MODEL QUESTION PAPER FOR ENTRANCE EXAM TO BE HELD ON 25-12-2014

1. Which is the heaviest element in Density?

    (a) Platinum   (b) Rhenium   (c) Uranium   (d) Osmium

2. Lightest element from the following is?

    (a) Potassium   (b) Calcium   (c) Lithium   (d) Cesium

3. Which is the largest planetary satellite?

    (a) Titan   (b) Europa   (c) Ganymede   (d) Oberon

4. Brightest star is

    (a) Sirius   (b) Procyon   (c) Rigel   (d) Vega

5. The first woman to orbit earth is

    (a) Laika   (b) Valentina Tereshkova   (c) Enos   (d) Angelo Heriquez

6. The Coldest place on earth is

    (a) Oymyakon   (b) Anzhi   (c) Terek   (d) Kiev

7. The worst forest five Occurred at

    (a) Cloquet   (b) Victoria   (c) Landes   (d) Ontario

8. The Country with the most mammal species is

    (a) China   (b) India   (c) Indonesia   (d) Colombia

9. The sleepiest mammal is

    (a) OPossum   (b) Koala   (c) Big brown bat   (d) Three – toed sloth

10. Which of the following fish is fatest one?

    (a) Sail fish   (b) Bhee shark   (c) Wahoo   (d) Tarpon

11. The bird with largest wing is

    (a) Albetross   (b) Sarus crane   (c) Great white pelecon   (d) Lammergeier

12. Longest snake is

    (a) Anaconda   (b) Diamond Python   (c) Indian Python   (d) Royal Python

13. Which of the following is most venomous snake?

    (a) Krait   (b) Taipon   (c) Indian Cobra   (d) Mamba

14. Who won the first grand prix (Motor racing)

    (a) Ferenc Scisz   (b) Lukasz Piszszek   (c) Clerge   (d) William Marshal

15. The red colour of ruby laser is due to which atom?

    (a) Aluminium   (b) Oxygen   (c) Silicon   (d) Cromium

16. Which of the following element is useful in preparing atom bomb?

    (a) Uranium   (b) Coal   (c) Petrol   (d) Spirit

17. Which of the following numbers is a perfect square?

    (a) 548543213   (b) 548543217   (c) 548543250   (d) 548543241

18. The product of two numbers is 24 then the minimum sum of such numbers is

    (a) 8   (b) 9   (c) 10   (d) 12

19. Value of 0.001 + 1.01 + 0.11 is

    (a) 1.013   (b) 1.121   (c) 1.101   (d) 1.111

20. If in a triangle PQR, PQ=4cm, PR=6cm, and QR=3cm then which of the following is true?

    (a) $\angle R > \angle Q$ (b) $\angle Q > \angle R$ (c) $\angle Q = \angle R$ (d) $\angle R < \angle P$

21. The cost price of 10 candles is equal to the selling price of 8 candles. What is the Percentage of

    Profit / Loss?

    (a) 25%   (b) 20%   (c) 23%   (d) 30%

22. The capacity of an ultrasound apparatus is

    (a) Less than 20 Hz (b) Between 20 Hz & 200000Hz (c) 2000Hz (d) Greater than 20000Hz

