BOOKLET SERIES

C

14/04/2019

AFFIX PRESCRIBED RUBBER STAMP

CODE :DEF-03/2019

Test Topic : PAIR OF STRAIGHT LINE QUADRATIC EQUATION AND BIONOMIAL THEOREM

MATHEMATICS

ROLL NO. (In figure) | | | | | | | | | | OMR SRIAL NO. | | | | | | | |

(Only in english)

OMR SERIAL NO. (In words).....

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NAME OF THE CENTRE .....

TIME : 1 Houre

MM : 100

Signature of the invigilator

IMPORTANT INSTRUCTIONS

1- The candidate will write his/her Roll No. only at the place provided for i.e. on the cover page and on answer sheet given and nowhere else.

2- Immediately on the receipt of the question booklet, the condidate all the pages and that on question is missing. If there is any discrepancy, it should be reported by the candidate to the ivigilator within 10 minutes of issue of this question booklet without any discrepancy be obtained.

vko';d funsZ'k

1- vH;FkhZ viuk vudekd doy vkoj.k i'B rFkk i'u ifLrdk d lkFk fn;s x, mRrj&i=d d fufn"V LFkku ij fy[kx] vU;= dgh ughA

2- i'u ifLrdk feyu d mijkUr vH;FkhZ dk rjUr tkp dj lfuf'pr dj yuk pkfg, fd ifLrdk e ij i"B g rFkk dkbZ i'u NV rk ugh x;k gA ;fn dkbZ folxfr g rk i'u&ifLrdk feyu d 10 feuV d Hkhrj gh d{k fujh{kd dk lfpr djuk pkfg, rFkk =fV jfgr nljh ifLrdk ikIr dj yuh pkfg,A

Numer of Questions : 50

SHUKLA SIR MATHS CLASSES

M.M. : 100 **MATHS** **TIME : 1 Hour**

T.G.T / P.G.T **(SHUKLA SIR MOB - 7800731619**

Test Topic : PAIR OF STRAIGHT LINE, QUADRATIC EQUATION AND BIONOMIAL THEOREM

1. The equation $ax^2 + by^2 + cx + cy = 0, c \neq 0$ represents a pair of straight lines, If :

(a) $a + b = 0$ (b) $a + c = 0$ (c) $b + c = 0$ (d) None of these

2. The angle between the lines represented by $x^2 - y^2 = 0$ is :

(a) 0^0 (b) 45^0 (c) 90^0 (d) 180^0

3. The equation $3x^2 + 2hxy + 3y^2 = 0$ represents a pair of striaght lines passing through the origin. The two lines are

(a) real and distinct, if $h^2 > 3$ (b) real and distinct, if $h^2 > 9$

(c) real and distinct, if $h^2 = 0$ (d) real and distinct, if $h^2 > 3$

4. If $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents parallel lines, then :

(a) $hf = bg$ (b) $h^2 = ag$ (c) $a^2 f = b^2 g$ (d) None of these

5. The equation $8x^2 + 8xy + 2y^2 + 26x + 13y + 15 = 0$ represents a pair of straight lines. The distance between them is :

(a) $\frac{7}{\sqrt{5}}$ (b) $\frac{7}{2\sqrt{5}}$ (c) $\sqrt{\frac{7}{5}}$ (d) None of these

6. Independnet term in the expansion of $\left(2x + \frac{3}{x}\right)^{12}$ is :

(a) 165 (b) 265 (c) 65 (d) None of these

7. The sum of coeffecients in the expansion of $(x + y)^n$ is 33554432 then greatest coefficient in the expansion is:

(a) ${}^{24}C_{12}$ (b) ${}^{26}C_{13}$ (c) ${}^{27}C_{13}$ (d) ${}^{25}C_{12}$

8. Let T_n be the no. of quadrilateral formed by using non collinear points and $T_{n+1} - T_n = 56$, then n will be :

(a) 7 (b) 6 (c) 8 (d) 9

9. The number of terms in the exapansion of $(3x + y + z + t)^{20}$ is :

(a) 190 (b) 2100 (c) 25 (d) None of these

10. The cofficient of 10th term from the last in the expansion of $\left(3x^2 + \frac{5}{x}\right)^{65}$ is :

(a) 21000 (b) 51502 (c) 15500 (d) None of these

11. The pair of straight lines givne by $2x^2 + 3y^2 - 6xy + 2x - 3y + 5 = 0$ has only bisector as :

(c) $y^2 - 4xy + 2x + 1 = 0$ (d) none

12. The family of straight lines $(2a+3b)x+(a-b)y+2a-4b=0$ is concurrent at the point :

(a) $\left(\frac{2}{5},-\frac{14}{5}\right)$ (b) $\left(\frac{-2}{5},\frac{-14}{5}\right)$ (c) $\left(-\frac{2}{5},\frac{14}{5}\right)$ (d) $\left(\frac{2}{5},\frac{14}{5}\right)$

13. If m_1 and m_2 are the slopes of the lines represented by the equation $ax^2+2hxy+by^2=0$, then the value of m_1+m_2 is :

