

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.

**Part - A**

Time : 2 hours

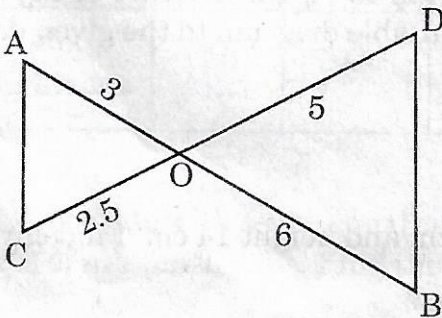
Marks : 35

**SECTION - I**

(Marks :  $7 \times 1 = 7$ )

- NOTE :** (i) Answer **all** the questions  
(ii) Each question carries 1 mark.

1. Evaluate  $\operatorname{cosec} 39^\circ \cdot \sec 51^\circ - \tan 51^\circ \cdot \cot 39^\circ$ .
2. Write the similarity criterion by which the given pair of triangles are similar.



16E(A)

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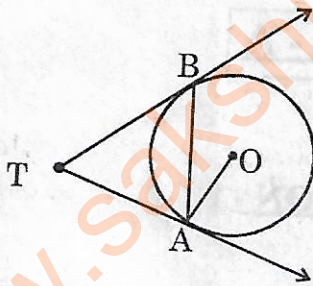
3. From English alphabet if a letter is chosen at random, then find the probability that the letter is a consonant.
4. In a right triangle ABC, right angled at 'C' in which  $AB = 13$  cm,  $BC = 5$  cm, determine the value of  $\cos^2 B + \sin^2 A$ .
5. A point P is 25 cm from the centre O of the circle. The length of the tangent drawn from P to the circle is 24 cm. Find the radius of the circle.
6. Find the the median of first seven composite numbers.
7. In a hemispherical bowl of 2.1 cm radius ice-cream is there. Find the volume of the bowl.

### SECTION - II

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

**NOTE :** (i) Answer **all** the following questions.  
 (ii) Each question carries 2 marks.

8. Write the mode formula for grouped data and explain the terms in it.
9. In the given figure, TA and TB are tangents to the circle with centre 'O'. If  $\angle ATB = 80^\circ$ , then find the measure of  $\angle ABT$ .



10. A bag contains balls which are numbered from 1 to 50. A ball is drawn at random from the bag, the probability that it bears a two digit number multiple of 7.
11. From the top of the building the angle of elevation of the top of the cell tower is  $60^\circ$  and the angle of depression to its foot is  $45^\circ$ , if the distance of the building from the tower is 30 meters, draw the suitable diagram to the given data.
12. Find the value of 
$$\frac{\tan^2 60^\circ + \cot^2 30^\circ}{\sin^2 30^\circ + \cos^2 60^\circ}$$
13. A right circular cylinder has radius 3.5 cm and height 14 cm. Find curved surface area.

**NOTE :** (i) Answer **all** the following questions.

(ii) In this section, every question has internal choice to answer.

(iii) Each question carries 4 marks.

14. Construct a triangle PQR, in which PQ = 4 cm, QR = 6 cm and  $\angle PQR = 70^\circ$ .

Construct triangle such that each side of the new triangle is  $\frac{3}{4}$  of the triangle PQR.

**OR**

Draw less than Ogive for the following frequency distribution. Find the median from obtained curve.

IQ	60-70	70-80	80-90	90-100	100-110	110-120	120-130
No. of students	2	5	12	31	39	10	4

15. Show that  $\frac{\cos \theta}{1 - \sin \theta} + \frac{1 - \sin \theta}{\cos \theta} = 2 \sec \theta$ .

**OR**

In a right angle triangle, the hypotenuse is 10 cm more than the shortest side. If third side is 6 cm less than the hypotenuse, find the sides of the right angle triangle.

16. Find the mean age of 100 residents of a colony from the following data.

Age (in years)	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of Persons	10	15	25	25	10	10	5

**OR**

A toy is made with seven equal cubes of sides  $\sqrt{7}$  cm. Six cubes are joined to six faces of a seventh cube. Find the total surface area of the toy.

17. If two dice are thrown at the same time, find the probability of getting sum of the dots on top is prime.

OR

The angle of elevation of the top of a hill from the foot of a tower is  $60^\circ$  and the angle of elevation of the top of the tower from the foot of the hill is  $30^\circ$ . If the tower is 50 m high. Find the height of the hill.

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