Sample Paper 02: 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 first Masjid (Mosque) on the surface of earth is?
   (A) Masjid-ul-Haram (B) Masjid-e-Nabavi (C) Masjid-e-Aqsa (D) Masjid-e-Quba

2. Hajj means
   (A) To aim (B) To be determined (C) To pain (D) To intend

3. NATO is a an ..... alliance
   (A) regional (B) cultural (C) military (D) economic

4. The oldest news agency in the world is
   (A) AFP (B) WAFA (C) BBC (D) CNN

5. The Most populous city in the world is
   (A) Beijing (B) Buenos Aires (C) Tokyo (D) Shanghai

6. The head of state of the United Kingdom is
   (A) Queen Elizabeth I (B) Queen Elizabeth II (C) Queen Elizabeth III (D) Queen Elizabeth IV

7. European Union has ..... members
   (A) 11 (B) 18 (C) 28 (D) 38

8. The river Thames is located in
   (A) Ireland (B) Finland (C) Scotland (D) England

9. International nurses' day is observed on....
   (A) May 3 (B) May 4 (C) May 7 (D) May 12

10. FIFA Women's World Cup 2015 winner is
    (A) England (B) Germany (C) USA (D) Japan

11. The highest temperature was recorded in
    (A) Tripoli (B) Los Angeles (C) Doha (D) California

12. ..... bought Nokia Mobile business.
    (A) Yahoo (B) AOL (C) Microsoft (D) Google

13. The total length of Karachi-Lahore Motorway is
(A) 1,100km (B) 1,000km (C) 1,600km (D) 1,400km

14. Kalabagh is famous for the mineral of:
(A) Stones (B) Salt (C) Iron (D) Sulphur

15. Which one of these is a River of Sindh
(A) Indus (B) Nari (C) Mula (D) Hub

16. How much of the total area is cultivated in Pakistan
(A) 15 (B) 45 (C) 65 (D) 85

17. Which pass connects Pakistan and Afghanistan
(A) Tochi Pass (B) Khyber Pass (C) Khunjerab Pass (D) Gomal Pass

18. Pakistan's Natural tree is
(A) Deodar (B) Oak (C) Pine (D) Magnolia

19. Pakistan purchased Gwadar from;
(A) Oman (B) Iran (C) Kuwait (D) none

20. Salt Mine, Khewra is located in district:
(A) DI Khan (B) Jehlum (C) DG Khan (D) Sindh

Mathematics

21. A sequence of numbers who's reciprocal from an arithmetic sequence is called ..... sequence
(A) Arithmetic (B) Geometric (C) Harmonic (D) None

22. For $\frac{1}{4}, \frac{2}{5}, 1, \ldots$ $6th$ term is
(A) -2 (B) $\frac{-2}{7}$ (C) $\frac{1}{9}$ (D) $\frac{-5}{6}$

23. a_{27} of $7, \frac{23}{2}, \frac{32}{2}, \ldots$ is
(A) 117 (B) 124 (C) $\frac{119}{2}$ (D) $\frac{146}{2}$

24. The fifth term and nth term of the $(A.P.)$ $1, 5, \ldots$ are
(A) $17, 4n-3$ (B) $4n-3, 17$ (C) $17, 3n-4$ (D) $17, 4n$

25. The $A.p.$ whose nth term is $2n-1$ is
(A) $1, 3, 6, \ldots.$ (B) $2, 3, 5\ldots.$ (C) $1, 3, 5, \ldots.$ (D) $5, 3, 1, \ldots.$

26. Probability theory was introduced by .....
(A) British mathematician (B) French mathematician (C) German mathematician
(D) American mathematician

27. Events A, B and C are equally likely when
(A) $p(A) + p(B) = p(C)$ (B) $p(A) = p(B) + p(C)$ (C) $p(B) = p(A) + p(C)$ (D) $p(A) = p(B) = p(C)$

28. The relation between ${}^nC_r$ and ${}^nP_r$
(A) ${}^nC_r = r!{}^nP_r$ (B) ${}^nC_r \times r! = {}^nP_r$ (C) ${}^nC_r \times n! = {}^nP_r$ (D) None

