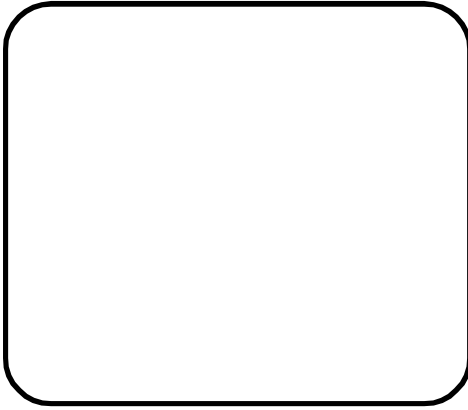


BOOKLET SERIES



REVISION TEST -1

21/04/2019

AFFIX PRESCRIBED RUBBER STAMP

CODE :DEF-04/2019

Test Topic : FUNCTIONS,STRAIGHT LINE PAIR OF STRAIGH LIEN, COMP, QUAD, BIONOMIAL

MATHEMATICS

ROLL NO. (In figure)

Grid for Roll No. (8 boxes)

OMR SRIAL NO.

Grid for OMR Serial No. (6 boxes)

(Only in english)

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

NAME OF THE CENTRE .....

TIME : 2 Houre

MM : 200

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 ques-tion booklet without any discrepancy be obtained.

vko' ; d funzk

- 1- vH; Fkz vi uk vuped day vkoj.k i'B rFkk izu i qLrdk dsl kFk fn; sx, mRrj&i =d dsfufn'V LFkku ij fy [kx] vU; = dgha ughA
2- izu i qLrdk feyus ds mi jkUr vH; Fkz dks rjUr tkp dj l fuf'pr dj yuh pkfg, fd i qLrdk ea i jsi "B gsrFkk dkbz izu NW rksugha x; k gA ; fn dkbz fol xfr gsrks izu&i qLrdk feyus ds 10 feuV ds Hkhrj gh d{k fujh{k dks l fpr dj uk pkfg, rFkk =qV jfgr nu jh i qLrdk i klr dj yuh pkfg, A

Numer of Questions : 100

BRAHM IAS ( NEAR COLNELGANJ POLICE STATION ALLAHABAD ) Mob. 7800731619 website: www.shuklasirmaths.com

# SHUKLA SIR MATHS CLASSES

M.M. : 200

MATHS

TIME : 2 Hour

T.G.T / P.G.T

(SHUKLA SIR MOB - 7800731619)

Test Topic : FUNCTIONS, STRAIGHT LINE, PAIR OF STRAIGHT LINES, COMPLEX, QUADRATIC, BINOMIAL THEOREM

- Which of the following functions from  $\mathbb{Z}$  to itself are bijections?  
(a)  $f(x) = x^3$  (b)  $f(x) = x + 2$  (c)  $f(x) = 2x + 1$  (d)  $f(x) = x^2 + x$
- Which of the following functions from  $A = \{x : -1 \leq x \leq 1\}$  to itself are bijections?  
(a)  $f(x) = \frac{x}{2}$  (b)  $g(x) = \sin\left(\frac{\pi x}{2}\right)$  (c)  $h(x) = |x|$  (d)  $k(x) = x^2$
- If the function  $f : \mathbb{R} \rightarrow A$  given by  $f(x) = \frac{x^2}{x^2 + 1}$  is a surjective, then A equals to :  
(a)  $\mathbb{R}$  (b)  $[0, 1]$  (c)  $(0, 1]$  (d)  $[0, 1)$
- Let  $f : \mathbb{R} \rightarrow \mathbb{R}$  be a function defined by  $f(x) = \cos(5x + 2)$ . Then  $f$  is :  
(a) injective (b) surjective (c) bijective (d) None of these
- If a function  $f : [2, \infty) \rightarrow B$  defined by  $f(x) = x^2 - 4x + 5$  is a bijection, then B equals to :  
(a)  $\mathbb{R}$  (b)  $[1, \infty)$  (c)  $[4, \infty)$  (d)  $[5, \infty)$
- Let  $f(x) = \frac{ax + b}{cx + d}$ , then  $f \circ f(x) = x$ , provided that :  
(a)  $d = -1$  (b)  $d = a$  (c)  $a = b = 1$  (d)  $a = b = c = d = 1$
- If  $f : \mathbb{R} \rightarrow \mathbb{R}$ , defined by  $f(x) = x^2 + 1$ , then the values of  $f^{-1}(17)$  and  $f^{-1}(3)$  respectively are :  
(a)  $\phi, \{4, -1\}$  (b)  $\{3, -3\}, \phi$  (c)  $\{4, -4\}, \phi$  (d)  $\{4, -4\}, \{2, -2\}$
- Let  $f(x) = x$  and  $g(x) = |x|$  for all  $x \in \mathbb{R}$ . Then the function  $\phi(x)$  satisfying :  
 $[\phi(x) - f(x)]^2 + [\phi(x) - g(x)]^2 = 0$  is :  
(a)  $\phi(x) = x, x \in [0, \infty)$  (b)  $\phi(x) = x, x \in \mathbb{R}$   
(c)  $\phi(x) = -x, x \in [-\infty, 0)$  (d)  $\phi(x) = x + |x|, x \in \mathbb{R}$
- Let  $A = \{x : -1 \leq x \leq 1\}$  and  $f : A \rightarrow A$  be a function such that  $f(x) = \sin \pi x$ , then  $f$  is :  
(a) one-one and onto (b) one-one and into (c) many one and onto (d) None of these
- Let  $f$  and  $g$  be two real functions such that  $f(x) = x^2$  and  $g(x) = 2x$ , then :  
(a)  $g \circ f = f + f$  (b)  $g \circ f = g + g$  (c)  $f \circ g = g + g$  (d)  $f \circ g = f + f$
- The function  $f(x) = \log(x + \sqrt{x^2 + 1})$  is :

