UNIVERSITY OF LUCKNOW

D.Pharm Entrance Examination

Mathematics Group — Model Test Paper Set 8

Total Questions: 100 | Section A: Chemistry & Physics (50) + Section B: Mathematics (50)

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SECTION A — Chemistry & Physics [50]

Chemistry

1. The boiling point does not depend upon :

(a) Solubility of compound in water (b) Hydrogen bonding

(c) Polarity of molecules (d) Size of molecule

Answer: (a) Solubility of compound in water

2. Which method is suitable for separation of organic compounds from aqueous solutions?

(a) Distillation (b) Solvent extraction

(c) Steam distillation (d) Fractional distillation

Answer: (b) Solvent extraction

3. On reaction with water, calcium carbide gives : heeveer mes DeefYeef :

(a) Carbine (b) Acetaldehyde

(c) Acetylene (d) Methane

Answer: (c) Acetylene

4. Cyclobutadiene is : meeFke :

(a) Homoaromatic (b) Antiaromatic

(c) Aromatic (d) Nonaromatic

Answer: (b) Antiaromatic

5. Which compound has magnetic susceptibility?

(a) Naphthalene (b) Benzene

(c) Anthracene (d) Azulene

Answer: (c) Anthracene

6. Chlorination of alkanes is an example of : Sukes :

(a) Free radical (b) Substitution

(c) Addition (d) Elimination

Answer: (a) Free radical

7. Which of the following compounds reacts with conjugated diene to form cyclohexene?

(a) Hexane (b) 1,3,5-hextriene

(c) Dienophile (d) Bromo benzene

Answer: (c) Dienophile

8. Allene must have which type of hybridization?

(a) Sp2 (b) Sp

(c) Sp3d (d) Sp3

Answer: (b) Sp

9. Chemical reactions that proceed from reactants to products through one or more intermediate stage(s) are called: pees jemee :

(a) Opposing reactions (b) Simple reactions

(c) Consecutive reactions (d) Parallel reactions

Answer: (c) Consecutive reactions

10. Temperature Jump Relaxation method is used to study: leeheceeve :

(a) Moderate reactions (b) Fast reactions

(c) Slow reactions (d) Substitution reactions

Answer: (b) Fast reactions

11. For solutes showing association, the value of van't Hoff factor (i) is: mecye :

(a) < (b) >

(c) = (d) =1

Answer: (a) <

12. Which of the following is independent of temperature ?

(a) Molality (b) Normality

(c) Molarity (d) Formality

Answer: (a) Molality

13. The equilibrium constant or a reaction is not affected by the presence of: DeefYeef :

(a) Temperature (b) Catalyst

(c) pH =4 (d) Pressure

Answer: (b) Catalyst

14. The pH of 0.1M aqueous solution of CH COONa at 25 :

(a) 8.58 (b) 8.38

(c) 8.68 (d) 8.88 1 Ans.(*): pH = (pk + pk + log c) a w 2 pk =

Answer: (d) 8.88 1 Ans.(*): pH = (pk + pk + log c) a w 2 pk =

15. A buffer solution contains 0.20 mole of NH OH 4 and 0.25 mole of NH Cl per litre, then the pH 4 value of the solution is given that dissociation constant of NH OH at room temperature is 4 1.81 :

(a) 9.16 (b) 11.89

(c) 8.72 (d) 10.3

Answer: (a) 9.16

16. The transition for which the first derivative of the chemical potential with respect to temperature is continuous but its second derivative of the chemical potential with respect to temperature is discontinuous is classified as: :

(a) First-order phase transition (b) Second-order phase transition

(c) Zero-order phase transition (d) Lambda transition

Answer: (b) Second-order phase transition

17. Cake is an example :

(a) Liquid in solid (b) Solid in liquid

(c) Gas in solid (d) Solid in solid

Answer: (c) Gas in solid

18. The catalytic action of an enzyme is: SbpeeFce :

(a) Does not depend on the nature of substrate (b) Non specific

(c) Heterogeneous (d) Highly specific

Answer: (d) Highly specific

19. The coagulating power of an effective ion carrying the charge opposite to the sol particles has been illustrated :

(a) Brownian movement (b) Gold number

(c) Hardy-schulze rule (d) Tyndall effect

Answer: (c) Hardy-schulze rule

20. Arsenic (III) sulphide forms a sol with a negative charge. Which of the following ionic substances should be most effective in the coagulating sol?

