UNIVERSITY OF LUCKNOW

D.Pharm Entrance Examination

Mathematics Group — Model Test Paper Set 9

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

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SECTION A — Chemistry & Physics [50]

Chemistry

1. What is the mass percentage of S in H SO ?

(a) 48.32% (b) 28.00%

(c) 32.65% (d) 65.30%

Answer: (c) 32.65%

2. Zeeman effect corresponds to the splitting of spectral lines in the presence :

(a) Neither electric field nor magnetic field (b) Magnetic field

(c) Electric field (d) Both electric and magnetic fields

Answer: (b) Magnetic field

3. The element with atomic number 37 belongs to which block in the modern periodic table?

(a) p-block (b) f-block

(c) s-block (d) d-block

Answer: (c) s-block

4. Which of the following metal hydrides has the crystal structure of rutile?

(a) LiH (b) NaH

(c) MgH (d) BaH 2 77 YCT

Answer: (c) MgH

5. Which of the following methods can't be used for the preparation of hydrogen gas?

(a) Electrolysis of the aqueous solution of NaOH or KOH (b) Reaction of ethanolamine solution with CO

(c) Reaction of saltlike hydrides with water (d) Steam reformer process

Answer: (b) Reaction of ethanolamine solution with CO

6. The common zeolite used for softening of hard water is Natrolite. Its molecular formula is: Yeejer peue :

(a) Na OAl O .2H O 2 2 3 (b) MgOAl O .3SiO .2H O 2 3 2

(c) Na OAl O .3SiO .2H O 2 2 3 2 (d) CaOAl O .SiO .2H O 2 3 2

Answer: (c) Na OAl O .3SiO .2H O 2 2 3 2

7. What is the temporary hardness of water if water contains 7.3 :

(a) 15 mg (b) 35 mg

(c) 20 mg (d) 25 mg

Answer: (a) 15 mg

8. Spodumene is the mineral of which element?

(a) Caesium (b) Sodium

(c) Potassium (d) Lithium

Answer: (d) Lithium

9. Which of the group 1 metal hydrides is stable up to 900 :

(a) Lithium hydride (b) Caesium hydride

(c) Sodium hydride (d) Potassium hydride

Answer: (a) Lithium hydride

10. The ingredients that makes up the baking powder are: yesefkeb :

(a) NaHCO , Starch and NaAl(SO) (b) NaHCO and Starch

(c) NaHCO , Starch, NaAl(SO) and 3 4 2 Ca(H PO) (d) Only NaHCO

Answer: (c) NaHCO , Starch, NaAl(SO) and 3 4 2 Ca(H PO)

