

This Question Paper contains 4 Printed Pages.

**16E(A)**

**MATHEMATICS, Paper - II**

*(English version)*

**(Parts A and B)**

**Time : 2 hrs. 45 min.]**

**[Maximum Marks : 40**

**Instructions :**

1. 15 minutes of time is allotted exclusively for reading the Question Paper and 2.30 hours for writing the answers.
  2. **Part - A** answers should be written in separate answer book.
  3. There are three sections in **Part-A**.
  4. Answer **all** questions.
  5. Every answer should be written visibly and clearly.
  6. There is internal choice in section - III.
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**Part - A**

**Time : 2 Hours**

**Marks : 30**

**SECTION - I**

**(Marks : 4×1=4)**

**Note :**

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

1. If  $A(4,0)$ ,  $B(0,y)$  and  $AB = 5$ , find the possible values of  $y$ .
2. A boy observed the top of an electric pole at an angle of elevation of  $30^\circ$ , when the observation point is 10 meters away from the foot of the pole. Draw suitable diagram for the above situation.

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**[1]**

**V**

3. Find the value of  $\tan^2 45^\circ + \cot^2 30^\circ$ .
4. If  $P(E) = 0.546$ , what is the probability of 'not E'?

**SECTION - II**

(Marks :  $5 \times 2 = 10$ )

**Note :**

- (i) Answer **all** questions.
- (ii) Each question carries **2** marks.
5. Find the centroid of ~~the~~ triangle, whose vertices are  $(-4, 4)$ ,  $(-2, 2)$  and  $(6, -6)$ .
6.  $\triangle ABC \sim \triangle DEF$  and their areas are  $64 \text{ cm}^2$  and  $121 \text{ cm}^2$  respectively. If  $EF = 15.4 \text{ cm}$ , then find  $BC$ .
7. Prove that  $\tan^2 A - \sin^2 A = \tan^2 A \cdot \sin^2 A$ .
8. A die is thrown once. Find the probability of getting
- (i) an even number
- (ii) an odd prime number.
9. Write less than cumulative frequency and greater than cumulative frequency table for the following data.

Class interval	5-10	10-15	15-20	20-25	25-30
Frequency	4	45	20	13	9

**SECTION - III**

(Marks : 4×4=16)

**Note :**

- (i) Answer **all** the questions.
- (ii) Choose any **ONE** from each question.
- (iii) Each question carries **4** marks.

10. (a) If  $\operatorname{cosec} \theta + \cot \theta = P$ , show that  $\frac{P^2 + 1}{P^2 - 1} = \sec \theta$ .

**OR**

- (b) Show that the points  $(-4, -7)$ ,  $(-1, 2)$ ,  $(8, 5)$  and  $(5, -4)$  taken in order are the vertices of a Rhombus.

11. (a) Find the mode of the following data.

Class interval	50-52	53-55	56-58	59-61	62-64
Frequency	15	110	135	115	25

**OR**

- (b) A chord of a Circle of radius 14 cm subtends  $120^\circ$  angle at the centre. Find the area of the corresponding major segment of the circle. ( $\pi = 3.14$ )

12. (a) A bag contains 20 discs, which are numbered from 1 to 20. If one disc is drawn at random from the bag, find the probability that it bears :

- (i) an even number,
- (ii) Prime number,
- (iii) Multiple of 5,
- (iv) Two digit odd number.

**OR**

- (b) The angle of elevation of the top of a building from the foot of the tower is  $30^\circ$  and the angle of elevation of the top of the tower from the foot of the building is  $60^\circ$ . If the tower is 30 m high, find the height of the building.

13. (a) Construct a triangle similar to the given  $\Delta ABC$ , with its sides equal to  $\frac{3}{4}$  of the corresponding sides of the  $\Delta ABC$

**OR**

- (b) Draw a Circle of radius 4 cm. From a point 7.5 cm away from its centre, construct the pair of tangents to the circle.
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**16E(B)**

**MATHEMATICS, Paper - II**

*(English version)*

**(Parts A and B)**

**Time : 2 hrs. 45 min.]**

**[Maximum Marks : 40**

**Instruction :** Write the answers to the questions in this **Part-B** on the Question paper itself and attach it to the answer book of **Part-A**.

