UNIVERSITY OF LUCKNOW

D.Pharm Entrance Examination

Mathematics Group — Model Test Paper Set 2

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

LUUPDATE

SECTION A — Chemistry & Physics [50]

Chemistry

1. Water and 95% ethanol are most used solvent in UV-spectroscopy because _____.

(a) They dissolve non-polar compounds (b) They are transparent in UV-spectrum

(c) They are H-bonded solvents (d) They are highly polar compounds

Answer: (b) They are transparent in UV-spectrum

2. The minimum amount of fissionable material that can produce a self sustaining chain reaction is called _____.

(a) Flux (b) Innoculum

(c) Feed (d) Critical mass

Answer: (d) Critical mass

3. Reactors which use UO Pellets enriched to 2 2.3% fuel, D O as moderators and water as 2 coolant is called _____.

(a) Boiling water reactor (b) Pressurised water reactor

(c) Fast breeder reactor (d) Steam generating heavy water reactor

Answer: (d) Steam generating heavy water reactor

4. Release of chemicals to the environment in US is tracked by _____.

(a) Toxics release inventory (b) International Chemical Laboratory

(c) IUPAC (d) Pollution prevention control board

Answer: (a) Toxics release inventory

5. % yield of any reaction is given by _____.

(a) (Theoretical weight obtained (b) [(Actual weight-The-oretical weight)

(c) (Actual weight obtained (d) [(Theoretical weight- Actual weight)

Answer: (c) (Actual weight obtained

6. The stability order for carbocations are _____.

(a) CH < primary < secondary < tertiary (b) Tertiary < CH < secondary < primary

(c) CH < tertiary < primary < secondary (d) Tertiary < secondary < primary < CH

Answer: (a) CH < primary < secondary < tertiary

7. Radical stabilization in free radicals is defined by _____.

(a) C-H bond enthalpy (b) C-H bond dissociation energy

(c) C-C bond enthalpy (d) C-C bond dissociation energy

Answer: (b) C-H bond dissociation energy

8. Example of homogenous catalysts used in homogenous hydrogenation is _____.

(a) Finely dispersed Platinum (b) Pt

(c) Complexes of Rhodium (d) Finely dispersed Rhodium

Answer: (c) Complexes of Rhodium

9. In epoxidation of E-2-butene, major product formed will be _____.

(a) trans-2,3-dimethyloxirane (b) Not determinable

(c) Racemic mixture of cis and trans-2,3- dimethyloxirane (d) cis-2,3-dimethyloxirane

Answer: (a) trans-2,3-dimethyloxirane

10. An IR-spectra is found to have a medium adsorption peak near 3400cm-1 IR-mheske :

(a) Amines (b) Alcohols

(c) Aldehydes (d) Esters

Answer: (a) Amines

11. In nitration process, the reaction typically proceeds through a _____.

(a) Free radical intermediate (b) Cationic intermediate

(c) Anionic intermediate (d) Zwitterionic intermediate

Answer: (b) Cationic intermediate

12. Diel's- Alder reaction is an example of _____

(a) Stereospecific syn (b) Regioselective syn

(c) Stereospecific anti (d) Regioselective anti

Answer: (a) Stereospecific syn

13. Preparation of initial extract typically implements _____.

(a) Mixture of polar and non-polar solvent (b) Polar solvents

(c) Supercritical fluids (d) Non-polar solvents

Answer: (b) Polar solvents

14. Benzoic acid and Glycine reacts in presence of Acyl synthetase to give _____.

(a) Hippuric acid (b) Salicylic acid

(c) Acylic acid (d) N-acetylprocainamide

Answer: (a) Hippuric acid

15. Cholesterol lowering drugs are known as _____.

(a) Quinones (b) Alkaloids

(c) Statins (d) Anthraquinones

Answer: (c) Statins

16. In polymerization process of Ethylene, it is heated at high pressure in presence of oxygen or a peroxide. This process is known as _____.

