# NATIONAL TALENT SEARCH EXAMINATION-2019-20, Assam

## SCHOLASTIC APTITUDE TEST (SAT) PAPER & HINTS & SOLUTION

### SOCIAL SCIENCE

1. The branch of Geography in which the study of human activities associated with production. distribution, consumption and exchange of resources is done in spatial and temporal contexts is known as -
   a) Agricultural Geography
   b) Economic Geography
   c) Industrial Geography
   d) Transport Geography
   **Ans.** **(b)**

2. Transport is an example of
   a) Primary Occupation
   b) Secondary Occupation
   c) Tertiary Occupation
   d) Quaternary Occupation
   **Ans.** **(c)**

3. Who is considered as the Father of modern economic geography?
   a) C.F. Jones
   b) G. G. Darkenwald
   c) George Chisholm
   d) Zimmermann
   **Ans.** **(c)**

4. Which of the following is a man made resource?
   a) Rivers
   b) Irrigation canal
   c) Mineral oil
   d) Forests
   **Ans.** **(b)**

5. IUCN was formed in the year
   a) 1947
   b) 1948
   c) 1949
   d) 1950
   **Ans.** **(b)**

6. Where is the headquarter of North East Frontier railway located?
   a) Karimganj
   b) Bongaigaon
   c) Dhubri
   d) Guwahati
   **Ans.** **(d))**

7. How many spheres are generally recognized by Earth Sciences?
   a) 3
   b) 4
   c) 5
   d) 6
   **Ans.** **(b)**

8. What Percentage of the Earth's land Surface is Desert?
   a) 25%
   b) 30%
   C) 35%
   d) 40%
   **Ans.** **(b)**

9. The lakes, riversk, seas and oceans together constitute the Earth's
   a) Lithosphere
   b) Hydrosphere
   c) Atmosphere
   d) Biosphere
   **Ans.** **(b)**

10. Which ocean occupies the entire South Pole?
    a) Pacific Ocean b) Atlantic Ocean
    c) Indian Ocean
    d) Southern Ocean
    **Ans.** **(d))**

11. How many countries are there in the world?
    a) 196
    b) 197
    c) 198
    d) 199
    **Ans.** **(b)**

12. How many districts are there in the state of Assam?
    a) 31
    b) 32
    c) 33
    d) 34
    **Ans.** **(c)**

13. Which is the longest National highway in Assam?
    a) NH 31
    b) NH 31 B
    c) Nil 36
    d) NH 37
    **Ans.** **(d))**

14. How many stages are there through which money has evolved?
    a) 3
    b) 4
    c) 5
    d) 6
    **Ans.** **(c)**

15. The historic Jonbeel Mela is organised in
    a) Golaghat
    b) Sibsagar
    c) Morigaon
    d) Kamrup (Rural)
    **Ans.** **(c)**

16. The money that is recognised by the law of the land, as valid for payment of debt is known as
    a) Commodity money    b) Token money    c) Dear Money    d) Legal tender money
**Ans.** **(d))**

17. In India, the first bank, Bank of Hindustan was established in the year-
    a) 1760    b) 1770    c) 1780    d) 1790
**Ans.** **(b)**

18. The Reserve Bank of India was established in
    a) 1925    b) 1935    c) 1945    d) 1955
**Ans.** **(b)**

19. Who is the chairman of NITI Aayog?
    a) Union Home Minister    b) Any union Minister of Cabinet Rank
    c) L.t. Governor of Delhi    e) Prime Minister
**Ans.** **(d))**

20. In India. the governments financial year runs from
    a) 1st January to 31st December    b) 1st March to 28th February
    c) 1st July to 30th June    d) 1st April to 31st March
**Ans.** **(d))**

21. Which of the following is not a key dimension of human development in the Human Development Index (HDI)
    a) A long and healthy life    b) Being knowledgeable
    c) A decent standard of living    d) Political participation
**Ans.**

22. The first bank that was established in Assam was
    a) Central Bank    b) SIDBI    c) IDBI    d) Guwahati Bank
**Ans.** **(d))**