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**Part - B**

**Time : 30 minutes**

**Marks : 10**

**SECTION - IV**

**(Marks :  $20 \times \frac{1}{2} = 10$ )**

**Note :**

- (i) Answer **all** the questions.
- (ii) Each question carries  $\frac{1}{2}$  mark.
- (iii) Marks will **not** be awarded in any case of over-written, rewritten or erased answers.
- (iv) Each question has four options. Write the **CAPITAL LETTERS** (A, B, C, D) showing the correct answer for the following questions in the brackets provided against them.

**14.** Slope of the line passing through the points  $(0, \sin 60^\circ)$  and  $(\cos 30^\circ, 0)$  is .....

[     ]

(A) 0

(B) 1

(C) -1

(D)  $\sqrt{3}$

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**V**

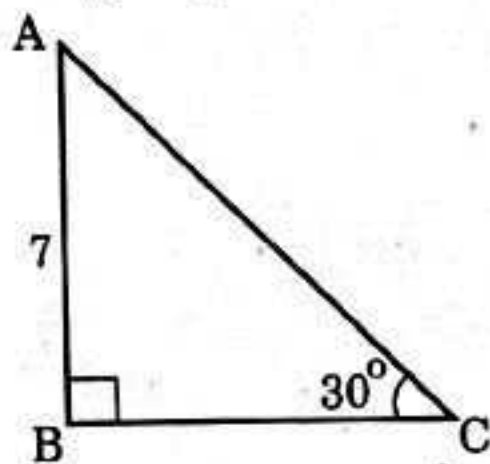
**[1]**

15.  $\triangle ABC \sim \triangle PQR$  and  $\angle A + \angle B = 115^\circ$ , then  $\angle R = \dots\dots$  [ ]  
 (A)  $55^\circ$  (B)  $65^\circ$   
 (C)  $75^\circ$  (D)  $45^\circ$

16. The area of a sector, whose radius is 7 cm and the angle is  $120^\circ$ , is .... sq. cm. [ ]  
 (A) 51.3 (B) 51.4  
 (C) 51.5 (D) 51.6

17. If  $\sec \theta - \tan \theta = 3$ , then  $\sec \theta + \tan \theta = \dots\dots$  [ ]  
 (A) 1 (B)  $\frac{1}{2}$   
 (C)  $\frac{1}{3}$  (D)  $\sqrt{2}$

18. In the given figure,  $BC = \dots\dots$  units. [ ]



- (A)  $7\sqrt{3}$   
 (B)  $7\sqrt{2}$   
 (C) 7  
 (D) 5

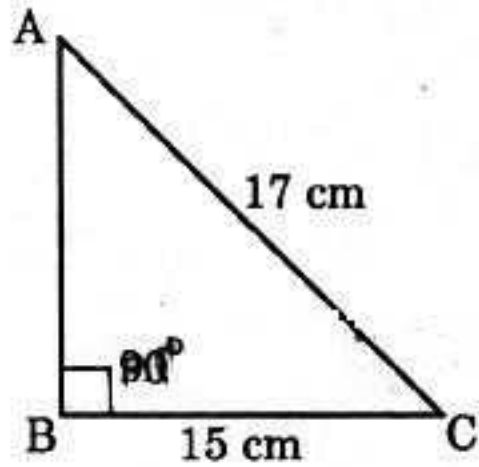
19. From a deck of cards, a card is drawn at random, then the probability of getting a red king is ..... [ ]  
 (A)  $\frac{1}{13}$  (B)  $\frac{3}{14}$   
 (C)  $\frac{3}{26}$  (D)  $\frac{1}{26}$

