Pre Board MT -07

INFINITY THINK BEYOND..... AN EDUCATIONAL INSTITUTE

10 th

Mock Test 07- Complete Syllabus (Basic Maths)-241

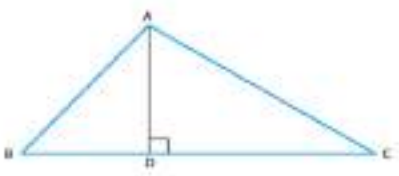
Time: 3 Hrs **Maximum marks : 80**

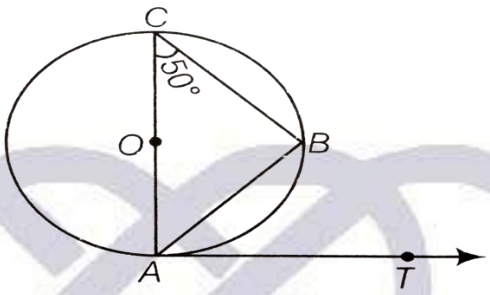
INSTRUCTIONS TO THE STUDENTS

1. This question paper has 5 sections A, B, C, D and E.
2. Section A has 20 MCQs carrying 1 mark each.
3. Section B has 5 questions carrying 2 marks each.
4. Section C has 6 questions carrying 3 marks each.
5. Section D has 4 questions carrying 5 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1 and 2 marks each.
7. All questions are compulsory. However, an internal choice in 2 questions of 2 marks, 2 questions of 3 marks and 2 question of 5 marks has been provided. An internal choice has been provided in the 2 marks questions of Section E.
8. Draw neat figures wherever required. Take $\pi = \frac{22}{7}$ wherever required if not stated.

SECTION A

(Questions 1 – 10 carry 1 marks)

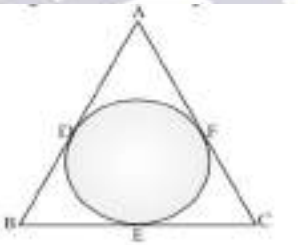
1	Given that HCF(156, 78) = 78, LCM(156,78) is (a) 156 (b) 78 (c) 156×78 (d) 156×2	**1**
2	The LCM of smallest prime number and the smallest odd composite number is (a) 2 (b) 4 (c) 9 (d) 18	**1**
3	If α, β are the zeroes of the polynomial $x^2 - 16$, then αβ(α + β) is (a) 0 (b) 4 (c) - 4 (d) 16	**1**
4	The pair of linear equations 3x + qy = 7 and px + 10y = 15 have no solution, then value of pq is (a) 10 (b) 30 (c) 45 (d) 15	**1**
5	The quadratic equation $3x^2 - 5x + 7 = 0$ has (a) no real roots (b) two equal roots (c) two distinct real roots (d) more than two real roots	**1**
6	If ABC and DEF are two triangles and $\frac{AB}{DE}=\frac{BC}{FD}$, then the two triangles are similar if (a) ∠A=∠F (b) ∠B=∠D (c) ∠A=∠D (d) ∠B=∠E	**1**
7	In triangle ABC, ∠BAC = 90° and AD ⊥ BC. Then  (a) BD . CD = BC^2 (b) AB . AC = BC^2 (c) BD . CD = AD^2 (d) AB . AC = AD^2	**1**

