Junior Science Talent Search Exam. (2014-2015)
Subject: Chemistry

Time: ----   **M.M. 40**

General Instructions:

Read the following instructions carefully before you answer the questions. Answers are to be given on a separate answer sheet. Use only blue/black point pen.

- Write your roll no. very clearly (one digit in one block) on this booklet and on the answer sheet (OMR sheet)

- This question paper comprises four Parts I, II, III and IV and you. See that parts I, II and III contain forty questions each and Part IV contains 30 questions. Answer all the 150 questions.

- Answer each question by filling the correct alternative among the four choices on the answer sheet as shown in example below:

    Example:

- Use of whitener / white fluid is strictly prohibited.
- Separate sheet has been provided for rough work in this test booklet.
- Now turn to the next page and start answering the questions.

Chemistry

51. Arrange the following in increasing order of their intermolecular force of attraction:
    (i) Salt
    (ii) Water
    (iii)   Carbondioxide
    a) iii < ii < i
    b) i < ii < iii
    c) ii < iii < i
    d) iii < i < ii

52. separation method used for separating two miscible liquids:
    a) Distillation
    b) Evaporation
    c) Separating funnel
    d) Chromatography

53. A compound of carbon, hydrogen and nitrogen contains these elements in the ration of their atomic 9:1:3.5, if its molecular mass is 108 u what is its molecular formula?
    a) $C_2 H_2 N$

b) $C_3 H_4 N$

c) $C_2 H_2 N$

d) $C_6 H_8 N_2$
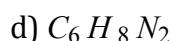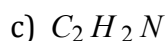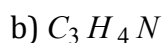
54. The correct chemical formula of the given compounds:

Aluminium Phosphate, Ammonium Carbonate and Sodium Sulphite

are: a) $Al_2 (PO_4)_3 , (NH_4)_2 CO_3 , Na_2 SO_4$

b) $AlPO_4 , NH_4 CO_3 , Na_2 SO_3$

c) $Al (PO_4)_3 , (NH_4)_2 CO_3 , Na_2 SO_4$

d) $Al_2 PO_4 , (NH_4)_2 CO_3 , Na_2 SO_3$

55. The process of respiration is:

a) Oxidation reaction which is endothermic
b) Reduction reaction which is endothermic
c) Combination reaction which is exothermic
d) Oxidation reaction which is exothermic

56. Orthoboric Acid used as mild antiseptic for eyes

is: a) $H_3 BO_2$

b) $H_2 B_4 O_7$

c) $B (OH)_3$

d) $Na_2 B_4 O_7$

57. Chemical symbol of Antimony

is: a) As

b) Sb
c) At
d) Am

58. Which chemical is not used for preventing coloured food

material: a) SO_2

b) Vit-C

c) Sodium benzoate
d) BHA

59. Identify the species having the same number of valence

electrons: a) O^- , Cl^-

b) O^{-2} , N^{+3}

c) Ne, Ar

d) Na, Mg

60. The table given below gives information about four unknown substances (Room temperature = $30°C$

Substance	M: Pt $(°C)$	S. Pt$(°C)$
A	-188	-40
B	-110	24
C	16	117
D	37	340

Which of the following substance is a volatile liquid? a) A

b) B
c) C
d) D

61. The diagram given below show the electron arrangement in the outer shell of 1, 2, 3, 4 and 5. All the elements are from period 3 of the periodic table:
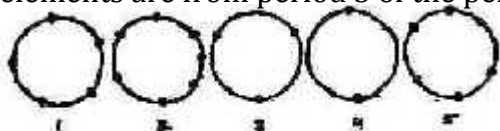
Which two elements farm a cavelent compound with YZ_2 type formula

a) 5 and 2
b) 1 and 2
c) 3 and 4
d) 1 and 5

62. Which weigh the maximum?

a) 2.24 L of CO_2 at STP
b) 6.022×10^{23} molecules of CO_2
c) 6.022×10^{23} atoms of carbon
d) 10 g of CO_2

63. Glyptal is an example of:

a) Soap
b) Detergent
c) Polymer
d) Fibre

64. In solid state, molar mass of Sulphur is:

a) 16 g
b) 32 g
c) 256 g
d) 128 g

65. Silver articles become black when exposed to air. It is due to the formation of:

a) Silver Oxide
b) Silver Nitrate
c) Silver Chloride
d) Silver Sulphide

66. 4.4 g of an unknown gas occupies 2.24 L of volume under STP conditions. The gas may be:

a) CO_2
b) CO
c) O_2
d) SO_2

67. 2.5 L of 1 M NaOH solution is mixed with 3 L of 0.5 M NaOH solution. The molarity of resulting solution is:

a) 0.08 M
b) 1.0 M
c) 0.73 M
d) 0.50 M

68. The label of a breakfast cereal showed that it contained 110 mg of sodium per 100 g of the cereal. The mass percent of sodium in the cereal is:
   a) 1.10%
   b) 0.110%
   c) 0.011%
   d) 11.0%