23. The roots of the equation $3x^2 + 9x + 12$ are

    (a) Real   (b) Imaginary   (c) Real & Equal   (d) 0

24. If the number 197*5462 is divisible by 9 then * is equal to

    (a) 7   (b) 1   (c) 2   (d) 4

25. Which of the following is a factor of $x^{14}-16$?

    (a) x+2   (b) x+4   (c) x-4   (d) x+6

26. If P=X, Q=+, R=- And S=÷ then 10P3, Q18,R24,S3 is

    (a) 52   (b) 48   (c) 46   (d) 40

27. The Simplest value of $\frac{2-\sqrt{3}}{2+\sqrt{3}} - \frac{2+\sqrt{3}}{2-\sqrt{3}}$ is

    (a) $8\sqrt{3}$ (b) $-8\sqrt{3}$ (c) $12\sqrt{3}$ (d) $-4\sqrt{3}$

28. Which of the following set is largest?

    (a) Z   (b) Q   (c) C   (d) R

29. If AD is the angular bisector of A in ΔABC then it divides BC in the ratio

    (a) a:b   (b) c:b   (c) b:a   (d) b:c

30. If n(A) = 20, n(B) = 15 and N (A∪B) = 25 than n (A∩B)=

    (a) 10   (b) 20   (c) 5   (d) 30

31. Which of the following is a prime number?

    (a) 49   (b) 51   (c) 53   (d) 63

32. Who discovered electro magnetic theory?

    (a) Maxwell   (b) Newton   (c) Einstein   (d) J C Bose

33. National fruit of India is

    (a) Banana   (b) Mango   (c) Guava   (d) Orange

34. At 2:15 0'clock , the angle between hour hand and minute hand of a clock is

    (a) 30^0 (b) 5^0 (c)$22:5^0$ (d) 28^0

35. A can do a piece of work in 9 days. B is 50% more efficient than A. The number of days it takes B to do the same work is

    (a) $4^1/_2$ (b) $13^1/_2$ (c) 3   (d) 6

36. The price of an article is cut 10%. To restore it to former value, the new price must be increased by

    (a) 10%   (b) 11.5%   (c) 9%   (d) $11^1/_9$ %

37. The largest number by which the expression n^3-n is divisible for all possible integral value of n is

    (a) 3   (b) 2   (c) 6   (d) 5

38. The total of 28 handshakes was exchanged at the conclusion of a party. Assuming that each participant was equally polite towards all the others, the number of people present was

    (a) 8   (b) 7   (c) 56   (d) 28

39. Each edge of a cube is increased by 50%. The percent of increase in surface area of the cube is

    (a) 50   (b) 125   (c) 150   (d) 750

40. Let the roots of x^2-3x+1=0 be m and n. Then the value of m^2+n^2 is

    (a) Positive Integer (b) A positive fraction   (c) An irrational number   (d) An imaginary number

41. The base of a triangle is 80^0, and one of the base angle is 60^0. The sum of the lengths of the other two sides is 90^0. The shortest side is

    (a) 40   (b) 17   (c) 12   (d) 45

42. If 9^{x+2}= 240+9^x then x is equal to

    (a) 0.1   (b) 0.2   (c) 0.5   (d) 0.3

43. If $\sqrt{x-1}$ – $\sqrt{x+1}$ + 1=0, then 4 x=

    (a) 5   (b) $4\sqrt{-1}$ (c) 0   (d) $1^1/_2$

44. Cockroach has developed special organs to dispose the wastes, known as

    (a) Medulla   (b) Cortex   (c) Malpighian tubules   (d) urethra

45. The kidneys of a dead person should be transplanted within _____ hours
    (a) 12   (b) 36   (c) 18   (d) 24
    (b)

46.   The speed of light is
    (a) 2×10^8m/sec   (b) 4×10^8m/sec   (c) 3×10^6m/sec   (d) 3×10^8m/sec

47. In mobile and satellite communication, _____ waves are used.
    (a) radio   (b) gamma   (c) electromagnetic (d) none of these

48. X-rays were discovered by
    (a) Henry Becquerel   (b) Roentgen   (c) Ritter
    d) Rudolf Hertz

49. Which of these is India's first super computer?
    (a) Param-7000   (b) Saga-220   (c) Param-8000   (d) K-Computer

50. LCD stands for
    (a) Local crystal Display   (b) Logical Crystal Display

    (c) Liquid Crystal Display   (d) Lateral Crystal Display

51. The value of acceleration due to gravity at the equator is,
    (a) 9.8m/s^2 (b) 9.83m/s^2 (c) 9.71m/s^2 (d) 9.78m/s^2

52. The relation connecting acceleration due to gravity and gravitational constant is,
    (a) $g = {GM}/{R^2}$ (b) $g = {GM}/{R}$ (c) $g = GMR^2$ (d) $g = GMR$

53. Laser is an acronym which stands for,
    (a) Light Amplification by Stimulated Emission of Radiation
    (b) Light And Simple Emission of Radiation
    (c) Long And Simple Emission of Radiation
  (a) None of these

54. The Value of 1 KWH is,
    (a) 37×10^5J   (b) 35×10^5J   (c) 36×10^5J   (d) 38×10^5J

55. Paleontology is the branch of biology that deals with study of
    (a) fossils   (b) plants   (c) photosynthesis (d) none of these