23. The 42nd amendment of the Constitution, by which, the words "Socialist", "secular "and "unity and integrity of the Nation" were incorporated in the preamble was enacted in
    a) 1975    b) 1976    c) 1977    d) 1978
**Ans.** **(b)**

24. How many principal organs are there in the United Nations?
    a) 4    b)5    c) 6    d)7
**Ans.** **(c)**

25. How many member States are there in the United Nations'?
    a) 192    b) 193    c) 194    d) 195
**Ans.** **(b)**

26. The Protection of human Rights bill received the assent of the President of India in
    a) 1992    b) 1993    c) 1994    d) 1995
**Ans.** **(b)**

27. When was the United Nations established?
    a) 1944    b) 1945    c) 1946    d) 1947
**Ans.** **(b)**

28. Who was the Chairman of' the drafting Committee of Indian Constitution?
    a) Dr. B.R. Ambedkar    b) Jawaharlal Nehru    c) Rajendra Prasad    d) M. Madhab Rao
**Ans.** **(a)**

29. The UN Charter, consists of a preamble and 19 chapters, which are divided into
    a) 110 articles    b) 111 articles    c) 112 articles    d) 113 articles
**Ans.** **(b)**

30. Which city was made the Capital of the province Eastern Bengal and Assam'?
    a) Jorhat    b) Karimganj    c) Silchar    d) Dhaka
**Ans.** **(d))**

31. When was the Rowlatt Act passed by the Imperial Legislative Council?
    a) 1917    b) 1918    c) 1919    d) 1920
**Ans.** **(c)**

32. The 'Chauri Chaura' incident occured in
    a) Uttar Pradesh    b) Bengal    c) Bombay    d) Madras
**Ans.** **(a)**

33. The mantra 'Do or Die' was given by Mahatma Gandhi to launch the
    a) Swadeshi movement
    b) Non Cooperation movement
    c) Civil Disobedience movement
    d) Quit India movement
**Ans. (d))**

34. Which Assamese submitted a memorandum to Moffat Mills in 1853 and ponted out that the L and revenue assessments were taking its toll on the assamese people?
    a) Kandarpeswar Singha
    b) Lakshmi Nath Bezharua
    c) Maniram Dewan
    d) Anandaram Dhekial Phukan
**Ans. (d))**

35. Where did the first organised peasant's movement of Assam take place?
    a) Rangia
    b) Lachima
    c) Patharughat
    d) Phulaguri
**Ans. (d))**

36. The Jnan Pradayini Sabha' was etablished by Anandaram Dhekiyal Phukan and Gunaviram Barua in
    a) 1855
    b) 1856
    c) 1857
    d) 1858
**Ans. (c)**

37. Who wrote the famous Assamese dictionary 'Hemkosh Abhidhan''?
    a) Hemchandra Goswami
    b) Hemchandra Baruah
    c) Lakshminath Bezbarua
    d) Chandra Kumar Agarwala
**Ans. (b)**

38. Who was the first president of Assam Pradesh Congress Committee?

    a) Nabin Chandra Agarwala
    b) Kuladhar Chaliha
    c) Bishnuram Medhi
    d) Siddhinath Sarma
**Ans. (b)**

39. Which martyr was hanged during the Quit India Movement for his involvement in train derailment at Borpathar, Assam?
    a) Kanaklata
    b) Sankar Chandra Barua
    c) Kushal Konwar
    d) Mahendranath Hazarika
**Ans. (c)**

40. Who was the founder of Indian National Congress?

    a) Mahatma Gandhi
    b) Allan Octavian Hume
    c) Jawaharlal Nehru
    d) Subhash Chandra Bose
**Ans. (b)**

## MATHEMATICS

41. Which of the following rational number has terminating decimal expansion ?

    (a) $\dfrac{64}{455}$
    (b) $\dfrac{13}{3125}$
    (c) $\dfrac{29}{343}$
    (d)) $\dfrac{77}{210}$

Ans. (b)

**Sol.** $\dfrac{13}{3125} = \dfrac{13}{5^5}$ denominator is in the form of $2^n \times 5^m$.

42. $3.\overline{27}$ is

    (a) an integer
    (b) a rational number
    (c) a natural number
    (d)) an irrational number