29. $4! + 5! =$
(A) 24 (B) 144 (C) 25 (D) 23

30. $\frac{6!}{8!} =$
(A) $\frac{1}{56}$ (B) 65 (C) 56 (D) $\frac{1}{56}$

31. The number of term in expansion of $(a - b)^{17}$ is
(A) 2 (B) 17 (C) 18 (D) 20

32. The coefficient of 21^{st} term in the expansion of $(a + b)^{23}$ is
(A) 1771 (B) 2891 (C) 3421 (D) 1563

33. Sum of even coefficient is equal to..... in binomial expression of $(1 + x)^n$
(A) $2n$ (B) $2n - 1$ (C) 2_{n-1} (D) 2^n

34. If n is an positive integer, then $n! > 3^{n-1}$ is true for all
(A) $n > 5$ (B) $n \geq 5$ (C) $n \geq 3$ (D) $n > 3$

35. If n is an positive integer, then $\begin{pmatrix} 5 \\ 5 \end{pmatrix} + \begin{pmatrix} 6 \\ 5 \end{pmatrix} + \begin{pmatrix} 7 \\ 5 \end{pmatrix} + ... + \begin{pmatrix} n+4 \\ 5 \end{pmatrix} =$
(A) $\begin{pmatrix} n+5 \\ 6 \end{pmatrix}$ (B) $\begin{pmatrix} n+5 \\ 5 \end{pmatrix}$ (C) $\begin{pmatrix} n+4 \\ 4 \end{pmatrix}$ (D) $\begin{pmatrix} n+6 \\ 6 \end{pmatrix}$

36. The 3600^{th} part of the degree is called .....
(A) Degree (B) Minute (C) Second (D) None

37. If $\sin\phi < 0$ and $\tan\phi > 0$ then terminal side line which quadrant
(A) I (B) II (C) III (D) IV

38. 1 radian = ... degree
(A) $57^\circ 17' 45''$ (B) $57^\circ 18' 48''$ (C) $57^\circ 18' 32''$ (D) $57^\circ 19' 43''$

39. $(\cot^2\phi - 1)(\sin^2\phi + 1) =$ .....
(A) $1 - \sin^2\phi$ (B) $1 + \sin^2\phi$ (C) $\cos 2\phi - \sin 2\phi$ (D) All

40. Measure of the central angle of an arc of a circle whose length is equal to the radius of the circle known as
(A) 1 Degree (B) Radian (C) Minute (D) Second

41. Measure of the central angle of an arc of a circle whose length is equal to the radius of the circle known as
(A) 1 Degree (B) Radian (C) Minute (D) Second

42. What are the roots of the equation $(logx)^3 = 2logx$
(A) $1, e^2$ (B) $1, \sqrt{e}$ (C) $1, e^{-2}$ (D) all $x > 0$

43. Set of real $\mathbb{R}$ is ..... of the set $\mathbb{C}$ of complex number is
(A) Prime ideal (B) Sub-ring (C) Maximal ideal (D) Ideal

44. Which one of the following polynomials $p(x)$ has the property that $p(x) = 0$ has a root $\sqrt{3}-\sqrt{2}$
(A) $2x^2 + 6x + 3$ choice $x^3 - 2x + 6$ (B) $x^4 + 2x^2 - 3$ (C) $x^4 - 10x^2 + 1$

45. Let $\mathbb{Q}$ be the set of rational numbers. Then $\mathbb{Q}(\sqrt{3}) = \{a + b\sqrt{3} : a, b \in \mathbb{Q}\}$ is a vector space over $\mathbb{Q}$ with dimension
(A) 1 (B) 2 (C) 3 (D) 4

46. How many subgroup does the group $Z_3 \oplus Z_{16}$ have?
(A) 6 (B) 10 (C) 12 (D) 20

47. Let $P_n(t)$ be the vector space of all polynomials of degree $\leq n$: Then
(A) dim $P_n(t) = n - 1$ (B) dim $P_n(t) = n$ (C) dim $P_n(t) = n + 1$ (D) 2

48. A one to one linear transformation preserves .....
(A) basis but not dimension (B) basis and dimension (C) dimension but not basis
(D) None of these

49. Evaluate $\int_0^{\frac{\pi}{2}} \frac{\sqrt{sinx}}{\sqrt{sinx} + \sqrt{cosx}} dx$
(A) $\frac{\pi}{4}$ (B) $\frac{\pi}{2}$ (C) 0 (D) 1

50. The area bounded by the curve $y = 2x - x^2$ and the straight line $y = -x$ is given by
(A) $\frac{9}{2}$ (B) $\frac{43}{6}$ (C) $\frac{35}{6}$ (D) None