56. Half life period of Radium-236 is,
    (a) 28 years   (b) 1620 years   (c) 5.3years   (d) 3.8years

57. According to Kapler's first law, the planets above in elliptical orbits around the sun with the sun at _____ of the ellipse
    (a) centre   (b) vertex   (c) focus   (d) none of these

58. Lung fishes belong to the group _____
    (a) Dipnoi   (b) Archaeopteryx (c) Onychophora (d) none of these

59. The mean of first six even natural numbers is
   (a) 8   (b) 7   (c) 5   (d) 10

60. On selling a watch for ` 720, Ravi loses 10% At what price should he sell it, in order to gain 15% ?
   (a) ` 840        (b) ` 920   (c) ` 100        (d) ` 900

61. Which of the following is Hardy-Ramanujan number ?
   (a) 1829   (b) 1792   (c) 1729   (d) 1279

62. The cube root of -17576 is
   (a) -24   (b) -36   (c) -46   (d) -26

63. A sum at a simple interest of 12.5% amounts to ` 2502.50 after 3 years. Then the sum is
   (a) 6820   (b) 1820   (c) 4820   (d) 5820

64. If the marks scored by Hari in 7 tests are 24, 23, 22, 23, 25, 26, 27, then his average score is,
   (a) 24.29   (b) 25.31   (c) 26.45   (d) 27.29

65. If $x + 1/x = 3$ then, $x^3 + 1/x^3 = ?$
   (a) 16   (b) 17   (c) 13   (d) 18

66. If the perimeter of a triangle is 14 cm and the sides are $x + 4$, $3x + 1$ and $4x + 1$ then its sides are,
   (a) 6,4,4   (b) 11,2,1   (c) 5,4,5   (d) 5,3,6

67. The length, breadth and height of a cubiod are in the ratio of 6:5:3 If the total surface area is 504 cm² then its volume is,
   (a) 750 cm²   (b) 710 cm²   (c) 620 cm²   (d) 720 cm²

68. Rama's age is 6 times Lakshman's age. After 15 years, Rama will be 3 times old as Laksman. Then their ages are (in years)
   (a) 60 and 10   (b) 30 and 5   (c) 18 and 3   (d) 24 and 4

69. The diameter of a cone is 10 cm and height is 12 cm. Then its total surface area is,
   (a) 280.85 cm²   (b) 282.85 cm²   (c) 283.85 cm²   (d) 284.85 cm²

70. The surface area of a sphere is 36π cm²
   (a) 72π cm³   (b) 360π cm³   (c) 36π cm³   (d) 76π cm³

71. The value of $\frac{\sqrt{2}}{\sqrt{3}-\sqrt{2}} + \frac{\sqrt{3}}{\sqrt{3}+\sqrt{2}}$ is
   (a) 10   (b) 5   (c) 7   (d) 8

72. How many 2 digit numbers can be formed using digits 1,2,3,4,5 without repetitions ?
   (a) 20   (b) 30   (c) 120   (d) 100

73. If $^nP_r = 360$ and $^nC_r = 15$ then r=?
   (a) 6   (b) 8   (c) 4   (d) 10

74. Chemical formula of Baking Soda is
    (a) Na_2Co_3 (b) Na_3Co_3 (c) $NaCo_3$ (d) Na_4Co_3

75. A concave lens of 20 cm focal length forms an image 15 cm from the lens. Then the object distance is
    (a) 16 cm   (b) -60 cm   (c) -40 cm   (d) -80 cm

76. Chemical formula of Plaster of Paris is,
    (a) $CaCo_3 - \frac{1}{2} H_2O$ (b) $CaCo_4 . \frac{1}{2} H_2O$ (c) $CaSo_4 . 2 H_2O$ (d) none of these

77. Which of the following is a phosphatic fertilizer?
    (a) Urea   (b) Ammonium sulphate
    (c) Super phosphate   (d) Ammonium Carbonate

78. Gestation period of cat is,
    (a) 68 days   (b) 61 days   (c) 66 days   (d) 64 days

79. World's first test tube baby was born on,
    (a) June 25, 1978   (b) July 25, 1978   (c) July 25, 1977   (d) June 25, 1977