(a) Anionic polymerization (b) Free radical polymerization

(c) Coordination polymerization (d) Cationic polymerization

Answer: (b) Free radical polymerization

17. The binding of oxygen molecules :

(a) Chelate Cooperativity (b) Interannular Cooperativity

(c) Intramolecular Cooperativity (d) Intermolecular Cooperativity

Answer: (d) Intermolecular Cooperativity

18. An alkaloid containing an indole core and produced in living organism from the amino acid tryptophan is _____.

(a) Bufotenin (b) Piperine

(c) Ephedrine (d) Quinine

Answer: (a) Bufotenin

19. Structure isoelectronic with naphthalene is _____.

(a) Pyrrole (b) Benzimidazole
(c) Imidazole (d) Furan
Answer: (b) Benzimidazole

20. Maltose, which is obtained by hydrolysis of starch and cellobiose are _____.
(a) Disaccharide (b) Sugar
(c) Polysaccharide (d) Monosaccharide
Answer: (a) Disaccharide

21. Anion exchange chromatographic methods at high pH (>12) with sodium hydroxide or sodium hydroxide :
(a) Proteins (b) Anions
(c) Sugar (d) Carbohydrates
Answer: (d) Carbohydrates

22. Liquid chromatography is a technique used to separate a sample into its individual parts. This separation occurs based on the interaction of the sample with the mobile and stationary phases. Because there many stationary :
(a) 50.20% (b) 41%
(c) 50% (d) 100%
Answer: (b) 41%

23. When macromolecular crowding increases, the chemical potential of protein _____.
(a) Increases (b) Remains unchanged
(c) Decreases (d) Initially increases then decreases
Answer: (a) Increases

24. For a molecule, molecular ion peak appears :
(a) CH -CHO-CH -CH 3 2 (b) CH -CH -CO -CH 3 2 2
(c) CH -CH -CO-CH -CH 3 2 2 (d) CH -CH -CO-O-CH -CH 3 2 2
Answer: (d) CH -CH -CO-O-CH -CH 3 2 2

25. XRD peaks are produced by _____
(a) Destructive interference (b) Diffraction
(c) Absorption (d) Constructive interference
Answer: (d) Constructive interference

Physics

26. A conductor has a positive charge of 19.2 × 10– 19 Coulombs. How many electrons are in short on the conductor ?
(a) 18 (b) 20
(c) 16 (d) 12
Answer: (d) 12

27. The cell reaction of a secondary battery is ?
(a) Reversible (b) Irreversible
(c) Endothermic (d) Equilibrium
Answer: (a) Reversible

28. The internal resistance of an ideal constant voltage source is ?
(a) Infinite (b) Zero
(c) equal to resistance of load (d) None of the above
Answer: (b) Zero

29. A body of mass 1 kg is suspended from a string of length 1 meter. The body is rotated in a vertical circle with constant speed 2 m/s. The tension of the string when it is horizontal is ?

(a) 4N (b) 3N

(c) 1N (d) 2N

Answer: (a) 4N

30. A person climbs up a stalled escalator in 60 s. If standing on the same but escalator running with constant velocity he takes 40 s. How much time is taken by the person to walk up the moving escalator ?

(a) 37 s (b) 27 s

(c) 24 s (d) 45 s

Answer: (c) 24 s

31. A projectile has a maximum range of 16 km. At the highest point of its motion, it explodes into two equal masses. One mass drops vertically downward. The horizontal distance covered by the other mass from the time of explosion will be:

(a) 32 km (b) 24 km

(c) 16 km (d) 8 km

Answer: (c) 16 km

32. In Bohr model of the hydrogen atom, the 2.2×106 electron travels with speed m/s in a circle (r = 5.3×10−11 m) about the nucleus. The value of B at the nucleus due to electron's motion, is:

(a) 30.0 T (b) 12.5 T

(c) 25.0 T (d) 40.0 T

Answer: (b) 12.5 T

33. The equation −J.E = +∇.sis called ∂t ?

(a) Stoke's law (b) None of these

(c) Coulombs law (d) Poynting theorem

Answer: (d) Poynting theorem

34. The peak voltage in a 240V A.C. source is ?

(a) 300 V (b) 340 V

(c) 240 V (d) 380 V

Answer: (b) 340 V

35. The phenomenon of adiabatic demagnetization is used to ?

(a) Demagnetize a magnet (b) Purify a gas i

(c) Produce very low temperature (d) Generate electricity

Answer: (c) Produce very low temperature

36. Which of the following produces magnetic field?

(a) Force (b) Electric dipole

(c) Diamagnetic substance (d) Time varying field

Answer: (d) Time varying field

37. The increase in the relativistic mass of a particle of rest mass 1 gm when it is moving with 0.8 c velocity is :

(a) 0.667 gm (b) 1 gm

(c) zero (d) 1.667 gm

Answer: (d) 1.667 gm

38. The frequency of a light spring when 1 kg weight is suspended on its end is 4 oscillations per second. If 4 kg weight suspended to the same spring, the frequency of oscillations shall be ?