8	The distance of the point (-3,4) from the origin is (a) -3 (b) 4 (c) 5 (d)-5	**1**
9	If (0,1) is one of the end points of diameter of a circle with centre (-3,2), then other point of the diameter is (a) (-6,3) (b) (0,2) (c) (0,0) (d) (-3,1)	**1**
10	If secθ + tanθ = y, then secθ – tanθ = (a) y (b) y^2 (c) $\frac{1}{y}$ (d) $\frac{2}{y}$	**1**
11	If θ=30^o, then $4\cos^3\theta - 3\cos\theta$ is (a) $\cos 30^o$ (b) $\cos 60^o$ (c) $\cos 90^o$ (d) $\cos 0^o$	**1**
12	AB is a chord of the circle and AOC is its diameter such that angle ACB = 50°. If AT is the tangent to the circle at the point A, then BAT is equal to  (a) 65° (b) 60° (c) 50° (d) 40°	**1**
13	If the area of a sector of a circle of radius 21cm is 231 cm^2, then length of its corresponding arc is (a) 11cm (b) 22cm (c) 21cm (d) 231cm	**1**
14	Two cubes have their volumes in the ratio 1 : 27. Find the ratio of their surface areas (a) 1:2 (b) 1:3 (c) 1:4 (d) 1:9	**1**
15	A joker's cap is in the form of a right circular cone of base radius 7cm and the slant height is 25cm. The area of the cap is (a) 225cm^2 (b)350cm^2 (c) 450cm^2 (d) 550cm^2	**1**
16	The empirical relation between three measures of central tendency i.e. mean, mode and median is (a) 3 median – 2 mean = mode (b) 3 median – 2 mode = mean (c) 3 mean – 2 mode = median (d) 3 mean – 2 median = mode	**1**
17	When a die is thrown then the probability of getting an odd prime number is (a) $\frac{1}{6}$ (b) $\frac{1}{2}$ (c) $\frac{2}{3}$ (d) $\frac{1}{3}$	**1**
18	A single alphabet is selected at random from the word "PROBABILITY". The probability of vowel is (a) $\frac{2}{11}$ (b) $\frac{7}{11}$ (c) $\frac{3}{11}$ (d) $\frac{4}{11}$	**1**
19	DIRECTIONS: In the question number 19 and 20, a statement of Assertion (A) is followed by a statement of Reason (R). Choose the correct option: (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.	**1**

	(d)Assertion (A) is false but reason (R) is true. **Assertion(A):** The number 6^n cannot end with digit 0, where n is a natural number. **Reason(R):** A number ends with 0, if its prime factorisation contains both 2 and 5.	
20	**Assertion(A):** If cosA + $\cos^2$A =1, then $\sin^2$A + $\sin^4$A = 1 **Reason(R):** $\sin^2$A + $\cos^2$A = 1	**1**

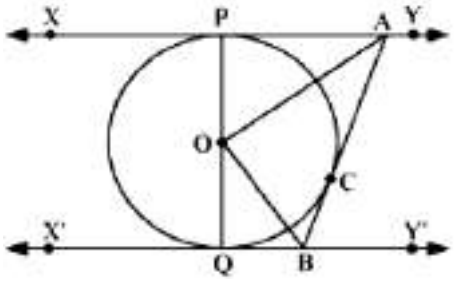
SECTION B

(Questions 21 – 25 carry 2 marks)

21	Two APs have the same common difference. The difference between their 100th terms is 100, what is the difference between their 1000th terms?	**2**
22	Diagonals AC and BD of a trapezium ABCD with AB ∥ DC intersect each other at the point O. Using a similarity criterion for two triangles, show that $\frac{OA}{OC} = \frac{OB}{OD}$	**2**
23	If 7 $\sin^2\theta$ + 3 $\cos^2\theta$ = 4, then show that tanθ = $\frac{1}{\sqrt{3}}$	**2**
24	A chord of a circle of radius 10cm subtends a right angle at the centre. Find the area of the corresponding minor segment. (Take π=3.14)	**2**
25	In the given figure, if AB = AC, prove that BE = EC. 	**2**

SECTION C

(Questions 26 – 31 carry 3 marks)

26	Prove that $\sqrt{5}$ is irrational.	**3**
27	If α and β are the zeroes of the quadratic polynomial $3x^2$ + 2x - 10. Find a quadratic polynomial whose zeroes are (2 α + 1) and (2 β + 1). **OR** Find the zeroes of the polynomial $6x^2$-7x-3 and verify the relationship between zeroes and its coefficients.	
28	Solve the following linear equations: 401x – 577y = 1027 -577x + 401y = -1907	**3**
29	Evaluate $\frac{\sin 30° + \tan 45° - \text{cosec}60°}{\sec 30° + \cos 60° - \cot 45°}$ **OR** Prove: $\frac{1+\sec A}{\sec A} = \frac{\sin^2 A}{1-\cos A}$	**3**
30	In Figure, XY and X'Y' are two parallel tangents to a circle with center O and another tangent AB with point of contact C intersecting XY at A and X'Y' at B. Prove that ∠ AOB = 90°. 	**3**

31 A box contains 20 balls bearing number 1,2,3…,20 respectively. A ball is drawn at random from the box, find the probability that number on the ball is **3**
(i) divisible by 2 or 3.
(ii) divisible by 2 and 3.
(iii) a perfect square number.