Ans. (b)

**Sol.** $3.\overline{27} = \dfrac{327-3}{99} = \dfrac{324}{99} = \dfrac{36}{11} =$ rational.

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43.  If $\alpha$ and $\beta$ are the zeros of the polynomial $f(x) = x^2 + px + q$, then a polynomial having $\dfrac{1}{\alpha}$ and $\dfrac{1}{\beta}$ as its

zeros is

(a) $x^2 + qx + p$        (b) $x^2 - px + q$        (c) $qx^2 + px + 1$        (d)) $px^2 + qx + 1$

**Ans.** (c)

**Sol.** $F(x) = x^2 + px + q$

$\therefore \ \alpha + \beta = -p \ \ \alpha\beta = q$

So, $\dfrac{1}{\alpha} + \dfrac{1}{\beta} = \dfrac{\alpha + \beta}{\alpha\beta} = \dfrac{-p}{q}$

$\dfrac{1}{\alpha\beta} = \dfrac{1}{q}$

Polynomial $= x^2 - \left(-\dfrac{p}{q}\right)x + \dfrac{1}{q} = qx^2 + px + 1$

44.  If zeros of the polynomial $f(x) = x^3 - 3px^2 + qx - r$ are in A.P., then

(a) $2p^3 = pq - r$        (b) $2p^3 = pq + r$        (c) $p^3 = pq - r$        (d)) $p^3 = pq + r$

**Sol.** (a)

Let the roots are $a - d$, $a$ & $a + d$

So,           $a - d + a + a + d = 3p$

                 $3a = 3p$

                 $a = p$          ... (1)

&             $(a - d)(a) + a(a + d) + (a - d)(a + d) = q$

            $a^2 - ad + a^2 + ad + a^2 - d^2 = q$

            $3a^2 - d^2 = q$          ... (2)

Now         $(a - d)a(a + d) = r$

            $a(a^2 - d^2) = r$

            $a^2 - d^2 = \dfrac{r}{a}$

            $d^2 = a^2 - \dfrac{r}{a}$          ... (3)

From eq. (2) & (3)

$$3a^2 - \left(a^2 - \dfrac{r}{a}\right) = q$$

$$2a^2 + \dfrac{r}{a} = q$$

$$\because \ a = p$$

So        $2p^2 + \dfrac{r}{p} = q$

          $2p^3 + r = pq$

          $2p^3 = pq - r$

**45.** The value of K for which the system of equations $x + 2y - 3 = 0$ and $5x + ky + 7 = 0$ has no solution, is

(a) 10        (b) 6        (c) 3        (d)) 1

**Ans.** (a)

**Sol.** $\dfrac{a_1}{a_2} = \dfrac{b_1}{b_2} \neq \dfrac{c_1}{c_2}$

$\dfrac{1}{5} = \dfrac{2}{k} \neq \dfrac{-3}{7}$

k = 10

**46.** The value of $\sqrt{6 + \sqrt{6 + \sqrt{6 + \ldots}}}$ is

(a) 4        (b) 3        (c) – 2        (d)) 3.5

**Ans.** (b)

**Sol.** Let $\sqrt{6 + \sqrt{6 + \sqrt{6 + \ldots}}} = t$

$\sqrt{6 + t} = t$

$6 + t = t^2$

$t^2 - t - 6 = 0$

$t^2 - 3t + 2t - 6 = 0$

$t(t - 3) + 2(t - 3) = 0$

t = 3        t = –2 (Not possible)

**47.** If $x = 1$ is a common root of the equations $ax^2 + ax + 3 = 0$ and $x^2 + x + b = 0$ then ab = ?

(a) – 3        (b) 3.5        (c) 6        (d)) 3

**Ans.** (d))

**Sol.** $x = 1$ is root of $ax^2 + ax + 3 = 0$

$a(1)^2 + a(1) + 3 = 0$

$a + a + 3 = 0$

$2a = -3$

$a = -3/2$

$x = 1$ is also root of $x^2 + x + b = 0$

$(1)^2 + 1 + b = 0$

$b = -2$

$a.b = \left(-\dfrac{3}{2}\right)(-2) = 3$

**48.** If $\dfrac{1}{x+2}, \dfrac{1}{x+3}, \dfrac{1}{x+5}$ are in A.P., then x = ?

(a) 5        (b) 3        (c) 1        (d)) 2

**Ans.** (c)

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**Sol.** $\dfrac{1}{x+2}, \dfrac{1}{x+3}, \dfrac{1}{x+5}$ are in A.P

