm (b)38.5 Sq cm (c)105 Sq cm (d)77 Sq cm	1
15	If the perimeter and the area of a circle are numerically equal, then the radius of the circle is (A) 2 units (B) π units (C) 4 units (D) 7 units	1
16	Two identical solid cubes of side a are joined end to end. Then the total surface area of the resulting cuboid is (A) $12a^2$ (B) $10a^2$ (C) $8a^2$ (D) $11a^2$	1
17	The pair of equations y = 0 and y = –7 has: (A) one solution (B) two solutions (C) infinitely many solutions (D) no solution	1
18	If $\sqrt{3}\sin\theta-\cos\theta=0$ and $0^0<\theta< 90^0$, then the value of θ is a)30^0 b)60^0 c)90^0 d)45^0	1
19	DIRECTION: In the question number 19 and 20, a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct option **Statement A (Assertion): sin 45^0=cos 45^0** **Statement R(Reason) : sin θ = cos θ for all values of θ.** (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A) (c) Assertion (A) is true but reason(R) is false. (d) Assertion (A) is false but reason(R) is true.	1
20	**Statement A (Assertion): For any two positive integers p and q, HCF (p, q) × LCM (p, q) = p × q** **Statement R(Reason) : If the HCF of two numbers is 5 and their product is 150, then their LCM is 30.** (a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A) (b) Both assertion (A) and reason (R) are true and reason (R) is not the correct explanation of assertion (A)	1

	(c) Assertion (A) is true but reason(R) is false. (d) Assertion (A) is false but reason(R) is true.	
	SECTION B	
	Section B consists of 5 questions of 2 marks each.	
21	Solve 2x + 3y = 11 and 2x – 4y = – 24 and hence find the value of ‘m’ for which y = mx+ 3. OR Find the zeroes of the quadratic polynomial $x^2 + 7x + 10$, and verify the relationship between the zeroes and the coefficients	2
22	Prove that the length of tangents of a circle from an exterior point are equal.	2
23	D is a point on the side BC of a triangle ABC such that ∠ADC = ∠BAC. Show that $CA^2 = CB.CD$ OR In the figure, DE||OQ and DF||OR, show that EF||QR. 	2
24	If sin A = 3/4, Calculate cos A and tan A.	2
25	A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding: (i) minor sector (ii) major sector (Use π = 3.14).	2
	SECTION C	
	Section C consists of 6 questions of 3 marks each.	
26	Prove that $3 + 2\sqrt{5}$ is irrational.	3
27	Find the roots of the following equations: $x+\frac{1}{x} = 2, x \neq 0$ OR A train travels 360 km at a uniform speed. If the speed had been 5 km/h more, it would have taken 1 hour less for the same journey. Find the speed of the train.	3
28	A quadrilateral ABCD is drawn to circumscribe a circle. Prove that AB + CD = AD + BC	3
29	Find a quadratic polynomial whose zeroes are reciprocals of the zeroes of the polynomial $f(x) = ax^2 + bx + c$, $a \neq 0$, $c \neq 0$.	3
30	Prove the following identities, where the angles involved are acute angles for which the expressions are defined $\sqrt{\frac{1+\sin A}{1-\sin A}} = \sec A + \tan A$ **OR** $(cosecA - sinA)(secA - cosA) = \frac{1}{(\tan A+\cot A)}$	3
31	A box contains 5 red marbles, 8 white marbles and 4 green marbles. One marble is taken out of the box at random. What is the probability that the marble taken out will be	3

(i) red?
(ii) white?
(iii) not green?

SECTION D

Section D consists of 4 questions of 5 marks each.

32 The altitude of a right triangle is 7 cm less than its base .If the hypotenuse is 13cm, find the other two sides. 5

33 A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top, which is open, is 5 cm. It is filled with water up to the brim. When lead shots, each of which is a sphere of radius 0.5 cm are dropped into the vessel, one-fourth of the water flows out. Find the number of lead shots dropped in the vessel. 5

OR

A Gulab jamun contains sugar syrup up to about 30% of its volume. Find approximately how much syrup would be found in 45 Gulab jamuns, each shaped like a cylinder with two hemispherical ends with length 5 cm and diameter 2.8 cm (see figure).

