GGSIPU mathmatics 2009

1. If Az $_1$, Bz $_2$, Cz $_3$ and Pz represents complex numbers such that

$|z_1 - z| = |z_2 - z| = |z_3 - z|$, then A,B,C lies on

a A straight line
b A circle
c A parabola
d An ellipse

2. if the complex numbers z_1,z_2 and origin form vertices of an equilateral triangle,then the value of $z_1^2 + z^2_2$

a z_1z_2 b z_1+z_2

c $2z_1z_2$ d z_1-z_2

3. Three numbers form an increasing GP.If the middle term is doubled, then the new numbers are in AP.The common ratio of the GP will be

a $2 - \sqrt{3}$ b $2 \pm \sqrt{3}$

c $3 \sqrt{2}$ d $3 + \sqrt{2}$

4. If the equations $ax^2+2cx+b=0$ and $ax^2+2bx+c= 0$, $b \neq c$ have a common root, then the value of a+4b+4c will be

a -2 b 1

c -1 d None of these

5. If one root of $ax^2+bx+c = 0$ as twice the other root, then

a $b^2 = 9ac$ b $2b^2 = 9ac$

c $2b^2 = ac$ d $b^2 = ac$

6. The number of ways of distributing 8 distinct toys among 5 children will be

a 5^8 b 8^5

c 8_{p_5} d 40

7. The value of $C_1 - 2.C_2 + 3.C_3 - 4.C_4 + \ldots$ Where $C_r = n_{C_r}$ will be

a -1 b 1

c 0 d None of these

8. If the equations

$2x-y+2z = 2$

$x-2y+z = -4$

$x+y+\lambda z = 4$

have no solution, then the value of λ will be

a 1 b 2

c:) 3 (d) -4

9. If A = $\begin{bmatrix} \alpha & 0 \\ 1 & 1 \end{bmatrix}$, B = $\begin{bmatrix} 1 & 0 \\ 5 & 1 \end{bmatrix}$, then the value of α, if A^2=B will be

a 4 b 3

c 5 d None of these

10. The probability that at least one of the events A and B occurs is 0.6. If A and B occur simultaneously with probability 0.2, then P $\bar{A}$) + P($\bar{B}$) will be

a 1.1 b 1.3 c 1.2 d 0.8

11. If $\sin^{-1}\frac{1}{5} + \cos^{-1} x = 1$, then x is

a $\frac{1}{5}$ b $\frac{2}{5}$

c $\frac{3}{5}$ (d) $\frac{\pi}{2}$

12. The value of $\tan\left[cos^{-1}\left(\frac{4}{5}\right) + tan^{-1}\left(\frac{2}{3}\right)\right]$ will be

a $\frac{6}{11}$ b $\frac{6}{17}$

c $\frac{11}{6}$ d|) $\frac{17}{6}$

13. In a $\triangle$ABC, if $\tan\frac{A}{2} = \frac{5}{6}$ and $\tan\frac{C}{2} = \frac{2}{5}$, then the sides a,b,c are in

a AP b GP

c HP d None of these

14. The value of

$\cos\left(\frac{\pi}{5}\right)\cos\left(\frac{2\pi}{5}\right)\cos\left(\frac{4\pi}{5}\right)\cos\left(\frac{8\pi}{5}\right)$ will be

a $\frac{1}{16}$ b $-\frac{1}{16}$

c 0 d $\frac{1}{2}$

15. The distance between the lines 3x+8y = 15 will be

a $\frac{3}{2}$ b $\frac{3}{8}$

c $\frac{3}{10}$ d 6

16. If the algebraic sum of the perpendicular distances from the points 2,0,0,2 and 1,1 on a variable line is zero ,then the line will pass through the fixed point

a 1,2 b a straight line

c 0,0 d 2,1

17. The locus of the point of intersection of the lines x $\cos\alpha$ + y $\sin\alpha$ = p and x $\sin\alpha$ - y $\cos\alpha$ = q α is a variable will be

a a circle b a straight line

c a parabola d an ellipse

18. The locus of the mid points of the chords of a circle which subtend a right angle at its centre equation of the circle is $x^2+y^2 = a^2$ will be