11. Metallic crystal structure of calcium :

(a) Simple cubic (b) Body centered cubic

(c) Hexagonal close packing (d) Face centered cubic

Answer: (d) Face centered cubic

12. Major cation in the intracellular fluid in animals is: heMegDeeW ceW Deblejeke :

(a) Calcium (b) Sodium

(c) Magnesium (d) Potassium

Answer: (d) Potassium

13. Calamine is the ore of: :

(a) Fe (b) Zn

(c) Ca (d) Al

Answer: (b) Zn

14. Which of the following alcohols cannot be oxidised to a carbonyl compound?

(a) n-butyl alcohol (b) Sec-butyl alcohol

(c) Ter-butyl alcohol (d) 1-pentanol

Answer: (c) Ter-butyl alcohol

15. By using SOCl , alcohols are converted into: 2 SOCl :

(a) Alkyl halides (b) Carboxylic acids

(c) Alkanes (d) Alkenes

Answer: (a) Alkyl halides

16. Consider the below reaction. CHCH(OH)CH :

(a) Oxidation (b) Reduction

(c) Redox reaction (d) Disproportionation

Answer: (a) Oxidation

17. The compound Nonactin binds to which metal ion?

(a) Na+ (b) Mg+2

(c) K+ (d) Ca+2

Answer: (c) K+

18. Stereochemistry of SN reaction involves: 2 SN DeefYeef :

(a) Racimisation with retention (b) Retention

(c) Inversion (d) Racimisation with inversion

Answer: (c) Inversion

19. For an E reaction, which of the following is correct?

(a) R-Br<R-I<R-Cl (b) R-Cl < R-Br < R-I

(c) R-Cl > R-Br > R-I (d) R-Cl<R-I<R-Br

Answer: (b) R-Cl < R-Br < R-I

20. The transition state of SN reaction has: 2 SN DeefYeef :

(a) Linear structure (b) Normal tetrahedral structure

(c) Carbon tetrahedral structure (d) Square planar structure

Answer: (c) Carbon tetrahedral structure

21. SN and SN reactions follow: 2 1 SN Deewj SN DeefYeef :

(a) First and second order (b) Second and first order

(c) Both follow second order (d) Both follow first order

Answer: (b) Second and first order

22. Which of the following statements is correct?

(a) Both are equally selective (b) Chlorination is more selective than bromination

(c) Bromination is less selective (d) Bromination is more selective than Chlorination

Answer: (d) Bromination is more selective than Chlorination

23. Which of the following is an antibiotic?

(a) Furosemide (b) Rantidin

(c) Dolo (d) Amoxycillin

Answer: (d) Amoxycillin

24. Morphine consists :

(a) Tertiary carbon (b) Quaternary carbon

(c) Tertiary amine and quaternary carbon (d) Tertiary amine

Answer: (c) Tertiary amine and quaternary carbon

25. Which of following compounds shows octahedral geometry?

(a) XeF (b) SF 3

(c) XeO (d) XeF 2

Answer: (b) SF 3

Physics

26. Newton's rings are fringes of:

(a) equal radii (b) both equal inclination and equal

(c) equal inclination (d) equal thickness

Answer: (d) equal thickness

27. Which of the following phenomenon is not concerned with the production of polarised light?

(a) Brewster's law (b) Dispersion

(c) Scattering (d) Double refraction

Answer: (b) Dispersion

28. Consider the following: A. Presence of audience in a hall decreases reverberation time. B. Open windows increase reverberation time ?

(a) Both A, B are false (b) Both A, B are true

(c) A is true, B is false (d) A is false, B is true

Answer: (c) A is true, B is false

29. A sound wave of unknown frequency gives 10 beats with a wave of frequency 300 Hz and 15 beats with a wave of frequency 325 Hz. The frequency of unknown wave is ?

(a) 340 Hz (b) 290 Hz

(c) 310 Hz (d) None of the above

Answer: (c) 310 Hz

30. A tuning fork of frequency 260 Hz is vibrated with a sonometer wire and 5 beats are heard. If the tension in the wire is slightly increase, the beat frequency also decreases. The original frequency of the sonometer is ?

(a) 255 Hz (b) 250 Hz

(c) 260 Hz (d) 265 Hz

Answer: (a) 255 Hz

31. The concept of internal energy was first introduced by ?

(a) Wien's law PV (b) Stefan's law

(c) Second law of thermodynamics (d) First law of thermodynamics

Answer: (d) First law of thermodynamics

32. Newton's law of cooling is a special case of ?

(a) Kirchhoff's law (b) Stefan's law

(c) Planck's law (d) Wien's displacement law

Answer: (b) Stefan's law

33. An iron plate 2 cm thick has a cross-section of cm2. 5000 Its one side is at 110°C and the other side is at 100°C. If thermal conductivity of iron is 0.115 cal/s-cm-°C, the rate of heat flow through the plate is ?

(a) 2875 cal/s (b) 2375 cal/s

(c) 4750 cal/s (d) 5750 cal/s

Answer: (a) 2875 cal/s

34. Transport phenomena is gases represent the transport of certain quantities. Which of the following is not correctly matched? Transport Phenomenon Quantity ?