80. The electronic configuration of Sodium is,
    (a) $1s^2 2s^2 2p^6 3s^1$ (b) $1s^2 2s^2 2p^6 3s^1 3p^2$ (c) $1s^2 2s^2 2p^6$
    (d) none of these

81. What must be subtracted from $6x^4 + 13x^3 + 13x^2 + 30x + 20$ so that the resulting polynominal is exactly divisible by $3x^2 + 2x + 5$?
    (a) $2x+15$ (b) $3x+15$ (c) $7x+15$ (d) $17x+25$

82. Value of the expression $\frac{4sin^2 60 - cos^2 45'}{tan^2 30' + sin^2 0}$ is
    (a) $\frac{15}{2}$ (b) $\frac{13}{2}$ (c) $\frac{17}{2}$ (d) $\frac{19}{2}$

83. A line joining (1,0) and (4,7) is perpendicular to line joining (9,a) with (-2,-1). Then 'a' is equal to
    (a) $\frac{41}{7}$ (b) $\frac{-51}{7}$ (c) $\frac{71}{7}$ (d) $\frac{61}{7}$

84. Hallikar is an example for _____ breed
    (a) Cross   (b) Exotic   (c) Indigenous   (d) Hyper

85. Molecualr formula of pentane ?
    (a) C_4H_{10} (b) C_5H_{12} (c) C_2H_4 (d) C_3H_3

86. Which of the following is an aromatic hydrocarbon ?
    (a) Napthalene   (b) Ethyne   (c) Ethane   (d) Butyne

87. Molecualr formula of Stearic Acid is
    (a) $C_6H_{15}CooH$ (b) $C_{17}H_{13}CooH$ (c) $C_{17}H_{15}CooH$ (d) $C_{17}H_{35}CooH$

88. The vegetable that contains more sucrose is
    (a) Beetroot   (b) Raddish   (c) Potato   (d) Green leaves

89. The fermented matter of molasses is called

    (a) Wart   (b) precipitate (c) bagasse   (d) raw material

90. How many amperes of current is required to deposit on cathode 5g of gold per hour? If the E.C.E of the gold is 0.00681 g/coulomb

    (a) 2.4   (b) 2.46   (c) 2.06   (d) 2.04

91. From Faraday's first law of electrolysis we have,

    (a) $m = ZQ$ (b) $m = \frac{Z}{Q}$ (c) $m = Z^Q$ (d) none of these

92. The theory of dissociation was formulated by,

    (a) Arrhenius   (b) C.V.Raman   (c) Newton   (d) Einstein

93. Which of the following is known as 'Marsh' gas?

    (a) Ethane   (b) Methane   (c) Ethene   (d) Methyne

94. Which of the following is an allotrope of carbon?

    (a) diamond   (b) gold   (c) silver   (d) platinum

95. Which type of glass is used to prepare lenses?

    (a) Lead glass   (b) borosilicate glass

    (c) soda-lime glass (d) safety glass

96. The first atomic power station in India is

    (a) BARC   (b) TAPS   (c) UASC   (d) MAPS

97. Which of the following is a fusion bomb?

    (a) Atom bomb   (b) hydrogen bomb

    (c) nitrogen bomb (d) carbon bomb

98. The value of 1 Mev =

    (a) $1.5 \times 10^{-13}J$ (b) $1.6 \times 10^{-15}J$ (c) $1.6 \times 10^{-13}J$ (d) $1.6 \times 10^{-14}J$