a $x^2+y^2= 3a^2$ b $x^2+y^2=\frac{a^2}{3}$

c $2x^2+y^2 = a^2$ c $4x^2+y^2 = a^2$

19. If the line 3x-2y+p = 0 is normal to the circle x^2+y^2 = 2x-4y-1,then p will be

a -5 b 7

b -7 d 5

20. If the two circles $x^2+y^2-10x+16 = 0$ intersect at two ral points, then

a $1<r<7$ b $3<r<10$

c $2<r<9$ d $2<r<8$

21. The equation of the tangent to the parabolas $y^2= 2x$ and $x^2=16y$ will be

a $x+y+2=0$ b $x -3y+1=0$

c $x+2y -2 = 0$ d $x+2y+2 = 0$

22. The equation of the tangent to the parabola $y^2 = 8x$, which is parallel to the line 2x-y+7=0,will be

a $y=x+1$ b $y=2x+1$

b $y = 3x+1$ d $y = 4x+1$

23. The distance of a point on ellipse $\frac{x^2}{6}+\frac{y^2}{2}= 1$ from its centre is 2. The eccentric is $\sqrt{2}$ angle of the point will be

a $\frac{\pi}{4}$ or $\frac{\pi}{3}$ b $\frac{\pi}{3}$ or $\frac{3\pi}{5}$

c $\frac{\pi}{4}$ or $\frac{3\pi}{4}$ d None of these

24. The distance between the foci of a hyperbola is 16 and its eccentricity is $\sqrt{2}$ .Its equation will be

a $x^2-y^2= 1$ b $x^2-y^2=20$

c $x^2-y^2= 4$ d $x^2-y^2=32$

25. The vector of magnitude 9 unit perpencular to the vectors $4\hat{i} - \hat{j} +3\hat{k}$ and $-2\ \hat{i} + \hat{j} - 2\hat{k}$ will be

a $3\ \hat{i} + 6\hat{j} -6\hat{k}$ b $-3\hat{i} + 6\hat{j} +6\hat{k}$

c $3\hat{i} -\hat{5j} +5\hat{k}$ d $\hat{i}+ 6\hat{j} +6\hat{k}$

26. If $\vec{a}x\vec{b} = \vec{c}$ x $\vec{b} \neq \vec{b}$, then $\vec{a} - \vec{c}$ will be equal to

a k $\vec{b}$ b k $\vec{t}$

c k $\vec{c}$ d k($\vec{a}+\vec{b}$

27. The value of of 'λ' so that the vectors $\hat{i}-3\hat{j}+\hat{k}$, $2\hat{i}+ \lambda\ \hat{j}+\hat{k}$ and $3\hat{i}+\hat{j}-2\hat{k}$ are coplanar, will be

a 0 c 2

c $-\frac{1}{2}$ d -4

28. The line passing through the point -1, 2, 3 and perpendicular to the plane x -2y+3z+5 = 0 will be

a $\frac{x+1}{1}=\frac{y-2}{3}=\frac{z-3}{5}$

b $\frac{x+1}{1}=\frac{y-2}{3}=\frac{z+3}{3}$

c $\frac{x+1}{1}=\frac{y-2}{3}=\frac{z-3}{2}$

d $\frac{x+1}{1}=\frac{y-2}{-2}=\frac{z-3}{3}$

29. The value of k, if the line $\frac{x-4}{1}=\frac{y-2}{1}=\frac{z-k}{1}$ lies on the plane 2x-4y+z = 7, will be

a 5 b 7

c 9 d 11

30. If the line of intersection of the planes 2x+3y+z=1 and x+3y+2z = 2makes angle α with positive direction of x-axis , then cosα will be equal to

a $\frac{1}{\sqrt{2}}$ b $\frac{1}{\sqrt{5}}$

c $\frac{1}{\sqrt{7}}$ (d) $\frac{1}{\sqrt{3}}$

31. If y= $\tan^{-1}\sqrt{\frac{1-cosx}{1+cosx}}$, then $\frac{dy}{dx}$ will be

a sin x cos x b $\frac{\pi}{2}$

c $\frac{1}{2}$ (d) $\frac{1}{1+cos^2x}$

32. The value of $\lim_{x\to 1}(1-x \cdot \tan\left(\frac{\pi x}{2}\right)$ will be

a $\frac{\pi}{2}$ b $\frac{2}{\pi}$

c 2 π (d π

33. Let f(x = $\begin{cases}\frac{x^2-4x+3}{x^2+2x-3}, & x \neq 1 \\ k & x=1\end{cases}$ If f(x) is ontinuous at x=1 , then the value of k will be

