This Question Paper contains 4 Printed Pages.

15E(A)

# **MATHEMATICS**, Paper - I

(English version)

# (Parts A and B)

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

#### Instructions :

- 15 minutes of time is allotted exclusively free reading the question paper and 2.30 hours for writing the answers.
- 2. Part-A answers should be written in Marate answer book.
- 3. There are three sections in Part-A.
- 4. Answer all questions.
- 5. Every answer should be written visibly and neatly.
- 6. There is an internal choice in section III of Part-A.

Time : 2 hours

#### SECTION - I

(Marks:  $4 \times 1 = 4$ )

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

1. Write  $A = \{2, 4, 8, 16\}$  in set-builder form.

2. Find the value of  $\log_5 \sqrt{625}$ .

15E(A) B [1]

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[Maximum Marks : 40

Part - A

Marks : 30

- 3. The larger of two supplementary angles exceeds the smaller by 58°, then find the angles.
- 4. Find the curved surface area of cylinder, whose radius is 7 cm. and height is 10 cm.

#### SECTION - II

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

NOTE: (i) Write answers to all questions.

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(ii) Each question carries 2 marks.

- 5. Rohan's mother is 26 years older thankin. The product of their ages after 3 years will be 360. Then write the socuired quadratic equation to find Rohan's present age.
- 6. Find the zeroes of the quadratic polynomial  $x^2 x 30$  and verify the relation between the zeroes and its co-efficients.
- 7. A Joker's cap is in the form of right circular cone, whose base radius is 7 cm and height is 24 cm. Find the area of sheet required to make 10 such caps.
- 8. Find the HCF of 1260 and 1440 by using Euclid's division lemma.
- 9. If the sum of first 15 terms of an A.P. is 675 and its first term is 10, then find 25th term.

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#### SECTION - III

NOTE: (i) Answer all the following questions.

(ii) Each question carries 4 marks.

10. (a) Show that  $2+5\sqrt{3}$  is irrational.

#### OR

(b) Check whether - 321 is a term of the A.P.: 22, 15, 8, 1, .....

11. (a) In a class test, the sum of Moulika's marks in Mathematics and English is 30. If she got 2 marks more in Mathematics and 3 marks less in English, the product of her marks would have been 210. Find her marks in the two subjects.

#### R

(b) An oil drum is in the space of cylinder, whose diameter is 2 m. and height is 7 m. The painter charges  $\gtrless 5$  per m<sup>2</sup> to paint the drum. Find the total charges to be paid to the painter for 10 drums.

12. (a) If  $A = \{x : x \text{ is a natural number less than is } 6\}$ .

 $B = \{x : x \text{ is a prime number which is a divisor of } 60\}.$ 

 $C = \{x : x \text{ is an odd natural number less than 10}\}.$ 

 $D = \{x : x \text{ is an even natural number which is a divisor of 48}\}.$ 

Then write roster form for all above sets and find

(i)  $A \cup B$  (ii)  $B \cap C$ (iii) A - D (iv) D - B.

#### OR

(b) 6 pencils and 4 note books together cost Rs. 90/- whereas 8 pencils and 3 note books together cost Rs. 85/-. Find the cost of one pencil and that of one note book.

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[3]

P.T.O.

13. (a) Find the zeroes of the quadratic polynomial  $p(x) = x^2 + x - 20^{-10}$  using graph.

# OR

(b) Solve the following pair of linear equations graphically,

2x + y = 4 and 2x - 3y = 12.

15E(A) B

MARCH, 2019

This Question Paper contains 4 Printed Pages.

# 15E(B)

# **MATHEMATICS**, Paper - I

(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.

# Part - B

Marks: 10

Time : 30 minutes

**NOTE** : (i) Each question has four options. Write the CAPITAL LETTERS (A, B, C, D) showing the currect answer for the following questions in the brackets provided against them.

(ii) Marks are not awarded for over-written answers.

(iii) All questions carry equal marks.

# SECTION IV

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

NOTE : (i) Answer all the questions.

