

NTSE STAGE – 1 (2016) (STATE OF M.P.)

SENT – 10

ANSWERS KEYS

PART-I MENTAL ABILITY(MAT)

1.(D) 2. (C) 3. (D) 4. (D) 5. (A) 6. (D) 7. (D) 8. (A) 9. (B) 10. (D) 11. (C) 12. (D)
13. (B) 14. (A) 15. (B) 16. (D) 17. (D) 18. (B) 19. (B) 20. (C) 21.(D) 22. (C) 23. (A) 24.(C)
25. (D) 26. (D) 27. (C) 28. (C) 29. (B) 30. (D) 31. (A) 32. (C) 33. (B) 34. (A) 35. (B) 36. (B)
37. (A,D) 38. (A) 39. (C) 40. (C) 41. (D) 42. (C) 43. (D) 44. (C) 45. (A) 46. (A) 47. (D) 48. (C)
49. (D) 50. (C)

PART-II (SAT)

PHYSICS

1. (A) 2. (B) 3. (A) 4. (NO OPTION IS MATCHING) 5. (A) 6. (B) 7. (B) 8. (D) 9. (C)
10. (D) 11. (B) 12. (A) 13. (C)

CHEMISTRY

14. (A) 15. (C) 16. (C) 17. (B) 18. (C) 19. (A) 20. (D) 21. (A) 22. (C) 23. (B) 24. (A)
25. (B) 26. (A)

BIOLOGY

27. (A) 28. (C) 29. (A) 30. (B) 31. (D) 32. (B) 33. (C) 34. (C) 35. (A) 36. (A) 37. (C)
38. (A) 39. (C) 40. (B)

HISTORY

41. (B) 42. (B) 43. (B) 44. (C) 45. (B) 46. (A) 47. (A) 48. (D) 49. (C) 50. (C) 51. (B)
52. (D) 53. (C) 54. (A) 55. (C)

GEOGRAPHY

56. (D) 57. (B) 58. (A) 59. (B) 60. (A) 61. (A) 62. (B) 63. (A) 64. (B) 65. (B) 66. (D)
67. (B) 68. (D) 69. (B) 70. (C)

CIVICS

71. (C) 72. (B) 73. (B) 74. (A) 75. (C)

ECONOMICS

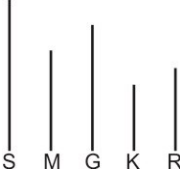

76. (D) 77. (C) 78. (C) 79. (B) 80. (D)

MATHEMATICS

81. (B) 82. (B) 83. (C) 84. (No option matching/bonus) 85. (A) 86. (C) 87. (A) 88. (D) 89. (D) 90. (D)
91. (C) 92. (B) 93. (C)
94. (A,C) 95. (A) 96. (B) 97. (C) 98. (D) 99. (D) 100. (B)

SOLUTIONS

MAT :

1. 36, **30**, 24, 18, 12
Hint : Difference of -6 in each step.
2. 1, 1, 4, 8, 9, 27, 16, 64, 25, **125**
Hint : Alternate series.
3. 3, 5, 8, 13, 21, **34**, 55
 $3 + 5 = 8$
 $8 + 13 = 21$
 $13 + 21 = 34$
4. 80, 78, 75, 71, **66**
Hint : Successive difference of -2, -3, -4, -5
5. 2, 7, 17, 32, 52, **77**
Hint : Difference in each step of 5, 10, 15, 20, 25
6. B E G K : A D F J : :
Hint : Difference in each letter is one.
7. A B C D : N P R T
+13 +14 +15 +16
8. Opposite Letters
9. a C E : b d F :: f h J : ?
+1 +1 +1
19. $90/7$ (remainder = 6 so it will be Saturday)
23. 
24. 
33.
$$\begin{array}{l} F \quad I = O \\ 6 + 9 \quad 15 \\ \text{So } E \quad M = R \\ 5 + 13 \quad 18 \end{array}$$
34. $9 + 2^2 = 13$
 $13 + 3^2 = 22$
 $22 + 4^2 = 38$
35. $\sqrt{4} \times \sqrt{9} = 2 \times 3 = 6$
 $\sqrt{16} \times \sqrt{25} = 4 \times 5 = 20$

40. Difference of 1, 2, 3, 4, 5, 6, 7

41. Difference of 10, 20, 40, 80, 160

43. $2^2 = 4$
 $3^2 = 9$
 $4^2 = 16$
 $5^2 = 25$

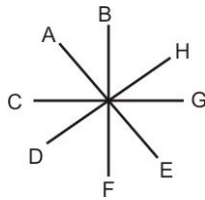
44. $1+1=2$
↓
 $3+3=6$
↓
 $3+3+3=9$
↓
 $2+6+9=17$

45. $26 \times 12 = 312$

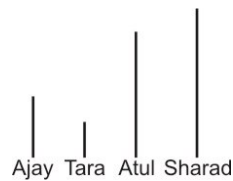
$$\frac{312}{3} = 104 \text{ in}$$

$$104 = 8 \text{ f } 8 \text{ in}$$

46.
47.
48.



50.



