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°, when the observation point is 10 meters away from the foot of the pole. Draw suitable diagram for the above situation.

3. Find the value of $\tan^2 45° + \cot^2 30°$.

4. If P(E) = 0.546, what is the probability of 'not E' ?

## SECTION - II

*(Marks : 5×2=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. $\Delta ABC \sim \Delta DEF$ and their areas are 64 $cm^2$ and 121 $cm^2$ respectively. If EF = 15.4 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 $\text{cosec}\,\theta + \cot\theta = P$, 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° 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° and the angle of elevation of the top of the tower from the foot of the building is 60°. If the tower is 30 m high, find the height of the building.

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

**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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This Question Paper contains 4 Printed Pages.

**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 × ½ = 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 $(0, \sin 60°)$ and $(\cos 30°, 0)$ is ..... [ ]

(A) 0 (B) 1

(C) –1 (D) $\sqrt{3}$

15. $\Delta ABC \sim \Delta PQR$ and $\angle A + \angle B = 115°$, then $\angle R$ = ..... [ ]

(A) 55° (B) 65°

(C) 75° (D) 45°

16. The area of a sector, whose radius is 7 cm and the angle is 120°, is .... sq. cm. [ ]

(A) 51.3 (B) 51.4

(C) 51.5 (D) 51.6

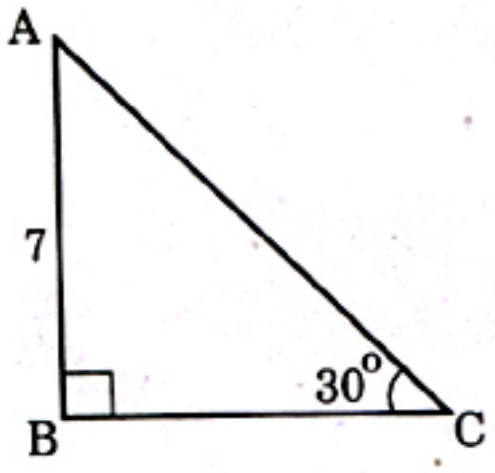


17. If $\sec\theta - \tan\theta = 3$, then $\sec\theta + \tan\theta$ = ..... [ ]

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

(C) $\frac{1}{3}$ (D) $\sqrt{2}$

18. In the given figure, BC = ..... 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

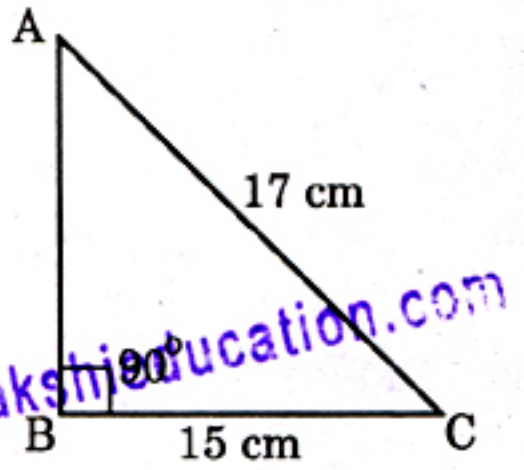
(C) 8.5 (D) 9.5

21. The distance of a point (3, 4) from the origin is ..... units. [ ]

(A) 5 (B) 6

(C) 7 (D) 8

**22.** In $\Delta ABC$, AB = ..... cm. [ ]




(A) 5

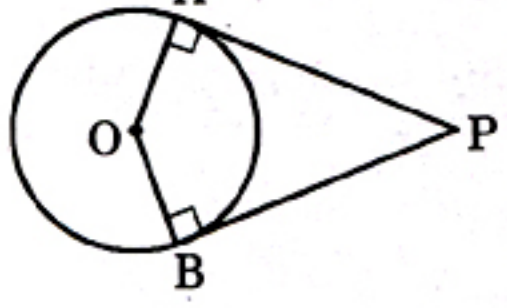
(B) 6

(C) 7

(D) 8



**23.** In the given figure, $\angle AOB = 120°$, then $\angle APO$ = ..... [ ]




(A) 30°

(B) 45°

(C) 60°

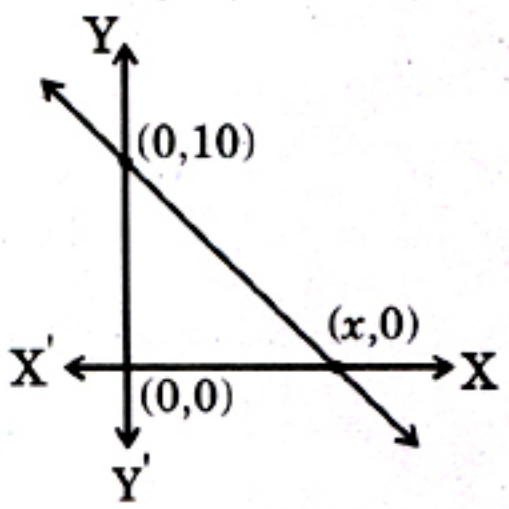
(D) 90°

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

(A) $\frac{x}{2}$ (B) $x$

(C) $2x$ (D) $5x$

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




(A) 6

(B) 8

(C) 10

(D) 12

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

(A) 15° (B) 18°

(C) 21° (D) 24°

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

(A) 15° (B) 30°

(C) 45° (D) 60°

**28.** If $P(E) = 1$, then $P(\overline{E}) =$ ..... [ ]

(A) 0 (B) 1

(C) $\frac{2}{3}$ (D) $\frac{3}{2}$



**29.** If $\Delta ABC$, $DE \| BC$, $AD = 2$ cm, $DE = 3$ cm and $AB = 6$ cm, then $BC =$ ..... 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 ..... 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 ..... [ ]

(A) $\frac{1}{3}$ (B) $\frac{2}{3}$

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

**32.** If $\cos\theta = \frac{3}{5}$, then $\sin\theta =$ ..... [ ]

(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 $x =$ ..... [ ]

(A) 3 (B) 5

(C) 4 (D) 8