20. The mean of first four odd prime numbers is ..... [ ]  
 (A) 6.5 (B) 7.5  
 (C) 8.5 (D) 9.5

21. The distance of a point (3, 4) from the origin is ..... units. [ ]  
 (A) 5 (B) 6  
 (C) 7 (D) 8

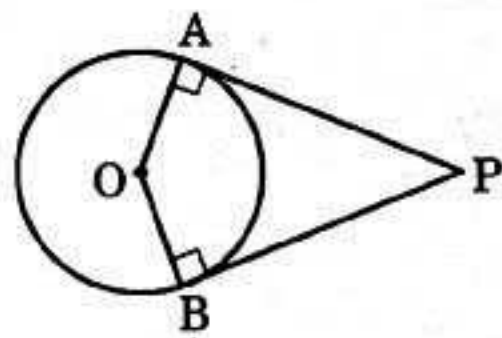


22. In  $\triangle ABC$ ,  $AB = \dots\dots\dots$  cm. [ ]



- (A) 5
- (B) 6
- (C) 7
- (D) 8

23. In the given figure,  $\angle AOB = 120^\circ$ , then  $\angle APO = \dots\dots$  [ ]

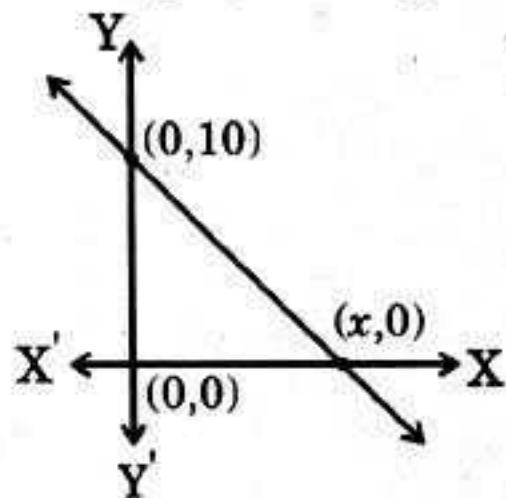


- (A)  $30^\circ$
- (B)  $45^\circ$
- (C)  $60^\circ$
- (D)  $90^\circ$

24. A.M. of  $x-5$ ,  $x$ ,  $x+5$  is  $\dots\dots$  [ ]

- (A)  $\frac{x}{2}$
- (B)  $x$
- (C)  $2x$
- (D)  $5x$

25. The area of given triangle is 60 sq. units, then  $x = \dots\dots$  units. [ ]



- (A) 6
- (B) 8
- (C) 10
- (D) 12

26. If  $\sin 2\theta = \cos 3\theta$ , then  $\theta = \dots\dots$  [ ]

- (A)  $15^\circ$
- (B)  $18^\circ$
- (C)  $21^\circ$
- (D)  $24^\circ$

27. A boy observed 20 m away from the base of a 20 m high pole, the angle of elevation of the top is  $\dots\dots$  [ ]

- (A)  $15^\circ$
- (B)  $30^\circ$
- (C)  $45^\circ$
- (D)  $60^\circ$



28. If  $P(E) = 1$ , then  $P(\bar{E}) = \dots\dots$  [    ]  
(A) 0 (B) 1  
(C)  $\frac{2}{3}$  (D)  $\frac{3}{2}$
29. If  $\triangle ABC$ ,  $DE \parallel BC$ ,  $AD = 2$  cm,  $DE = 3$  cm and  $AB = 6$  cm, then  $BC = \dots\dots$  cm. [    ]  
(A) 3 (B) 6  
(C) 9 (D) 12
30. The length of the tangent drawn from a point 6 cm away from the centre of a circle with radius 3 cm is  $\dots\dots$  cm. [    ]  
(A)  $2\sqrt{3}$  (B)  $3\sqrt{3}$   
(C) 3 (D) 4
31. When a die is rolled, the probability of getting an odd prime number is  $\dots\dots$  [    ]  
(A)  $\frac{1}{3}$  (B)  $\frac{2}{3}$   
(C)  $\frac{1}{6}$  (D) 3
32. If  $\cos \theta = \frac{3}{5}$ , then  $\sin \theta = \dots\dots$  [    ]  
(A)  $\frac{3}{4}$  (B)  $\frac{4}{5}$   
(C)  $\frac{5}{12}$  (D)  $\frac{5}{13}$
33. Mode of 3, 4, 5 and  $x$  is 5, then  $x = \dots\dots$  [    ]  
(A) 3 (B) 5  
(C) 4 (D) 8
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