SAT :

PHYSICS :

1. A

$$\Rightarrow R_{eq} = \frac{2 \times 2}{2 + 2}$$

$$\Rightarrow R_{eq} = 1 \Omega$$

2. B

3. A

$$10 \text{ VSD} = 8 \text{ MSD}$$

$$\Rightarrow 1 \text{ VSD} = \frac{8}{10} \text{ MSD} = 0.8 \text{ MSD}$$

$$\Rightarrow \therefore \text{LC} = 1 \text{ MSD} - 1 \text{ VSD}$$
$$= 1 - 0.8 = 0.2 \text{ mm}$$

4. $S_{n^{\text{th}}} = u + \frac{a}{2}(2n - 1)$

$$\begin{aligned}
 5. \quad & \therefore \frac{x^2 - 32}{9} \\
 & \Rightarrow \frac{x}{5} = \frac{x - 32}{9} \\
 & \Rightarrow 9x = 5x - 160 \\
 & \Rightarrow x = -40
 \end{aligned}$$

$$\begin{aligned}
 6. \quad & \text{Total distance} = x + x = 2x \\
 & \text{Total time} = t_1 + t_2 \\
 & = \frac{x}{50} + \frac{x}{150} \\
 \therefore \text{Av. Speed} & = \frac{\text{Total distance}}{\text{Total time}} = \frac{2x}{\frac{x}{50} + \frac{x}{150}} = 75 \text{ km/h}
 \end{aligned}$$

7. Latitude of that place

8. $R_s > R_1$ and $R_P + R_3$

9. Mars – Jupiter

10. D

11. B

12. A

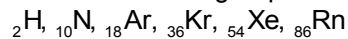
High resistance low melting point

13. C

CHEMISTRY :

14. Elements of same group have similar valence shell configuration

15. Elements of zero group are inert gases and these are



16. Covalent compounds are generally bad conductor of electricity

17. B

18. $\text{CH}_2\text{O} \Rightarrow \text{HCHO}$ = Formaldehyde

CH_3COOH = Acetic acid

$\text{C}_6\text{H}_{12}\text{O}_6$ = Glucose/Fructose

$\text{C}_{12}\text{H}_{22}\text{O}_{11}$ = Sucrose

19. A

20. D

21. A

22. C

23. B

24. A

25. B

26. A

MATHS

$$\begin{aligned}
 81. \quad & \cot a = 9/40 \\
 & \text{Cosec } A = 41/40
 \end{aligned}$$

$$82. \quad \sin c = 5/13$$

$$83. \quad (\sec\theta + \tan\theta)(1 - \sin\theta)$$

$$\Rightarrow \left(\frac{1 + \sin \theta}{\cos \theta} \right) (1 - \sin \theta)$$

$$\Rightarrow \frac{1 - \sin^2 \theta}{\cos \theta} = \cos \theta$$

84. $\tan \theta = \frac{1}{\sqrt{3}}$

$$\frac{\operatorname{cosec}^2 \theta - \sec^2 \theta}{\operatorname{cosec}^2 \theta + \sec^2 \theta} \Rightarrow \frac{4 - \frac{4}{3}}{4 + \frac{4}{3}} = \frac{1}{2}$$

(Hence Bonus because NO option Matched)

85. $3x^2 + 2x + K = 0$

$$D \geq 0$$

$$4 - 12K \geq 0$$

$$-12K \geq -4$$

$$K \leq \frac{1}{3}$$

86. $(x - 5)(x + 8) = 30$

$$x^2 + 8x - 5x - 40 - 30 = 0$$

$$x^2 + 3x - 70 = 0$$

$$x^2 + 10x - 7x - 70 = 0$$

$$(x + 10)(x - 7) = 0$$

$$X = 7$$

87. $\frac{1}{2} \times 3x \times x = 96$

$$x^2 = 64$$

$$x = 8$$

$$3x = 24$$

88. $P(E) = \frac{2}{7}$

89. $N(s) = 52$

$$\text{For event} = {}^{12}C_1 = 12$$

$$P(E) = \frac{12}{52} = \frac{4}{13}$$

90. Breadth = x

$$\text{Length} = x + 23$$

$$2(x + 23) + 2x = 206$$

$$4x = 160$$

$$x = 40$$

$$\text{Breadth} = 40$$

$$\text{Length} = 63$$

$$\text{Area} = 2520$$

91. $6a^2 = 864$

$$a^2 = 144$$

$$a = 12$$

$$\text{Volume} = a^3 = 1728$$

92. Longest Pole = Diagonal Length

$$= \sqrt{a^2 + b^2 + c^2} = \sqrt{289} = 17$$

93. Coordinate of point on x-axis = (x, 0)

$$|AB| = |AC|$$

$$(7-x)^2 + 6^2 = (-3-x)^2 + 4^2$$

$$20x = 60$$

$$x = 3$$

$$A : (3, 0)$$

94. $|AB| = \sqrt{5^2 + 3^2}$

$$= \sqrt{34}$$

$$|BC| = \sqrt{64 + 4}$$

$$= \sqrt{68}$$

$$|CA| = \sqrt{9 + 25}$$

$$= \sqrt{34}$$

$$|AB| = |CA|$$

\therefore isosceles

$$\Rightarrow BC^2 = AB^2 + CA^2$$

$$68 = 34 + 34 = 68$$

\therefore Right angled

95. Let divides in K : 1 ratio

$$-3K + 4 = 0$$

$$K = \frac{4}{3}$$

96. B

97. C

98. CP = x

$$SP = \frac{3}{2}x$$

$$\% \text{Profit} = \frac{\frac{3}{2}x - x}{x} \times 100 = 50\%$$

99. Let A's cost price = x

$$\text{B's cost price} = \frac{120x}{100} = \frac{6}{5}x$$

$$\text{C's cost price} = \frac{120x}{100} \times \left(1 + \frac{25}{100}\right)$$

$$= \frac{120}{100} \times \frac{5}{4} \times x$$

$$= \frac{3}{2}x$$

$$\frac{3}{2}x = 225$$

$$x = \frac{450}{3} = 150$$

$$x = 150$$

100. $h = 14\text{cm}^2$

$$2\pi rh = 264$$

$$r = 3\text{cm}$$

$$\text{Volume} = \pi r^2 h$$

$$= \frac{22}{7} \times 9 \times 14 = 396 \text{ cm}^3$$