$\Rightarrow \dfrac{2}{x+3} = \dfrac{1}{x+2} + \dfrac{1}{x+5}$

$\dfrac{2}{x+3} = \dfrac{2x+7}{(x+2)(x+5)}$

$2(x+2)(x+5) = (2x+7)(x+3)$

$2(x^2 + 7x + 10) = (2x^2 + 7x + 6x + 21)$

$2x^2 + 14x + 20 = 2x^2 + 13x + 21$

$x = 1$

49. If the sum of 1st n terms of an A.P. is $3n^2 + n$ then its common difference is

(a) 6      (b) 4      (c) 14      (d)) 10

**Ans.** (a)

**Sol.**      $S_n = 3n^2 + n$

n = 1      $S_1 = a_1 = 4$          $a_1 = 4$

n =2      $S_2 = a_1 + a_2 = 14$      $a_2 = 10$

         $d = a_2 - a_1$          $\Rightarrow 10 - 4 = 6$

50. Sides of two similar triangles are in the ratio 4 : 9. Areas of these triangles are in the ratio

(a) 2 : 3      (b) 4 : 9      (c) 81 : 16      (d)) 16 : 81

**Ans.** (d))

**Sol.** $\dfrac{\Delta_1}{\Delta_2} = \left(\dfrac{4}{9}\right)^2 = \dfrac{16}{81}$

51. A vertical stick 20 m long casts a shadow 10 m long on the ground. At the same time, a tower casts a shadow 50 m long on he ground. The height of the tower is

(a) 100 m      (b) 120 m      (c) 25 m      (d)) 200 m

**Ans.** (a)

**Sol.**

Sol. (a)
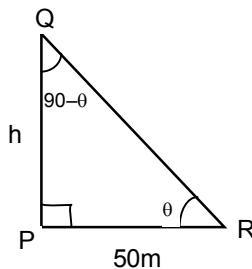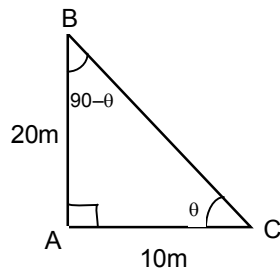


$\Delta ABC \sim \Delta PQR$ .

$\dfrac{AB}{PQ} = \dfrac{BC}{QR} = \dfrac{AC}{PR}$

$\dfrac{20}{h} = \dfrac{10}{50} \Rightarrow h = 100m$

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52. If the centroid of the triangle formed by the points (a, b), (b, c) and (c, a) is at the origin then $a^3 + b^3 + c^3 = ?$
    (a) abc        (b) 0        (c) a + b + c        (d)) 3abc

Ans. (d))

**Sol.** Centroid $\rightarrow \left( \dfrac{a+b+c}{3}, \dfrac{a+b+c}{3} \right) = (0,0)$

$\therefore \qquad \dfrac{a+b+c}{3} = 0 \Rightarrow$ a + b +c = 0

$a^3 + b^3 + c^3$ = 3abc

53. The coordinates of the point P dividing the line segment joining the points A(1, 3) and B(4, 6) in the ratio 2 : 1 are
    (a) (2, 4)        (b) (3, 5)        (c) (4, 2)        (d)) (5, 3)

Ans. (b)

Sol. $x = \dfrac{2(4)+1(1)}{2+1} = 3$

$y = \dfrac{2(6)+1(3)}{2+1} = 5$

So, p(3, 5)

54. If $\sin\theta + \sin^2\theta = 1$ then $\cos^{12}\theta + 3\cos^{10}\theta + 3\cos^8\theta + \cos^6\theta + 2\cos^4\theta + 2\cos^2\theta - 2 = ?$
    (a) 1        (b) 2        (c) 3        (d)) 0

