UNIVERSITY OF LUCKNOW

D.Pharm Entrance Examination

Mathematics Group — Model Test Paper Set 6

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

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SECTION A — Chemistry & Physics [50]

Chemistry

1. The metal obtained from the auto reduction of its oxide with sulfide is : Gme Oeeleg :

(a) Al (b) Zn

(c) Cu (d) Fe

Answer: (c) Cu

2. Takai reaction of aldehydes gives which of the following products?

(a) Epoxide (b) Alkane

(c) Alkyne (d) Alkene

Answer: (d) Alkene

3. Which of the following is an example of dialdehyde?

(a) Glyoxal (b) Buteraldehyde

(c) Vanicin (d) Furfural

Answer: (a) Glyoxal

4. The process by which ketones are formed by the hydrolysis of salts of secondary nitro compounds is known :

(a) Friedel craft's (b) Dakin-West reaction

(c) Nef Reaction (d) Fukuyama coupling

Answer: (c) Nef Reaction

5. Ketones from _____

(a) amine (b) ketal

(c) enamine (d) imine

Answer: (d) imine

6. Amines act as : Deceervme efke :

(a) Lewis bases (b) Both good nucleophiles & lewis bases

(c) Good electrophiles (d) Good nucleophiles

Answer: (b) Both good nucleophiles & lewis bases

7. Primary and Secondary amines form____

(a) enamines and enamines; aldehydes and ketones (b) imines and enamines; ketones and aldehydes

(c) imines and enamines; aldehydes and ketones (d) enamines and imines; aldehydes and ketones

Answer: (c) imines and enamines; aldehydes and ketones

8. The product formed in Bischler-Napieralski reaction :

(a) Amine (b) Cyclic imine

(c) Nitrile (d) Aldehyde

Answer: (b) Cyclic imine

9. Carbylamine test is used for the detection :

(a) All amines (b) Primary amines

(c) Tertiary amines (d) Secondary amines

Answer: (b) Primary amines

10. Which of the following act (s) as thermosetting resins ?

(a) Polyesters (b) Poly styrene

(c) Polyethylene (d) Polyamides

Answer: (a) Polyesters

11. Which of the folloiwng is a polymeric product?

(a) Cotton (b) Meat

(c) Wood (d) Rubber

Answer: (d) Rubber

12. Poly oxy methylene is formed from monomers unit :

(a) Tetrhydro furan (b) Ethylene oxide

(c) Caprolactum (d) Trioxane

Answer: (d) Trioxane

13. The type of bonding predominant in polymers is : yengueke :

(a) Metallic (b) Covalent

(c) Ionic (d) Dipole forces

Answer: (b) Covalent

14. Which of the following polymers is non-polar?

(a) PVC (b) Polypropylene

(c) Acrylonitrile (d) Both Acrylonitrile & PVC

Answer: (b) Polypropylene

15. Which of the following is not a basic amino acid?

(a) Arginine (b) Aspargine

(c) Serine (d) Glutamine

Answer: (c) Serine

16. Ruff degradation takes place in the presence :

(a) Mg2+ (b) Mn2+

(c) Fe2+ (d) Fe3+

Answer: (d) Fe3+

17. Rickets is caused by the deficiency of : efjkes :

(a) Vitamin-D (b) Vitamin-B

(c) Vitamin-C (d) Vitamin-A

Answer: (a) Vitamin-D

18. Hormone that is not synthesised by the process :

(a) Glucagon (b) Insulin

(c) Melatonin (d) Somatostatin

Answer: (c) Melatonin

19. PS I and PS II consists of _____

(a) Fe3+ (b) Ca2+

(c) Mn2+ (d) Fe2+

Answer: (c) Mn2+

20. Glucose and galactose are : iuetke :

(a) Non-sugars (b) Epimers
(c) Disacharides (d) Anomers
Answer: (b) Epimers

21. Which of the following is not responsible for water pollution?
(a) Bio-degradable waste (b) Sewage waste
(c) Radio-active waste (d) Pesticides
Answer: (a) Bio-degradable waste

22. Acid rains are caused due to : Decue Je<ee& efke :
(a) Both SO & NO (b) NO 2
(c) CO 2 2 (d) SO
Answer: (a) Both SO & NO

23. Itai disease is caused :
(a) Mercury pollution (b) Lead pollution
(c) Sodium pollution (d) Cadmium pollution
Answer: (d) Cadmium pollution

24. Which of the following is not an antibiotic?
(a) Oflaxins (b) Ranitidine
(c) Cefixime (d) Tetracyclins
Answer: (b) Ranitidine