(a) 16 per sec (b) 2 per sec
(c) 4 per sec (d) 8 per sec
Answer: (b) 2 per sec

39. If work required to blow a soap bubble of radius R is W, then the additional work required to blow its radius upto 3 R will be ?
(a) 3 W (b) 9 W
(c) 8 W (d) 27 W
Answer: (c) 8 W

40. Eight equal drops of water are falling through air with a steady velocity of 5 cm/sec. If the drops collapse, what will be the new terminal velocity?
(a) 40 cm/s (b) 10 cm/s
(c) 5 cm/s (d) 20 cm/s
Answer: (d) 20 cm/s

41. In the circuit show in figure, power developed across 1 Ω, 2 Ω and 3 Ω resistance are in the ratio of ?
(a) 4 : 2 : (b) 6 : 4 :
(c) 2 : 1 : (d) 1 : 2 :
Answer: (a) 4 : 2 :

42. A capacitor of capacitance 6 μF is changed upto 100 volt. The energy stored in the capacitor is– ?
(a) 0.06 H (b) 0.03 J
(c) 0.3 J (d) 0.6 J
Answer: (b) 0.03 J

43. An electron and a proton are about m apart. Their relative motion is chiefly determined by ?
(a) magnetic forces (b) gravitational forces
(c) nuclear forces (d) electrical forces
Answer: (d) electrical forces

44. Twenty seven identical drops of mercury are charged simultaneously to the potential of 10 volts. If all the drops combine to form a single drop, what will be the potential of bigger drop ? Assume drops to be spherical ?
(a) 100 volts (b) 70 volts
(c) 120 volts (d) 90 volts
Answer: (d) 90 volts

45. J=σE, where J is current density, σ is conductivity and E is electric field, is ?
(a) A form of Ohm's law (b) Ampere's law
(c) Maxwell's equation (d) Continuity equation
Answer: (a) A form of Ohm's law

46. Zone plate is a device to study diffraction. The radii of its zones are proportional to ?
(a) square root of natural numbers (b) natural numbers
(c) square of natural numbers (d) inverse of natural numbers
Answer: (a) square root of natural numbers

47. Two yellow sodium lines of wavelengths ° ° 5890A and 5896A are just resolved by a prism. The resolving power of the prism is ?
(a) 0.102 (b) 5893
(c) 981.16 (d) 6
Answer: (c) 981.16

48. The ratio of light intensity scattered by two ° ° colours of wavelengths 4000A and 6000A is ?

(a) 5 (b) 7

(c) 2 (d) 1

Answer: (a) 5

49. In case of diffraction due to an opaque circular disc, the centre of the shadow is always ?

(a) none of the above (b) bright

(c) dark (d) coloured

Answer: (b) bright

50. Light is polarized to the maximum, when it is incident on a glass surface at an angle of incidence ?

(a) 530 (b) 670

(c) 570 (d) 370

Answer: (c) 570

SECTION B — Mathematics [50]

51. If a, b, c, x, y, z are the real numbers such that $a^2 + b^2 + c^2 = 1$, $x^2 + y^2 + z^2 = 1$, then ax + by + cz ?

(a) Greater than or equal to 1 (b) Less than or equal to 3

(c) Greater than or equal to 3 (d) Less than or equal to 1

Answer: (d) Less than or equal to 1

52. How many numbers from 1 to 1000 are not divisible by 2, 3 and 5?

(a) 264 (b) 268

(c) 266 (d) 262

Answer: (c) 266

53. The relevant residues are 1, 7, 11, 13, 17, 19, 23 and 29 (eight). We count 8 ?

(a) 17 cm (b) 14 cm

(c) 20 cm (d) 15 cm

Answer: (d) 15 cm

54. In the following figure, O is the centre of the circle and D, E and F are the mid points of AB, BO and OA respectively. If ?

(a) 30 (b) 120

(c) 90 (d) 60

Answer: (d) 60

55. If a, b, c, d are four positive real numbers such that abcd = 1, then (1 + a) (1 + b)(1 + c) (1 + d) is :

(a) Less than or equal to 15 (b) Greater than or equal to 8

(c) Greater than or equal to 16 (d) Less than or equal to 8

Answer: (c) Greater than or equal to 16

56. The volume of a hemisphere is 18 ?

(a) 18 (b) 21

(c) 27 (d) 24

Answer: (c) 27

57. If (3, 2), (6, 3), (x, y) and (6, 5) are the vertices of a parallelogram, the (x, y) is:

(a) (5, 6) (b) (9, 6)

(c) (9, 8) (d) (8, 7)

Answer: (b) (9, 6)

