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NORTHWEST ACCREDITATION COMMISSION, USA HIGH SCHOOL DIPLOMA (Secondary/10Th) 2018-2019

Subject- MATHEMATICS

Question Paper No. :

M	M	8	4
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Subject Code : ME1004

Question Paper Code:

M	T	6	5
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Total Time: 03.00 Hours.

Total Marks: 100

GENERAL INSTRUCTIONS

1. OPENING AND CHECKING OF THE QUESTION-BOOKLET

Break open the seal of the Question-Booklet only when the announcement is made by the Invigilator. After breaking the seal and before attempting the questions, student should immediately check for:

- a) The number of the printed page in the Question-Booklet is the same as mentioned on the cover page of the Booklet and
- b) Any printing error in the Booklet pages, if any.
Any discrepancy or error should be brought to the notice of the Invigilator who will then replace the Booklet. No additional time will be given for this.

2. No student, without the permission of the Superintendent or the Invigilator concerned, is to leave his/ her seat or the Examination Room.

3. FILLING UP THE REQUIRED INFORMATION ON QUESTION-BOOKLET AND ANSWER SHEET

After breaking open the seal and checking the Booklet, student should:

- a) Fill up the **Question Paper No.** and **Question Paper Code** (mentioned on the cover of Question-Booklet) in the space provided on the First Answer Sheet.
- b) Fill up his/her Roll Number on the First Answer Sheet and on each Supplementary Answer Sheet, if taken.
- c) Student should mention the total number of **Supplementary Answer Sheet**, if taken, in the space provided on the First Answer Sheet and also fill up the Serial Number mentioned on each **Supplementary Answer Sheet** along with his/her Roll Number in the register maintained by the Invigilator. Student must tie all the Answer Sheets with the thread provided by the Invigilator.

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 contains 8 questions which are very short carrying 3 marks each in approximately 30-40 words.
- b) Section B contains 10 questions which are short carrying 4 marks each in approximately 80-100 words.
- c) Section C contains 6 questions which are long carrying 6 marks each in approximately 140-150 words.

5. Student found in possession of Cellular Phone / Mobile Phone / Pager or any other Communication Device and/or any Book/Note whether using or not, will be liable to be debarred for taking examination(s) either permanently or for specified period or/and dealt with as per law or/and ordinance of the School/SERI according to the nature of offence, or/and he/she may be proceeded against and shall be liable for prosecution under the relevant provision of the Statutory Law.

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

This Question Paper MUST be attached with Answer Sheet

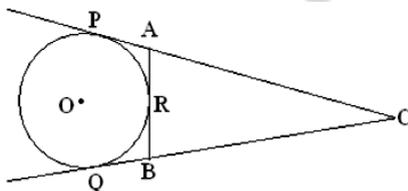
SECTION A

Total number of questions: 8

Marks allocated to each question: 3

Total marks: 24

- Question 1.** If the 10th term of an A.P. is 47 and its first term is 2. Find the sum of its first 15 terms.
- Question 2.** Solve: $p^2x^2 - q^2 = 0$
- Question 3.** An underground water tank is in the form of a cuboids of edges 48 m, 36 m and 28 m. Find the volume of the tank.
- Question 4.** A die is thrown once. What is the probability of getting a prime number?
- Question 5.** Find the value of a so that the point (3, a) lies on the line represented by $2 - 3y = 5$.
- Question 6.** In Fig, CP and CQ are tangents to a circle with centre O. ARB is another tangent touching the circle at R. If CP = 11cm, and BC = 7cm, then find the length of BR.



- Question 7.** If α, β are the zeroes of a polynomial, such that $\alpha + \beta = 6$ and $\alpha\beta = 4$, then write the polynomial.
- Question 8.** ABC is a isosceles triangle, in which AB = AC, circumscribed about a circle. Show that BC is bisected at the point of contact.

SECTION B

Total number of questions: 10

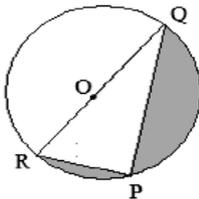
Marks allocated to each question: 4

Total marks: 40

- Question 9.** Two dice are rolled once. Find the probability of getting such numbers of the two dice, whose product is 12.

