

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

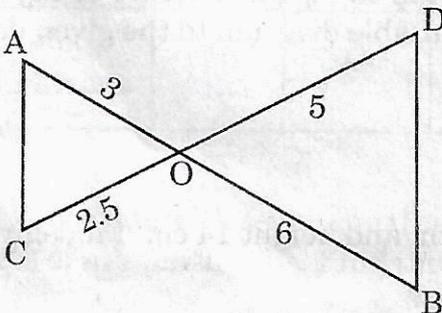
Marks : 35

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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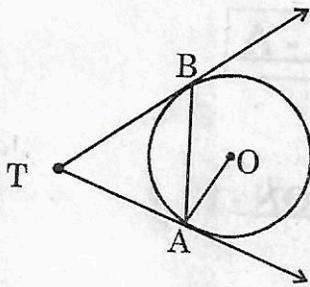
3. From English alphabet if a letter is chosen at random, then find the probability that the letter is a consonant.
4. In a right triangle ABC, right angled at 'C' in which $AB = 13$ cm, $BC = 5$ cm, determine the value of $\cos^2 B + \sin^2 A$.
5. A point P is 25 cm from the centre O of the circle. 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° and the angle of depression to its foot is 45° , 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.

