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NORTHWEST ACCREDITATION COMMISSION, USA
GRADE 10TH 2017-2018

Subject- MATHEMATICS　　　　　　Question Paper No. : [M][M][8][4]

Subject Code : ME1004　　　　　　Question Paper Code: [M][T][6][5]

Total Time: 03.00 Hours.	Total Marks: 100

GENERAL INSTRUCTIONS

4. INSTRUCTIONS ABOUT QUESTION PAPER

This Question Paper is divided into three Sections – A, B and C. All Sections are compulsory. Attempt all Sections as per instructions.

　a)　Section A question No. 1 to 8 are very short questions carrying 3 marks each.

　b)　Section B question No. 9 to 18 are short questions carrying 4 marks each.

　c)　Section C question No. 19 to 24 are long questions carrying 6 marks each.

THE ANSWER SHEET IS TO BE RETURNED ON COMPLETION OF THE TEST

SECTION A

Question 1. The points A(4, 7), B(p, 3) and C(7, 3) are the vertices of a right triangle, right-angled at B. Find the value of p.

Question 2. In Figure 4, a triangle ABC is drawn to circumscribe a circle of radius 3 cm, such that the segments BD and DC are respectively of lengths 6 cm and 9 cm. If the area of D ABC is 54 cm², then find the lengths of sides AB and AC.
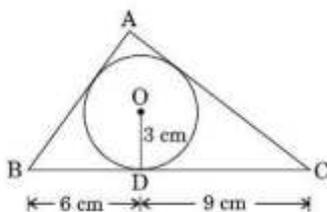
Figure 4

Question 3. For what value of p, the points (-5, 1), (1, p) and (4, -2) are collinear?

Question 4. Find all the zeroes of the polynomial 2x4 – 3x3 – 6x2 + 6x + 4 if it is given that two of its Zeroes are $-\sqrt{2}$ and$\sqrt{2}$.

Question 5. The 4th term of an A.P. is zero. Prove that the 25th term of the A.P. is three times its 11th term.

Question 6. Construct a circle whose radius is equal to 4cm. Let P be a point whose distance from its centre is 6cm. Construct two tangents to it from AP.

Question 7. If the point P(x, y) is equidistant from the points A(a + b, b – a) and B(a – b, a + b). Prove that bx = ay.

Question 8. Three different coins are tossed together. Find the probability of getting
(a) exactly two heads
(b) at least two heads.
(c) at least two tails

SECTION B

Total number of questions: 10	Marks allocated to each question: 4	Total marks: 40

Question 9. Represent the following system of linear equations graphically. Also find the co-ordinates of the vertices of the triangle formed by these lines and y-axis.

$$x + y = 3$$
$$3x - 2y = 4$$

Question 10. Two tangents TP and TQ are drawn to a circle with centre 'O' from an external point T Prove that Đ PTO = 2ĐOPQ

OR

In figure, AD⊥ BC and BD = $\frac{1}{3}$ CD. Prove that $2CA^2 = 2AB^2 + BC2$
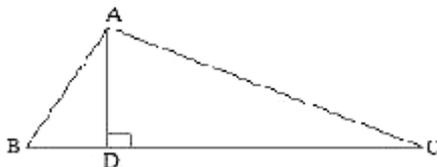
Question 11. Solve for x:

$$\frac{1}{(x-1)(x-2)} + \frac{1}{(x-2)(x-3)} = \frac{2}{3}, x \neq 1,2,3$$

OR

Solve for x:

$$\frac{1}{p+q+x} = \frac{1}{p} + \frac{1}{q} + \frac{1}{x}$$

Question 12. 504 cones, each of diameter 3.5 cm and height 3 cm, are melted and recast into a metallic sphere. Find the diameter of the sphere and hence find its surface area. (Use p= $\frac{22}{7}$)

Question 13. The angle of elevation of an aero plane from point A on the ground is 60°. After flight of 15 seconds, the angle of elevation changes to 30°. If the aero plane is flying at a constant height of $1500\sqrt{3}$ m, find the speed of the plane in km/hr.

Question 14. If A(4, 3), B(-1, y) and C(3, 4) are the vertices of a right triangle ABC, right-angled at A, then find the value of y.

Question 15. The sum of the 2nd and the 7th terms of an AP is 30. If its 15th term is 1 less than twice its 8th term, find the AP.

<p align="center">**OR**</p>

The 16th term of an AP is five times its third term. If its 10th term is 41, then find the sum of its first fifteen terms.

Question 16. All the vertices of a rhombus lie on a circle. Find the area of the rhombus, if the area of the circle is 1256 cm² . {Use = 3.14 }

Question 17. Find the values of k so that the area of the triangle with vertices (k+1, 1), (4, − 3) and (7, − k) is 6 sq. units.

Question 18. A man standing on the deck of a ship, which is 10 m above water level, observes the angle of elevation of the top of a hill as 60° and the angle of depression of the base of a hill as 30°. Find the distance of the hill from the ship and the height of the hill.

<p align="center">**OR**</p>

A hemispherical bowl of internal diameter 36 cm contains liquid. This liquid is filled into 72 cylindrical bottles of diameter 6 cm. Find the height of each bottle, if 10% liquid is wasted in this transfer.

SECTION C

Total number of questions: 6	Marks allocated to each question: 6	Total marks: 36

Question 19. A bus travels at a certain average speed for a distance of 75 km and then travels a distance of 90 km at an average speed of 10 km/h more than the first speed. If it takes 3 hours to complete the total journey, find its first speed?

<p align="center">**OR**</p>

In a school, students decided to plant trees in and around the school to reduce air pollution. It was decided that the number of trees, that each section of each class will plant, will be double of the class in which they are studying. If there are 1to 12 classes in the school and each class has two sections, find how many trees were planted by the students. Which value is shown in this question?

Question 20. The diagonal of a rectangular field is 16 metres more than the shorter side. If the longer side is 14 metres more than the shorter side, then find the lengths of the sides of the field.

OR

The sum of two numbers is 8. Determine the numbers if the sum of their reciprocal is $\frac{8}{15}$.

Question 21. The sum of first six terms of an AP is 42. The ratio of its 10th term to its 30th term is 1 : 3. Calculate the first and the thirteenth term of the AP.

OR

The sum of first five terms of an AP and the sum of the first seven terms of the same AP is 167. If the sum of first ten terms of this AP is 235, find the sum of its first twenty terms.

Question 22. Find the coordinates of the points which divide the line segment joining (-8, 0) and (0, 6) into four equal parts.

OR

ABC, an isosceles $\triangle$ in which AB = AC, is circumscribed about a circle. Show that BC is bisected at the point of contact.

Question 23. A motor boat whose speed is 18km/h in still water takes 1 hours more to go 24km upstream than to return downstream to the same spot. Find the speed of stream.

OR

A peacock in sitting on the top of a pillar which is 9m high. From a point 27m away from the bottom of the pillar, a snake is coming to its hole at the base of the pillar. Seeing the snake the peacock pounces on it. If their speeds are equal at what distance from the hole is the snake caught?

Question 24. A child's game has 8 triangles of which 3 are blue and rest are red and 10 squares of which 6 are blue and rest are red. One piece is lost at random. Find the probability that it is a:

(a) Triangle   (b) Square
(c) Square of blue colour   (d) Triangle of red colour

OR

A die is thrown once. Find the probability of getting:
  (a) A prime number
  (b) A number lying between 2 and 6.
  (c) An odd number.

END OF THE QUESTION PAPER