

This Question Paper contains 4 Printed Pages.

**16E(A)**

**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**.

**Part - A**

Time : 2 Hours

Marks : 35

**SECTION - I**

(Marks : 5×2=10)

**NOTE :**

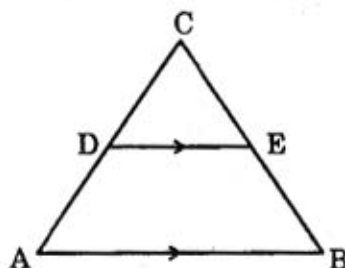
1. Answer **ANY FIVE** questions, choosing atleast **TWO** from each of the following **Groups**, i.e., **A** and **B**.
2. Each question carries 2 marks.

**GROUP - A**

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

1. What value of 'x' will make  $DE \parallel AB$  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.

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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 (use  $\pi = \frac{22}{7}$ ).

### GROUP - B

*(Trigonometry, Applications of Trigonometry, Probability and Statistics)*

5. If  $\cos A = \frac{12}{13}$ , then find  $\sin A$  and  $\tan A$ .
6. A boy observed the top of an electric pole at an angle of elevation of  $60^\circ$ , 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  $\tan A = \frac{3}{4}$ , then find  $\sin A$ .
14. Find the mean of first 'n' natural numbers.

**SECTION - III**

(Marks 4×4=16)

**NOTE :**

1. Answer **ANY FOUR** of the following questions, choosing at least **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  $\operatorname{cosec} \theta + \cot \theta = k$ , then show that  $\cos \theta = \frac{k^2 - 1}{k^2 + 1}$ .
20. Two men on either side of a temple of 30 m height observe its top at the angles of elevation  $30^\circ$  and  $60^\circ$  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.

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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  $30^\circ$  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.

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