(a) Na PO 2 4 3 3 (b) KCl

(c) Al (SO) (d) MgCl

Answer: (c) Al (SO)

21. There is desorption of physical adsorption when: Yeewefleke :

(a) Concentration increases (b) Temperature decreases

(c) Temperature increases (d) Pressure increases

Answer: (c) Temperature increases

22. Micelles from the ionic surfactants can be formed only above a certain temperature called as: Dee :

(a) Kraft temperature (b) Boyle's temperature

(c) Inversion temperature (d) Transition temperature

Answer: (a) Kraft temperature

23. The revised metric system was proposed by: mebMeesefOele ceeref :

(a) General Conference on Weights and Measures (b) National Institute of Standards and Technology

(c) International Organization for Standardlization (d) U.S. Metric Association

Answer: (a) General Conference on Weights and Measures

24. The SI unit for the amount of substance :

(a) Candela (b) Mole

(c) Gram (d) Kilogram

Answer: (b) Mole

25. "A given compound always contains exactly the same proportion of elements by weight" is stated under which law?

(a) Law of multiple proportions (b) Law of conservation of mass

(c) Avogadro's law (d) Law of definite proportions

Answer: (d) Law of definite proportions

Physics

26. What is the percentage change in time period of a simple pendulum, if the length of simple pendulum increase by 3%?

(a) 3% (b) 3.5%

(c) 1.5% (d) 6%

Answer: (c) 1.5%

27. In Joule Thomson expansion, the inversion temperature is the temperature below which gas :

(a) none of the above (b) obeys Boyle's law

(c) shows heating (d) shows cooling

Answer: (d) shows cooling

28. The second law of thermodynamics may be written, in usual symbols, as :

(a) dQ = dU + dW (b) dS = TdQ

(c) dQ = TdS (d) dU = dQ + PdV

Answer: (c) dQ = TdS

29. The colour of a star predicts:

(a) its temperature (b) its distance

(c) its size (d) its weight

Answer: (a) its temperature

30. An ideal gas is taken through a series of changes represented in the figure below: The net work done by the gas at the end of the cycle is equal to ?

(a) 5 PV (b) 2PV

(c) 3 PV (d) zero

Answer: (c) 3 PV

31. A storage battery of e.m.f 8.0V and internal resistance 0.5Ω is charge by 120V d.c. supply using a series resistor 15.5Ω. The terminal voltage of the battery will be ?

(a) 12.5V (b) 11.5V

(c) 10.2V 1016 (d) 13V

Answer: (b) 11.5V

32. Which of the following will form a virtual and erect image for all positions of the object ?

(a) Convex lens (b) Conscave mirror

(c) Convex mirror (d) None of the above

Answer: (c) Convex mirror

33. Helium - Neon laser is ?

(a) Two level laser (b) Three level laser

(c) Five level laser (d) Four level laser

Answer: (d) Four level laser

34. In double slit experiment the shape of the fringes is :

(a) Hyperbolic (b) None of these

(c) Straight lines (d) Circular

Answer: (a) Hyperbolic

35. Length of the wire is increased by 1 mm on hanging a weight of 1 kg increase in length on hanging a weight of 2 kg will be :

(a) 4 mm (b) 2 mm

(c) 1 mm (d) 0

Answer: (b) 2 mm

36. Two satellites A and B are revolving around the earth in the same orbit. Mass of B is thrice to that of A. Then the correct statement is ?

(a) speeds of A and B are greater (b) P.E.s of A and B are equal

(c) None of the above (d) speeds of A and B are equal

Answer: (d) speeds of A and B are equal

37. If we throw a body upwards with velocity of 4 m/s, at what height its kinetic energy reduces to m/s² half of the initial value? Take g = ?