51. The differential equation of all non-vertical lines in the plane is
(A) $\frac{d^2y}{dx^2} = 0$ (B) $\frac{d^2x}{dy^2} = 0$ (C) $\frac{dy}{dx} = 0$ (D) $\frac{dx}{dy} = 0$

52. Let p and q be distinct primes. How many (mutually-nonisomorphic) abelian groups are there of order p^2q^4
(A) 6 (B) 8 (C) 10 (D) 12

53. Which one of the following Rings does not have the same number of units as the three others?
(A) $\mathbb{Z} \oplus \mathbb{Z}$ (B) $\mathbb{Z} \oplus \mathbb{Z}_5$ (C) $\mathbb{Z} \oplus \mathbb{Z}_3$ (D) $\mathbb{Z} \oplus \mathbb{Z}_0$

54. A linear transformation $T : U \longrightarrow V$ is one-to-one if and only if kernel of T is equal to
(A) U (B) V (C) 0 (D) Im(T)

55. For a scalar point function $\phi(x, y, z)$, div grat ϕ is
(A) scalar point function (B) vector point function (C) guage function (D) None

56. Given two vectors $\hat{i}-\hat{j}$ and $\hat{i}+2\hat{j}$, the unit vector coplanar with the two vectors and perpendicular to first vector is
(A) $\frac{1}{2}(\hat{i}+\hat{j})$ (B) $\frac{1}{5}(2\hat{i}+\hat{j})$ (C) $\pm\frac{1}{\sqrt{2}}(\hat{i}+\hat{j})$ (D) None

57. If A and B are two mutually exclusive events, then
(A) $p(A) < p(\bar{B})$ (B) $p(A) < p(B)$ (C) $p(A) > p(\bar{B})$ (D) None

58. The equation of the directrix of the parabola $y^2 + 4y + 4x + 2 = 0$ is
(A) $x = -1$ (B) $x = 1$ (C) $\frac{-3}{2}$ (D) $\frac{3}{2}$

59. A tensor of rank 5 in a space of 4 dimensions has components
(A) 5 (B) 4 (C) 625 (D) 1024

60. A vector is said to be irrational if
(A) $\bigtriangledown\bar{F} = 1$ (B) $\bigtriangledown\bar{F} = 0$ (C) $\bigtriangledown \times \bar{F} = 0$ (D) None

61. The period of $cotx$ is
(A) $\frac{\pi}{2}$ (B) π (C) 2π (D) 4π

62. If ω is an imaginary cubic root of unity then $(1 + \omega - \omega^2)^7$ equal to
(A) 128ω (B) -128ω (C) $128\omega^2$ (D) $-128\omega^2$

63. The radius of circle passing through the foci of the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$ and having its center at $(0, 3)$ is
(A) 4 (B) 3 (C) $\sqrt{12}$ (D) $\frac{7}{2}$

64. A ring R is a Boolean Ring if, for all $x \in \mathbf{R}$
(A) $x^2 = x$ (B) $x^3 = -x$ (C) $x^2 = 0$ (D) $x^2 = 1$

65. The group of Quaternions is a non-abelian group of order .....
(A) 6 (B) 8 (C) 10 (D) 1

66. Every group of prime order is .....
(A) an abelian but not cyclic (B) an abelian group (C) a Non-abelian group (D) a cyclic group

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

68. If H is a subgroup of index ..... then H is a normal subgroup of G
(A) 2 (B) 4 (C) prime number (D) None

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

70. Let G be a cylic group of order 24 generated by a then order of a^{10} is .....
(A) 2 (B) 12 (C) 10 (D) 1

71. If a vector space V has a basis of n vectors, then every basis of V must consist of exactly ..... vectors.
(A) $n+1$ (B) n (C) $n-1$ (D) $n+3$

72. An indexed set of vectors $\{v_1, v_2, ...v_p\}$ in R^n is said to be ..... if the vector equation $x_1v_1 + x_2v_2 + ... + x_pv_P = 0$ has only the trivial solution.
(A) linearly independent (B) basis (C) linearly dependent (D) none

73. The set C_n of all nth roots of unity for a fixed positive integer n is a group under .....
(A) addition (B) addition modulo n (C) multiplication (D) multiplication modulo n

74. Intersection of any collection of normal subgroup G .....
(A) is normal subgroup (B) may not be normal subgroup (C) is cyclic subgroup (D) is abelian subgroup

