

Max Marks: 100

Date: 20.11.2022 **ABHIMANYU BATCH MATHEMATICS : REVISION TEST-3 (SET A)** Topic: Trigonometry II + Straight Lines + Circle + Complex Number + PnC + Probability

- 1. The value of tan (-945°) is -2 (a) -1 (b) (c) -3 (d) -4 $\tan\theta\sin\left(\frac{\pi}{2}+\theta\right)\cos\left(\frac{\pi}{2}-\theta\right) =$ 2. (a) (b) 0 $\cos^2\theta$ (d) $sin^2\theta$ (c) $\sin(\pi + \theta) \sin(\pi - \theta) \csc^2\theta =$ 3. 1 (b) -1 $\sin \theta$ (a) (c) (d) $-\sin\theta$ $\cos A + \sin (270^{\circ} + A) - \sin(270^{\circ} - A) + \cos(180^{\circ} + A) =$ 4. 0 (c) 1 (a) -1 (b) (d) 1/2If sin A = $\frac{4}{5}$ and cos B = $-\frac{12}{13}$, where A and B lie in first and third quadrant respectively, then cos (A + B) = 5. (a) $\frac{56}{65}$ (b) $-\frac{56}{65}$ (c) $\frac{16}{65}$ (d) $-\frac{16}{65}$ If $\cos \theta = \frac{8}{17}$ and θ lies in the 1st quadrant, then the value of $\cos (30^\circ + \theta) + \cos (45^\circ - \theta) + \cos (120^\circ - \theta)$ is 6. (b) $\frac{23}{17}\left(\frac{\sqrt{3}+1}{2}+\frac{1}{\sqrt{2}}\right)$ $\frac{23}{17}\left(\frac{\sqrt{3}-1}{2}+\frac{1}{\sqrt{2}}\right)$ (a)
 - (c) $\frac{23}{17} \left(\frac{\sqrt{3}-1}{2} \frac{1}{\sqrt{2}} \right)$ (d) $\frac{23}{17} \left(\frac{\sqrt{3}+1}{2} - \frac{1}{\sqrt{2}} \right)$
- If $\sin \theta = \frac{12}{13}$, $\left(0 < \theta < \frac{\pi}{2} \right)$ and $\cos \phi = -\frac{3}{5}$, $\left(\pi < \phi < \frac{3\pi}{2} \right)$, then $\sin (\theta + \phi)$ will be 7. (b) $\frac{-56}{65}$ (c) $\underline{Space for Rough Work}$ $\frac{-56}{61}$ $\frac{1}{65}$ (a) (d) -56



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8. If
$$\frac{\pi}{2} < \alpha < \pi$$
, $\pi < \beta < \frac{3\pi}{2}$; $\sin \alpha = \frac{15}{17}$ and $\tan \beta = \frac{12}{5}$, then the value of $\sin (\beta - \alpha)$ is

(a)
$$\frac{-171}{221}$$
 (b) $\frac{-21}{221}$ (c) $\frac{21}{221}$ (d) $\frac{171}{221}$

9. If the distance of any point P from the points A(a + b, a - b) and B(a - b, a + b) are equal, then the locus of P is (a) x - y = 0 (b) ax + by = 0 (c) bx - ay = 0 (d) x + y = 0

10. What is the equation of the locus of a point which moves such that 4 times its distance from the X-axis is the square of its distance from the origin?

(a)
$$x^2 - y^2 - 4y = 0$$
 (b) $x^2 + y^2 - 4|y| = 0$ (c) $x^2 + y^2 - 4x = 0$ (d) $x^2 + y^2 - 4|x| = 0$

- 11. The slope of a line that makes an angle of measure 30° with Y-axis is
 - (a) $\sqrt{3}$ (b) $-\sqrt{3}$ (c) $\pm\sqrt{3}$ (d) $\pm\frac{1}{\sqrt{3}}$
- 12. If A(5, 8), B(-3, 4) and C(7, k) are vertices of $\triangle ABC$ and $m \angle B = 90^{\circ}$, then k = (a) 16 (b) -12 (c) -16 (d) 12
- A line cuts off equal intercepts on the co-ordinate axes. The angle made by this line with the positive direction of X-axis is
 - (a) 90° (b) 135° (c) 45° (d) 120°