99. The atomic number of silicon is

    (a) 16   (b) 14   (c) 18   (d) 19

100. A bag of rice weighs 200kg. To what height it would be raised so that its potential energy is 9800J?

    (a) 6m   (b) 4m   (c) 5m   (d) 7m

101. Who won the nobel prize for synthesizing ammonia?

    (a) Newton   (b) Hardy   (c) Harbour   (d) Haber

102. Boiling point of mercury is

    (a) 2600°C   (b) 357°C   (c) -183°C   (d) 100°C

103. Melting point of copper is

    (a) 659°C   (b) -38.8°C   (c) -210°C   (d) 1083°C

104. The young one of a cockroach is

    (a) caterpillar   (b) lymph   (c) nymph   (d) tadpole

105. Expansion of ART is
    (a) Arificial Reproductive Technology
    (b) Assisted Reproductive Technology
    (c) Animal Reproductive Technology
    (d) Agressive Reproductive Technology
106. Galilean Telescope was designed in
    (a) 1509   (b) 1559   (c) 1609   (d) 1619
107. The type of lens used in a simple microscope is
    (a) Binocular lens   (b) plano concave lens
    (c) convex lens   (d) concave convex lens
108. Centripetal force is given by
    (a) F = ma   (b) $F = \frac{mv^2}{r}$ (c) $F = \frac{gv^2}{r}$ (d)none of these
109. "Among the orbitals of same energy, electron do not start pairing until all these orbitals singly occupied." This rule was given by,
    (a) Fredrich Hund   (b) Paulis (c) Vander wall (d) Aufbau
110. Value of universal gravitational constant G=
    (a) 6.57×10^{-11} Nm^2/kg^2 (b) 6.76×10^{-11} Nm^2/kg^2
    (c) 6.67×10^{-11} Nm^2/kg^2 (d) 6.78×10^{-11} Nm^2/kg^2
111. LASER stands for
    a. Light Amplification by Stimulated Emission of Radiation
    b. Light and stimulated emitted radiation
    c. Long & Short extra radiation
    d. None of these
112. Four resistors 5 Ω, 6 Ω, 4 Ω & 8 Ω are connected in parallel. The equivalent resistance is
    a. $\frac{89}{120}$ b. $\frac{120}{89}$ c. $\frac{130}{99}$ d. $\frac{99}{130}$
113. Which of the following radio isotopes is used in the treatment of cancer?
    a. Radio Sodium b. Uranium – 235 c. Cobalt – 60 d. Radio Iridium
114. What is the age of the earth
    a. 3.8 billion years b. 3.5 billion years c . 3.7 billion years d.3.9 billion years

115. Kepler's third law states that the orbital period of a planet is proportional to the cube of the

 a. Major axis of the orbit b. Minor axis of the orbit c. Semi-minor axis of the orbit d. Semi- Major axis of the orbit

116. Thyroid gland secrets a harmone called

 a. Cretins b. Thyoxin c. Thyroxime d. Thyrixime

117. Which of the following is an aluminium are?

 a. Haematite b. Bauxite c. Pyrolusite d. Chromite

118. Copper is refined by

 a. Crystallisation b. Electrolytic Refining c. Distillation d. liquation

119. Which of the following is a non metal?

 a. Gold b. Silver c. Carbon d. Aluminium

120. H-C-H bond angle of methane molecule in three dimension is

 a. $119^0\ 28'$ b. $129^0\ 128^0$ c. $139^0\ 28^0$ d. $109^0\ 28^0$

121. Which of the following is a saturated hydrocarbon?

 a. Alkane b. Alkene c. Alkyne d. None of these

122. Which of the following ore is found in Mysore District

 a. Chromite b. Magnesite c. Pyrolusite d. Haematite

123. Which of the following is a flightless bird?

 a. Ostrich b. Pigeon c. swan d. flamingo

124. Lemurs is a

 a. Flying mammal b. Aquatic mammal c. Burrowing forms

 b. d. carnivorous mammal

125. Which of the following is a green algae ?

 a. Sargassam b. Spirogyra c. Chlorella c. None of these

126. Shark is an example for

 a. Cartilaginous b. Bony fish c. Hippocampus d. None of these

127.Parenchyma cells contain chloroplasts called

 a. Sclerenchyma b. Chorenchyma c. Collenchyma d. None of these

128. If the sum of the roots of a quadratic equation is -1 and their product is -6 then the roots are

 a. -2, 1 b. 3, -4 c. 2, -3 d. -6, 5

129.If in a H P, $T_n = \frac{1}{12}$ and $T_{10} = \frac{1}{42}$ then $T_{19} = ?$