Ans. (a)

Sol. $\sin\theta = 1 - \sin^2\theta$

$\sin\theta = \cos^2\theta$

Now $\cos^{12}\theta + 3\cos^{10}\theta + 3\cos^8\theta + \cos^6\theta + 2\cos^4\theta + 2\cos^2\theta - 2$

$\cos^6\theta \{\cos^6\theta + 3\cos^4\theta + 3\cos^2\theta + 1\} + 2\{\cos^4\theta + \cos^2\theta - 1\}$

$\sin^3\theta [(\cos^2\theta + 1)^3] + 2(\sin^2\theta + \sin\theta - 1)$

$\sin^3\theta(1 + \sin\theta)^3 + 2[1 - \cos^2\theta + \sin\theta - 1]$

$\sin\theta \cdot \sin^2\theta(1 + \sin\theta)^3 + 2[-\sin\theta + \sin\theta]$

$\sin\theta(1 - \cos^2\theta)(1 + \sin\theta)^3 + 0$

$\sin\theta(1 - \sin\theta)(1 + \sin\theta)(1 + \sin\theta)^2$

$\sin\theta(1 - \sin^2\theta)(1 + 2\sin\theta + \sin^2\theta)$

$\sin\theta \cdot \cos^2\theta (1 + 2\sin\theta + 1 - \cos^2\theta)$

$\sin\theta \cdot \sin\theta(2 + 2\sin\theta - \sin\theta)$

$\sin^2\theta(2 + \sin\theta)$

$(1 - \cos^2\theta)(2 + \sin\theta)$

$(1 - \sin\theta)(2 + \sin\theta)$

$2 + \sin\theta - 2\sin\theta - \sin^2\theta$

$2 - \sin\theta - \sin^2\theta$

$2 - (\sin\theta + \sin^2\theta) = 2 - 1 = 1$

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55. The value of $\sin^2 29° + \sin^2 61°$
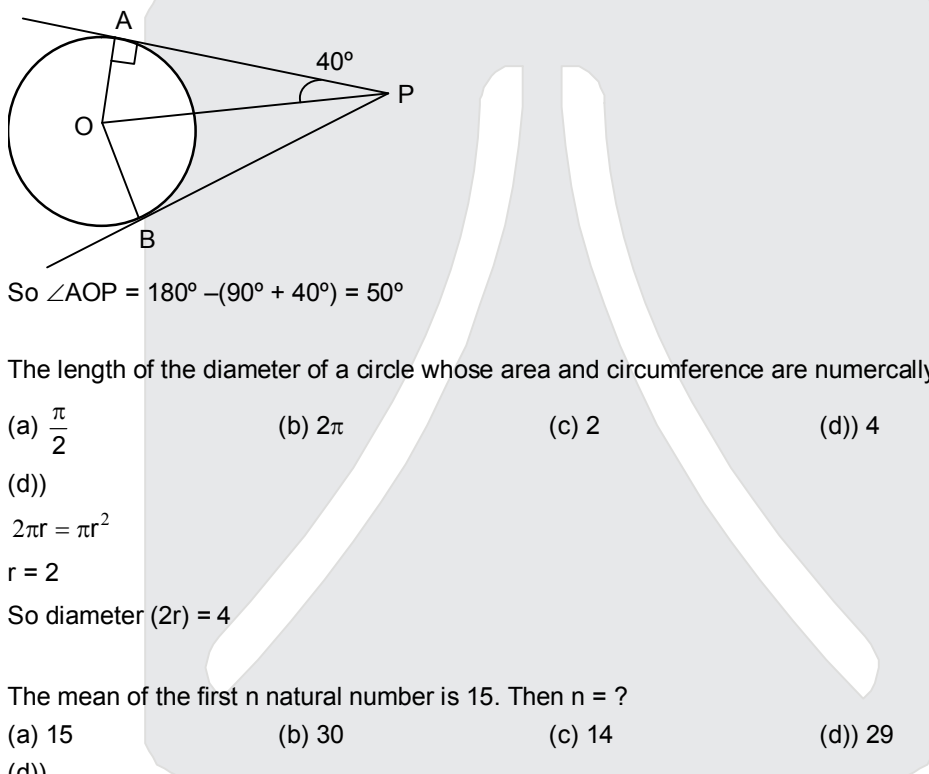    (a) $2\sin^3 29°$      (b) $2\sin^2 61°$      (c) 0      (d)) 1