a 1 b $\frac{1}{2}$ c -1 d $-\frac{1}{2}$

34. The point on the curve y= $2x^2$ -4x+5, at which the tengent is parallel to x-axis, will be

a 1,3 b -1,3

c 1, -3 d -1,-3

35. The point on $x^2 = 2y$, which is closest to the point 0,5 will be

a 2 $\sqrt{2}$, 0 b 0,0

c 2,2 d None of these

36. The interval, in which the function f(x = x^2e^{-x} is an increasing function, will be

a -∞,∞ b -2,0

c 2, ∞) (d) (0,2

37. Let f(x = $\begin{cases} x^n.sin\left(\frac{1}{x}\right), & x \neq 0 \\ 0, & x = 0 \end{cases}$ Then, f(x)s differentiable at x =0, if

a n ∈ 0,1 b n ∈ 1,2

c n ∈ 1, ∞ d n ∈ -∞, ∞

38. In which interval the function f(x = $\sqrt{log_{10}\left(\frac{5x-x^2}{4}\right)}$ is defined ?

a [1,4] b [0,5

c 0,1 d -1, ∞

39. The functioin f(x = sin x + cos x will be

a an even function b an odd function

c a constant function (None of these

40. The value of $\frac{\cos\sqrt{x}}{\sqrt{x}}$ dx will be

a 2sin $\sqrt{x}$ + c b 2cos $\sqrt{x}$ + c

c 2sin x + c d($\sqrt{2}$sin x + c

41. The valueb of $\int_2^3 \frac{\sqrt{x}}{\sqrt{5-x}+\sqrt{x}}$ dx will be

a $\frac{\sqrt{3}}{2}$ b $\frac{1}{\sqrt{2}}$

c $\frac{1}{2}$ d $\frac{1}{\sqrt{3}}$

42. The area common to the curves $y^2 = x$ and $x^2 = y$ will be

a 1 1q unit b $\frac{2}{3}$ sq unit

c $\frac{1}{4}$ sq unit d $\frac{1}{3}$ sq unit

43. If $x+y \leq 2$; $x \geq 0$; $y \geq 0$, then the point, at which the maximum value of $3x+2y$ is attained, will be

a 0,0 b $\left(\frac{1}{2},\frac{1}{2}\right)$

c 2,0 d 0,2

44. The maximum value of $p = 6x+8y$, if $2x+y \leq 30$; $x+2y \leq 24$, $x \geq 0, y \geq 0$, will be

a 90 b 120

c 96 d 240

45. regression of saving s of a family on income y may be expressed as $s = a + \frac{y}{m}$, where a and m are constants. In a random sample of 100 families the variance of saving is one quarter of the variance of incomes and the correlation coefficient is found to be 0.8, the value of m is

a 0.8 b 1.25

c 0.25 d (d) he of these

46. The integral $\int_1^{10} x^3$ dx is approximately evaluated by Trapezoidal rule $\int_1^{10} x^3 = 3\left[\frac{1+10^3}{2} + \alpha + 7^3\right]$ for n=3, then the value of α is

a 4^3 b 4^2

c 5^3 d None of these

47. The solution of the equation $\log_7 \log_5 \sqrt{x^2+5+x} = 0$ is

a x = -2 b x = 2

c x = 4 d x =5

48. A balloon is coming down at the arate of 4m/min and its angle of elevation is 45^0 from a point on the ground which has been reduced to 30^0, after 10 min . Balloon will be on the ground at a distance of how many meters from the observer ?

a 20 $\sqrt{3}$ m b 203+ $\sqrt{3}$m

c 103+ $\sqrt{3}$m **d** None of these

49. A fair coin is tossed n times. If the probability of getting 7 heads is equal to the probability of getting 9 heads,then the value of n will be

a 8 **c** 13

c 15 **d** None of these

50. The probabilities of solving a equation by three students are $\frac{1}{2},\frac{1}{4},\frac{1}{6}$ respectively. What is the probability. What is the probability that the equation is solved ?

a $\frac{35}{48}$ **b** $\frac{1}{48}$

c $\frac{11}{16}$ **d** $\frac{2}{11}$