14. Equation of the straight line making equal intercepts on the axes and passing through the point (2, 4) is

- (a) 4x y 4 = 0 (b) 2x + y 8 = 0 (c) x + y 6 = 0 (d) x + 2y 10 = 0
- 15. If $\left(\frac{3}{2}, \frac{5}{2}\right)$ is the midpoint of line segment intercepted by a line between axes, the equation of the line is
 - (a) 5x + 3y + 15 = 0 (b) 3x + 5y + 15 = 0 (c) 5x + 3y 15 = 0 (d) 3x + 5y 15 = 0
- 16. A straight line passes through the points (5, 0) and (0, 3). The length of perpendicular from the point (4, 4) on the line is

(a)
$$\frac{15}{\sqrt{34}}$$
 (b) $\frac{\sqrt{17}}{2}$ (c) $\frac{17}{2}$ (d) $\sqrt{\frac{17}{2}}$



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- 17. The equation of a circle touching the coordinate axes and the line 3x 4y = 12 is
 - (a) $x^2 + y^2 + 6x + 6y + 9 = 0$ (b) $x^2 + y^2 + 6x + 6y - 9 = 0$ (c) $x^2 + y^2 - 6x - 6y + 9 = 0$ (d) $x^2 + y^2 - 6x - 6y + 9 = 0$

18. The sides of a rectangle are given by $x = \pm a$ and $y = \pm b$. The equation of the circle passing through the vertices of the rectangle is

 b^2

(a)
$$x^2 + y^2 = a^2$$
 (b) $x^2 + y^2 = a^2 + b^2$

(c)
$$x^2 + y^2 = a^2 - b^2$$
 (d) $(x + a)^2 + (y - b^2) = a^2 + b^2$

19. Equation of circle with centre (-a, -b) and radius $\sqrt{a^2 - b^2}$ is

(a)
$$x^2 + y^2 + 2ax + 2by + 2b^2 = 0$$

(b) $x^2 + y^2 - 2ax - 2by - 2b^2 = 0$
(c) $x^2 + y^2 - 2ax - 2by + 2b^2 = 0$
(d) $x^2 + y^2 - 2ax + 2by + 2a^2 = 0$

20. $x^2 + y^2 (2k - 1) xy - 2x + 4y + 3 = 0$ represents the equation of circle, find k and radius of the circle?

(a)
$$-2,\sqrt{2}$$
 (b) $\frac{1}{2},\sqrt{2}$ (c) $-2,\sqrt{3}$ (d) $2,\sqrt{3}$

- 21. $x^2 + hxy + y^2 6x 2y + k = 0$ is the equation of the circle and 2 is the radius of the circle, then find the values of h and k?
 - (a) h = 0, k = -6 (b) h = 0, k = 6 (c) h = -3, k = 6 (d) h = 3, k = 6

22. The length of the common chord of the two circles $(x - a)^2 + y^2 = a^2$ and $x^2 + (y - b)^2 = b^2$ is

(a)
$$\frac{ab}{\sqrt{a^2 + b^2}}$$
 (b) $\frac{2ab}{\sqrt{a^2 + b^2}}$ (c) $\frac{a + b}{\sqrt{a^2 + b^2}}$ (d) $\sqrt{a^2 + b^2}$

- 23. Le the tangents drawn from the origin to the circle, $x^2 + y^2 8x 4y + 16 = 0$ touch it at the points A and B. The $(AB)^2$ is equal to
 - (a) $\frac{56}{5}$ (b) $\frac{64}{5}$ (c) $\frac{32}{5}$ (d) $\frac{52}{5}$

24. If the length of a the common chord of two circles $x^2 + y + 8x + 1 = 0$ and $x^2 + y^2 + 2\mu y - 1 = 0$ is $2\sqrt{6}$, then the value of μ is (a) ± 2 (b) ± 3 (c) ± 4 (d) none of these