(a) None of the above (b) Viscosity Mass

(c) Diffusion Energy (d) Conduction Momentum

Answer: (a) None of the above

35. Which of the following is the unit of strain?

(a) Watt (b) Joule

(c) No unit (d) Newton

Answer: (c) No unit

36. If the diameter of a capillary tube is increased by two times, then the height of liquid rise in it will be :

(a) one-fourth (b) two times

(c) half (d) remains same

Answer: (c) half

37. The surface tension of a liquid ?

(a) Decreases with temperature (b) Decreases with surface area

(c) Increases with temperature (d) Increases with surface area

Answer: (a) Decreases with temperature

38. The negative electrode in lead acid battery is ?

(a) Iron (b) Silver

(c) Carbon (d) Lead

Answer: (d) Lead

39. A particle moves in a circular path with uniform speed. The direction of acceleration of the particle will be :

(a) Along the radius (b) Acceleration is zero

(c) Along the tangent to the path (d) Normal to the plane of the path

Answer: (a) Along the radius

40. Which of the following is conservative force?

(a) Gravitational Force (b) Viscous force

(c) None of the above (d) Frictional force

Answer: (a) Gravitational Force

41. In above velocity-time graph of a particle, the distance covered in first 4 seconds is ?

(a) Zero (b) 12m

(c) 20m (d) 16m

Answer: (d) 16m

42. Which of the following is not necessary for performing LASER action ?

(a) Spontaneous emission (b) Meta-energy level

(c) Population inversion (d) Stimulated emission

Answer: (a) Spontaneous emission

43. A plane polarized light is passed through a quarter wave plate. The circularly polarized light is obtained, when the angle between plane polarized light and principal axis of the plate is ?

(a) 900 (b) 1800

(c) 00 (d) 450

Answer: (d) 450

44. A diffraction grating has 4000 lines and is fully exposed at normal incidence. The resolving power of the grating in the third order of the ° spectrum at the 5000Awavelength is ?

(a) 15000 (b) 7500

(c) 18000 (d) 12000

Answer: (a) 15000

45. The mean separation of two points on moon that can be resolved by a 500 cm telescope aperture is (distance of the moon is 4×105 km, eye is most sensitive to wavelength 5500Å) ?

(a) 40 m (b) 43 m

(c) 50.6 m (d) 53.6 m

Answer: (d) 53.6 m

46. Fraunhofer spectrum is ?

(a) Band absorption spectrum (b) Line absorption spectrum

(c) Line emission spectrum (d) Band emission spectrum

Answer: (b) Line absorption spectrum

47. Which of the following are coherent sources?

(a) Two halves of a 60 Watt bulbs (b) A 60 Watt and a 100 Watt bulbs

(c) Two bulbs of 60W each (d) Two virtual sources obtained by biprism

Answer: (d) Two virtual sources obtained by biprism

48. Ratio of focal lengths of two lenses of Huygens eyepiece is ?

(a) 2 : (b) 3 :

(c) 1 : (d) None of the above

Answer: (b) 3 :

49. The critical angle is maximum when light travels from ?

(a) glass to water (b) glass to air

(c) water to air (d) air to water

Answer: (a) glass to water

50. With the decrease in the prism angle, the angular dispersion between red and violet rays ?

(a) Increases (b) Decreases

(c) Depends on the incidence angle (d) Does not change

Answer: (c) Depends on the incidence angle

SECTION B — Mathematics [50]

51. y=5 and if 2 1 =5 then x+ 2 x ?

(a) 3 (b) 1

(c) 4 (d) 2

Answer: (b) 1

52. The number of real solutions of the equation x+9+ 4+x =5is:

(a) 0 (b) 1

(c) 2 (d) 3

Answer: (b) 1

53. If a, b and c are real numbers, then both the roots of the equation (x ?

(a) Are positive (b) Are negative

(c) Do not exist (d) Are real

Answer: (d) Are real

54. The number of real roots of the equation)x ?

(a) 3 (b) 1

(c) 4 (d) 2

Answer: (c) 4

55. The positive value of x = 12+ 12+ 12+...up to ?

(a) 1 (b) 2

(c) 4 (d) 3

Answer: (c) 4

56. The orthocenter of the triangle ABC, whose angular points are A(1, 2), B(2, 3), is of the form:

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

(c) (2, 5) (d) (1, 6)

Answer: (d) (1, 6)

57. The possible solutions (s) of the equation tan 1 x+ =2cosx, lying in the interval 0 ?

(a) 2 (b) 1

(c) 4 (d) 3

Answer: (a) 2

58. If the median of the triangle ABC through A is perpendicular to AB, then the value of tan A + 2 tan B is:

(a) 0 (b) cos C

(c) tan C (d) sin C

Answer: (a) 0

59. An aero plane flying at a height of 3,000 m above the ground passes vertically above another plane at an instant, when the angles of elevation of the two planes from the same point of the ground are 60 ?