58. From the following results of two colleges A and B, find out which of the two is better?

(a) data is not sufficient (b) college B

(c) college A (d) both are same

Answer: (d) both are same

59. The measure of the central tendency is given by the X-coordinate of the point of intersection of the more than ogive and less than ogive is:

(a) Median (b) Mean

(c) Mode (d) All the above

Answer: (a) Median

60. If the mean of n observations is 46n , then n is equal to: 11 ?

(a) 23 (b) 12

(c) 22 (d) 11

Answer: (d) 11

61. In a Mathematics test 15 students scored 80 marks, 20 students scored 75 marks, 28 students scored 65 marks and 25 students scored 60 marks, mode of the score is:

(a) 75 (b) 65

(c) 80 (d) 60

Answer: (b) 65

62. For the following distribution: Class 0 -5 5 -10 10 -15 15 -20 20- 25 Frequency 10 15 12 20 9 The sum of lower limits of the median class and modal class is:

(a) 25 (b) 15

(c) 30 (d) 35

Answer: (a) 25

63. The units digit of 3100 is :

(a) 3 (b) 0

(c) 2 (d) 1

Answer: (d) 1

64. The number of positive divisors of 8 ?

(a) 20 (b) 100

(c) 80 (d) 16

Answer: (c) 80

65. If the point P(x, y) is equidis tant from the points A (a + b, b ?

(a) bx = ay (b) ax = by

(c) y = bx (d) x = ay

Answer: (a) bx = ay

66. How many cards must be picked from a standard pack of 52 cards to surely get 2 cards of the same suit?

(a) 2 (b) 5

(c) 3 (d) 4

Answer: (b) 5

67. Among any group of 11 integers, the number of integers with the same remainder when they are divided by 10 is:

(a) atmost 5 (b) exactly 3

(c) atleast 2 (d) atleast 5

Answer: (c) atleast 2

68. What should be the value of k so that the linear equation in two variables x and y, 31x+124y = k has integer valued solutions?

(a) 72 (b) 155

(c) 103 (d) 134

Answer: (b) 155

69. If a rectangle has perimeter 96 meters and its length is three times its breadth, then the area of the rectangle is :

(a) 432 cubic meters (b) 436 cubic meters

(c) 432 sq. meters (d) 436 sq. meters

Answer: (c) 432 sq. meters

70. Two hotels stand 25m apart. One of them is 70m high and the angle of depression of the top of other as observed from the top of this hotel is 45 ?

(a) 43 m (b) 44 m

(c) 46 m (d) 45 m

Answer: (d) 45 m

71. Consider a population with is finite and sampling is with replacement. If the variance of the population is 2176.8 with sample size of 16, then the variance of the sampling distribution of means is:

(a) 134.12 (b) 136.05

(c) 137.04 (d) 135.21

Answer: (b) 136.05

72. The median for a moderately asymmetrical series having mode and mean as 125 km and 130.7 km respectively is:

(a) 124.8 m (b) 128.8 m

(c) 128.8 km (d) 129.7 m

Answer: (c) 128.8 km

73. Which of the following is a rational number?

(a) 4+ 5 4 (b) 4+ 5 4+ 5

(c) 4 (d) 4+ 5

Answer: (a) 4+ 5 4

74. For 4 data points of two correlated variables x and y, it is given that ?

(a) x= (103+36y) 116 1 (103+36x) (b) x= 116 1

(c) y= 116 (d) y= (36+103x) 116 1 (36+103y)

Answer: (c) y= 116

75. What should be filled at the places of 1, 2 and 3 to make the statement correct?

(a) rectangles; areas; frequencies (b) triangles; areas; item size

(c) rectangles; parameters; item size (d) triangles; parameters; frequencies

Answer: (a) rectangles; areas; frequencies

76. For a given series of items, if we subtract 'a' from every item and divide every item by 'b', then arithmetic mean of the series:

(a) increases by 'a' and multiplied 'b' (b) increases by 'a' and divided by 'b'

(c) diminishes by 'a' and multiplied by 'b' (d) diminishes by 'a' and divided by 'b'

Answer: (d) diminishes by 'a' and divided by 'b'

77. The curves that occur for a distribution in which class - frequencies go on decreasing symmetrically on either side of central value, are called :

(a) extremely asymmetrical curves (b) moderately asymmetrical curves

(c) symmetrical curves (d) U - shaped curves

Answer: (c) symmetrical curves

78. An equilateral triangle of side 10 m is to be painted on a wall. If the cost of painting is ` 15 per m^2, then the cost to paint the triangle is :