(ii) Each question carries  $\frac{1}{2}$  mark.

14. If n(A) = 8, n(B) = 3,  $n(A \cap B) = 2$ , then  $n(A \cup B) = ....$  [ ] (A) 5 (B) 7

- (C) 9 (D) 13
- 15E(B) [1] B

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15. The discriminant	of $6x^2 - 5x + 1 = 0$ is	
(A) 1	(B) 2	1 J
(C) 6	(D) $-\frac{5}{6}$	
<ul> <li>16. Sum of the zeroes of (A) 5</li> <li>(C) 6</li> <li>17. Which of the followith (A) √2</li> </ul>	of the polynomial $x^2 + 5x + 6$ is (B) $-5$ (D) $\frac{5}{6}$ (ng is not irrational ? 1	[ ]
(C) $\sqrt{4}$ <b>18.</b> One root of the equation	(D) $\sqrt{5}$ tion $x - \frac{3}{2} = 2$ is	
(A) 1 (C) 3	x (B) 2 (D) 4	[]
(A) 6 (C) 7	hen $a =$ (B) $\pm 6$ (D) $\pm 7$	1 1 -
<ul> <li>20. If total surface area of</li> <li>(A) 32 cm<sup>3</sup></li> <li>(C) 128 cm<sup>3</sup></li> </ul>	<sup>2</sup> a cube is 96 cm <sup>2</sup> , then its volume is (B) 64 cm <sup>3</sup> (D) 256 cm <sup>3</sup>	1
<b>21.</b> $\log_{10} 0.001 = \dots$ (A) 2 (C) -2	(B) 3 . (D) - 3	l l
15E(B) B	[2]	

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22. Match the following :

If  $\alpha$ ,  $\beta$ ,  $\gamma$  are zeroes of a cubic polynomial  $ax^3 + bx^2 + cx + d$ ,  $(a \neq 0)$ , then ....

- (i)  $\alpha + \beta + \gamma$  (a)  $-\frac{d}{a}$ (ii)  $\alpha \beta + \beta \gamma + \gamma \alpha$  (b)  $\frac{c}{a}$
- (iii)  $\alpha \beta \gamma$  (c)  $-\frac{b}{a}$

(A)  $(i) \rightarrow c, (ii) \rightarrow b, (iii) \rightarrow a$  (B)  $(i) \rightarrow a, (ii) \rightarrow b, (iii) \rightarrow c$ (C)  $(i) \rightarrow b, (ii) \rightarrow a, (iii) \rightarrow c$  (D)  $(i) \rightarrow c, (ii) \rightarrow a, (iii) \rightarrow b$  I

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23.	The next term in A.P.	√3, -	$\sqrt{12}$ ,	$\sqrt{27}$	is
	(A) $\sqrt{32}$			( <b>B</b> )	√36
	(C) $\sqrt{42}$			D)	$\sqrt{48}$

24. The shaded region in the river figure shows ...

$\mu = $	<u> </u>	5-	
1	È		
	三()		E
-7	X	1	-

$(\mathbf{A})  \mathbf{A} - \mathbf{B}$	(B) B-A		
(C)	μ-Β	( <b>D</b> )	$\mathbf{A}\cup\mathbf{B}$

25. 5x-3 represents ..... polynomial. 1 1 (A) Linear **(B)** Quadratic -(C) Cubic (D) A and B 26. The common difference of A.P. log<sub>2</sub> 2, log<sub>2</sub> 4, log<sub>2</sub> 8 is .... 1 L (A) 1 (B) 2 (C) 3 (D) 4 27. The sum of first 'n' odd natural numbers is ..... L 1 (B)  $n^2$ (A) n

(C) $n(n+1)$	(D) $\frac{n(n+1)}{2}$	
15E(B) B	3]	P.T.O.