Ans. (d))

Sol. $\because \sin\theta = \cos(90° - \theta)$

$\sin^2 29° + \sin^2 61° = \sin^2 29° + \cos^2 29° = 1$

56. If tangents PA and PB from a point P to a circle with centre O are inclined to each other at an angle of 80° then $\angle POA$ is equal to
    (a) 50°      (b) 60°      (c) 70°      (d)) 80°

Ans. (a)



So $\angle AOP = 180° - (90° + 40°) = 50°$

57. The length of the diameter of a circle whose area and circumference are numercally equal, is
    (a) $\dfrac{\pi}{2}$      (b) $2\pi$      (c) 2      (d)) 4

Ans. (d))

**Sol.** $2\pi r = \pi r^2$

$r = 2$

So diameter (2r) = 4

58. The mean of the first n natural number is 15. Then n = ?
    (a) 15      (b) 30      (c) 14      (d)) 29

Ans. (d))

**Sol.** Sum of first n - natural no = $\dfrac{n(n+1)}{2}$

Mean = $\dfrac{\dfrac{n(n+1)}{2}}{n} \Rightarrow \dfrac{n+1}{2} = 15$

n = 29

59. The median of first 10 prime number is
    (a) 11      (b) 12      (c) 13      (d)) 14

Ans. (b)

**Sol.** 2,3,5,7,11,13,17,19,23,29

Median $= \dfrac{11+13}{2}$ = 12

60. Which of the following cannot be the probability of an event ?

    (a) $\frac{2}{3}$          (b) – 1.5          (c) 0.8          (d)) 0.5

Ans. (b)

Sol. Probability lie between 0 to 1.

## BIOLOGY

61. In autotrophic organism energy requirement is fulfilled by -
    (a) Photosynthesis      (b) Respiration      (c) Digestion      (d)) Transpiration
Ans. (a)

62. Which of the following maintains the opening and closing of stomatal proe ?
    (a) Guard cell                          (b) Chlorophyll
    (c) Oxygen                             (d)) Rate of Photosynthesis
Ans. (a)

63. Which of the following method is used for vegetative propagation of sugarcane ?
    (a) Grafting                           (b) Artificial Reproduction
    (c) Budding                            (d)) Tissue culture
Ans. (a)

64. Example of unisexual flower is -
    (a) Hibiscus            (b) Mustard            (c) Papaya            (d)) Rose
Ans. (c)

65. The process by which the plant embryo develops into seedling under appropiate condition is known as -
    (a) Germination        (b) Reproduction        (c) Fertilization        (d)) Plantation
Ans. (a)

66. In energy pyramid of terrestrial ecosystem, which of the following is peresent at the bottom of the pyramid ?
    (a) Primary consumer                    (b) Producer
    (c) Top carnivores                      (d)) Secondary consumer
Ans. (b)

67. Kulh in Himachal Pradesh is associated to -
    (a) Water management  (b) Air Pollution Control
    (c) Wild life protection                (d)) River Dams
Ans. (a)

68. The technique that is used ot grow ornamental plant from one parent is known as  -
    (a) Tissue culture                      (b) Vegetative propagation
    (c) Hybrid                             (d)) Budding
Ans. (b)

69. In muscle cells the break down of pyruvate in absence of oxygen produces -
    (a) Ethanol + $CO_2$ + Energy            (b) Lactic acid + Energy
    (c) $CO_2$ + Water + Energy              (d)) $CO_2$
Ans. (b)

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70. Pulmonary vein carries oxygen from -
    (a) Left auricle to left ventricle
    (b) Right ventricle to lung
    (c) From lungs to left auricle
    (d)) Brain to left auricle
Ans.    (c)

