

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 :

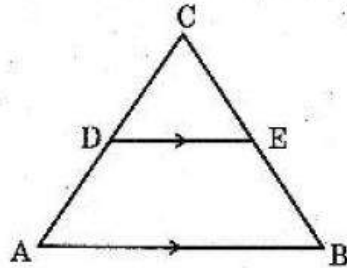
1. Answer **ANY FIVE** questions, choosing atleast **TWO** from each of the following **Groups**, i.e., **A** and **B**.
2. Each question carries **2** marks.

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 ?

$AD = 8x + 9$, $CD = x + 3$, $BE = 3x + 4$, $CE = x$



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.

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° , 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° and 60° 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.
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° 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.

16E(B)

MATHEMATICS, Paper - II

(English version)

Parts A and B

Time : 2½ Hours]

[Maximum Marks : 50

Instruction : 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 - B

Time : 30 minutes

Marks : 15

NOTE :

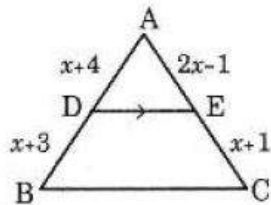
1. Answer **all** the questions.
2. Each question carries $\frac{1}{2}$ mark.
3. Answers are to be written in the question paper only.
4. Marks will **not** be awarded in case of any over-writing, rewriting or erased answers.

I. Write the **CAPITAL LETTER** showing the correct answer for the following questions in the brackets provided against them.

$10 \times \frac{1}{2} = 5$

1. In the figure, $DE \parallel BC$. Find the value of 'x'.

[]



- (A) $\sqrt{5}$
(C) $\sqrt{3}$

- (B) $\sqrt{6}$
(D) $\sqrt{7}$

2. Volume of the cone =

[]

(A) $\pi r h$

(B) $\pi r l$

(C) $\pi r (r + l)$

(D) $\frac{1}{3} \pi r^2 h$

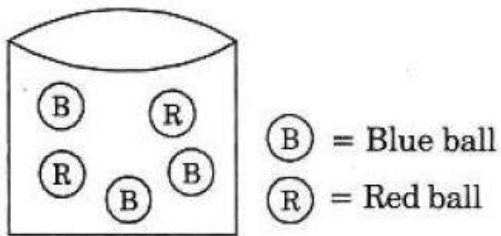
3. If the Arithmetic mean of 8, 6, 4, x , 3, 6, 0 is 4;
then the value of $x = \dots\dots$ []
(A) 7 (B) 6
(C) 1 (D) 4
4. Probability of getting a prime (or) composite []
(A) Mutually exclusive. (B) Likely
(C) 0 (D) None
5. Length of the class 11 – 20 is []
(A) 9 (B) 10
(C) 11 (D) 20
6. The ratio of volumes of two spheres is 8 : 27,
then the ratio of surface areas []
(A) 2 : 3 (B) 4 : 27
(C) 8 : 9 (D) 4 : 9
7. In $\triangle ABC$, $\angle B = 90^\circ$, $\sin C = \frac{3}{5}$, then $\cos A = \dots\dots$ []
(A) $\frac{3}{5}$ (B) $\frac{4}{5}$
(C) $\frac{5}{4}$ (D) $\frac{5}{3}$

12. Football is an example of (Geometrical shape).

13. A.M. of $a - 2$, a , $a + 2$ is

14. $P(E) + P(\text{Not } E) = \dots\dots\dots$

15. From the figure, the probability to get Blue colour ball is



16. In ΔABC , $AC^2 = AB^2 + BC^2$, then right angle is at

17. Base area of circular cylinder is 154 cm^2 .
Then its radius is

18. Curved surface area of a hemisphere with radius ' r ' is

19. A.M. of 1, 2, x , 3 is 0, then $x = \dots\dots\dots$

20. $\sin (60^\circ + 30^\circ) = \dots\dots\dots$

III. Find the correct answer for the questions given under **Group-A** selecting them from **Group-B** and write the indicating letter in the brackets provided against each question.

$$10 \times \frac{1}{2} = 5$$

(i) **Group - A**

Group - B

21. Number of chords of a circle is []

(A) 5.1

22. In a circle $d = 10.2$ cm,
then $r = \dots\dots$ cm. []

(B) $\frac{\sqrt{3}a}{2}$

(C) Infinite

23. Perimeter of a semi-circle,
whose radius is ' r ' = []

(D) 90°

24. The height of an equilateral
triangle, whose side is
' a ' units = []

(E) $\sqrt{\frac{3a}{2}}$

(F) 45°

25. If $\triangle ABC \sim \triangle XYZ$; $\angle C = 60^\circ$,
 $\angle B = 75^\circ$, then $\angle X = \dots\dots$ []

(G) $\frac{36}{7}r$

(H) 0

(ii) **Group - A**

26. If $\sec \theta + \tan \theta = \frac{1}{2}$, []
then $\sec \theta - \tan \theta = \dots\dots\dots$

27. $\cos (90 - \theta) = \dots\dots\dots$ []

28. If $P(E) = 0.65$, then $P(\bar{E}) = \dots\dots$ []

29. If $\sin \theta = \cos \theta$, then $\theta = \dots\dots$ []

30. Sum of 15 observations is 420, []
then A.M. = $\dots\dots\dots$

Group - B

(I) $\sin \theta$

(J) 0.35

(K) 28

(L) 30°

(M) 0

(N) 2

(O) $\cos \theta$

(P) 45°