	15L B				141		MARC	H, 20	19	
		(C)	K > 6		( <b>D</b> )	K > 25			Ϊŝ.	
		(A)	K = 6		(B)	K < 6.25				
	33.	If th	e equation :	$x^2 + 5x + K$	= 0 has rea	l and distinct r	oots, then	ſ	J	
		101								
		(C)	- 3		( <b>D</b> )	-2				, j
	32.	(A)	c+2y 9= 3	0  and  kx +	y - 7 = 0 ha (B)	is no solution, t 2	$hen k = \dots$	L	]	190
	96	16.0		0 1 1				Ge.		
22	34	(C)	18 π		<b>(D)</b>	24 π				
		(A)	6π		( <b>B</b> )	$12 \pi$				
	31,	The	volume of a	cone, whose	radius is 3 c	m and height i	s 8 cm, is c	m <sup>3</sup> . [	1	
			451		2.77.6	10.00000000	\$2).			
		(C)	(2, 0)	18	(D)	(4, 0)				
	656583)	(A)	(2, - 3)	- montes	(B)	(0, -3)		6		
	30.	The	line 2x – 3v	= 8 intersec	ts X-axis at			1	T	
		(C)	2	3.	(D)	3				
		(A)	0	. Ψ	6	1				
			<i>←(</i> -	Ý.	→X					08
				Y	а;					
	29,	The	number of	zeroes of the	e polynomia	l in the graph i	8	E	]	
		(C)	$x^2 + \sqrt{2}$		( <b>D</b> )	x - 2				
		(A)	$x^2 - 2$		( <b>B</b> )	$x^2 + 2$		<u>.</u>		
•0	28.	The	ouadratic r	polynomial. v	vhose zeroe	s are . 15 and -	12 ie	ř	ĩ	

# Andhra Pradesh SSC Class 10th Maths Question Paper 1 With Solution 2019

QUESTION PAPER CODE 15E(A)

#### **SECTION - I**

(4 \* 1 = 4)

Question 1: Write  $A = \{2, 4, 8, 16\}$  in set-builder form.

#### Solution:

 $A = \{2^n / n \in \mathbb{N}, \text{ and } n < 5\}$ 

#### Question 2: Find the value of $\log_5 \sqrt{625}$ .

#### **Solution:**

 $log_5 \sqrt{625}$ =  $log_5 25$ =  $log_5 5^2$ =  $2 log_5 5$ = 2 \* 1= 2

Question 3: The larger of two supplementary angles exceeds the smaller by 58°, then find the angles.

#### Solution:

Let the required supplementary angles be x and y.  $x + y = 180^{\circ} - (1)$ The larger angle exceeds the smaller by 58°.  $x - y = 58^{\circ} - (2)$ Solve (1) and (2), 2x = 238 x = 238 / 2 $x = 119^{\circ}$  $y = 61^{\circ}$ 

Question 4: Find the curved surface area of the cylinder, whose radius is 7cm and height is 10cm.

#### **Solution:**

Radius if the cylinder (r) = 7cm Height of the cylinder (h) = 10cm The curved surface area of the cylinder =  $2\pi$ rh = 2 \* (22 / 7) \* (7) \* (10) = 440 cm<sup>2</sup>

#### **SECTION - II**

(5 \* 2 = 10)

Question 5: Rohan's mother is 26 years older than him. The product of their ages after 3 years will be 360. Then write the required quadratic equation to find Rohan's present age.

#### **Solution:**

Let Rohan's present age be x years. His mother's age at present is (x + 26) years. After 3 years, Rohan's age = (x + 3) years After 3 years, his mother's age = (x + 26) + 3 = (x + 29) years The product of their ages = (x + 3) (x + 29)= x \* x + x \* 29 + 3 \* x + 3 \* 29=  $x^2 + 29x + 3x + 87$ =  $x^2 + 32x + 87$ By the sum, the product of their ages is 360  $x^2 + 32x + 87 = 360$   $x^2 + 32x + 87 = 360 = 0$  $x^2 + 32x - 273 = 0$  is the required quadratic equation. Question 6: Find the zeroes of the quadratic polynomial  $x^2 - x - 30$  and verify the relation between the zeroes and its coefficients.

