

MOTION

Nurturing potential through education

NATIONAL TALENT SEARCH EXAMINATION(NTSE) 2016 STAGE-I

SCHOLASTIC APTITUDE TEST (SAT) 100-C

1.	(4)	2.	(2)	3.	(3)	4.	(4)	5.	(3)	6.	(2)	7.	(2)
8.	(1)	9.	(1)	10.	(3)	11.	(1)	12.	(4)	13.	(3)	14.	(1)
15.	(2)	16.	(3)	17.	(3)	18.	(3)	19.	(1)	20.	(1)	21.	(4)
22.	(4)	23.	(3)	24.	(4)	25.	(1)	26.	(4)	27.	(1)	28.	(1)
29.	(2)	30.	(4)	31.	(1)	32.	(3)	33.	(3)	34.	(1)	35.	(1)
36.	(2)	37.	N.A	38.	(1)	39.	(3)	40.	(2)	41.	(3)	42.	(2)
43.	(3)	44.	(4)	45.	(1)	46.	(3)	47.	(2)	48.	(1)	49.	(2)
50.	(4)	51.	(3)	52.	(3)	53.	(2)	54.	(3)	55.	(2)	56.	(1)
57.	(2)	58.	(2)	59.	(3)	60.	(1)	61.	(2)	62.	(3)	63.	(2)
64.	(1)	65.	(2)	66.	(1)	67.	(2)	68.	(1)	69.	(1)	70.	(2)
71.	(3)	72.	(4)	73.	(2)	74.	(2)	75.	(2)	76.	(3)	77.	(3)
78.	(3)	79.	(3)	80.	(4)	81.	(4)	82.	(4)	83.	(1)	84.	(1)
85.	(4)	86.	(2)	87.	(3)	88.	(1)	89.	(4)	90.	(2)	91.	(1)
92.	(2)	93.	(3)	94.	(4)	95.	(2)	96.	(2)	97.	(4)	98.	(1)
99.	(3)	100.	(2)										

SOLUTION

1. (4)

$$V_{\text{avg}} = \frac{\text{Total distance}}{\text{Total time}}$$

$$V_1 = \frac{4n}{T_1} \quad V_2 = \frac{4n}{T_2}$$

$$T_1 = \frac{4n}{8n} \quad T_2 = \frac{4n}{4n}$$

$$V_{\text{avg}} = \frac{8n}{T_1 + T_2} = 53 \text{ km/hr}$$

2. (2)

3. (3)

From work energy theorem

$$W_{\text{net}} = \Delta KE$$

$$= \frac{1}{2}mv_f^2 - \frac{1}{2}mv_i^2$$

$$= \frac{1}{2} \times 5(10^2 - 6^2)$$

$$= \frac{1}{2} \times 5 \times 64 = 160 \text{ J}$$

4. (4)

5. (3) $P = \frac{F}{A}$

∴ As area decreases pressure increases

6. (2)

7. (2)

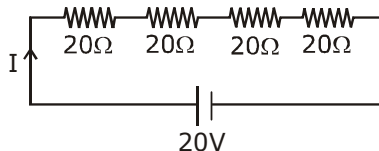
$$R = \frac{\rho L}{A}$$

So $R \propto L$

$$R \propto \frac{1}{A}$$

⇒ Thick, short, cool

8. (1)



$$R_{\text{eq}} = 20 \times 4 = 80\Omega$$

$$V = 20 \text{ V}$$

$$i = \frac{V}{R} = \frac{20}{80} = \frac{1}{4} \text{ A}$$

Potential drop at each resistor = iR

$$= \frac{1}{4} \times 20 = 5 \text{ V}$$

9. (1)

10. (3)

11. (1)

Image 1 → at .2d from mirror 1

Image 2 → at (.2d + .8d + .8d) = 1.8d

i.e. image of image formed in mirror 2

12. (4)

13. (3)

14. (1)