(a) $\frac{2h}{b}$ (b) $-\frac{2h}{b}$ (c) $\frac{2h}{a}$ (d) $-\frac{2h}{a}$

14. The difference of the tangent of the angle which the lines $x^2(\sec^2\theta-\sin^2\theta)-2xy\tan\theta+y^2\sin^2\theta=0$ make with x-axis is :

(a) $2\tan\theta$ (b) 2 (c) $2\cot\theta$ (d) $\sin 2\theta$

15. Which of the following pair of straight lines intersect at right angle?

(a) $2x^2=y(x+2y)$ (b) $(x+y)^2=x(y+3x)$ (c) $2y(x+y)=xy$ (d) $y=\pm 2x$

16. The equation $\frac{a}{x-a}+\frac{b}{x-b}=1$ has roots equal in magnitude but opposite in sign, then the value of $a+b$ is :

(a) -1 (b) 0 (c) 1 (d) None of these

17. If a,b,p,q are non-zero numbers, then the two equations $2a^2x^2-2abx+b^2=0$ and $p^2x^2+3pqx+q^2=0$, have :

(a) no common root (b) one common roots, iff $2a^2+b^2=p^2+q^2$

(c) two common roots, iff $3pq=2ab$ (d) two common roots, iff $3qb=2ap$

18. If *a, b, c* are real and the difference between the roots of the quadratic equation $ax^2+bx+c=0$ is less than 2, then Δ, the discriminant satisfies by the realtion :

(a) $0\le\Delta<4a^2$ (b) $4a^2<\Delta$ (c) $\Delta=4a^2$ (d) none of these

19. If $a(p+q)^2+2bpq+c=0$ and $a(p+r)^2+bpr+c=0$ then qr equals :

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

20. The number of real roots of the equation $\left(x+\frac{1}{x}\right)^3+\left(x+\frac{1}{x}\right)=0$ is :

(a) 2 (b) 0 (c) 1 (d) 3

21. The value of a for which one root of the equation $x^2=(a+1)x+a^2+a-8=0$ exceeds 2 and the other is less than 2 are given by :

(a) $a>3$ (b) $0<a<10$ (c) $-2<a<3$ (d) None of these

22. The equation $(3-x)^4+(2-x)^4=(5-2x)^4$ has :

d two non-real roots (d) None

23. If α and β are two roots of the quadratic equations $x^2 + px + 1 = 0$ and γ, δ are the roots of $x^2 + qx + 1 = 0$, then $(a-\gamma)(\beta-\gamma)(\alpha+\delta)(\beta+\delta) =$:

(a) $q^2 + p^2$ (b) $q^2 - p^2$ (c) $q^2 - 2p$ (d) None of these

24. If the equation $x^4 - 8x^3 + ax^2 + bx + 16 = 0$ has positive roots, then (a,b) is :

(a) $(2,4)$ (b) $(16,-24)$ (c) $(24,-32)$ (d) $(32,-24)$

25. The value of 'a' for which $(a^2-1)x^2 + 2(a-1)x + 2$ is positive for any x are :

(a) $a \geq 1$ (b) $a \leq 1$ (c) $a \geq -3$ (d) $a \leq -3$ or $a \geq 1$

26. If $b_1 b_2 = 2(c_1 + c_2)$, then at least one of the equations $x^2 + b_1 x + c_1$ and $x^2 + b_2 x + c_2$ has :

(a) real roots (b) purely imaginary roots (c) imaginary roots (d) none of these

27. Number of real solutions of the quation $\sin a^x \cos a^x = \dfrac{a^x + a^{-x}}{4}$ is :

(a) 1 (b) 2 (c) 3 (d) 0

28. The set of values of x, which satisfy $5x + 2 < 3x + 8$ and $\dfrac{x+2}{x-1} < 4$ is :

(a) $(2,3)$ (b) $(-\infty,1) \cup (2,3)$ (c) $(-\infty,1)$ (d) $(1,3)$

29. The condition that $x^3 - px^2 + qx - r = 0$ may have two of its roots equal to each other but of opposite singns is :

(a) $r = pq$ (b) $r = 2p^3 + pq$ (c) $r = p^2 q$ (d) None of these

30. If α is a roots of the equation $x^{11} - x^{10} + x^8 - x^7 + x^5 - x^4 + x^2 - x - 20 = 0$ then α^{12}

(a) is equal to 61 (b) is greater than 61 (c) is less than 61 (d) none of these

31. If α and β are the roots of $x^2 + x + 1 = 0$, then $2\alpha^{13} + 3\beta^{13}$ and $3\alpha^{31} + 2\beta^{31}$ are the roots of :

(a) $x^2 - x + 1 = 0$ (b) $x^2 + 5x + 7 = 0$ (c) $x^2 - 5x - 7 = 0$ (d) $x^2 + 5x - 7 = 0$