SECTION D

(Questions 32 – 38 carry 4 marks)

32 The sides of a right triangle are such that the longest side is 4 m more than the shortest side and the third side is 2 m less than the longest side. Find the length of each side of the triangle. Also, find the difference between the numerical values of the area and the perimeter of the given triangle. **5**

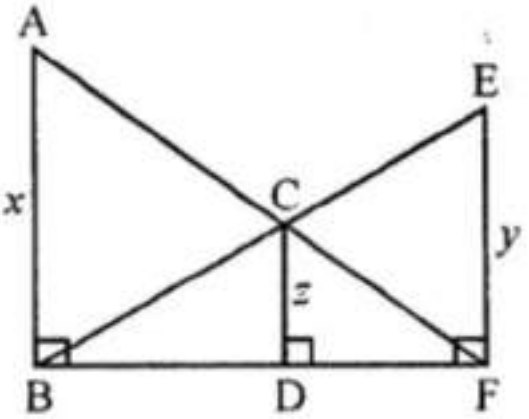
OR

Express the equation $\frac{x-2}{x-3} + \frac{x-4}{x-5} = \frac{10}{3}$; (x ≠3,5) as a quadratic equation in standard form. Hence, find the roots of the equation so formed.

33 Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other sides are divided in the same ratio. **3 + 2**

OR

In given figure, AB ‖ CD ‖ EF, where AB= x units, CD= z units and EF= y units. Prove that $\frac{1}{x} + \frac{1}{y} = \frac{1}{z}$



34 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**

35 The median of the following data is 525. Find the values of x and y, if the total frequency is 100. **5**

CLASS INTERVAL	FREQUENCY
0-100	2
100-200	5
200-300	x
300-400	12
400-500	17
500-600	20
600-700	y
700-800	9
800-900	7
900-1000	4

SECTION E

(Questions 36 – 35 carry 5 marks)

36 Two friends Pradeep and Deepak are playing a game. Pradeep asks Deepak to think of a mathematical sequence which is as follows in increasing order: a, a + d, a + 2d, a + 3d, ... The 10th term of the sequence is 109 and 15th term is 149 **1 + 1 + 2**

Now on the basis of above, answer the following:

(i)What is 1st term of above sequence?

(ii) What is the common difference, if the sequence forms an AP?

(iii)(a) What is the sum of first 20 terms of the AP?

OR

(b)If the sequence has 25 terms, then what will be the sum of last 10 terms?

37 To save ships from accidents during the sea journey, at possible accident places, light houses are erected so as to warn the ships. In one such case, from the top of the light house a ship is spotted with angle of depression of 60^o and after 5 minutes angle of depression of the ship changes to 30^o. If height of light house is 80 meter, then by using the above information answer the following questions. **1 + 1 + 2**

(i)At what distance is the ship from light house when angle of depression is 30^o?

(ii) At what distance is the ship from light house when angle of depression is 45^o?

(iii) (a)At what distance will be the ship from light house when angle of depression is 60^o?

OR

(b) What is the speed of the ship in m/min ?

38 Anushka was thrilled to know that the football tournament is fixed with a monthly timeframe from 20th July to 20th August and for the first time in the FIFA Women's World Cup's history, two nations host 10 venues. Her father felt that the game can be better understood if the position of players is represented as on points on a coordinate plane. **2 + 1 + 1**

	(i)At an instance, the midfielders and forward formed a parallelogram. Find the positions of the central midfielders(D) if the position of other players who formed the parallelogram are: A(1,2), B(4,3) and C(6,6) (ii)(a)Check if the Goalkeeper G(-3,5), Sweeper H(3,1) and Wing-back K(0,3) fall on a same straight line. **OR** (b)Check if the full-back J(5,-3) and centre-back I(-4,6) are equidistant from forward C(0,1) and if C is the mid-point of IJ. (iii) If Defensive midfielder A(1, 4), Attacking midfielder B(2,-3) and Striker E(a,b) lie on the same straight line and B is equidistant from A and E, find the position of E.	