Telangana Board

2024 Question Papers







This Question Paper contains 4 Printed Pages

15E/16E(A)

MATHEMATICS

(English Version)

Parts A and B

Time : 3 hours] ***[Maximum Marks : 60***

Instructions :

1. Answer **all** the questions under **Part-A** on a separate answer book.
2. Write the answers to the questions under **Part-B** on the Question Paper itself and attach to the answer book of **Part-A**.

Part-A

Time : 2 hours 30 minutes] **[Marks : 60**

SECTION - I

$6 \times 2 = 12$

Note : 1. Answer **ALL** the following questions

2. Each question carries **2** marks.

1. Find the centroid of the triangle whose vertices are (2, 3), (−4, 7) and (2, −4).

2. Find the probability of getting a 'vowel' if a letter is chosen randomly from the word "INNOVATION"

3. Express 'tan θ' in terms of 'sin θ'.

4. "An observer standing at a distance of 10m from the foot of a tower, observes its top with an angle of elevation of 60°". Draw a suitable diagram for this situation.

5. The sides of a triangle measure $2\sqrt{2}$, 4 and $2\sqrt{6}$ units. Is it a right-angled triangle? Justify.

6. Solve the quadratic equation

$2\sin^2\theta - 3\sin\theta + 1 = 0$, where $0° \leq \theta \leq 90°$

SECTION - II

$6 \times 4 = 24$

Note : 1. Answer **ALL** the following questions.

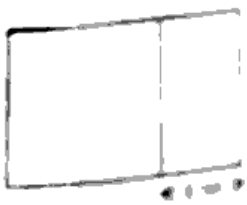
2. Each question carries 4 marks.

7. Write the formula for Median of a grouped data and explain each term of it.

8. If $x^2 + y^2 = 10xy$, then prove that

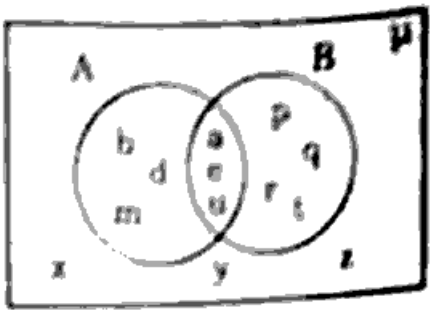
$2\log(x+y) = \log x + \log y + 2\log 2 + \log 3$

9. A strip of width 4 cm is attached to one side of a square to form a rectangle. The area of the rectangle formed is 77 cm^2, then find the length of the side of the square.



10. From the given Venn diagram show that

$n(A \cup B) = n(A) + n(B) - n(A \cap B)$.



11. A box contains four slips numbered 1, 2, 3, 4 and another box contains five slips numbered 5, 6, 7, 8, 9. If one slip is taken randomly from each box,

(i) How many number pairs are possible ?

(ii) What is the probability of both being odd ?

(iii) What is the probability of getting the sum of the numbers 10 ?

12. Which term of the A.P. 21, 16, 11, ... is -81 ? Also find the term which becomes zero.

SECTION - III

$4 \times 6 = 24$

Note : 1. Answer any **4 questions** from the given **six** questions

2. Each question carries **6** marks

13. Draw the graph of the quadratic polynomial $p(x) = x^2 - 4x + 3$ and find the zeroes of the polynomial from the graph.

14. In an acute angled triangle ABC, if $\sin(A + B - C) = \frac{1}{2}$ and $\cos(B + C - A) = \frac{1}{2}$, then find $\angle A$, $\angle B$ and $\angle C$.

15. Find the mode for the following data.

Class interval	1000 - 1500	1500 - 2000	2000 - 2500	2500 - 3000	3000 - 3500	3500 - 4000	4000 - 4500	4500 - 5000
Frequency	24	40	33	28	30	22	16	7

16. If A(−2, 2), B(a, 6), C(4, b) and D(2, −2) are the vertices of a parallelogram ABCD, then find the values of a and b. Also find the lengths of its sides.

17. Construct triangle ABC with BC = 7 cm, $\angle B = 45°$ and $\angle C = 60°$. Then construct another triangle similar to Δ ABC, whose sides are $\frac{3}{5}$ times of the corresponding sides of Δ ABC.

18. Prove that $2\sqrt{3} - \sqrt{5}$ is an irrational number.

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