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25.	The conjugate of $\frac{(2+i)^2}{3+i}$ in the form of a + ib is								
	(a)	$\frac{13}{2} + i\left(\frac{15}{2}\right)$	(b)	$\frac{13}{10} + i\left(\frac{-15}{2}\right)$	(c)	$\frac{13}{10} + i\left(\frac{-9}{10}\right)$	(d)	$\frac{13}{10} + i \left(\frac{9}{10}\right)$	
26.	If α is a real number such that $z - i\alpha$ is real and $z = \frac{11 - 3i}{1 + i}$, then the value of α is								
	(a)	4	(b)	-4	(c)	-7	(d)	7	
27.	The smallest positive integer n for which $(1 + i)^{2n} = (1 - i)^{2n}$ is								
	(a)	1	(b)	2	(c)	3	(d)	4	
28.	If $\left(\frac{1+1}{1-1}\right)$	If $\left(\frac{1+i}{1-i}\right)^m = 1$, then the least positive integral value of m is							
	(a)	2	(b)	3	(c)	4	(d)	1	
29.	If ω=	$\frac{-1+\sqrt{3}i}{2}$, then (3 +	- ω + 3ω	$^{2})^{4} =$					
	(a)	16	(b)	-16	(c)	16 ω	(d)	$16 \omega^2$	
30.	If α is an imaginary cube root of unity, then for $\ n\in N$, the value of $\alpha^{3n+1}+\alpha^{3n+3}+\alpha^{3n+5}$ is								
	(a)	-1	(b)	0	(c)	1	(d)	3	
31.	If α and β are roots of the equation $x^2 + x + 1 = 0$, then $\alpha^2 + \beta^2$ is								
	(a)	$\frac{-1+i\sqrt{3}}{2}$	(b)	-1	(c)	1	(d)	$\frac{-1-i\sqrt{3}}{2}$	
32.	If the cube roots of unity are 1, ω , ω^2 , then the roots of the equation $(x - 2)^3 + 27 = 0$ are								
	(a)	-1, -1, -1			(b)	$-1, -\omega, -\omega^2$			
	(c)	$-1, 2 + 3\omega, 2 + 3\omega$	v^2		(d)	-1 , $2-3\omega$, $2-3\omega^2$			
33.	If ${}^{12}P_r$	If ${}^{12}P_r = 1320$, then r is equal to							
	(a)	5	(b)	4	(c)	3	(d)	2	
Space for Rough Work									