- (a) neither on even nor an odd function (b) an even function  
 (c) an odd function (d) a periodic function
12. The function  $f : R \rightarrow R$  defined by  $f(x) = \sin x$  is :  
 (a) into (b) onto (c) one-one (d) many-one
13. If  $g(x) = x^2 + x - 2$  and  $\frac{1}{2}(g \circ f)(x) = 2x^2 - 5x + 2$ , then  $f(x)$  is equal to :  
 (a)  $2x - 3$  (b)  $2x + 3$  (c)  $2x^2 + 3x + 1$  (d)  $2x^2 - 3x - 1$
14. Let the function  $f$  be defined by  $f(x) = \frac{2x+1}{1-3x}$ , then  $f^{-1}(x)$  is :  
 (a)  $\frac{x-1}{3x+2}$  (b)  $\frac{3x+2}{x-1}$  (c)  $\frac{x+1}{3x-2}$  (d)  $\frac{2x+1}{1-3x}$
15. If  $f(x) = \log\left(\frac{1+x}{1-x}\right)$ , then  $f(x)$  is :  
 (a) even (b)  $f(x_1)f(x_2) = f(x_1 + x_2)$  (c)  $\frac{f(x_1)}{f(x_2)} = f(x_1 - x_2)$  (d) odd
16. If  $f(x) = \frac{2x+1}{3x-2}$ , then  $f(2)$  is equal to :  
 (a) 1 (b) 3 (c) 4 (d) 2
17. If  $f(x) = x - x^2 + x^3 - x^4 + \dots$  to  $\infty$  for  $|x| < 1$ , then  $f^{-1}(x)$  equal to :  
 (a)  $\frac{x}{1+x}$  (b)  $\frac{x}{1-x}$  (c)  $\frac{1-x}{x}$  (d)  $\frac{1}{x}$
18. If  $f(x) = \log\left(\frac{1-x}{1+x}\right)$ , then  $f(a) + f(b)$  equal to :  
 (a)  $f\left(\frac{a-b}{1+ab}\right)$  (b)  $f(ab)$  (c)  $f\left(\frac{a+b}{1+ab}\right)$  (d)  $f(a) + f(b)$
19. If  $f : R \rightarrow R$  is defined by  $f(x) = 2x + |x|$ , then  $f(2x) + f(-x) - f(x) =$   
 (a)  $2x$  (b)  $2|x|$  (c)  $-2x$  (d) None of these
20. If  $f : R \rightarrow R$ ,  $g : R \rightarrow R$  and  $h : R \rightarrow R$  is such that  $f(x) = x^2$ ,  $g(x) = \tan x$  and  $h(x) = \log x$  then the value of  $[h \circ (g \circ f)]$ , if  $x = \frac{\sqrt{\pi}}{2}$  will be :  
 (a) 0 (b) 1 (c) -1 (d) 10
21. The function  $f(x) = 10^x$  from  $R$  to  $[0, \infty)$ , is :  
 (a) one-one and onto (b) one-one and into (c) a constant function (d) an identity function

