This Question Paper contains 4 Printed Pages.

MATHEMATICS, Paper - II
(English version)
Parts A and B

Time : 2½ Hours]   *[Maximum Marks : 50*

Instructions :

1   *Answer 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 it to the answer book of **Part-A***

$$\boxed{\text{Part - A}}$$

Time : 2 Hours   **Marks : 35**

<u>**SECTION - I**</u>   *(Marks : 5×2=10)*
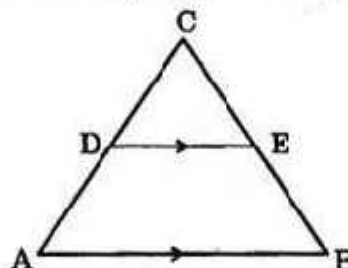
NOTE :

1.   *Answer **ANY FIVE** questions, choosing atleast **TWO** from each of the following **Groups**, i.e., **A** and **B** .*

2.   *Each question carries 2 marks.*

GROUP - A
(Similar triangles, Tangents and Secants to the circle, Mensuration)

1.   What value of 'x' will make DE ∥ AB in the given figure ?

$AD = 8x + 9, \quad CD = x + 3, \quad BE = 3x + 4, \quad CE = x$

2.   Find the length of a tangent drawn from a point, which is 15 cm away from centre of circle having 9 cm as radius.

3. Find the volume of right circular cone with radius 6 cm and height 7 cm.

4. Find the volume of a sphere of radius 2.1 cm $\left(\text{use } \pi = \dfrac{22}{7} \right)$.

GROUP - B

(Trigonometry, Applications of Trigonometry, Probability and Statistics)

5. If $\cos A = \dfrac{12}{13}$, then find $\sin A$ and $\tan A$.

6. A boy observed the top of an electric pole at an angle of elevation of 60°, when the observation point is 8 metres away from the foot of the pole. Find the height of the pole.

7. A bag contains 5 red and 8 white balls. If a ball is drawn at random from the bag, what is the probability that it will be ......

   (i) white ball, *(ii)* not a white ball?

8. Write the formula of median for a grouped data. Explain the terms in words.

SECTION - II   *(Marks 4×1=4)*

NOTE :

   1. *Answer ANY FOUR of the following Six questions.*
   2. *Each question carries 1 mark.*

9. What are the similar triangles ?

10. Find the volume of hemisphere of radius 3.5 cm.

11. Find the probability of getting a head when a coin is tossed once. Also find the probability of getting a tail.

12. Find the mode of 5, 6, 9, 6, 12, 3, 6, 11, 6, 7.

13. If $\tan A = \dfrac{3}{4}$, then find $\sin A$.

14. Find the mean of first 'n' natural numbers.

NOTE:

1. *Answer **ANY FOUR** of the following questions, choosing atleast **TWO** from each group, i.e., **A** and **B**.*

2. *Each question carries 4 marks.*

GROUP - A
(Similar triangles, Secants and Tangents to a Circle and Mensuration)

15   State and prove the Pythagoras theorem.

16.   Prove that the parallelogram circumscribing a circle is a rhombus.

17.   A chord of a circle of radius 10 cm subtends a right angle at the centre. Find the area of the corresponding *(i)* Minor segment, *(ii)* Major segment. (use $\pi = 3.14$)

18.   A heap of rice is in the form of a cone of diameter 12 m. and height 8 m. Find its volume. How much canvas cloth is required to cover the heap ? (use $\pi = 3.14$)

GROUP - B
(Trigonometry, Applications of Trigonometry, Probability and Statistics)

19.   If $\csc \theta + \cot \theta = k$, then show that $\cos \theta = \dfrac{k^2 - 1}{k^2 + 1}$.

20.   Two men on either side of a temple of 30 m height observe its top at the angles of elevation 30° and 60° respectively. Find the distance between the two men.

21.   One card is drawn from well shuffled deck of 52 cards. Find the probability of getting .....
   (i) a king of red colour,   *(ii)* a face card,   *(iii)* the jack of hearts,
   (iv) a red face card,   *(v)* a spade,   *(vi)* the queen of diamond.

22. The distribution below gives the weights of 30 students of a class. Find the median weight of the students.

Weight (in kgs)	40-45	45-50	50-55	55-60	60-65	65-70	70-75
Number of students	2	3	8	6	6	3	2

SECTION - IV *(Marks 1×5=5)*

NOTE .

1. *Answer **ANY ONE** of the following questions.*

2. *The question carries **5** marks.*

23. / Construct a triangle of sides 4 cm, 5 cm and 6 cm, then construct a triangle similar to it, whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.

24. A tree breaks due to storm and the broken part bends so that the top of the tree touches the ground by making 30° angle with the ground. The distance between the foot of the tree and the top of the tree on the ground is 6 m. Find the height of the tree before falling down.