(a) 2 m (b) 4 m

(c) 0.4 m (d) 1 m

Answer: (c) 0.4 m

38. A force F=4i+5j+6k is applied on a body ⌢ ⌢ ⌢ and it is displaced by x=3i+7j+8k. How much work is done?

(a) 95 (b) 60

(c) 48 (d) 120

Answer: (a) 95

39. If A and B are tensors of rank 2 , then what ij ij will be the rank of tensor A +B . ij ij ?

(a) 0 (b) 4

(c) 2 (d) 3

Answer: (c) 2

40. A paramagnetic material is placed in a magnetic field. The magnetic field is increased till magnetization becomes constant. Now temperature is decreased, the magnetization will:

(a) None of these (b) Remain constant

(c) Decrease (d) Increase

Answer: (b) Remain constant

41. Efficiency of Carnot engine is 50% and its temperature of sink if 17°C. For 60% efficiency, the temperature of the sink will be ?

(a) 750 K (b) 800 K

(c) 650 K (d) None of these

Answer: (d) None of these

42. First law of thermodynamics represents conservation of– ?

(a) heat (b) Momentum

(c) Work (d) Energy

Answer: (d) Energy

43. Newton's law of cooling is also applicable on one to the following :

(a) Forced convicting losses (b) Natural convection losses

(c) None of the above (d) Convection losses

Answer: (b) Natural convection losses

44. If a point charge is placed at the origin, then the 30V equipotential surface will have radius ?

(a) 900m (b) 450m

(c) 135m (d) 270m

Answer: (b) 450m

45. A bullet of mass 2 gm is having a charge of 2μC. Through what potential difference must it be accelerated, starting from rest, to acquire a speed of 10 m/s ?

(a) 5 V (b) 5 kV

(c) 50 kV (d) 50 V

Answer: (c) 50 kV

46. Three equal resistances each of value R are connected so as to form a triangle. The equivalent resistance across any two corners of triangle is ?

(a) 3R (b) R 2 1

(c) R 3 (d) R

Answer: (c) R 3

47. The dimensions of the quantity o are ε o equivalent to those of :

(a) Resistance (b) Force

(c) Momentum (d) Current

Answer: (a) Resistance

48. The most important characteristic of a laser is:

(a) high intensity (b) coherence

(c) directionality (d) polarization

Answer: (b) coherence

49. The coherence time of laser beam of 10-5 wavelength 7400 Ấ is 4 × second . The coherence length will be :

(a) 10 km (b) 11.2 km

(c) 12 km (d) 5 km

Answer: (c) 12 km

50. The sun appears red at sunrise or sunset. This can be explained on the basis of:

(a) Raman effect (b) Compton effect

(c) Rayleigh scattering (d) Phonon scattering

Answer: (c) Rayleigh scattering

SECTION B — Mathematics [50]

51. If x + =2cos , isequal to x 10 x^5 1 ?

(a) 2 (b) 0

(c) 32 these (d) None of

Answer: (b) 0

52. The average of the squares of number 0, 1, 2, 3 ?

(a) n(2n+1) 2 1 n(2n+1) (b) (n+1)(2n+1) 6 these

(c) none of (d) 6 1

Answer: (d) 6 1

53. For what values of m, is arithmetic am +bm mean of a and b?

(a) 2 these (b) none of am+1+bm+1

(c) 0 (d) 1

Answer: (c) 0

54. If a, b c are in A.P. then are 3a, 3b, 3c ?

(a) HP (b) none of these

(c) GP (d) AP

Answer: (c) GP

55. If Z is a complex number then minimum value of |Z| + |Z ?

(a) 0 (b) 1

(c) none of these (d) 2

Answer: (b) 1

56. The reflection of the complex number in 1+2i the straight line iz = z is 4+3i efce ?

(a) 1 (b) 2 + i these

(c) none of (d) 4

Answer: (a) 1

57. If |z + 4| = 3 then the maximum value |z + 1| is ?

(a) none of these (b) 6

(c) 4 (d) 0

Answer: (b) 6

58. For the function f(z) = , at the point z z^2 = 0 is z ?

(a) none of these (b) an essential

(c) a pole of order 2 (d) a removable singularity

Answer: (d) a removable singularity

59. If = i, then the value of z is ?

(a) none of these 8 8 ke (b) i

(c) cos +isin 4 4 (d) cos +isin

Answer: (d) cos +isin

60. There are 10 lamps in a hall. Each of them can be switched on independently. The number of ways in which the hall can be illuminated is Ske ?