(a) 100 300m 100 (b) 300 10 m 30

(c) 100 30m (d) m

Answer: (a) 100 300m 100

60. A tree is broken by wind, its upper part touching the ground at a point 16 m from the foot of the tree and making an angle of 45 ?

(a) 42 1+ 2 m (b) 16 2m ( ) ( )

(c) 4 2+1 m (d) 4 1+ 2 m

Answer: (a) 42 1+ 2 m

61. When we use Mean value theorem for f (x) = x(x ?

(a) 0.317 (b) 0.236

(c) 1.764 (d) 0.138

Answer: (b) 0.236

62. If f(x) = 2x + log(3), and F(x) is its e antiderivative such that F(2) = 7, then the value of x for which the curve F(x) cuts the abscissa axis is:

(a) x = 1 (b) x = 3

(c) x = 2 (d) x = 0

Answer: (a) x = 1

63. The arithmetic mean of the data (x, f) : (8, 5), (10, 8), (15, 8), (20, 4) is:

(a) 25 (b) 12.5

(c) 12.8 (d) 12.4

Answer: (c) 12.8

64. The median of the numbers 20, 18, 22, 27, 25, 12, 15 is:

(a) 22 (b) 20

(c) 19.8 (d) 19.9

Answer: (b) 20

65. The mode of the number 25, 15, 23, 40, 27, 25, 23, 20 is:

(a) 25 (b) 24.7

(c) 13 (d) 24.8

Answer: (a) 25

66. The relation between mean deviation (M.D.) and standard deviation (S.D) is:

(a) 3M.D. = 4S.D (b) 5M.D. = 4 S.D

(c) 4 M.D. = 3S.D (d) 4 M.D. = 5S.D

Answer: (b) 5M.D. = 4 S.D

67. Then the mean and the standard deviation of the remaining 45 observations, respectively, are:

(a) 6.38, 1.97 (b) 8.36, 1.91

(c) 6.26, 1.89 (d) 6.83, 1.78

Answer: (a) 6.38, 1.97

68. The mean deviation about the mean and the standard deviation of the set of numbers 3, 5, 6, 7, 10, 12, 15, 18, respectively, are:

(a) 3.75, 2.575 3+5+6+7+10+12+15+18 (b) 4.1, 4.5

(c) 4.15, 4.825 (d) 4.25, 4.875

Answer: (d) 4.25, 4.875

69. If A and B are mutually exclusive events such that P(A) = 0.29 and P(B) = 0.43, then P(A ?

(a) 0.37 (b) 0.85

(c) 0.50 (d) 0.29

Answer: (d) 0.29

70. If the mean of a Poisson distribution is 0.5, then the ratio of P(x = 3) to (x = 2) is ?

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

(c) 1 : 8 (d) 1 : 6

Answer: (d) 1 : 6

71. The Eigen vectors corresponding to distinct Eigen values of a real symmetric matrix are:

(a) Symmetric (b) Orthogonal

(c) Invertible (d) Distinct

Answer: (b) Orthogonal

72. The norm of v = (3, 4) ?

(a) 25 (b) 5

(c) 16 (d) 9

Answer: (b) 5

73. If A has 5 elements and B has 7 elements, then the minimum number of elements that A ?

(a) 2 (b) 7

(c) 12 (d) 5

Answer: (b) 7

74. If f(x) = ,then value of |f(2) ?

(a) 1 (b) 0

(c) 3 (d) 2

Answer: (d) 2

75. x^3 3x 22. If f(x) = and g(x) = are two real-valued functions, then the number of solutions of (g(cid:3)f)(x)=(f(cid:3)g)(x)is:

(a) 3 (b) 1

(c) 2 (d) 0

Answer: (a) 3

76. For a set of circles in a plane, the relation 'concentric' is a ?

(a) reflexive only (b) not transitive

(c) symmetric only (d) equivalence relation

Answer: (d) equivalence relation

77. If {x} and [x] represent fractional and integral part of x, then the value of [x] + {x+k} ?

(a) 1 (b) 1000x

(c) 0 (d) x

Answer: (d) x

78. If [x] represent the integral part of x, then the range of the function y = [x^2] ?

(a) {1, 2} (b) {0}

(c) {0, 1, 2} (d) {0, 1}

Answer: (c) {0, 1, 2}

79. Let P(n) : n(n + 1) (n + 2) is divisible by 12. Then which of the following is true?

(a) P(5) (b) P(9)