25. Valinomycin consists of : Jesefueveescee :
(a) K+ (b) Ca2+
(c) Mg2+ (d) Na+
Answer: (a) K+

Physics

26. Velocity of sound will be highest in ?
(a) Vacuum (b) Steel
(c) Water (d) Air
Answer: (b) Steel

27. The frequency of transverse vibrations of a string is 100 cycles/sec. If the tension of the string is increased to its four times, the frequency will be :
(a) 50 cycles/sec (b) 25 cycles/sec
(c) 200 cycles/sec (d) 100 cycles/sec
Answer: (c) 200 cycles/sec

28. Which of the following is not a thermo dynamical variable ?
(a) Internal Energy (b) Enthalpy
(c) Heat (d) Temperature
Answer: (c) Heat

29. If one molecule of a monoatomic gas (γ = 5/3) is mixed with one molecule of a diatomic gas (γ = 7/5), what will be the value of γ for the mixture :
(a) 1.5 (b) 2
(c) 3.5 (d) 2.5
Answer: (a) 1.5

30. The ratio of earth's magnetic intensities at its pole and at equator is ?

(a) 2.5 (b) 1.0

(c) 1.5 (d) 2.0

Answer: (d) 2.0

31. In Wheatstone bridge method of finding unknown resistance or inductance, the instrument used as null detector is ?

(a) Ammeter (b) Voltmeter

(c) Galvanometer (d) All of these

Answer: (c) Galvanometer

32. The resistances in a post office box are made of ?

(a) Manganin (b) Copper

(c) Iron (d) Brass

Answer: (a) Manganin

33. What is the fundamental basis of a laser?

(a) Stimulated emission (b) Spontaneous emission

(c) Scattering 1012Watt (d) Absorption

Answer: (a) Stimulated emission

34. A zone plate is to be constructed with focal length of 50cm forλ= 5.0×10-5cm. Its first radius will be:

(a) 0.50 mm (b) 0.60 mm

(c) 0.40 mm (d) 0.75 mm

Answer: (a) 0.50 mm

35. What should be the minimum number of lines in grating to resolve sodium doublet (5890 Å and 5896 Å) in third spectral order?

(a) 1312 (b) 656

(c) 328 (d) 984

Answer: (c) 328

36. Red light is used as a danger signal because it :

(a) produces least photo-chemical effect (b) is comfortable for eyes

(c) None of the above (d) is scattered least

Answer: (d) is scattered least

37. A parallel beam of light of wavelength 5460 Å is incident at an angle of 30o on a plane transmission grating which has 6000 lines/cm. the highest order spectrum that can be seen is ?

(a) 2 (b) 5

(c) 3 (d) 4

Answer: (a) 2

38. If the earth stops rotating, the value of 'g' at the equator will ?

(a) Decrease (b) Increase

(c) None of the above (d) Remain same

Answer: (b) Increase

39. For a particle moving under a central force, it's motion will be– ?

(a) along the helix (b) in space

(c) None of the above (d) in a plane

Answer: (d) in a plane

40. The value of λ for which vectors ˆ ˆ j+4kˆ and i-λ are perpendicular is ?

(a) 10 (b) 3
(c) 7 (d) 14
Answer: (d) 14

41. Physical quantities which have same units are :
(a) Pressure and strain (b) Force and work
(c) Pressure and volume (d) Pressure and stress
Answer: (d) Pressure and stress

42. The free electron density in a super conductor is ?
(a) None of these (b) Zero at absolute zero
(c) Finite at absolute zero (d) Infinite at absolute zero
Answer: (c) Finite at absolute zero

43. A 5.5 metre long string has a mass of 0.035 kg. If the tension in the string is 77 N, the speed of a wave on the string is ?
(a) 102 m/sec (b) 165 m/sec
(c) 110 m/sec (d) 77 m/sec
Answer: (c) 110 m/sec

44. Gibbs paradox in Statistical Mechanics is related to the additive property of ?
(a) Energy (b) Entropy
(c) Temperature (d) Momentum
Answer: (b) Entropy

45. In an isothermal reversible expansion of a perfect gas at temperature T, heat Q enters the system. The statement which is true is:
(a) All the heat Q is converted to work (b) No part of heat Q is converted to work
(c) Part of Q increases the internal energy (d) Part of heat Q is converted to work
Answer: (a) All the heat Q is converted to work

46. When applied to solar radiation, Planck's law reduces to Wien's law in following region:
(a) visible (b) infrared
(c) ultraviolet (d) microwave
Answer: (c) ultraviolet

47. According to Wien's law, a star which appears blue will be :
(a) very cold (b) as hot as sun
(c) hotter than the sun (d) colder than the sun
Answer: (c) hotter than the sun

48. When a copper ball is heated, the largest percentage increase will occur in its – ?
(a) Volume (b) Diameter
(c) Density (d) Area
Answer: (a) Volume