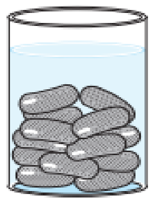


Fig. 13.15

34 The following table shows the ages of the patients admitted in a hospital during a year: 5

Age (in years)	5-15	15-25	25-35	35-45	45-55	55-65
Number of patients	6	11	21	23	14	5

Find the mode and the mean of the data given above.

35 Sides AB and AC and median AD of a triangle ABC are respectively proportional to sides PQ and PR and median PM of another triangle PQR. 5
Show that $\Delta ABC \sim \Delta PQR$.

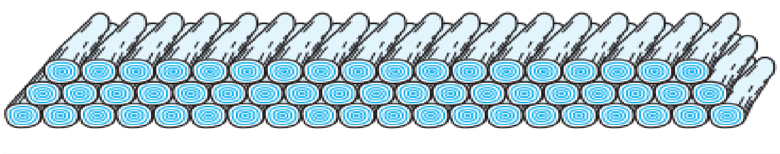
OR

State and prove Basic Proportionality Theorem

SECTION E

Case study based questions are compulsory.

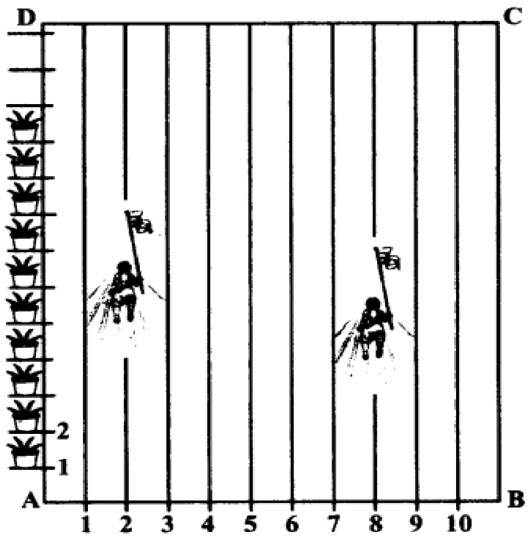
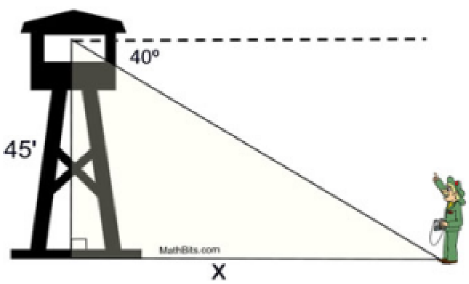
36 200 logs are stacked in the following manner: 20 logs in the bottom row, 19 in the next row, 18 in the row next to it and so on.



i)Using the given information write an arithmetic progression. 1
ii.) In how many rows are the 200 logs placed ?

OR

If 209 logs are stacked in the same manner:20 logs in the bottom,19 in the next row,18 in the row next to it and so on, then in how many rows are the 209 logs placed ? 2
iii.)How many logs are in the top row ? 1

37	To conduct Sports Day activities, in your rectangular shaped school ground ABCD, lines have been drawn with chalk powder at a distance of 1 m each. 100 flower pots have been placed at a distance of 1 m from each other along AD, as shown in given figure below. Niharika runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5 th distance AD on the eighth line and posts a red flag.  (1) Coordinate if Niharika? (2) Coordinate if Preet ? (3) If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag? Or Find the distance between Preet and Niharika?	1 1 2
38	A hunter found a tall tower inside a dense forest. He was planning to climb the tower and noticed that the angle of depression from the top of tower was 40^0 and the height of the tower was 45 m.His fellow colleague however, said that the angle of depression is actually 10^0 less than what the hunter has measured keeping into account the new angle of depression, answer the following questions.  1) What is the new angle of elevation to the top of the tower ? 2) If the height of the tower decreases, will the angle of depression increase or decrease ? 3) What is the new distance of the hunter from the base of the tower ? Or What is the new distance between Hunter and top of tower?	1 1 2