71. The structure of kidney that collects the filtrate is known as -
    (a) Bowman's capsule    (b) Capillaries    (c) Nephron    (d)) Urinary bladder
Ans.    (a)

72. All the involuntary actions of human body is conrolled by -
    (a) Fore brain    (b) Hind brain    (c) Heart    (d)) Tissue
Ans.    (b)

73. The less secretion of growth hormone from pituitary gland results -
    (a) Dwarfism    (b) Gigantism    (c) Acromegaly    (d)) Anaemia
Ans.    (a)

74. The life span of human egg is -
    (a) 24 hours    (b) 48 hours    (c) 76 hours    (d)) 90 hours
Ans.    (a)

75. The genotypic ratio of Mendel's monohybrid cross is -
    (a) 3 : 1    (b) 1 : 2 : 1    (c) 9 : 3 : 3 : 1    (d)) 2 : 1
Ans.    (b)

76. The study that deals with the relationship distance of organisms on the basis of their DNA structure is known as -
    (a) Molecular phylogeny
    (b) Fossil study
    (c) Embryology
    (d)) Histology
Ans.    (a)


## PHYSICS

77. If a plane mirror is rotated by an angle 15º then the reflected light will be rotated by :
    (a) 15º    (b) 15º    (c) 45º    (d)) 7.5º
Ans.    (b)

78. If an object is placed away from the centre of curvature of a concave mirror, then the image would be :
    (a) Magnified, real inverted
    (b) Climinished, real erect
    (c) Diminshed, virtual, erect
    (d)) Diminished, real , inverted
Ans.    (d))

79. At total internal reflection the angle between the reflected ray and the incident ray is :
    (a) Two times the angle of incidence
    (b) Equal to the angle of incidence
    (c) Zero(0º)
    (d)) 90º
Ans.    (a)

80. If an object is placed of the focus of a biconvex lens then the image will be formed :
    (a) At focus on the otherside of the lens
    (b) At the centre of curvature
    (c) At infinity
    (d)) In between focus and centre of curvature
Ans.    (c)

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81. The correct sequence in the increasing order of frequency is :
    (a) Violet, Yellow, Orange        (b) Red, Orange, Violet
    (c) Blue, Yellow, Violet         (d)) Blue, Red, Orange

Ans. (b)

82. A person can see distant object clearly but find if difficult to read a book. The person is suffering from :
    (a) Astigmatism            (b) Myopia
    (c) Hypermetropia         (d)) Prebyopia

Ans. (c)

83. If a conductor is folded 8 times then the resistance will be :

    (a) 8 time      (b) 4 times      (c) $\frac{1}{8}$ times      (d)) $\frac{1}{64}$ times

Ans. (d))
    $R^2 = n^2 \times R_1$

    $R_2 = \dfrac{R}{64}$

84. If R is the resistance, I is the current flowing and V is the potential difference across a conductor at constant temperature, then Ohm's law is :
    (a) I = VR      (b) R = VI      (c) V= IR      (d)) V = $I^2R$

Ans. (c)
    Using Ohm's Law V = IR

85. How much energy us Kilowatt hour is consumed in operating two 200 watt bulb for 10 hours per day in a month (30 days) ?
    (a) 60 KWH      (b) 6 KWH      (c) 30 KWH      (d)) 200 KWH

Ans. (Bonus)

86. Particles released from Uranium atom in the increasing order of their velocity :
    (a) Alpha, Gamma, Beta     (b) Alpha, Beta, Gamma
    (c) Gamma, Beta, Alpha     (d)) Beta, Gamma, Alpha

Ans. (b)

87. We can write on a black board because of the force called :
    (a) Viscous force         (b) Frictional force
    (c) Gravitational force      (d)) Nuclear force

Ans. (b)

88. The energy released by sun is due to :
    (a) Fission reaction             (b) Fusion reaction
    (c) Both fission and fusion reaction    (d)) Chemical reaction

Ans. (b)

## CHEMISTRY

89. Which of the following are exothermic processes ?
    (i) Reaction of water with lime          (ii) Dilution of an acid
    (iii) Evaporation of water                (iv) Sublimation of Camphor
    (a) (i) and (ii)          (b) (ii) and (iii)          (c) (i) and (iv)          (d)) (iii) and (iv)

Ans.    (a)

Exothermic Raction – A reaction which is acumpained by release of energy.