49. The correct value of 00C on Kelvin scale is :
(a) 273.15 K (b) 273 K
(c) 273.2 K (d) 273.16 K
Answer: (a) 273.15 K

50. The temperature of a mole of diatomic gas is raised at constant volume by 10 °K. The amount of heat added to the gas is :

(a) 10 R (b) 5 R

(c) 15 R (d) 25 R

Answer: (d) 25 R

SECTION B — Mathematics [50]

51. If f(x) and g(x) defined as {f(x) = 1, if x ?

(a) fog and gof both are continuous (b) fog is not continuous

(c) g is not continuous (d) f is not continuous

Answer: (b) fog is not continuous

52. The function f define by f(x) = {x^2 + 3x + a, if x ?

(a) a = 5, b = 3 (b) a = 3, b = 5

(c) a (d) a = 3, b = 0

Answer: (b) a = 3, b = 5

53. The theorem which allows us to translate difficult line integrals into more simple double integral is ?

(a) Green's theorem (b) Stoke's theorem

(c) Cantor's theorem (d) Mean value theorem

Answer: (a) Green's theorem

54. A metric space is compact if every open cover of x has ?

(a) empty set (b) nonempty set

(c) finite subcover (d) subgroup

Answer: (c) finite subcover

55. A function that defines a concept of distance between any two members of set which are usually called points is ?

(a) a set (b) metric space

(c) determinant (d) open set

Answer: (b) metric space

56. A group isomorphism from a group to itself is ?

(a) homomorphism (b) closure

(c) Abelian (d) group automorphism

Answer: (d) group automorphism

57. To verify that (s, d) is a metric space we should first check that if d (x, y) = 0 then ?

(a) x = 0 (b) x = y

(c) y = 0 (d) y =

Answer: (b) x = y

58. Every holomorphic function is:

(a) Complex (b) Commutative

(c) analytic (d) Complex vector space

Answer: (c) analytic

59. The external direct product of additive group of integer Z with itself is ?

(a) Cyclic but not abelian (b) Not cyclic group

(c) Abelian as well as cyclic group (d) Cyclic group

Answer: (b) Not cyclic group

60. If n and m are natural numbers then the equation.(Z ?

(a) Have no common solution (b) Have one common solution

(c) Have more than two common solution (d) Have two common solution

Answer: (a) Have no common solution

61. Number of zeros in 100 ! is:

(a) 25 (b) 1000

(c) 24 100! (d) 100

Answer: (c) 24 100!

62. Graph of given equation y = decreases where ?

(a) 1 < x < 5 (b) 0< x <1

(c) x < 0 (d) x > 5

Answer: (a) 1 < x < 5

63. If f(-x) = f(x) for all x in the domain, then f(x) is __, even and symmetric about the y axis ?

(a) odd (b) irrational

(c) even (d) rational

Answer: (c) even

64. Let 'A' be cantor set then which of the following statement is false ?

(a) perfect (b) It is closed and bounded

(c) measure is zero (d) countable

Answer: (d) countable

65. Let S be any set then Derived set of S is ?

(a) Always Infinite (b) Always Uncountable

(c) Always open (d) Always closed

Answer: (d) Always closed

66. A prime p can be written as the sum of two squares if ?

(a) p = 1 or p (b) p = 3 or p

(c) p = 4 or p (d) p = 2 or p

Answer: (d) p = 2 or p

67. The graph of the equation r = sin 3 ?

(a) Cardioid (b) Three leaved Rose

(c) Four leaved Rose (d) Spiral

Answer: (b) Three leaved Rose

68. Let [x] denotes the greatest integer less than or equal to x. If f(x) = [x sinx ?

(a) continuous at x = 0 (b) differentiable at x = 1

(c) continuous in (-1,0) (d) differentiable in (-1,1)