69. The formula or phosphate salt of a metal is MPO_4. The formula of its nitrate salt will be:
   a) MNO_3

   b) $M(NO_3)_2$

   c) $M_2(NO_3)_3$

   d) $M(NO_3)_3$

70. At higher altitude (mountains) people add common salt to water to boil potatoes. This is done to:
   a) Increase boiling point of water
   b) Decrease boiling point of water
   c) Cook salty potatoes
   d) None of the above

71. Mercury is used in thermometers because it has:
   a) Lowest heat of fusion
   b) Lowest specific heat among all the liquids
   c) High specific heat among all the liquids
   d) Highest Latent heat of fusion

72. Which of the following will not show tyndall effect:
   a) Blood
   b) Starch solution
   c) $CuSO_4$ solution
   d) Sulphur solution

73. Valency of phosphorous is:
   a) 1, 3, 5
   b) Only 3
   c) Only 5
   d) 3 and 5 both

74. Arrange the following in order of increasing their calorific value:
   a) Petrol
   b) Wood
   c) Cow dung cake
   d) Biogas
   (i)   a < b < c < d
   (ii)   b < a < d < c
   (iii)   c < b < a < d
   (iv)   d < b < a < c

75. Florescent tube glows because of: a) Plasma
   b) Phosphorous
   c) Sulphur

d) Hydrogen

76. Number of Aluminium ions present in 0.051 g of $Al_2 O_3$
    a) 6.022×10^{22} ions
    b) 6.023×10^{23} ions
    c) 6.023×10^{21} ions
    d) 6.022×10^{20} ions

77. The residue obtained after destructive distillation of wood is:
    a) Coke
    b) Char coal
    c) Coal tar
    d) Ash

78. Which among the following fuels has the highest calorific value?
    a) Coal
    b) Kerosene
    c) Biogas
    d) Hydrogen

79. A colloridal solution in which both the dispersed phase and dispersion medium are liquids is:
    a) Milk
    b) Butter
    c) Shaving cream
    d) Jelly

80. Which of the following statement is correct for the melting of ice?
    a) At $0°C$, water exists only in the solid state
    b) At $0°C$ water exist in solid as well as in liquid state
    c) At $0°C$ vapour pressure of ice is equal to vapour pressure of liquid water
    d) Both (2) and (3) are correct

81. Identify the oxide which reacts with HCl and NaOH both:
    a) $Al_2 O_3$
    b) CO_2
    c) $Na_2 O$
    d) CaO

82. Which of the following metals does not react with dil Sulphuric acid but reacts with a solution of Ferrous sulphate:
    a) Cu
    b) Zn
    c) Fe
    d) Mg

83. Geeta poured 20 g of salt into 200 ml of water in beaker. She stirred the water to dissolve the salt completely. Then she heated the mixture until it was reduced to half. How many grams of salt can be recovered from remaining solution:
    a) 0 g
    b) 10 g
    c) 20 g
    d) 40 g

84. Which of the following is not an indicator:

a) Litmus
b) Turmeric (Haldi)
c) Phenolphthalein
d) Sodium hydroxide

85. Match the following:
   (i)   Bakelite   (a) prepared by using wood pulp
   (ii)   Rayon   (b) used for making parachutes
   (iii) Nylon   (c) used to make electrical switches
   (iv)   Terylene   (d) fabric do not wrinkle easily
   a) i – c, ii – a, iii – b, iv – d
   b) i – a, ii – b, iii – c , iv – d
   c) i – b, ii – c, iii – d, iv – a
   d) i – c, ii – a, iii – d, iv – b

86. Among the following – has highest density:
   a) Air
   b) Exhast from chimney
   c) Cotton
   d) Honey

87. Acid present in 'spinach':
   a) Oxalic acid
   b) Lactic acid
   c) Tartaric acid
   d) Formic acid

88. In completer combustion of fuel gives x. Burning or coal and diesel release y, which is extremely suffocating gas.
   Identify x and y respectively:
   a) CO_2 , NO_2
   b) NO_2 , CO_2
   c) CO , SO_2
   d) SO_2 , CO_2

89. A student was given an unknown solution in a test tube. When he added universal indicator solution to test tube, it turned violet. The unknown solution is most likely to be:
   a) Baking soda solution
   b) Starch solution
   c) Caustic soda solution
   d) Vinegar solution

90. The ionic radii of N^{3-} , O^{2-} , F^- , Na^+ follow the decreasing order:
   a) $N^{3-} > O^{2-} > F^- > Na^+$
   b) $N^{3-} > Na^+ > O^{2-} > F^-$
   c) $Na^+ > O^{2-} > N^{3-} > F^-$
   d) $O^{2-} > F^- > Na^+ > N^{3-}$