(a) none of these ke (b) 1023

(c) 102 (d) 210

Answer: (b) 1023

61. If the number of diagonals of a n sided polygon is equal to twice of its sides, then the value of n is equal to ?

(a) 7 (b) none of these

(c) 10 (d) 5

Answer: (a) 7

62. Given that, number of points on a circle is n. The number of triangles joining these points is 84. then n is equal to Ske ?

(a) 9 (b) none of these ke

(c) 7 (d) 8

Answer: (a) 9

63. The polynomial f(x) = + + 1 is f(x) = $x^4 + x^2 + 1$ ke ?

(a) none of these (b) reducible over the filed of real numbers

(c) irreducible over ring of integers (d) reducible over the field F of five

Answer: (d) reducible over the field F of five

64. A group having no proper non subgroup is efpeme mecetn ?

(a) Normal (b) Simple subgroup

(c) none of (d) Abslian subgroup

Answer: (b) Simple subgroup

65. Let G be group of order 17. The to numbers of non-isomorphic subgroup of G is ceeve ueerefpeS efke ?

(a) 2 (b) 1

(c) 3 (d) 17

Answer: (a) 2

66. Let G be a cyclic group of order 24. The total number of group isomorphism a onto itself is ceeve ueerefpeS efke ?

(a) 8 (b) 3

(c) 17 (d) 7

Answer: (a) 8

67. Suppose square matrix A is nilpotent then 1 + A is ceeefveS efke ?

(a) none of these (b) inventible

(c) non degenerate (d) not

Answer: (b) inventible

68. All the units in ring of all integers modulo 8 8 are ceeheebke ?

(a) 2, 4, 6 (b) 0, 1

(c) 1, 3, 5, 7 (d) none of these

Answer: (c) 1, 3, 5, 7

69. The value of div(curl F) i.e. V.V x equal to div(curl F) i.e. V.V x F ke ?

(a) none of these ke (b) 1

(c) 0 (d) V2F

Answer: (c) 0

70. Let inverse of i^5 is a then i^5 * a = 1 (identity element) 1 1 ?

(a) 4 (b) 3

(c) 2 (d) 1

Answer: (b) 3

71. The sides of a triangle are in the ratio 1 : 3:2then the angles of the triangle are in the ratio ?

(a) 3 : 2 : 1 (b) 2 : 3 : 4

(c) 1 : 2 : 3 (d) 1 : 3 : 5

Answer: (c) 1 : 2 : 3

72. The contour on the xy-plane, where the partial x^2 y^2 derivative of + with respect to y is equal to the partial derivative of 6y + 4x with respect to x, is peneB x^2 y^2 ke ?

(a) x + y = 4 (b) x

(c) x = 2 (d) y = 2

Answer: (d) y = 2

73. if f(x) is continuous at x = 2 ?

(a) 80 (b) 16

(c) 32 (d) 8 YCT

Answer: (a) 80

74. Given set A = {2, 3, 4, 5} and set B = {11, 12, 13, 14, 15}. Two numbers randomly selected are from each set What is probability that the sum of the numbers equal 16?

(a) 0.2 (b) 0.3

(c) 0.35 (d) 0.25

Answer: (a) 0.2

75. The probability that they occur simultaneously is 0.14. What is the probability that neither of them occurs?

(a) 0.39 (b) 0.28

(c) 0.72 (d) 0.61

Answer: (a) 0.39

76. In a class of 60 students, 25 students play cricket and 20 students play tennis and 10 students play both the games, then the number of students who play neither is ?

(a) 25 (b) 35

(c) 0 (d) 45

Answer: (a) 25

77. The angle between two diagonals of a cube is Ieve ?

(a) cos (b) 30

(c) 45 (d) cos-1

Answer: (a) cos

78. If the coefficient of variation and standard deviation are 60 and 21 respectively, the arithmetic mean of distribution is ?

