Sample Paper 01: Public Service Commission

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This is a sample paper for the post of Lecturer or Subject Specialist or any other equivalent position.

General Knowledge

1. The largest country of the world population wise is
   (A) USA (B) China (C) Canada (D) Russia

2. The capital of Australia is
   (A) Andorra (B) Canberra (C) Kabul (D) Tirana

3. Alexandria is the second most populated city in Egypt located on the
   (A) Indus Delta (B) Ganga Delta (C) Mile Delta (D) Amazon Delta

4. The first round of China Japan war was during
   (A) 1994-95 (B) 1931-33 (C) 1937-45 (D) 1945-48

5. Kurds are inhabitants of northern Iraq, Turkey, Iran, Parts of Syria and
   (A) Germany (B) Greece (C) Ethiopia (D) Azerbaijan

6. The best period a country or literature is called
   (A) Augustan Age (B) Golden Age (C) Dark Age (D) Bronze Age

7. Which of the following groups suffer the most from inflation
   (A) Debtors (B) Business class (C) Creditors (D) Holders of real assets

8. Which prime minster of Pakistan face the supreme court for Panama paper
   (A) Liaqat Ali Khan (B) Yousaf Raza Gillani (C) Raja Pervaiz Ashraf (D) Mian Nawaz Sharif

9. Who among are the following are not protected against inflation
   (A) Salaried class (B) Industrial workers (C) Pensioners (D) Agricultural farmers

10. Who is the author of "*Akbar Nama*"
    (A) Arthur Conan Doyle (B) Mark Twain (C) Abdul Fazal (D) Kautilya

11. To which Prophet did Jews call the son of Allah
    (A) Hazrat Haroon (A.S) (B) Hazrat Essa (A.S) (C) Hazrat Moossaa (A.S) (D) Hazrat Ozair (A.S)

12. Percentage of the nitrogen gas in the air is
    (A) 40 (B) 68 (C) 78 (D) 85

13. Green vegetable are good source of
(A) Minerals and Vitamins (B) Protein (C) Fat and Oil (D) Starch

14. The farthest planet from sun is
(A) Jupiter (B) Mercury (C) Pluto (D) Saturn

15. Who was not the president of Pakistan
(A) Nawabzada Nasrullah Khan (B) Pervaz Musharaf (C) Zulfiqar Ali Bhutto (D) Muhammad Zia-ul-Haq

16. When did Paksitan become Islamic Republic (A) 1947 (B) 1956 (C) 1962 (D) 1973

17. Which part of the word is called "land of free people"
(A) UK (B) Thailand (C) West Indies (D) Pakistan

18. World largest desert in area is
(A) Sahara (B) Arabia (C) Gobi (D) Mogave

19. What is subway
(A) underground passage (B) a road or path raised above ground level (C) short passage to any place (D) none

20. Which is the largest river of Pakistan
(A) Chinab (B) Jehlum (C) Nelum (D) Sind

Mathematics

21. $\sin \frac{\pi}{2} = ?$
(A) 0 (B) 1 (C) 2 (D) $\frac{\pi}{2}$

22. Which of the following is continuous for all values of x?
(A) $\frac{1}{x^2-1}$ (B) $\frac{1+\cos x}{3+\sin x}$ (C) $\frac{x}{\sin x}$ (D) $\frac{x}{1+\sin x}$

23. What was the color of the bus driver's eyes?
(A) Green (B) Yellow (C) Blue (D) Red

24. Least upper bound of $f(x)$ is $2x^2, 0 < x < 2$ is?
(A) 0 (B) 2 (C) 8 (D) None of these

25. Any two conjugate subgroup of a group G are?
(A) Equivalent (B) Similar (C) Isomorphic (D) None of these

26. If $\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix}^n - \begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}^n = \begin{bmatrix} 0 & 6 \\ -6 & 0 \end{bmatrix}$ then n =?
(A) -7 (B) -5 (C) 5 (D) 6

27. nZ is a maximal ideal of a ring Z if and only if n is ..... ?
(A) a prime number (B) composite number (C) natural number (D) None of these

