

This Question Paper contains 4 Printed Pages.

New Syllabus

16E(A)

MATHEMATICS, Paper - II

(English version)

Parts A and B

Time : 2 hrs. 45 min.]

[Maximum Marks : 40

Instructions :

1. In the time duration of 2 hours 45 minutes, 15 minutes of time is allotted to read and understand the Question paper.
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**.

Part - A

Time : 2.15 Hours

Marks : 35

Note :

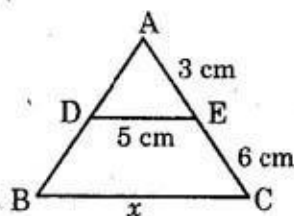
1. Answer **all** the questions from the given **three** sections I, II and III of **Part-A**.
2. In section - III, every question has internal choice. Answer **any one** alternative.

SECTION - I

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

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

- Q1 In the given figure, $\triangle ABC \sim \triangle ADE$, then find the value of 'x'.



11. Find the probability of getting a sum of the numbers on them is 7, when two dice are rolled at a time.
12. If $\tan \theta = \sqrt{3}$ (where θ is acute), then find the value of $1 + \cos \theta$.
13. "A conical solid block is exactly fitted inside the cubical box of side ' a ', then the volume of conical solid block is $\frac{4}{3} \pi a^3$." Is this statement true? Justify your answer.
14. If the surface area of a hemisphere is ' S ', then express ' r ' in terms of ' S '.
15. Write the formula to find the median for grouped data and explain each term.
16. "If the angle of elevation of Sun increases from 0° to 90° , then the length of shadow of a tower decreases." Is this statement true? Justify your answer.

SECTION - II

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

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

17. Prove that $\sqrt{\frac{1 - \sin \theta}{1 + \sin \theta}} = \sec \theta - \tan \theta$, (where θ is acute).
18. ABC is an isosceles triangle and $\angle B = 90^\circ$, then show that $AC^2 = 2AB^2$.
19. Find the volume and surface area of a sphere of radius 42 cm $\left(\pi = \frac{22}{7}\right)$.
20. If $\tan(A+B) = 1$, and $\cos(A-B) = \frac{\sqrt{3}}{2}$, $0^\circ < A+B < 90^\circ$ and $A > B$;
 find A and B.
21. A solid metallic ball of volume 64 cm^3 melted and made into a solid cube.
 Find the side of the solid cube.

13. A boat has to cross a river. It crosses the river by making an angle of 60° with the bank of the river due to the stream of the river and travels a distance of 450 m to reach the another side of the river. Draw the diagram for this data.

SECTION - III

(Marks : $4 \times 4 = 16$)

NOTE :

1. Answer *all* the following questions.
 2. In this section, every question has internal choice to answer.
 3. Each question carries 4 marks.
14. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of red ball, find the number of blue balls in the bag.

OR

Evaluate
$$\frac{\tan^2 60^\circ + 4 \cos^2 45^\circ + 3 \sec^2 30^\circ + 5 \cos^2 90^\circ}{\operatorname{cosec} 30^\circ + \sec 60^\circ - \cot^2 30^\circ}$$

15. Consider the following distribution of daily wages of 50 workers of a factory.

Daily wages in Rupees	200-250	250-300	300-350	350-400	400-450
Number of Workers	6	8	14	10	12

Find the mean daily wages of the workers in the factory by using step-deviation method.

OR

Draw a circle of radius 5 cm. From a point 8 cm away from its centre, construct a pair of tangents to the circle. Find the lengths of tangents.

- Q16. The following table gives production yield per hectare of Wheat of 100 farms of a village.

Production yield (Quintal/Hec.)	50-55	55-60	60-65	65-70	70-75	75-80
Number of farmers	2	24	16	8	38	12

Draw both Ogives for the above data. Hence obtain the median production yield.

OR

Construct a triangle of sides 5 cm, 6 cm and 7 cm, then construct a triangle similar to it, whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.

- Q17. DWACRA is supplied cuboidal shaped wax block with measurements $88 \text{ cm} \times 42 \text{ cm} \times 35 \text{ cm}$. From this how many number of cylindrical candles of 2.8 cm diameter and 8 cm of height can be prepared ?

OR

Two poles of equal heights are standing opposite to each other, on either side of the road, which is 80 m wide. From a point between them on the road, the angles of elevation of top of the poles are 60° and 30° respectively. Find the height of the poles.