(a) 35 (b) 30

(c) 21 (d) 60

Answer: (a) 35

79. The area of the circle having its centre at (3, 4) and touching the line 5x + 2y ?

(a) 12 (b) 16

(c) 25 (d) 4

Answer: (d) 4

80. If every element of a group G is its own inverse, then G is ?

(a) cyclic (b) infinite

(c) finite (d) abelian

Answer: (d) abelian

81. The points of discontinuity of the function f(x) 1 = is log|x| 1 he ?

(a) 1 (b) 3 1

(c) 2 (d) 4

Answer: (a) 1

82. The power set of a set A having four distinct elements is:

(a) 16 (b) 8

(c) 14 (d) 32

Answer: (a) 16

83. Consider n(U) = 20, n(A) = 12, n(B) = 9 and n ?

(a) 11 (b) 3

(c) 17 (d) 8

Answer: (d) 8

84. When n(A) = 3 and n(B) = 5, then the number of injection functions that can be defined from A to B is:

(a) 60 (b) 40

(c) 30 (d) 120

Answer: (a) 60

85. How many integer solutions are there for the equation x+y + z = 15, where x ?

(a) 1 (b) 136

(c) 6 (d) 15

Answer: (b) 136

86. The number of words that can be formed by using the letters of the word "MATHEMATICS" that start as well as end with T is:

(a) 20,860 9! (b) 80,720

(c) 37,528 (d) 90,720

Answer: (d) 90,720

87. The number of positive integers not exceeding 1,000, which are divisible by 7 or 11, is:

(a) 210 (b) 240

(c) 120 (d) 220

Answer: (d) 220

88. In how many ways can 12 balloons be distributed at a birthday party of 10 children?

(a) 45 ways (b) 48 ways

(c) 55 ways (d) 56 ways

Answer: (c) 55 ways

89. The number of odd three-digit positive integers that have no repeated digits is:

(a) 128 (b) 160

(c) 240 (d) 320

Answer: (d) 320

90. The number of permutation can be made out of the letters word 'COMPUTER" as:

(a) 40,320 (b) 10,080

(c) 5, 040 (d) 720

Answer: (a) 40,320

91. The number of ways to distribute 20 identical balls in 4 different boxes such that no box remains empty is:

(a) 696 (b) 969

(c) 52 (d) 323

Answer: (b) 969

92. If =1, then the smallest positive ?

(a) 2 (b) 3

(c) 4 (d) 1

Answer: (a) 2

93. If the sum and product of any two distinct complex numbers are 4 and 8 respectively, then the number are:

(a) 2 + 3i; 2 (b) 1 + 2i; 3

(c) 3 + 2i; 1 (d) 2 + 2i; 2

Answer: (d) 2 + 2i; 2

94. When 22000 is divided by 17, then the remainder is:

(a) 5 (b) 2

(c) 1 (d) 9

Answer: (c) 1

95. The largest term in the Binomial expansion of 1 50 (3+ 2x) , when x = , is: 5 ?

(a) third term (b) eighth term

(c) sixth term (d) fifth term

Answer: (c) sixth term

96. The sum of the series 1+ + + + ?

(a) 3e (b) 2 YCT

(c) e (d) 2e e

Answer: (a) 3e

97. x and at x = 1 the series is 1 ?

(a) (c, q) = (d, r) (b) (c, r) = (d, r)

(c) (c, d) = (d, r) (d) (c, d) = (d, q)

Answer: (b) (c, r) = (d, r)

98. The greatest common divisor of three integers 105, 140 and 350 is:

(a) 70 (b) 15

(c) 35 (d) 5

Answer: (c) 35

99. What is the maximum number of division used by the Euclidean algorithm to find the greatest common divisor of two positive integers 252 and 198?

(a) 12 (b) 36

(c) 4 (d) 16

Answer: (c) 4

100. The prime factorization of 42833 is given by:

(a) 7.21.219 (b) 7.29.211

(c) 7.21.291 (d) 7.21.299

Answer: (b) 7.29.211