28. If a die is thrown twice, the probability of occurrence of 4 at least once is:
(A) $\frac{11}{36}$ (B) $\frac{7}{12}$ (C) $\frac{35}{36}$ (D) None of these

29. If a vector space is **V** has a base of n vectors, then every basis of **V** must consist of exactly ..... vectors.
(A) $n+1$ (B) n (C) $n-1$ (D) None of these

30. The complex matrix A= $\begin{bmatrix} 2 & 2+i \\ 2-i & 6 \end{bmatrix}^n$ has which one of the following as an eigenvalue?
(A) -1 (B) 3 (C) 7 (D) i

31. A problem in mathematics is given to three students A,B,C and their respective probability of solving the problem is $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$. Probability that the problem is solved is ?
(A) $\frac{3}{4}$ (B) $\frac{1}{2}$ (C) $\frac{2}{3}$ (D) $\frac{1}{3}$

32. If $\alpha \neq \beta$ and $\alpha^2 = 5\alpha - 3$, $\beta^2 = 5\beta - 3$, then the equation having $\frac{\alpha}{\beta}$ and $\frac{\beta}{\alpha}$ as its roots is ?
(A) $3x^2+19x+3=0$ (B) $3x^2-19x+3=0$ (C) $3x^2+19x-3=0$ (D) $3x^2-16x+1=0$

33. The eigenvalues of a matrix $\begin{bmatrix} 2 & b \\ 3 & -1 \end{bmatrix}^n$ are -4 and $b-1$. Find b?
(A) 2 (B) 3 (C) 4 (D) 6

34. How many generators does the graph $(Z_{24}, +)$ have?
(A) 2 (B) 6 (C) 8 (D) 10

35. The number of conjugacy classes of a symmetric group of degree 3 is ..... ?
(A) 0 (B) 2 (C) 3 (D) 4

36. What are Zero divisors in the ring integers modulo 6?
(A) $\bar{1}, \bar{2}, \bar{4}$ (B) $\bar{0}, \bar{2}, \bar{3}$ (C) $\bar{0}, \bar{2}, \bar{4}$ (D) $\bar{2}, \bar{3}, \bar{4}$

37. If 1, $\frac{1}{2}\log_3(3^{1-x}+2)$, $\log_3(4.3^x-1)$ are in A.P. then x is equal to ?
(A) $\log_3 4$ (B) $1-\log_3 4$ (C) $1-\log_4 3$ (D) $\log_4 3$

38. Which of the following group is cyclic?
(A) $Z_2 \times Z_4$ (B) $Z_2 \times Z_6$ (C) $Z_3 \times Z_4$ (D) $Z_3 \times Z_6$

39. $\lim_{n\to\infty} \frac{1+2(10)^n}{5+3(10)^n} = ?$
(A) $\frac{1}{5}$ (B) $\frac{2}{3}$ (C) $\frac{3}{8}$ (D) ∞

40. $\lim_{n\to\infty} \frac{\sqrt{1-cos2x}}{\sqrt{2}x} = ?$
(A) 1 (B) -1 (C) 0 (D) does not exist

41. Set of square matrices of order 3 forms a .....?
(A) groupoid (B) semi group (C) momoid (D) group

42. The dimension of the row space or column space of a matrix is called the ..... of the matrix.
(A) Basis (B) Null space (C) Rank (D) None of these

43. $(\underline{a} \times \underline{b}) \times \underline{c}$ is a vector lying in the plane containing vectors.
(A) $\underline{a}$,$\underline{b}$ and $\underline{c}$ (B) $\underline{a}$ and $\underline{c}$ (C) $\underline{b}$ and $\underline{c}$ (D) $\underline{b}$ and $\underline{a}$

44. $(p \wedge q) \longrightarrow p$ is a
(A) contradiction (B) tautology (C) simple proposition (D) none of these

45. In class of 100 students, there are 70 boys whose average marks in the subjects are 75. If the average marks of the complete class is 72, then what is the average of the girls?
(A) 73 (B) 65 (C) 68 (D) 74