Using the letters of the word TRICK, a five letter word with distinct letters is formed such that C is in the mid									
In how many ways this is possible?									
(a)	6	(b)	120	(c)	24	(d)	72		
The nu	mber of words that can be formed out of the letters of the word ARTICLE so that the vowels occupy even								
places is									
(a)	36	(b)	574	(c)	144	(d)	754		
How n	How many 5 digit telephone numbers can be constructed using the digits 0 to 9, if each number starts with 67								
no digit appears more than once?									
(a)	335	(b)	336	(c)	338	(d)	337		
The nu	mber of 5 digit telep	phone nu	umber having a least of	one of th	eir digits repeated is				
(a)	90,000	(b)	100,000	(c)	30,240	(d)	69,760		
The nu	mber of 4 digit nu	mber wit	thout repetition that of	can be fo	ormed using the digit	s 1, 2, 3	, 4, 5, 6, 7 in which		
each number has two odd digits and two even digits is									
(a)	436	(b)	454	(c)	432	(d)	450		
There are 10 intermediate stations on a railway line between two particular stations. The number of wa							mber of ways that a		
train can be made to stop at 3 of these intermediate stations so that no two of these halting stations are									
consec	utive, is								
(a)	56	(b)	126	(c)	20	(d)	120		
Everyb	Everybody in a room shakes hands with everybody else. The total number of handshakes is 45. The total num								
of persons in the room is									
(a)	9	(b)	10	(c)	5	(d)	15		
There	There are 20 straight lines in a plane such that no two of them are parallel and no three of them are concurrent. I								
their points of intersection are joined, then the number of new line segments formed are									
(a)	3420	(b)	14535	(c)	2907	(d)	17955		
	Using t In how (a) The nu places (a) How m no digi (a) The nu (a) The nu (a) The nu (a) The nu (a) The nu (a) Everyb of pers (a) There a their po (a)	Using the letters of the work In how many ways this is provided in the many ways this is provided in the places is (a) 6 The number of words that places is (a) 36 How many 5 digit telephore no digit appears more than (a) 335 The number of 5 digit telephore (a) 90,000 The number of 4 digit number has two odd 6 (a) 436 There are 10 intermediated train can be made to store consecutive, is (a) 56 Everybody in a room shaked of persons in the room is (a) 9 There are 20 straight lines their points of intersection (a) 3420	Using the letters of the word TRIC In how many ways this is possible? (a) 6 (b) The number of words that can be for places is (a) 36 (b) How many 5 digit telephone number no digit appears more than once? (a) 335 (b) The number of 5 digit telephone nu (a) 90,000 (b) The number of 4 digit number wite each number of 4 digit number wite each number has two odd digits and (a) 436 (b) There are 10 intermediate stations train can be made to stop at 3 consecutive, is (a) 56 (b) Everybody in a room shakes hands of persons in the room is (a) 9 (b) There are 20 straight lines in a plat their points of intersection are joint (a) 3420 (b)	Using the letters of the word TRICK, a five letter word In how many ways this is possible? (a) 6 (b) 120 The number of words that can be formed out of the letter places is (a) 36 (b) 574 How many 5 digit telephone numbers can be constructer no digit appears more than once? (a) 335 (b) 336 The number of 5 digit telephone number having a least of (a) 90,000 (b) 100,000 The number of 4 digit number without repetition that of each number has two odd digits and two even digits is (a) 436 (b) 454 There are 10 intermediate stations on a railway line be train can be made to stop at 3 of these intermediate train can be made to can be train can be train c	Using the letters of the word TRICK, a five letter word with disk In how many ways this is possible?(a)6(b)120(c)The number of words that can be formed out of the letters of the places is(b)574(c)(a)36(b)574(c)How many 5 digit telephone numbers can be constructed using no digit appears more than once?(c)(c)(a)335(b)336(c)The number of 5 digit telephone number having a least one of the (a)90,000(b)100,000(c)The number of 4 digit number without repetition that can be for each number has two odd digits and two even digits is (a)(c)(c)There are 10 intermediate stations on a railway line between the train can be made to stop at 3 of these intermediate station consecutive, is(b)126(c)(a)56(b)126(c)(c)(a)9(b)10(c)(c)There are 20 straight lines in a plane such that no two of them at their points of intersection are joined, then the number of new line (a)3420(b)14535(c)	Using the letters of the word TRICK, a five letter word with distinct letters is formed In how many ways this is possible?(a)6(b)120(c)24The number of words that can be formed out of the letters of the word ARTICLE so places is(a)36(b)574(c)144How many 5 digit telephone numbers can be constructed using the digits 0 to 9, if ear no digit appears more than once?(a)335(b)336(c)338The number of 5 digit telephone numbers can be constructed using the digits repeated is (a)(a)90,000(b)100,000(c)30,240The number of 4 digit number withor repetition that can be formed using the digit (a)(a)436(b)454(c)432(a)56(b)126(c)20Event with everybody else. The test number of hands by of persons in the room is (a)(a)9(b)10(c)5(a)36(b)126(c)20Colspan="4">Event with everybody else. The test number of hands by of persons in the room is (a)(a)9(b)10(c)5(a)32(b)126(c)20Colspan="4">Event word word word word word word word word	Using the letters of the word TRICK, a five letter word with distinct letters is formed such that In how many ways this is possible?(a)6(b)120(c)24(d)The number of words that can be formed out of the letters of the word ARTICLE so that the places is(c)144(d)(a)36(b)574(c)144(d)How many 5 digit telephone numbers can be constructed using the digits 0 to 9, if each number no digit appears more than once?(c)338(d)(a)335(b)336(c)338(d)The number of 5 digit telephone number having a least one of the digits repeated is (a)(d)(d)(d)The number of 4 digit number with using a least one of the digits repeated is (a)(d)(d)(d)The number of 4 digit number with use the repetition that can be repetitive at the set of the digits in the one of the digits in the one of the digits in the one of the digit is(d)(a)436(b)454(c)432(d)(a)56(b)126(c)20(d)Consecutive, is (a)5(d)10(c)5(d)(a)9(b)10(c)5(d)(b)10(c)5(d)10(c)3420(b)14535(c)2907(d)		