75. A group G having order ..... where P is a prime is always abelian.
(A) p^4 (B) p^2 (C) $2p$ (D) p^3

76. The number of conjugacy classes of symmetric group of degree 3 is .....
(A) 6 (B) 2 (C) 3 (D) 4

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

78. The set of all solutions to be homogeneous equation $Ax = 0$ where A is an $m \times n$ matrix is
(A) Null space (B) Column space (C) Rank (D) None

79. If 7 cards are dealt from an ordinary deck of 52 playing cards, What is the probability that at least one of them will be queen
(A) 0.4773 (B) 0.4774 (C) 0.4775 (D) 0.4776

80. Every group of order ≤ 5 is
(A) cyclic (B) abelian (C) not abelian (D) none

81. Number of non-isomorphic groups of order 8 is.....
(A) 4 (B) 2 (C) 3 (D) 5

82. $\underline{a}.(\underline{b} \times \underline{c})$ 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) $\underline{c}.(\underline{a} \times \underline{b})$

83. Let G be a group. Then the derived group G' is ..... subgroup of G.
(A) Cyclic (B) Abelian (C) Normal (D) None

84. Finite simple abelian groups are of order
(A) 4 (B) prime power (C) power of 2 (D) prime number

85. Set of integers $\mathbb{Z}$ is ..... of the set Q of rationals
(A) prime ideal (B) subring (C) maximal ideal (D) None

86. Solution set of the equation $1+\cos x = 0$ is
(A) $\{\pi+n\pi : n \in \mathbb{Z}\}$ (B) $\{2n\pi : n \in \mathbb{Z}\}$ (C) $\{\frac{\pi}{2}+n\pi : n \in \mathbb{Z}\}$ (D) $\{\pi+2n\pi : n \in \mathbb{Z}\}$

87. None-zero elements of a field form a group under
(A) addition (B) multiplication (C) subtraction (D) division

88. Let Q be a set of rational numbers. Then $Q(\sqrt{3}) = \{a+b\sqrt{3}; a, b \in Q\}$ is a vector space over Q with dimension
(A) 1 (B) 2 (C) 3 (D) 4

89. Let W be a subspace of the space R^3. If $dim\mathbf{W} = 0$, then W is a
(A) line through the origin 0 (B) plane through the origin 0 (C) entire space R^3 (D) a point

90. Let $P_n(t)$ be a vector space of all polynomials of degree $\leq n$: Then
(A) $P_n(t) = n-1$ (B) $P_n(t) = n$ (C) $P_n(t) = n+1$ (D) 2

91. In the group $(Z, 0)$ of all integers where $a \circ b = a+b+1$ for $a, b \in Z$, then inverse of -3 is
(A) -3 (B) 0 (C) 3 (D) 1

92. Let G be a group in which $g^2 = 1$ for all g in G. Then G is.....
(A) abelian (B) cyclic (C) abelian but not cyclic (D) non-abelian

93. The metric coefficients in cylindrical coordinates are
(A) $(1,1,1)$ (B) $(1,0,1)$ (C) $(1,r,1)$ (D) None

94. The value of quantity $\delta_{ij}x_ix_j$ is
(A) x_i (B) 0 (C) $x_i{}^j$ (D) x_ix_j

95. A tensor of rank 5 in a space 4 dimensions has components
(A) 5 (B) 2 (C) 625 (D) 1024

96. f' is bounded if and only if
(A) $a > 1+c$ (B) $a > 2+c$ (C) $a \geq 1+c$ (D) $a \geq 2+c$

97. The value of $\sin\left(\cos^{-1}\frac{\sqrt{3}}{2}\right)$ is
(A) $\frac{\sqrt{3}}{2}$ (B) $\frac{1}{\sqrt{2}}$ (C) $\frac{1}{2}$ (D) 1

98. Let $\mathbb{R}$ be the cofinite topology. Then $\mathbb{R}$ is a
(A) T_0 but not T_1 (B) T_1 but not T_2 (C) T_2 but not T_3 (D) T_2 but not T_1

99. A particular integral of the differential equation $(D^2+4)y = x$ is
(A) xe^{-2x} (B) $x\cos 2x$ (C) $x\sin 2x$ (D) $\frac{x}{4}$

100. The area of the cardioid $r = a(1 + \cos\theta)$ is equal

(A) $4\pi a^2$ (B) $8\pi a$ (C) $\frac{3\pi a^2}{2}$ (D) $2\pi a^2$