46. Let X and Y be a vector space over the field F with $dimX = m$ and $dimY = n$ then the $dim\mathbf{H}om(X, Y)=$
(A) mn (B) n (C) n^m (D) m^2

47. The order and degree of the differential equation $(1 + 3\frac{dy}{dx})^{\frac{2}{3}} = 4\frac{d^3y}{dx^3}$ are
(A) $1, \frac{2}{3}$ (B) $3, 1$ (C) $3, 3$ (D) $1, 2$

48. Multiplicative identity in complex number is
(A) $(0, 0)$ (B) $(0, 1)$ (C) $(1, 0)$ (D) $(1, 1)$

49. 3 is
(A) An odd integer (B) Irrational number (C) Rational number (D) Imaginary number

50. Factorization of $9a^2 + 16b^2$ is
(A) $(3a - 4ib)(3a + 4ib)$ (B) $(3a - 4b)(3a + 4b)$ (C) $(3b - 4a)(3b + 4a)$ (D) $(3b - 4ia)(3b + 4ia)$

51. The value of $(a + bi)^3$ is
(A) a^3+b^3 (B) $a^3+3ab^2+3a^2b+b^3$ (C) $a^3-b^3-3ab(a+b)$ (D) $a^3-3ab^2+3a^2bi-b^3i$

52. If n is prime then $\sqrt{n}$ is
(A) Rational (B) Irrational (C) Natural number (D) Verbal no

53. p : Islamabad is capital of Pakistan
q: Lahore is not capital of Pakistan, the conjunction $p \wedge q$ is
(A) False (B) True (C) Not valid (D) Unknown

54. $p : 4 < 7$, q: 7¡11, the conjunction $p \wedge q$ is
(A) False (B) True (C) Not valid (D) Unknown

55. A disjunction of two statements p and q is true if

(A) p is false (B) Both p and q are false (C) One of p and q is true (D) q is false

56. An element b of a set B can be written as

(A) $b \subseteq B$ (B) $b < B$ (C) $b \in B$ (D) $B \in b$

57. If $A = \{1, 3, 4\}$, $B = \{c, a, f\}$ then $A \cap B = ?$

(A) $\{0\}$ (B) $\{c, a, f\}$ (C) ϕ (D) $\{1, 2, 3, 4, e, d, f\}$

58. If A is matrix of order $m \times n$ and B is a matrix of order $n \times p$ then order of AB is

(A) $p \times n$ (B) $n \times p$ (C) $p \times p$ (D) $m \times p$

59. Let $A = [a_{ij}]_{m \times n}$ If $a_{ij} = 0 \ \forall i \neq j$ and $a_{ij} \neq 0$ for some $i = j$ then matrix A is

(A) Diagonal matrix (B) Symmetric matrix (C) Hermitian matrix (D) None of these

60. If a system of equation has a unique solution or infinitely many solutions then it is known as

(A) Consistent (B) Inconsistence (C) None linear (D) None

61. Minimum number of equation for any system of equations

(A) $|A| \neq 0$ (B) $|A| = 0$ (C) $|A| = \infty$ (D) None

62. The leading diagonal or main diagonal of a square matrix known as

(A) The secondary diagonal (B) The principal diagonal (C) Both a and b (D) None of these

63. If n is a nonnegative integer, Then $a_n x^n + ... + a_1 x + a_o$ is a

(A) Polynomial of degree 3 (B) Polynomial of degree n (C) Polynomial of degree 2 (D) Polynomial of degree 0

64. $7y^2 + 5\sqrt{y} + 3$ is a polynomial over

(A) Natural number (B) Integers (C) Rational number (D) None of these

65. Which is the root of the equation $x^4 - 9x^3 + 6x^2 + 2 = 0$

(A) 1 (B) 2 (C) -2 (D) -1

66. $x^2 + 4x + 4$ is

(A) Polynomial (B) Equaton (C) Identity (D) None of these

67. The product of the roots of the equation $9x^2 - 5x - 27 = 0$ is

(A) $\frac{5}{27}$ (B) $\frac{-5}{9}$ (C) $\frac{-1}{3}$ (D) -3

68. A relation in which the equality is true only for a number of unknown is called

(A) Identity (B) Equation (C) Algebraic equation (D) Algebraic relation

69. $x + \frac{3}{x} = 4$ is

(A) A transcendental equation (B) Cubic equation (C) An identity (D) An equation

70. The function of the form $f(x) = \frac{p(x)}{q(x)}\ q(x) \neq 0$ where $p(x)$ and $q(x)$ are polynomial in x is called

