

This Question Paper contains 4 Printed Pages.

**16E(A)**

**MATHEMATICS, Paper - II**

*(English version)*

**Parts A and B**

**Time : 2 hrs. 45 min.]**

**[Maximum Marks : 40**

**Instructions :**

1. Read the whole question paper and understand every question thoroughly without writing anything and 15 minutes of time is allotted for this.
  2. Answer the questions under **Part - A** on a separate answer book.
  3. Write the answers to the questions under **Part-B** on the question paper itself and attach it to the answer book of **Part- A**.
  4. Answer **all** the questions from the given Three sections I, II and III of **Part-A**.
  5. In section III, every question has internal choice. Answer any **one** alternative.
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**Part - A**

**Time : 2 hours**

**Marks : 35**

**SECTION - I**

*(Marks : 7×1=7)*

**NOTE :**

- (i) Answer **all** the questions.
  - (ii) Each question carries **1** mark.
1. Prathyusha stated that “the average of first 10 odd numbers is also 10”. Do you agree with her ? Justify your answer.
  2. Write the formula to find the median of a grouped data and explain the alphabet in it.
  3. The length of the tangent to a circle from a point 17 cm from its centre is 8 cm. Find the radius of the circle.

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**[1]**

4. Find the value of  $\tan 2A$ , if  $\cos 3A = \sin 45^\circ$ .
5. Srivani walks 12 m due East and turns left and walks another 5 m, how far is she from the place she started?
6. A pole and its shadow have same length, find the angle of the sun ray made with the earth at that time.
7. What is the probability of getting exactly two heads, when three coins tossed simultaneously?

**SECTION - II**

(Marks :  $6 \times 2 = 12$ )

**NOTE :**

- (i) Answer **all** the questions.
- (ii) Each question carries **2** marks.

8. Find measure of the angles A and B, if  $\cos (A - B) = \frac{\sqrt{3}}{2}$  and  $\sin (A + B) = \frac{\sqrt{3}}{2}$ .
9. What is the probability of a number picked from first twenty natural numbers is even composite number?
10. From the top of a tower of  $h$  m height, Anusha observes the angles of depression of two points X and Y on the same side of tower on the ground to be  $\alpha$  and  $\beta$ . Draw the suitable figure for the given information.
11. Find the median of  $\frac{2}{3}, \frac{4}{5}, \frac{1}{2}, \frac{3}{4}, \frac{6}{5}$ .
12. The height and the base radius of a Cone and a Cylinder are equal to the radius of a Sphere. Find the ratio of their volumes.
13. In  $\triangle ABC$ ,  $\overline{PQ} \parallel \overline{BC}$  and  $AP = 3x - 19$ ,  $PB = x - 5$ ,  $AQ = x - 3$ ,  $QC = 3$  cm. Find  $x$ .

**SECTION - III**

(Marks : 4×4=16)

**NOTE :**

- (i) Answer **all** the questions.
- (ii) In this section, every question has internal choice to answer.
- (iii) Each question carries 4 marks.

14. How many silver coins of diameter 5 cm and thickness 4 mm have to be melted to prepare a cuboid of 12 cm × 11 cm × 5 cm dimension ?

**OR**

Incomes of the families in a locality are given. Find the mode of the data.

Income (in ₹)	1-200	201-400	401-600	601-800	801-1000
Number of families	7	10	16	12	3

15. Prove that :

$$\frac{\cos A}{1 - \tan A} + \frac{\sin A}{1 - \cot A} = \sin A + \cos A.$$

**OR**

Show that :

$$(\sec \theta - \tan \theta)^2 = \frac{1 - \sin \theta}{1 + \sin \theta}.$$

16. From the top of a tower of 50 m high, Neha observes the angles of depression of the top and foot of another building to be 45° and 60° respectively. Find the height of the building.

**OR**

From the deck of 52 cards, if a card is randomly chosen, find the probability of getting a card with (i) a prime number on it, (ii) face on it.

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**[3]**

17. Construct an equilateral triangle XYZ of side 5 cm and construct another triangle similar to  $\triangle XYZ$ , such that each of its sides is  $\frac{4}{5}$  of the sides of  $\triangle XYZ$ .

**OR**

Heights of the pupils of a particular school are given. Draw greater than cumulative curve and find the median height from it.

Height (in cm)	90-100	100-110	110-120	120-130	130-140	140-150
Number of pupils	5	2	3	8	8	6