(a) 659.5 (b) 649.5

(c) ` 549.5 (d) ` 559.5 ` `

Answer: (b) 649.5

79. Find the two numbers whose sum is 30 and product of whose HCF and LCM is 224 ?

(a) 12, 18 (b) 14, 16

(c) 11, 19 (d) 13, 17

Answer: (b) 14, 16

80. At how many points does the polynomial x^3 ?

(a) 0 (b) 3

(c) 1 (d) 2

Answer: (c) 1

81. A non-terminating but recurring decimal is:

(a) A natural number (b) A rational number

(c) A whole number (d) An integer

Answer: (b) A rational number

82. Number of positive integers, which are less than 108 and prime to 108, is ?

(a) 15 (b) 36

(c) 18 (d) 17

Answer: (b) 36

83. PQ is the direct common tangent of two circles (S, 9 cm) and (R, 4 cm) which touch each other externally. Find the area of the quadrilateral cm^2)?

(a) 65 (b) 78

(c) 69 (d) 72

Answer: (b) 78

84. Then Euclid's Division lemma gives 31513=dq +r & 34369=dq +r 1 2 ?

(a) 1.9 (b) 0.3

(c) 1 (d) 3

Answer: (c) 1

85. Find the remainder when 3215 is divided by 43 ?

(a) 28 (b) 30

(c) 33 (d) 35

Answer: (a) 28

86. Find the number of ways in which 8064 can be resolved as the product of two factors?

(a) 24 (b) 22

(c) 26 (d) 20

Answer: (a) 24

87. The following sentences are steps involved in finding the H.C.F. of 29 and 24 by using Euclid's Division algorithm. Arrange them in sequential order from first to last (A) 5=1 ?

(a) B, C, A (b) B, A, C

(c) C, A, B (d) A, B, C

Answer: (a) B, C, A

88. A number of three digits in scale of 7 when expressed in scale of 9 has its digits reversed in order. Find the number expressed in scale of 10 ?

(a) 246 (b) 245

(c) 248 (d) 247

Answer: (c) 248

89. A 6 feet tall man finds that the angle of elevation of the top of a 24 feet height pillar and the angle of depression of its base are complementary angles. The distance of the man from the pillar is:

(a) 8 3 feet (b) None of these

(c) 6 3 feet (d) 2 3 feet

Answer: (c) 6 3 feet

90. Two hemispherical vessels can hold 10.8 liters and 50 liters of liquid respectively. The ratio of their minor curved surface area is:

(a) 9 : 25 (b) 25 : 9

(c) 16 : 25 (d) 4 : 3

Answer: (a) 9 : 25

91. The number of real solutions of equation x^2 ?

(a) 4 (b) 1

(c) 2 (d) 3

Answer: (a) 4

92. The ratio of the radius of two cylinders is 2:3 and the ratio of their heights is 5:3. The ratio of their volumes will be:

(a) 9 : 4 (b) 27 : 20

(c) 4 : 9 (d) 20 :27 =

Answer: (d) 20 :27 =

93. If the roots of quadratic equation $x^2+px+q=0$are tan30 ?

(a) 1 (b) 0

(c) 3 (d) 2

Answer: (c) 3

94. A metallic cone of diameter 32 cm and height 9 cm is melted and made into identical spheres each of radius 2 cm. How many such spheres can be made?

(a) 72 (b) 64

(c) 52 (d) 48

Answer: (a) 72

95. X is a non-negative integer valued random ?

(a) 4 & 2 (b) 2 & 2

(c) 2 & 4 (d) 2 & 3

Answer: (c) 2 & 4

96. For what values of m the equations (m+2)x+(2m+1)y=2(m ?

(a) 4 (b) 3

(c) 2 (d) 5

Answer: (a) 4

97. P (3, 1), Q (6, 5) and R (x, y) are three points such that the angle ?

(a) 2 (b) 4

(c) 1 (d) 0

Answer: (a) 2

98. The system of equations 2x+4y=6and 4x+8y=6has:

(a) no solution (b) exactly two solutions

(c) infinitely many solutions (d) a unique solution

Answer: (a) no solution

99. The terms of the two series 3+10+17+...and 63+65+67+...are equal, then the value of n is:

(a) None of these (b) 19 nth

(c) 9 (d) 13

Answer: (d) 13

100. The number of values of k for which the system of equations x+y=2, kx+y=4, x+ky=5has at least one solution is:

(a) 2 (b) 3

(c) 0 (d) 1

Answer: (d) 1