(c) P(4) (d) P(1)

Answer: (c) P(4)

80. If P(n): 4n + 3 is a prime number, then which of the following is INCORRECT?

(a) P(4) (b) P(1)

(c) P(2) (d) P(3)

Answer: (d) P(3)

81. If nC = 28, the value of n is: n ?

(a) 7 (b) 9

(c) 8 (d) 6

Answer: (c) 8

82. How many diagonals are there in polygon of 15 sides?

(a) 135 (b) 120

(c) 105 (d) 90

Answer: (d) 90

83. In how many ways can 5 ladies and 5 gentlemen be seated at a round table so that no two ladies are next two each other?

(a) 120 (b) 2880

(c) 720 (d) 24

Answer: (c) 720

84. How many different words can be formed using all the letters of the word ORDINATE so that the vowels occupy odd places?

(a) 576 (b) 484

(c) 441 (d) 400

Answer: (a) 576

85. For any complex number z, the minimum value of |z| + |z ?

(a) 2 (b) 1

(c) 0 (d) 3

Answer: (a) 2

86. The triangle formed by the points 1, , i 2 as vertices in the Argand diagram is:

(a) equilateral (b) right-angled

(c) isosceles (d) scalene

Answer: (c) isosceles

87. What is the remainder when 1! + 2! + ... 100! is divided by 15?

(a) 1 (b) 3

(c) 4 (d) 2

Answer: (b) 3

88. What is the remainder when is divided by 7?

(a) 1 (b) 2

(c) 4 (d) 3

Answer: (c) 4

89. The number of positive integers n ?

(a) 1034 (b) 519

(c) 103 (d) 831

Answer: (a) 1034

90. The points (p. q + r), (q, r + p) and (r, p + q) are:

(a) collinear (b) vertices of a right angled triangle

(c) vertices of an equilateral triangle (d) concyclic

Answer: (a) collinear

91. The equation - =1,r <1 represents: 1-r 1+r ?

(a) an ellipse (b) a circle

(c) a pair of straight lines YCT (d) a hyperbola

Answer: (d) a hyperbola

92. y = is the reflection of y = log x in the line 10 whose equation is:

(a) y= 10 10x (b) y = x + 10

(c) y = 10x (d) y = x x

Answer: (d) y = x x

93. The relation sin x + 2 sin 2x = 3x, 0 ?

(a) one solution in each quadrant (b) two solutions in the first quadrant

(c) one solution in the second quadrant (d) no solution in any quadrant

Answer: (d) no solution in any quadrant

94. If = 4, then the value of x ?

(a) tan(8) (b) ttnana

(c) tan(4) (d) tan(2)

Answer: (a) tan(8)

95. Using Rolle's theorem for a function f(x) = x (x + 1) (x + 2) (x + 3), f'(x) = 0 has:

(a) two real roots (b) four real roots

(c) two real roots and a complex root (d) three real roots

Answer: (d) three real roots

96. Applying Lagrange's Mean Value theorem to ?

(a) 0.5 (b) 1.5

(c) 1.25 (d) 2

Answer: (b) 1.5

97. The mean deviation of the values 8, 15, 53, 49, 19, 62, 7 , 15, 95, 77 about the median is:

(a) 26.1 (b) 21.7

(c) 25.1 (d) 27.2

Answer: (d) 27.2

98. Suppose 300 misprints are distributed randomly throughout a book of 500 pages. What is the probability that a given page contains 2 or more misprints?

(a) 0.1 (b) 0.329

(c) 0.549 (d) 0.122

Answer: (d) 0.122

99. Which of the following functions is the only analytic function?

(a) f(z) = Im(z) (b) f(z) = z

(c) f(z) = sin(z) (d) f(z) = R(iz)

Answer: (c) f(z) = sin(z)

100. If b = c = 0 in the equation $ax^2 + bx + c = 0$, then the value of roots are ?

(a) 1, 0 (b) 0, 0

(c) 0, 1 (d) 1, 1

Answer: (b) 0, 0