102 gm of Al_2O_3 contains = 2 gram moles of Aluminium ion

$$.051 \text{ gm of } \text{Al}_2\text{O}_3 \text{ contains} = \frac{2 \times .051}{102} = .001$$

15. (2)

16. (3)

17. (3)

18. (3)

19. (1)

20. (1)

21. (4)

22. (4)

23. (3)

24. (4)

25. (1)

26. (4)

27. (1)

28. (1)

29. (2)

30. (4)

31. (1)

32. (3)

33. (3)

34. (1)

35. (1)

36. (2)

$$2^2[1^2 + 2^2 + \dots + 12^2] = 2^2[650] = 2600$$

37. N.A.

$$x^{b^2} x^{b^{2+2ab}} x^{a^2-b^2} = x^{b^2+b^{2+2ab}+a^2-b^2} = x^{b^{2+2ab}+a^2}$$

38. (1)

$$(x + 2)(2x^2 - 4x + 3)$$

$$K = b$$

39. (3)

$$3px + p^2y = 7p$$

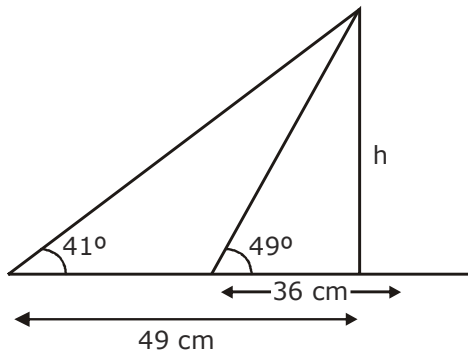
$$3px + 9y = 15 \times 3$$

$$(9 - p^2)y = 45 - 7p$$

$$y = \frac{45 - 7p}{9 - p^2}$$

$$p = \pm 3$$

40. (2)



$$\tan 90^\circ = \frac{\tan 41^\circ + \tan 49^\circ}{1 - \tan 41^\circ \tan 49^\circ}$$

$$\infty = \frac{\tan 41^\circ + \tan 49^\circ}{1 - \tan 41^\circ \tan 49^\circ}$$

$$\Rightarrow \tan 41^\circ \tan 49^\circ = 1$$

$$\frac{h}{49} \times \frac{h}{36} = 1$$

$$h = 42 \text{ cm}$$

41. (3)

$$\angle ABC = \pi - a$$

$$\angle ADC = \pi - b$$

$$\angle ABC + \angle ADC + x + y = 2\pi$$

$$\pi - a + \pi - b + x + y = 2\pi$$

$$a + b = x + y$$

42. (2)

$$\angle POR = 360^\circ - 80^\circ$$

$$= 280^\circ \text{ (obtuse)}$$

$$\text{Hence } \angle RQP = 140^\circ$$

$$\therefore \angle RQS = 40^\circ$$

43. (3)

$$\text{Area} \propto (\text{side})^2$$

$$\therefore A_1 : A_2 = 1 : 4$$

44. (4)

$$a - 6 = 5 \Rightarrow a = 5 + 6$$

$$a^2 - b^2 = 300$$

$$\Rightarrow (a + b)(a - b) = 300$$

$$(a + b) = \frac{300}{5} = 60$$

45. (1)

$$D > 0$$

$$4 - 4[a] [-2] > 0$$

$$4 + 80 > 0$$

$$1 + 2a > 0$$

$$2a > -1$$

$$a > -1/2$$

46. (3)

$$\frac{c^2}{ab} + \frac{a^2}{bc} + \frac{b^2}{ca}$$

$$\frac{c^3 + a^3 + b^3}{abc}$$

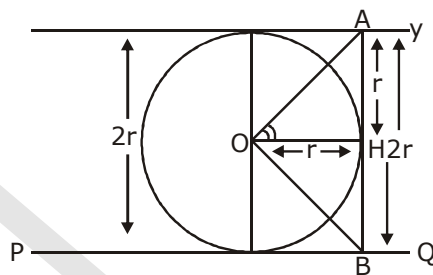
$$\Rightarrow \frac{a^3 + b^3 + c^3}{abc}$$

$$\text{i.e } a + b + c = 0$$

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

$$= 3$$

47. (2)