## **Solution:**

Given the polynomial  $x^2 - x - 30$ , To find the zeros,  $x^2 - x - 30 = 0$  [say]  $= x^2 - 6x + 5x - 30$  = x (x - 6) + 5 (x - 6) = (x + 5) (x - 6) x = -5 and x = 6Sum of the zeroes = 6 + (-5) = 1 = (-1) / 1  $= - (\text{coefficient of } x) / (\text{coefficient of } x^2)$ Product of the zeroes = 6 (-5) = -30 = (-30 / 1) $= (\text{constant term}) / (\text{coefficient of } x^2)$ 

Question 7: A joker's cap is in the form of a right circular cone, whose base radius is 7cm and height is 24cm. Find the area of the sheet required to make 10 such caps.

## Solution:

Base radius of the conical cap (r) = 7cm Height (h) = 24cm Slant height (l) =  $\sqrt{r^2 + h^2}$ =  $\sqrt{7^2 + 24^2}$ =  $\sqrt{49 + 576}$ =  $\sqrt{625}$ = 25 cm Area of sheet required to make a cap = Lateral surface area of the cap =  $\pi rl$  = (22 / 7) \* 7 \* 25 = 550 sq.cm

Area of sheet required to 10 such caps = 10 \* 550 = 5500 sq.cm

## Question 8: Find the HCF of 1260 and 1440 by using Euclid's division lemma.

#### **Solution:**

The given numbers are 1260 and 1440. 1440 = 1260 \* 1 + 180 1260 = 180 \* 7 + 0 HCF of 1440 and 1260 is 180.

Question 9: If the sum of the first 15 terms of an AP is 675 and its first term is 10, then find 25<sup>th</sup> term.

#### **Solution:**

First-term of an AP = a = 10Let the common difference be d. Sum of the first 15 terms is  $S_{15} = 675$ (15 / 2) = [2a + 14d] = 675[2 \* 10] + 14d = (675 \* 2) / 1514d = 90 - 20 = 70d = 70 / 14d = 5

 $25^{th}$  term of an AP is  $a_{25} = a + 24d$ = 10 + 24 \* 5 = 10 + 120 = 130 Question 10: [a] Show that  $2 + 5\sqrt{3}$  is irrational.

OR

[b] Check whether -321 is a term of the AP 22, 5, 8, 1.....

Solution:

[a] Let us assume the contrary that  $2 + 5\sqrt{3}$  is rational that is coprime can be found for 'a' and 'b' and  $b \neq 0$  such that  $2 + 5\sqrt{3} = (a / b)$  $5\sqrt{3} = (a / b) - 2$  $\sqrt{3} = (a / b) - (2 / 5)$ Since (a / 5b) and  $(2 / 5) \in Q$ ,  $(a / 5b) - (2 / 5) \in Q$ . So,  $\sqrt{3}$  is rational. But this contradicts the fact that  $\sqrt{3}$  is irrational.

So, our assumption that 2 +  $5\sqrt{3}$  is rational is wrong. So, 2 +  $5\sqrt{3}$  is irrational.

[b] From the given AP, 22, 15, 8, 1 ..... a = 22, d = -7  $n^{th}$  term of an AP =  $a_n = a + (n - 1)d$ In this AP, let the  $n^{th}$  term be -321 a + (n - 1)d = -321 22 + (n - 1)(-7) = -321 (n - 1)(-7) = -343 n - 1 = (-343) / (-7) n = 49 + 1 n = 50Hence, -321 will be the 50<sup>th</sup> term in the given AP. **Question 11:** 

[a] In a class test, the sum of Moulika's marks in mathematics and English is 30. If she got 2 marks more in mathematics and 3 marks less in English, the product of her marks would have been 210. Find her marks in the two subjects.

## OR

[b] An oil drum is in the shape of the cylinder, whose diameter is 2m and height is 7m. The painter charges Rs. 5 per m<sup>2</sup> to paint the drum. Find the total charges to be paid to the painter for 10 drums.