Eg. Reaction of water with lime $CaO(s) + H_2O(l) \rightarrow Ca(OH)_2(aq.) + Energy$

Eq. Dilution of an acid $\rightarrow$ Exothermic process.

Ans. (i) and (ii)

90. Which of the following gases can be used for storage of fresh sample of an oil for a long time ?
    (a) $CO_2$ or $O_2$          (b) $N_2$ or $O_2$          (c) $CO_2$ or He          (d)) He of $N_2$

Ans.    (d))

Rancidity can be prevented by packing fat and oil containing foods in nitrogen or noble gas because there are unreactive and inert.

91. An aqueous solution turns red litmus solution blue. Excess addition of which of the following will reverse the change ?
    (a) Baking powder                    (b) Lime
    (c) Ammonium hydroxide solution      (d)) Hydrochloric acid

Ans.    (d))

Aquious solution turns red litmus to blue $\rightarrow$ Basic solution.

Basic solution pH > 7.

Excess addition of acid such as HCl, will change the basic nature of solution to acidic nature and pH will shift in reverse, that is below 7.

92. Silver articles become black on exposure to air for longer time which may be due to the formation of :
    (a) AgCN          (b) $Ag_2O$          (c) $Ag_2S$          (d)) $Ag_2S$ and AgCN

Ans.    (c)

Due to formation of a coating of black silver sulphide ($Ag_2S$) on its surface by the action of $H_2S$ present in air.

$$2Ag(s) + H_2S(g) \rightarrow Ag_2S(s) + H_2(g))$$
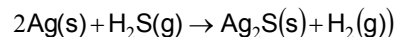
             Black

93. Which of the following four metals would be displaced from the solution of its salts by other three metals?
    (a) Mg          (b) Cu          (c) Zn          (d)) Fe

Ans.    (b)

A more active metal will Displace a less active metal from it's salt

Here Reactivity of metal $\rightarrow$ Mg> Zn > Fe > Cu

Cu is least reactive. So other 3 metals can displace Cu metal from it's salt.

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94.     Which of the following is not required to find the pH of a solution ?
        (a) pH paper          (b) Litmus paper          (c) Universal indicator    (d)) Standard pH chart
Ans.    (b)


95.     Soaps are :
        (a) Calcium Salt of acids
        (b) Magnesium salts of acids
        (c) Sodium and potassium salts of long chain fatty acids
        (d)) Salts of bases
Ans.    (c)
        Soaps $\rightarrow$ A Soap is sodium or potassium salt of some long chain carboxylic or fatty Acids.
        Eq.          RCOONa $\rightarrow$ Sodium Soap.
                     RCOOK $\rightarrow$ Potassium Soap.

96.     The general formula of esters where R represents the alkyl group is :
        (a) ROH               (b) RCOR               (c) RCOOH               (d)) RCOOR
Ans.    (d))


97.     Which of the following does not belong to the same homologus series ?
        (a) $CH_4$            (b) $C_2H_6$           (c) $C_3H_8$           (d)) $C_3H_6$
Ans.    (d))


98.     Which of the following elements would lose an electron easily ?
        (a) Mg               (b) Na                 (c) Rb                 (d)) Ca
Ans.    (c)
        Ionisation energy (IE).
        In general the value of ionization energy decreases while, moving from top to bottom in a grow.
        This is because effective nuclear charge decrease.


99.     Upto which element the law of octaves was found to be applicable ?
        (a) O                (b) Ca                 (c) Co                 (d)) K
Ans.    (b)
        Ca $\rightarrow$ According to law of Octaves


100.    Where would your locate the element with electronic configuration 2,8 in the modern periodic table ?
        (a) group 8          (b) group 2            (c) group 15           (d)) group 18
Ans.    (d))
        Group 18 $\rightarrow$ 2 +8  electrons $\rightarrow$ Neon Ne

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