42. Two dice are thrown simultaneously. The probability of obtaining a total score of 5 is

(a)
$$\frac{1}{9}$$
 (b) $\frac{1}{18}$ (c) $\frac{1}{36}$ (d) $\frac{1}{12}$

43. If two dice are thrown simultaneously, then the probability that the sum of the numbers which come up on the dice to be more than 5 is

- (a) $\frac{5}{18}$ (b) $\frac{5}{36}$ (c) $\frac{13}{18}$ (d) $\frac{1}{6}$
- 44. If 3 coins were tossed, then the probability of getting 2 heads is
 - (a) $\frac{3}{8}$ (b) $\frac{2}{8}$ (c) $\frac{1}{8}$ (d) none of these

45. A flashlight has 10 batteries out of which 4 are dead. If 3 batteries are selected without replacement and tested, then the probability that all 3 are dead is

- (a) $\frac{1}{30}$ (b) $\frac{2}{8}$ (c) $\frac{1}{15}$ (d) $\frac{1}{10}$
- 46. Two cards are drawn at random from a pack of 52 cards. Find the probability that they are both Aces if the first card is not replaced?
 - (a) $\frac{1}{169}$ (b) $\frac{1}{221}$ (c) $\frac{4}{13}$ (d) $\frac{3}{13}$

47. Letters in the word HULULULU are rearranged. The probability of all three L being together is

- (a) $\frac{3}{20}$ (b) $\frac{2}{5}$ (c) $\frac{3}{28}$ (d) $\frac{5}{23}$
- 48. Probability of solving of sum correctly by A, B and C is $\frac{1}{2}, \frac{1}{3}$ and $\frac{1}{5}$ respectively. The probability that at least one of them solves it correctly is
 - (a) $\frac{11}{15}$ (b) $\frac{4}{15}$ (c) $\frac{1}{20}$ (d) $\frac{19}{20}$



49. A room contains 3 sockets for bulbs. If from a collection of 10 bulbs, out of which 6 are defective, 3 bulbs are selected at random and put in the sockets, then the probability that the room is lighted is

(a)
$$\frac{3}{5}$$
 (b) $\frac{1}{5}$ (c) $\frac{5}{6}$ (d) $\frac{1}{6}$

50. If $P(A) = \frac{4}{5}$, $P(B') = \frac{2}{5}$, $P(A \cap B) = \frac{1}{2}$, then $P(A \cap B')$ is equal to

(a)
$$\frac{3}{10}$$
 (b) $\frac{1}{5}$ (c) $\frac{4}{5}$ (d) $\frac{1}{2}$

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1.	(a)	2.	(d)	3.	(b)	4.	(b)	5.	(d)
6.	(a)	7.	(b)	8.	(d)	9.	(a)	10.	(b)
11.	(c)	12.	(c)	13.	(b)	14.	(c)	15.	(c)
16.	(d)	17.	(c)	18.	(b)	19.	(a)	20.	(b)
21.	(b)	22.	(b)	23.	(b)	24.	(b)	25.	(c)
26.	(c)	27.	(b)	28.	(c)	29.	(c)	30.	(b)
31.	(b)	32.	(d)	33.	(c)	34.	(c)	35.	(c)
36.	(b)	37.	(d)	38.	(c)	39.	(a)	40.	(b)
41.	(b)	42.	(a)	43.	(c)	44.	(a)	45.	(a)
46.	(b)	47.	(c)	48.	(a)	49.	(c)	50.	(a)