## Solution:

[a] Given that the sum of Moulika's marks in Mathematics and English is 30. Let the marks of Moulika in Mathematics be x and that of in English be 30 - x. If she got 2 marks more in mathematics then marks in maths = x + 2And she got 3 marks less in English then the marks in English = 30 - x - 3 = 27 - xProduct of these two = (x + 2) (27 - x) = 210 $x^2 - 25x + 156 = 0$ (x - 12) (x - 13) = 0x = 12, 13Case (i) If x = 12, the marks of Moulika in Mathematics = 12English = 30 - 12 = 18Case (ii) If x = 13, the marks of Moulika in Mathematics = 13English = 30 - 13 = 17

[b] The diameter of the oil drum which is in the shape of cylinder = d = 2m The radius of the drum = r = d / 2 = 2 / 2 = 1m Height = h = 7cm Total surface area of the drum which is in the shape of cylinder =  $2\pi r (r + h)$ = 2 \* (22 / 7) \* (1) \* (1 + 7) = 2 \* (22 / 7) \* 8 = 50.28 sq.m

Charges to paint the drum per sq.m = Rs. 5 The total cost of painting 10 such type of drums = 50.28 \* 5 \* 10 = Rs. 2514

#### **Question 12:**

(i) [a] If A = {x : x is a natural number less than is 6}.
B = {x : x is a prime number which is a divisor of 60}.
C = {x : x is an odd natural number less than 10}.
D = {x : x is an even natural number which is a divisor of 48}.
Then write the roster form for all the above sets and find

[a] A ∪ B
[b] B ∩ C
[c] A - D
[d] D - B

# OR

(ii) 6 pencils and 4 notebooks together cost Rs. 90 whereas 8 pencils and 3 notebooks together cost Rs. 85. Find the cost of one pencil and that of one notebook.

#### Solution:

(i) [a] A =  $\{1, 2, 3, 4, 5\}$ B =  $\{2, 3, 5\}$ C =  $\{1, 3, 5, 7, 9\}$ D =  $\{2, 4, 6, 8, 12, 14, 16, 24, 48\}$ 

[a]  $A \cup B = \{1, 2, 3, 4, 5\} \cup \{2, 3, 5\} = \{1, 2, 3, 4, 5\}$ [b]  $B \cap C = \{2, 3, 5\} \cap \{1, 3, 5, 7, 9\} = \{3, 5\}$ [c]  $A - D = \{1, 2, 3, 4, 5\} - \{2, 4, 6, 8, 12, 14, 16, 24, 48\} = \{1, 3, 5\}$ [d]  $D - B = \{2, 4, 6, 8, 12, 14, 16, 24, 48\} - \{2, 3, 5\} = \{4, 6, 8, 12, 16, 24, 48\}$ 

(ii) Let the cost of one pencil be Rs. x.Cost of one notebook = Rs. y.

The total cost of 6 pencils and 4 notebooks = Rs. 90 6x + 4y = 90 - (1)

The total cost of 8 pencils and 3 notebooks = Rs. 85 8x + 3y = 85 ---- (2)On solving the above two equations, x = 5, y = 15. The cost of one pencil = Rs. 5 The cost of one notebook = Rs. 15

Question 13: [a] Find the zeroes of the quadratic polynomial  $p(x) = x^2 + x - 20$  using the graph.

#### OR

[b] Solve the following pair of linear equations graphically. 2x + y + 4 and 2x - 3y = 12.