(A) Identity (B) Equation (C) Fraction (D) Algebraic equation

71. A plane which pases through the point $(3, 2, 0)$ and the line $\frac{x-4}{1} = \frac{y-7}{5} = \frac{z-4}{4}$ is

(A) $x - y + z = 1$ (B) $x + y + z = 5$ (C) $x + 2y - z = 1$ (D) $2x - y + z = 5$

72. The solution of the equation $\frac{d^2y}{dx^2} = e^{-2x}$ is

(A) $\frac{e^{-2x}}{4}$ (B) $\frac{e^{-2x}}{4} + cx + d$ (C) $\frac{e^{2x}}{4} + cx^2 + d$ (D) $\frac{e^{-2x}}{4} + cx - d$

73. Fifth term of GP is 2, then the product of its 9 term is

(A) 256 (B) 512 (C) 1024 (D) None of these

74. The vectors $v_1 = (-1, 1, 1)$, $v_2 = (1, 1, 1)$, and $v_3 = (1, -1, k)$ from a basis for R^3 for all real values of k EXCEPT $k =$

(A) -2 (B) -1 (C) 0 (D) 1

75. $\int_0^{10\pi} |\sin x| dx$

(A) 20 (B) 8 (C) 10 (D) 18

76. Center of the graph of quaternions Q_8 is of order

(A) 1 (B) 2 (C) 8 (D) 4

77. $\underline{a}.(\underline{b} \times \underline{c})$ is not equal to

(A) $\underline{a}.(\underline{c} \times \underline{b})$ (B) $(\underline{a} \times \underline{b}).\underline{c}$ (C) $\underline{b}.(\underline{c} \times \underline{a})$ (D) $\underline{c}.(\underline{a} \times \underline{b})$

78. Let G be a group. Then the derived group G' is ..... subgroup of G.

(A) Normal but not fully invariant (B) Characteristic but not fully invariant (C) Fully invariant (D) None of these

79. $\int_{-\pi}^{\pi} \frac{2x(1 + \sin x)}{1 + \cos 2x}$ is

(A) $\frac{\pi^2}{4}$ (B) π^2 (C) 0 (D) $\frac{\pi}{2}$

80. If $\sin y = x \sin(a + y)$, then $\frac{dy}{dx}$ is

(A) $\frac{\sin a}{\sin a \sin^2(a + y)}$ (B) $\frac{\sin^2(a + y)}{\sin a}$ (C) $\sin a \sin^2(x + y)$ (D) $\frac{\sin(a - y)}{\sin a}$

81. The differential equation $ydx - 2xdy = 0$ represents

(A) a family of straight lines (B) a family of parabola (C) a family of hyperbola (D) a family of circles

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(A) a family of straight lines (B) a family of parabola (C) a family of hyperbola (D) a family of circles

83. Two cards are drawn from a well shuffled pack, find the probability that one of them is an ace of heart:
(A) $\frac{1}{25}$ (B) $\frac{1}{26}$ (C) $\frac{1}{52}$ (D) $\frac{1}{13}$

84. Let A and B be two events such that $p(A) = 3$, $p(A \bigcup B) = 8$, if A and B are independent events, then $p(B)$:
(A) $\frac{5}{7}$ (B) $\frac{5}{13}$ (C) $\frac{1}{13}$ (D) $\frac{1}{2}$

85. The value of $\sqrt{3}sinx + cosx$ will be greatest when x is equal to
(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{4}$ (C) $\frac{\pi}{6}$ (D) $\frac{\pi}{3}$