Answer: (b) differentiable at x = 1

69. Graph of the curve y = x+3 (x+1)is increasing when:

(a) x<-3 or x>-5 (b) 3< x <-2

(c) x<-3 or x>-2 (d) x > -3 or x <-y

Answer: (c) x<-3 or x>-2

70. A sequence is a convergent sequence if and only if it is a ?

(a) subsequence (b) non - decreasing sequence

(c) Cauchy sequence (d) bounded sequence

Answer: (c) Cauchy sequence

71. If f(x)=x+[x] then which of the following is true ?

(a) continuous but not differentiable at x=0 (b) differentiable at x=0

(c) differentiable at any point (d) not continuous at x=0

Answer: (d) not continuous at x=0

72. If f is continuous on [a,b], then f is :

(a) differentiable (b) integrable

(c) decreasing (d) increasing

Answer: (b) integrable

73. Given set U = {(x,y) >7}is ?

(a) Close (b) Compact

(c) Semi open x (d) Open

Answer: (d) Open

74. A sequence of real numbers is a real- valued function defined on the set of :

(a) natural number i.e.f:N (b) whole number

(c) rational number (d) irrational number

Answer: (a) natural number i.e.f:N

75. How many subgroups of the permutation group S^4 have of order 3?

(a) can not say (b) 4

(c) 8 (d) 0

Answer: (b) 4

76. How many 3-Sylow subgroup are there in the group of order 15?

(a) 0 (b) 3

(c) 1 (d) 5

Answer: (c) 1

77. The product of an even permutation and an odd permutation is ?

(a) Odd (b) zero

(c) not define (d) Even

Answer: (a) Odd

78. The rank of an integral - elementary function f is:

(a) real analytic function (b) Integral elementary function

(c) continuous function (d) the depth of the formula defining f

Answer: (d) the depth of the formula defining f

79. If external direct product of two groups A & B is abelian then ?

(a) A and B both are abelian (b) only B is abelian

(c) A and B both are not abelian (d) only A is abelian

Answer: (a) A and B both are abelian

80. Which of the following is not true?

(a) {C\{0}, x} is a group (b) {R\{0}, x} is a group

(c) {Z\{0}, x} is a group (d) {Q\{0}, x} is a group

Answer: (c) {Z\{0}, x} is a group

81. If f(z)= (x + 2)+5yi then for any z, f(z) is ?

(a) Differentiable for some z (b) Differentiable for all z

(c) none of the above (d) Not-differentiable for any z

Answer: (d) Not-differentiable for any z

82. What is the order of a 7-Sylow subgroup of $GL^3(Z^7)$?

(a) 1 (b) 343 7-Sylow

(c) 49 (d) 7

Answer: (b) 343 7-Sylow

83. The external direct product of additive group of integers Z With itself is?

(a) not cyclic (b) Can not say

(c) cyclic order (d) cyclic of finite

Answer: (a) not cyclic

84. If all the zeros of a polynomial p(z) have negative real parts, then all the zeros of p'(z) must have ?

(a) Negative real part (b) both positive and negative real part

(c) Real part is zero (d) Positive real part

Answer: (a) Negative real part

85. Find out the number of equivalence classes that can be defined by the set {4, 5, 6}:

(a) 4 (b) 6

(c) 5 (d) 15

Answer: (c) 5

86. Calculate the number of asymptotes for the (x^2 function f (x) = (x ?

(a) 2 (b) 1

(c) 0 (d) 3

Answer: (d) 3

87. Which one is true when a matrix is in row echelon form?

(a) c any a or b (b) a

(c) Both statements are true (d) b

Answer: (b) a

88. The spin field or rotation field or turning field goes around the origin instead of away from it. The field is S. if S is perpendicular to R then their dot product is:

(a) infinite (b) 0

(c) not defined (d) 1 (cid:1)(cid:2) (cid:1)(cid:2)

Answer: (b) 0

89. The derivative of function is ?

(a) range (b) order

(c) slope (d) rate of change

Answer: (d) rate of change

90. Which one may or may not take form of model?

(a) statistical models (b) differential equations

(c) logical models (d) game theoretic models

Answer: (c) logical models

91. The ordinary differential equation is: (d2y ?

(a) Linear and Non homogeneous (b) Linear and homogeneous

(c) Non linear and Non homogeneous (d) Non linear and homogeneous

Answer: (a) Linear and Non homogeneous

92. What is the solution of this differential (d2y) (dx^2) equation ?

(a) y (x) = acos (x) + bsin x (b) y (x) = a sin (x)
(c) y (x) = tan (x) (d) y (x) = cot (x)
Answer: (a) y (x) = acos (x) + bsin x

93. When the growth rate was 1% per year, the world population in 1965 was 4 billion. If the 4(2.1)t. modeled equation is given by P = Population growth in Sweden in from July 1965 to July 1966 was approx ?
(a) 1540000000 (b) 1440000000
(c) 1340000000 (d) 1640000000 j
Answer: (d) 1640000000 j

94. A convergent sequence is ?
(a) unique (b) bounded
(c) integral (d) conditional
Answer: (b) bounded

95. The sum of a convergent series is?
(a) integral (b) unique
(c) conditional (d) bounded
Answer: (c) conditional

96. Find the prism volume in the order dz dy dx (six orders are possible) ?
(a) 3 (b) 1
(c) 4 (d) 2
Answer: (a) 3

97. Which operator is used in Stokes' theorem ?
(a) logical (b) open
(c) set (d) Curl
Answer: (d) Curl

98. Which composition of elementary function is not as considered derivable?
(a) exponential (b) polynomial
(c) trigonometric (d) injective
Answer: (d) injective

99. Which is not the way to write Taylor expansion:
(a) constant (b) onto
(c) quadratic (d) cubic
Answer: (b) onto

100. Every metric space is:
(a) Normed space (b) Topological
(c) Congruent (d) Continuous
Answer: (a) Normed space