#### **Solution:**

[a] Let  $y = x^2 + x - 20$ 



[b]



**SECTION - IV** 

(20 \* 0.5 = 10)

Question 14: If n(A) = 8, n(B) = 3,  $n(A \cap B) = 2$ , then  $n(A \cup B) =$ \_\_\_\_\_ (A) 5 (B) 7 (C) 9 (D) 13

Answer: C

 Question 15: The discriminant of  $6x^2 - 5x + 1 = 0$  is \_\_\_\_\_\_

 (A) 1
 (B) 2
 (C) 6
 (D) (-5 / 6) 

Answer: A

Question 16: Sum of the zeroes of the polynomial  $x^2 + 5x + 6 = 0$  is (A) 5 (B) -5 (C) 6 (D) (5 / 6)

**Answer: B** 

Question 17: Which of the following is not irrational?(A)  $\sqrt{2}$ (B)  $\sqrt{3}$ (C)  $\sqrt{4}$ (D)  $\sqrt{5}$ 

Answer: C

Question 18: One root of the equation x - (3 / x) = 2 is \_\_\_\_\_ (A) 1 (B) 2 (C) 3 (D) 4

Answer: C

 Question 19: If 4, a, 9 are in GP, then a = \_\_\_\_\_

 (A) 6
 (B)  $\pm 6$  (C) 7
 (D)  $\pm 7$ 

Answer: B

Question 20: If the total surface area of a cube is 96cm<sup>2</sup>, then its volume is

(A)  $32cm^3$  (B)  $64 cm^3$  (C)  $128cm^3$  (D)  $256 cm^3$ 

**Answer: B** 

Question 21:  $\log_{10} 0.001 =$ (A) 2(B) 3(C) -2(D) -3

Answer: D

Question 22: Match the following. If a, b, c are the zeroes of a cubic polynomial  $ax^3 + bx^2 + cx + d = 0$ , then [i] a + b + c [a] (-d / a) [ii] ab + bc + ca [b] (c / a) [iii] abc [c] (-b / a) (A) [i] - c, [ii] - b, [iii] - a (B) [i] - a, [ii] - b, [iii] - c (C) [i] - b, [ii] - a, [iii] - c (D) [i] - c, [ii] - a, [iii] - b

Answer: A

Question 23: The next term in AP  $\sqrt{3}$ ,  $\sqrt{12}$ ,  $\sqrt{27}$ , ..... (A)  $\sqrt{32}$  (B)  $\sqrt{36}$  (C)  $\sqrt{42}$  (D)  $\sqrt{48}$ 

**Answer: D** 

**Question 24: The shaded region in the figure shows** 



Answer: C

Question 25: 5x - 3 represents \_\_\_\_\_ polynomial.

(A) Linear	(B) Quadratic	(C) Cubic	(D) Fourth
degree			

Answer: A

 Question 26: The common difference in AP log2 2, log2 4, log2 8 ..... is

 (A) 1
 (B) 2
 (C) 3
 (D) 4

Answer: A

Question 27: The sum of the first 'n' odd natural numbers is \_\_\_\_\_(A) n(B)  $n^2$ (C) n (n + 1)(D) n (n + 1) / 2

Answer: B

Question 28: The quadratic polynomial, whose zeroes are  $\sqrt{2}$ and  $\sqrt{-2}$  is \_\_\_\_\_ (A) x<sup>2</sup> - 2 (B) x<sup>2</sup> + 2 (C) x<sup>2</sup> +  $\sqrt{2}$  (D) x - 2

Answer: A

Question 29: The number of zeroes of the polynomial in the graph is \_\_\_\_\_



Answer: D

**(B)** 1

(A) **0** 

Question 30: The line 2x - 3y = 8 intersects x-axis at(A) (2, -3)(B) (0, -3)(C) (2, 0)(D) (4, 0)

Answer: D

Question 31: The volume of the cone, whose radius is 3cm and height is 8cm,is \_\_\_\_\_ cm<sup>3</sup>.(A)  $6\pi$ (B)  $12\pi$ (C)  $18\pi$ (D)  $24\pi$ 

Answer: D

Question 32: If 6x + 2y + 9 = 0 and kx + y - 7 = 0 has no solution, then k =

(A) 3 (B) 2 (C) -3 (D) -2

Answer: A

Question 33: If the equation  $x^2 + 5x + k = 0$  has real and distinct roots, then

(A) k = 6 (B) k < 6.25 (C) k > 6 (D) k > 25

Answer: B