32. If $a + b + c = 0$ then the roots of the equation $3ax^2 + 4bx + 5c = 0$ are :

(a) positive (b) negative (c) real and distinct (d) complex

33. The quadratic equation with real coefficients one of those complex roots has the real part 12 and modules 13 is :

(a) $x^2 - 12x + 13 = 0$ (b) $x^2 - 24x + 13 = 0$ (c) $x^2 - 24x + 169 = 0$ (d) $x^2 - 24x - 169 = 0$

34. Solution of the equation $\log_5\left(5^{1/x} + 125\right) = \log_5 6 + \left(1 + \dfrac{1}{2x}\right)$ is :

(a) $\{2,4\}$ (b) $\left\{\dfrac{1}{2}, \dfrac{1}{4}\right\}$ (c) $\left\{2, \dfrac{1}{4}\right\}$ (d) $\left\{\dfrac{1}{2}, 4\right\}$

35. If x satisfies $|x-1| + |x-2| + |x-3| \geq 6$ then

(a) $x \leq x \leq 4$ (b) $x \leq -2$ or $x \geq 4$ (c) $x \leq 0$ or $x \geq 4$ (d) None of these

36. If α and β are roots of the equation $x^2 + px + q = 0$ and also of $x^{2n} + p^n x^n + q^n = 0$. If $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ are roots of $(x+1)^n + x^n + 1 = 0$, then *n* must be :

(a) an even integer (b) an odd integer (c) equal to 2 (d) none of these

37. The smallest +ve integer n, for which $n! < \left(\frac{n+1}{2}\right)^n$ holds is :

(a) 1 (b) 2 (c) 3 (d) 4

38. $2^{2n} - 7n - 1$ is divisible by

(a) 36 (b) 64 (c) 49 (d) 25

39. Coefficient of x^{-4} in $\left(\frac{3}{2} - \frac{3}{x^2}\right)^{10}$ is :

(a) $\frac{405}{226}$ (b) $\frac{504}{259}$ (c) $\frac{450}{263}$ (d) None of these

40. The number of dissimiliar terms in the expansion of $(a+b)^n$ is $n+1$, therefore number of dissimiliar terms in the expansion of $(a+b+c)^{12}$ is :

(a) 13 (b) 39 (c) 78 (d) 91

41. The power of x occuring in the 7th term in the expansion of $\left(\frac{4x}{5} - \frac{8}{5x}\right)^9$ is :

(a) 3 (b) -3 (c) 5 (d) -5

42. Sum of the coefficient in the expansion of $(ax^3 - 3x + 2)^{25}$ is equl to the sum of the coefficients in the expansions of $(x^2 - ay^2)^{25}$, then the value of *a* equals :

(a) -1 (b) 1 (c) 0 (d) none of these

43. In the expansion of $(1+x)^{11}$ the fifth term is 24 times the third term. Then the value of x^2 is :

(a) 4 (b) 9 (c) 16 (d) 24

44. Fifth term from the end in the expansion of $\left(\frac{x^3}{2} - \frac{2}{x^2}\right)^{12}$ is :

(a) $-7920x^{-4}$ (b) $7920x^{-4}$ (c) $7920x^4$ (d) $-7920x^4$

45. The sum of the series $\sum_{r=0}^{10} {}^{20}C_r$ is :

(a) 2^{20} (b) 2^{19} (c) $2^{19} + \frac{1}{2}{}^{20}C_{10}$ (d) $2^{10} - \frac{1}{2}{}^{20}C_{10}$

46. The coefficient of x^m in $(1+x)^p+(1+x)^{p+1}+.....+(1+x)^n$, $p \le m \le n$ is :

(a) ${}^{n+1}C_{m+1}$ (b) ${}^{n-1}C_{m-1}$ (c) ${}^{n}C_{m}$ (d) ${}^{n}C_{m+1}$

47. If $(1+x)^n = C_0 + C_1x + C_2x^2 + ...C_nx^n$, then ${C_0}^2 + {C_1}^2 + ... + {C_n}^2$ is equal to :

(a) ${}^{2n}C_n$ (b) ${}^{2n}C_{n-1}$ (c) ${}^{2n+1}C_n$ (d) ${}^{2n-1}C_n$

48. The coefficient of x^{50} in the expansion $(1+x)^{100}+2x(1+x)^{99}+3x^2(1+x)^{98}+...+1001x^{1000}$ is :

(a) ${}^{100}C_{50}$ (b) ${}^{1001}C_{50}$ (c) ${}^{1002}C_{50}$ (d) ${}^{1000}C_{50}$

49. If $n \in N$ such that $\left(7+4\sqrt{3}\right)^n = I+F$ where $I \in N$ and $0 < F < 1$, then the value of $(I+F)(I-F)$ is :

(a) 0 (b) 1 (c) 7^{2n} (d) 2^{2n}

50. The sum of all the coefficients of the expansion of $(x+y)^n$ is 1024. Then the greatest coefficient in the rth term, where r =

(a) 6 (b) 5 (c) 4 (d) None

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14-04-2019

MATH TEST – ANSWERS

TOPIC : STRAIGHT LINE AND COMPLEX NUMBER

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