- Question 10.** Evaluate $\frac{\cos 70^\circ}{\sin 20^\circ} + \frac{\cos 55^\circ \cos 635^\circ}{\tan 5^\circ \tan 25^\circ \tan 45^\circ \tan 65^\circ \tan 85^\circ}$

Question 11. Find the area of the shaded region in figure. if $PQ = 24\text{cm}$, $PR = 7\text{cm}$ and O is the centre of the circle.



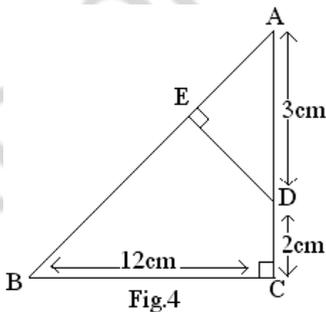
Question 12. Prove that the parallelogram circumscribing a circle is a rhombus.

Question 13. Find HCF and LCM of 336 and 54 by prime factorization and verify that $\text{HCF} \times \text{LCM} = \text{product of the two numbers}$.

Question 14. 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.

$$\begin{aligned} x + y &= 3 \\ 3x - 2y &= 4 \end{aligned}$$

Question 15. In Figure $\triangle DABC$ is right angled at C and $DE \perp AB$. Prove that and hence find the length of AE and DE .



Question 16. Find the sum of all three digit numbers which are divisible by 7.

Question 17. Find the value of $\text{cosec } 30^\circ$ geometrically.

Question 18. The incircle of an isosceles triangle ABC , in which $AB=AC$, touches side BC , CA and AB at D , E and F respectively. Prove that $BD = CD$

SECTION C

Total number of questions: 6

Marks allocated to each question: 6

Total marks: 36

- Question 19.** Due to sudden floods, some welfare associations jointly requested the government to get 100 tents fixed immediately and offered to contribute 50% of the cost. If the lower part of each tent is of the form of a cylinder of diameter 4.2 m and height 4 m with the conical upper part of same diameter but height 2.8 m, and the canvas to be used costs Rs. 100 per sq. m, find the amount, the associations will have to pay. What values are shown by these associations?

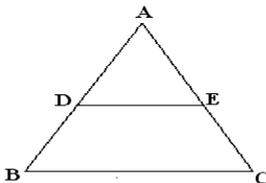
$$\left[\text{Use } \pi = \frac{22}{7} \right]$$

OR

The sum of the squares of two consecutive odd numbers is 394. Find the numbers.

- Question 20.** 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 two sides are divided in the same ratio. Using the above result, do the following:

In Fig. DE || BC and BD = CE. Prove that $\triangle ABC$ is an isosceles triangle.



OR

An arithmetic progression 5, 12, 19, ... has 50 terms. Find its last term. Hence find the sum of its last 15 terms.

- Question 21.** A card is drawn at random from a well-shuffled deck of playing cards. Find the probability that the card drawn is
- a card of spade or an ace.
 - a black king.
 - neither a jack nor a king.
 - either a king or a queen.

OR

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:

- triangle
- square
- square of blue of colour
- triangle of red colour

Question 22. The following table gives the daily income of 50 workers of a factory:

Daily income (in Rs.)	100-120	120-140	140-160	160-180	180-200
Number of workers	12	14	8	6	10

Find the Mean, Mode and Median of the above data.

OR

The mean of the following frequency table is 53. But the frequencies f_1 and f_2 in the classes 20 40 and 60 80 are missing. Find the missing frequencies

Age (In Year)	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100	Total
Number Of People	15	F_1	21	F_2	17	100

Question 23. Prove that $\frac{1}{\operatorname{cosec} \theta - \cot \theta} - \frac{1}{\sin \theta} = \frac{1}{\sin \theta} - \frac{1}{\operatorname{cosec} \theta + \cot \theta}$

OR

Evaluate without using Trigonometric tables:

$$\frac{\cos 220^\circ + \cos^2 70^\circ}{\sec^2 50^\circ - \cot^2 40^\circ} + 2 \operatorname{cosec}^2 58^\circ - 2 \cot 58^\circ \tan 32^\circ - 4 \tan 13^\circ \tan 37^\circ \tan 45^\circ \tan 53^\circ \tan 77^\circ$$

Question 24. D and E are points on the sides CA and CB respectively of $\triangle ABC$ right angled at C. prove That $AE^2 + BD^2 = AB^2 + DE^2$.

OR

Solve for x: $(x-3)/(x-4) + (x-5)/(x-6) = 10/3$

END OF THE QUESTION PAPER