This Question Paper contains 4 Printed Pages.

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 :

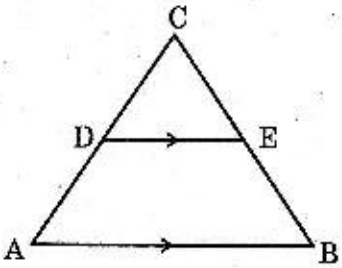
1. *Answer **ANY FIVE** questions, choosing atleast **TWO** from each of the following **Groups**, i.e., **A** and **B**.*
2. *Each question carries 2 marks.*

GROUP - A

(Similar triangles, Tangents and Secants to the circle, Mensuration)

1. What value of 'x' will make DE || 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 $\left(\text{use } \pi = \frac{22}{7}\right)$.

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 atleast **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 $\cos\theta = \dfrac{k^2 - 1}{k^2 + 1}$.

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.

This Question Paper contains 4 Printed Pages.

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

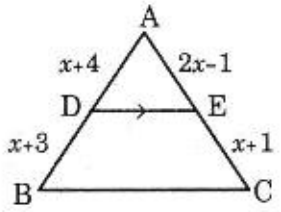
Time : 30 minutes ***Marks : 15***

NOTE :

1. *Answer* ***all*** *the questions.*
2. *Each question carries ½ 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.* $10 \times ½ = 5$

1. In the figure, DE || BC. Find the value of 'x'. [ ]



(A) $\sqrt{5}$ (B) $\sqrt{6}$

(C) $\sqrt{3}$ (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 = ... [ ]

(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 ΔABC, $\angle B = 90°$, $\sin C = \frac{3}{5}$, then $\cos A$ = ... [ ]

(A) $\frac{3}{5}$ (B) $\frac{4}{5}$

(C) $\frac{5}{4}$ (D) $\frac{5}{3}$

8. If a coin is tossed, then the probability that a head turns up is ..... [ ]

(A) $\frac{1}{2}$ (B) $\frac{1}{4}$

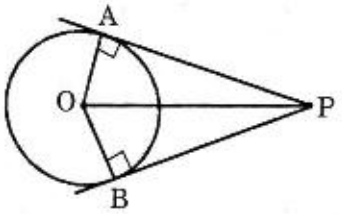
(C) $\frac{1}{3}$ (D) $\frac{1}{6}$

9. If $x = \sin\theta$, $y = \cos\theta$, then which of the following is true? [ ]

(A) $x^2 + y^2 = 1$ (B) $x^2 - y^2 = 1$

(C) $\frac{x}{y} = 1$ (D) $xy = 1$

10. In the figure, if $\angle APB = 60°$ and OP = 10 cm, then PA = ... cm. [ ]



(A) 5 (B) $5\sqrt{2}$

(C) $5\sqrt{3}$ (D) 20

II. *Fill in the blanks with suitable answers.* $10 \times ½ = 5$

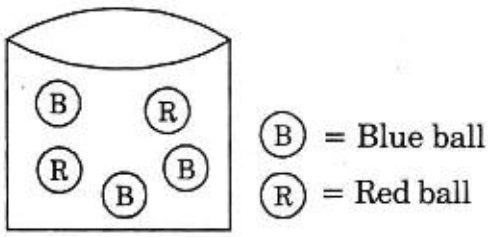
11. Sum of the central angles in a circle is .....

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

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

14. P(E) + P(Not E) = ...

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 = ...

20. sin (60° + 30°) = ...

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 ..... [ ]

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

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

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

25. If $\Delta ABC \sim \Delta XYZ$; $\angle C = 60°$, $\angle B = 75°$, then $\angle X$ = ... [ ]

(A) 5.1

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

(C) Infinite

(D) 90°

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

(F) 45°

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

(H) 0

(ii) **Group - A** | **Group - B**

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

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

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

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

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

(I) $\sin\theta$

(J) 0.35

(K) 28

(L) 30°

(M) 0

(N) 2

(O) $\cos\theta$

(P) 45°