ΔAOM

$$OM = r$$

$$AM = OM = r$$

$$\angle AOM = 45^\circ$$

$$\angle BOM = 45^\circ$$

$$\angle AOB = 90^\circ$$

48. (1)

$$\frac{\cos \theta}{\cot \theta - 1} - \frac{\sin \theta}{\cot \theta - 1} = \frac{\cos^2 \theta - \sin^2 \theta}{(\cos \theta - 1) \sin \theta}$$

$$= \cos \theta + \sin \theta$$

49. (2)

$$\text{Red colours} = 2$$

$$\text{Total colours} = 52$$

$$p = \frac{2}{52} = \frac{1}{26}$$

50. (4)

$$\tan 20 \cdot \tan 40 \cdot \cot 40 \cdot \cot 20$$

$$= 1$$

51. (3)

$$a = 11, d = 2,$$

$$a + (n - 1)d + a(n - 2)d = 60^\circ$$

$$2z1 + d[2n - 3] = 60$$

$$2 \times 11 + 2[2n - 3] = 60$$

$$2(n - 3) = 38$$

$$2(2n - 3) = 38$$

$$2n - 3 = 19$$

$$2n = 22$$

$$n = 11$$

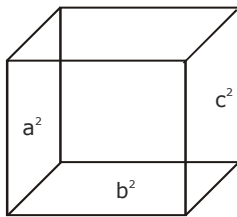
52. (3)
 $2\pi r - 2r = 60$
 $2r\left(\frac{22}{7} - 1\right) = 60$
 $r = \frac{30 \times 7}{15} = 14\text{cm}$

$$A = \pi r^2 = \frac{22}{7} \times 14 \times 14$$

$$= 22 \times 28 = 616 \text{ cm}^2$$

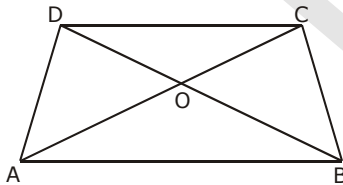
$$(14)^2 \pi \text{ cm}^2$$

53. (2)



Sides are $a = b = c \Rightarrow l = a$
length $\Rightarrow b = b$
breadth $\Rightarrow h = c$
height $\Rightarrow h = c$
Hence $V = lbh = abc$

54. (3)



$$\frac{AB}{CA} = \frac{3}{2}$$

$$\frac{\text{Area AOB}}{\text{Area COD}} = ?$$

$$= \frac{9}{4}$$

55. (2)
 $5 + 9 + x + 7 + 4 + y = 7 \times 6$
 $\Rightarrow 25 + x + y = 42$
 $x + y = 17$

56. (1)

57. (2)

58. (2)

59. (3)

60. (1)

61. (2)

62. (3)

63. (2)

64. (1)

65. (2)

66. (1)

67. (2)

68. (1)

69. (1)

70. (2)

As per United Nation Recent Data India has 132 Rank Now.

71. (3)

72. (4)

73. (2)

74. (2)

75. (2)

76. (3)

77. (3)

78. (3)

79. (3)

80. (4)

81. (4)

82. (4)

83. (1)

84. (1)

85. (4)

86. (2)

87. (3)

88. (1)

89. (4)

90. (2)

91. (1)

92. (2)

93. (3)

32 gm of O_2 contains = 6.022×10^{23} molecules

$$8 \text{ gm of } O_2 \text{ contains} = \frac{6.022 \times 10^{23}}{32} \times 8$$

$$= 1.51 \times 10^{23}$$

94. (4)

95. (2)

96. (2)

97. (4)

98. (1)

99. (3)

100. (2)