22. The straight lines  $x + y = 0$ ,  $3x + y - 4 = 0$  and  $x + 3y - 4 = 0$  form a triangle, which is :  
 (a) isosceles (b) equilateral (c) right angled (d) none of these
23. The number of lines that are parallel to  $2x + 6y - 7 = 0$  and have an intercept 10 between the co-ordinate axis is  
 (a) 1 (b) 2 (c) 4 (d) infinity many
24. If a, b, c are in A.P. then  $ax + by + c = 0$  represents :  
 (a) a straight line (b) a family of concurrent line (c) a family of parallel lines (d) None of these
25. If the points (1, 3) and (5, 1) are two opposite vertices of a rectangle and the other two vertices lie on the line  $y = 2x + c$  then the value of c is :  
 (a) 4 (b) -4 (c) 2 (d) None of these
26. Line L has intercepts a and b on the co-ordinate axes. When the axes are rotated through a given angle, keeping the origin fixed, the same line has intercepts p and q. Then :  
 (a)  $a^2 + b^2 = p^2 + q^2$  (b)  $\frac{1}{a^2} + \frac{1}{b^2} = \frac{1}{p^2} + \frac{1}{q^2}$  (c)  $a^2 + p^2 = b^2 + q^2$  (d)  $\frac{1}{a^2} + \frac{1}{p^2} = \frac{1}{b^2} + \frac{1}{q^2}$
27. The larger of two angles made with x-axis of a straight line drawn through (1, 2) so that it intersects  $x + y = 4$  at a distance  $\frac{\sqrt{6}}{3}$  from (1, 2) is :  
 (a)  $105^\circ$  (b)  $75^\circ$  (c)  $60^\circ$  (d)  $15^\circ$
28. 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
29. For what value of k is  $4x^2 + 8xy + ky^2 = 9$  the equations of a pair of straight lines ?  
 (a) 0 (b) 4 (c) 9 (d) -9
30. The angle between the lines represented by  $x^2 - y^2 = 0$  is :  
 (a)  $0^\circ$  (b)  $45^\circ$  (c)  $90^\circ$  (d)  $180^\circ$
31. 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
32. The line passing through (0, 1) and perpendicular to the line  $x - 2y + 11 = 0$  is :  
 (a)  $2x + y - 2 = 0$  (b)  $2x + y - 1 = 0$  (c)  $2x - y + 3 = 0$  (d)  $2x - y + 1 = 0$
33. The coefficient of  $x^{53}$  in the expansion  $\sum_{m=0}^{100} {}^{100}C_m (x-3)^{100-m} \cdot 2^m$  is :  
 (a)  ${}^{100}C_{43}$  (b)  $-{}^{100}C_{53}$  (c)  ${}^{100}C_{53}$  (d)  $-{}^{100}C_{100}$
34. The sum of the coefficients in the expansion of  $(1 + 5x - 7x^3)^{3165}$  is :  
 (a) 1 (b)  $2^{3165}$  (c)  $2^{3164}$  (d) -1

35. The value of :  $\frac{(18^3 + 7^3 + 3.18.7.25)}{3^6 + 6.243.2 + 15.81.4 + 20.27.8 + 15.9.16 + 6.3.32 + 64}$  is :
- (a) 0 (b) 1 (c) 2 (d) None of these
36. If , in the expansion of  $(1+x)^m(1-x)^n$ , the coefficient of  $x$  and  $x^2$  are 3 and  $-6$  respectively, then  $m$  is =
- (a)  $-6$  (b) 9 (c) 12 (d) 24
37. Let  $R = (5\sqrt{5} + 11)^{2n+1}$  and  $f = R - [R]$  where  $[ ]$  denotes the greatest integer function. Then  $Rf =$
- (a)  $2^{2n+1}$  (b)  $2^{4n+1}$  (c)  $4^{2n+1}$  (d) None of these
38. If  $s_n = \sum_{r=0}^n \frac{1}{{}^nC_r}$  and  $t_n = \sum_{r=0}^n \frac{r}{{}^nC_r}$  then  $\frac{t_n}{s_n}$  is :
- (a)  $n-1$  (b)  $\frac{1}{2}n-1$  (c)  $\frac{1}{2}n$  (d)  $\frac{2n-1}{2}$
39. The sum  $\sum_{i=0}^m \binom{10}{i} \binom{20}{m-i}$ , where  $\binom{p}{q} = 0$  if  $p < q$  is the maximum when  $m$  is :
- (a) 5 (b) 10 (c) 15 (d) 20
40. Find coefficient of  $t^{32}$  in the expansion of  $(1+t^2)^{12}(1+t^{12})(1+t^{24})$  is :
- (a)  ${}^{12}C_6 + 2$  (b)  ${}^{12}C_5$  (c)  ${}^{12}C_6$  (d)  ${}^{12}C_7$
41. If  $a+b+c=0$  and  $a, b, c$  are rational, then the roots of the equation  $(b+c-a)x^2 + (c+a-b)x + (a+b-c) = 0$  are :
- (a) rational (b) irrational (c) imaginary (d) equal
42. The set of values of  $p$  for which the roots of the equation  $3x^2 + 2x + p(p-1) = 0$  are of opposite sign is :
- (a)  $(-\infty, 0)$  (b)  $(0, 1)$  (c)  $(1, \infty)$  (d)  $(0, \infty)$
43. The value of  $m$  for which the roots of the equation  $x^2 + (m-2)x + m+2 = 0$  are in ratio 2:3, is
- (a)  $\frac{1}{2}$  (b)  $-\frac{1}{2}$  (c)  $\frac{26}{3}$  (d)  $-\frac{26}{3}$
44. If the equation  $ax^2 + bx + c = 0$  and  $x^2 + 2x + 3 = 0$  have a common root, then  $a : b : c =$
- (a) 2 : 4 : 5 (b) 1 : 3 : 4 (c) 1 : 2 : 3 (d) None of these
45. In a quadratic equation with leading coefficient 1, a student reads the coefficient 16 of  $x$  wrongly as 19 and obtain the roots as -15 and -4. The correct roots are
- (a) 6, 10 (b) -6, -10 (c) -7, -9 (d) None of these
46.  $7^{\log_7(x^2-4x+5)} = x-1$ ,  $x$  may have values
- (a) 2, 3 (b) 7 (c) -2, -3 (d) 2, -3