 a. $\frac{1}{87}$ b. $\frac{1}{67}$ c. $\frac{1}{97}$ d. $\frac{1}{57}$

130. The Value of 1+2+3+--------------+50 =

 a. 1375 b. 1275 c. 1475 d. 1575

131. The angles of a triangle are in A.P. If the smallest angle is 36^0, then the other angles are

    a. 36, 54, 72   b. 36, 46, 56 c. 36, 60, 84   d. 36, 50, 64

132. If in a Sequence, $T_n = 4n^2 - 1$ and $T_n = 35$ then n=?

    a. 2   b. 4   c. 6   d. 3

133. If $S_n = 1 + \frac{1}{3} + \frac{1}{9} + \frac{1}{27} + $ ---------, then $S_\infty = $

    a. $^5/_2$ b. $^3/_2$ c. $^2/_3$ d. $^1/_3$

134. If $A = \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 5 & 3 \\ 2 & 3 & 1 \end{pmatrix}$ then AB =

    a. $\begin{pmatrix} 5 & 11 & 13 \\ 27 & 5 & 11 \end{pmatrix}$ b. $\begin{pmatrix} 11 & 5 & 13 \\ 27 & 11 & 5 \end{pmatrix}$ c. $\begin{pmatrix} 5 & 11 & 5 \\ 11 & 27 & 13 \end{pmatrix}$ d. None of these

135. If $A = \begin{pmatrix} 1 & 3 \\ 1 & 0 \end{pmatrix}$ then $A^2 - A - 3I$ is

    a. $\begin{pmatrix} 1 & 1 \\ 1 & 1 \end{pmatrix}$ b. $\begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix}$ c. $\begin{pmatrix} 1 & 3 \\ 1 & 0 \end{pmatrix}$ d. $\begin{pmatrix} 0 & 0 \\ 0 & 0 \end{pmatrix}$

136. If $\begin{pmatrix} 1 & 3 \\ 5 & -2 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} -2 & 3 \\ 0 & 1 \end{pmatrix} \begin{pmatrix} 2 \\ -1 \end{pmatrix}$ then x, y are equal to

    a. -1,-2   b. 1, -2   c. -1, 2   d. -1, 3

137. H.C.F of $2m^2 + 2m + m^3 + 1$ and $2m + 1 + m^2$ is

    a. 0   b. m + 2   c. m + 1   d. m - 1

138. L.C.M of $2a^3bc$ and $6a^2c$ is

    a. $6a^3bc$ b. $6a^2bc^2$ c. $12a^5bc^2$ d. $6ab^2c^2$

139. If $x^2y^2 - xy$ is a factor of $x^4 + x^2y^2 + y^4$, then the other factor is

    a. $x^2 + y^2 - 2xy$ b. $x^2 + y^2 + xy$ c. $x^2 - y^2 + xy$ d. $x^2 + y^2 + 2xy$

140. If $a + b + c = 2S$ then $b^2 + c^2 - a^2 + 2bc$ is

    a. 2s(s-a)   b. 3s(s-a)   c. 4s(s-a)   d. 6s(s-a)

141. The product of $\sqrt[3]{5}$ and $\sqrt[4]{2}$ is

    a. $\sqrt[6]{5000}$ b. $\sqrt[7]{5000}$ c. $\sqrt[8]{5000}$ d. $\sqrt[12]{5000}$

142. If $(m+8)^2 - 5 = 31$ then m=

    a. 2, -14   b. -2, +14   c. -2, -14   d. 2, 14

143. The sum of a number and twice its square is 105. Then the number is

    a. 7   b. 5   c. 9   d. 8

144. If the centres of the circle lie on either side of the common tangent, then tangent is

    a. Direct common tangent   b. Conjugate common tangent

    c. Transverse common tangent   d. None of these

145. If 2 and 3 are the roots of a quadratic equation then its equation 13

    a. $x^2+5x-6=0$ b. $x^2+5x+6=0$ c. $x^2-5x-6=0$ d. $x^2-5x+6=0$

146. The value of 4×5^3

     a. 2   b. 12   c. 6   d.0

147. Circle having equal radii are _____ circles

     a. Similar   b. Congruent   c. Equal   d.Conjugate

148. According to Thale's theorem,

    a. A straight line drawn paralled to a side of a triangle, divides the other two sides proportionately

    b. If two angles of triangles are equal then two sides proportional

    c. Sum of the three angles is 180^0

    d. Sum of two sides is greater than the third side

149. Total surface area of a cylinder with base radius as 5cm and height 6cm in square centi meters

     a. 100π b. 120π c. 130π d. 110π

150. Euler's formula states that

     a. N+R=2+A   b. N+A=2R   c. N-A=2+R   d.N+R=2-A