86. If a particle in equilibrium is subjected to four forces, $F_1 = 2\hat{i} - 5\hat{j} + 6\hat{k}$, $F_2 = \hat{i} + 3\hat{j} - 7\hat{k}$, $F_3 = 2\hat{i} - 2\hat{j} - 3\hat{k}$ and F_4, then F_4 is equal to
(A) $-5\hat{i} + 4\hat{j} + 4\hat{k}$ (B) $5\hat{i} - 4\hat{j} - 4\hat{k}$ (C) $3\hat{i} - 2\hat{j} - \hat{k}$ (D) $3\hat{i} + \hat{j} - 10\hat{k}$

87. Find the sum of the roots of equations $\sqrt{x-1} + \sqrt{2x-1} = x$
(A) 1 (B) 2 (C) 4 (D) 6

88. The equation $3x^2 + 7xy + 2y^2 + 5x + 2 = 0$ represents
(A) a pair of straight line (B) en ellipse (C) a hyperbola (D) a parabola

89. The equation of the normal to the hyperbola $\frac{x^2}{16} - \frac{y^2}{9} = 1$ at $(-4, 0)$ is:
(A) $y = 0$ (B) $y = x$ (C) $x = 0$ (D) $x = -y$

90. Determine the exact value of the sum $\arctan 1 + \arctan 2 + \arctan 3$
(A) $\frac{\pi}{2}$ (B) π (C) $\frac{3\pi}{2}$ (D) $\frac{\pi}{3}$

91. The value of $\int_0^{\pi} \frac{x \tan x}{\sec x + \cos x} dx$ is
(A) $\frac{3\pi^2}{4}$ (B) $\frac{\pi^2}{3}$ (C) $\frac{\pi^2}{4}$ (D) $\frac{\pi^2}{2}$

92. The value of $\int_0^{\infty} \frac{dx}{1+x^2}$ is
(A) $\frac{\pi}{2}$ (B) $\frac{\pi}{4}$ (C) 0 (D) ∞

93. The value of $\hat{i} \times (\bar{a} \times \hat{i}) + \hat{j} \times (\bar{a} \times \hat{j}) + \hat{k} \times (\bar{a} \times \hat{k})$
(A) $\bar{a}$ (B) $2\bar{a}$ (C) $3\bar{3}$ (D) 0

94. $f(z) = \frac{1}{z}$ is not uniformly continuous in the region
(A) $0 \leq |z| \leq 1$ (B) $0 \leq |z| < 1$ (C) $0 < |z| < 1$ (D) $0 < |z| \leq 1$

95. $f(z) = z^3 + 3i$ is .....
(A) analytic everywhere except $z = 3i$ (B) analytic everywhere except $z = 0$ (C) analytic everywhere except $z = -3i$ (D) analytic everywhere

96. The projection of vector $\hat{i} - 2\hat{j} + \hat{k}$ on the vector $4\hat{i} - 4\hat{j} + 7\hat{k}$ is

(A) $\frac{5\sqrt{6}}{10}$ (B) $\frac{19}{9}$ (C) $\frac{9}{19}$ (D) $\frac{\sqrt{6}}{19}$

97. If $\bar{a} = 2\hat{i} + 4\hat{j} - 5\hat{k}$ and $\bar{b} = \hat{i} + 2\hat{j} + 3\hat{k}$ then $|\bar{a} \times \bar{b}|$ is

(A) $11\sqrt{5}$ (B) $11\sqrt{3}$ (C) $11\sqrt{7}$ (D) $11\sqrt{2}$

98. Two parallel like forces $4n$ and $8n$ are acting $18m$ apart, find the position of the resultant from small force:

(A) $12N$ (B) $10N$ (C) $8N$ (D) None of these

99. $-(p \wedge q)$ is logically equivalent to

(A) $-p \wedge -q$ (B) $-p \vee -q$ (C) $-p \wedge q$ (D) $p \wedge -q$

100. $\int_0^1 \frac{dx}{x}$ is

(A) 0 (B) 1 (C) 2 (D) None of these
