Test Date: 06-10-2019

Test Booklet Code **D, E & F**

Test No. 2

Answers & Hints

for Olympiads, NTSE & Class X-2020

All India Aakash Test Series for Class X (2020)

TEST - 2

Test Date : 06-10-2019

ANSWERS

SECTION-I (Code-D)

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

SECTION-II (Code-E)

1.	(2)	7.	(4)	13.	(4)	19.	(3)	25.	(2)
2.	(4)	8.	(2)	14.	(3)	20.	(2)	26.	(4)
3.	(2)	9.	(3)	15.	(1)	21.	(4)	27.	(1)
4.	(3)	10.	(2)	16.	(3)	22.	(3)	28.	(3)
5.	(4)	11.	(2)	17.	(3)	23.	(3)	29.	(2)
6.	(2)	12.	(3)	18.	(4)	24.	(4)	30.	(4)

SECTION-III (Code-F)

1.	(3)	4.	(2)	7.	(3)	10.	(2)	13.	(3)
2.	(3)	5.	(4)	8.	(1)	11.	(2)	14.	(2)
3.	(1)	6.	(1)	9.	(2)	12.	(1)	15.	(2)

All India Aakash Test Series for Class X (2020)

TEST - 2

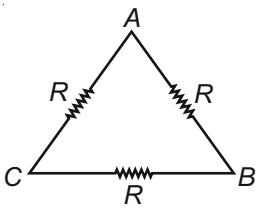
Hints to Selected Questions

SECTION-I (Code-D)

1. Answer (2)
2. Answer (2)
3. Answer (1)
4. Answer (1)
5. Answer (4)
6. Answer (2)
7. Answer (2)

$I = \frac{q}{t} = \frac{14}{3.5} = 4$ A

8. Answer (2)
9. Answer (3)
10. Answer (2)
11. Answer (2)



$R = \frac{72}{3}$

$= 24\ \Omega$

$R_{net} = \frac{2R \times R}{2R + R} = \frac{2R}{3}$

So, $R = \frac{2 \times 24}{3}$

$= 16\ \Omega$

12. Answer (2)

Current in each branch is 2 A

$V_P = V - 8$

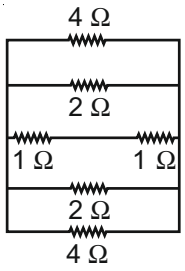
$V_Q = V - 12$

Now, $V_P - V_Q = (V - 8) - (V - 12)$

$= 4$ V

13. Answer (4)

Equivalent circuit



$\frac{1}{R_{net}} = \frac{1}{4} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{4}$

$R_{net} = 0.5\ \Omega$

14. Answer (1)
15. Answer (4)

$\delta = 2i - A$

$i = \frac{\delta + A}{2} = 60°$

and $r = \frac{A}{2} = 30°$

and $1 \times \sin i = \mu \sin r$

$\mu = \frac{\sqrt{3}}{2} \times \frac{2}{1}$

$\mu = \sqrt{3}$

and $\frac{c}{v} = \sqrt{3}$

$v = \frac{3 \times 10^8}{\sqrt{3}}$

$= 1.73 \times 10^8$ m/s

16. Answer (1)

$P = \frac{1}{f} = \frac{1}{v} - \frac{1}{u}$

$P = \frac{1}{-0.80} - \frac{1}{-0.4}$

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or $P = -1.25 + 2.5$

$= 1.25$ D

17. Answer (4)

$v = -100$ cm

$f = -40$ cm

Here, $\frac{1}{f} = \frac{1}{v} + \frac{1}{u}$

$\frac{1}{u} = \frac{1}{-40} - \frac{1}{-100}$

$\Rightarrow \frac{1}{u} = \frac{-3}{200}$

$u = -66.67$ cm

Distance of object from screen

$x = 100 - 66.67$

$= 33.33$ cm

18. Answer (1)

$m = -\frac{v}{u} = -x$

$\frac{v}{u} = x$

$v = xu$

$f = \frac{uv}{u+v} = \frac{(-u)\times(-xu)}{(-u)+(-xu)} = \frac{xu}{-(x+1)}$

$u = \frac{-f(x+1)}{x}$

19. Answer (2)

$f = \frac{uv}{u-v}$

$= \frac{-80\times120}{-80-120}$

$= 48$ cm

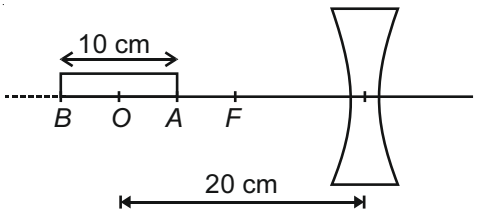
$\frac{i}{o} = \frac{v}{u}$

$i = \frac{v}{u}\times o = \frac{120}{-80}\times12$

$= -1.5 \times 12$

$= -18.00$ cm

20. Answer (2)



For end A,

$\frac{1}{v_1} = \frac{1}{f} + \frac{1}{u}$

$= \frac{1}{-10} + \frac{1}{-15}$

$= \frac{5}{-30}$

$v_1 = -6$ cm

For end B,

$\frac{1}{v_2} = \frac{1}{f} + \frac{1}{u}$

$= \frac{1}{-10} + \frac{1}{-25}$

$\frac{1}{v_2} = \frac{5+2}{-50}$

$v_2 = \frac{-50}{7}$ cm

$= -7.14$ cm

Length of the rod $= -6 - (-7.14)$

$= 1.14$ cm

Magnification $= \frac{1.14}{10}$

$= 0.114$

21. Answer (3)

22. Answer (2)

23. Answer (4)

24. Answer (2)

25. Answer (2)

26. Answer (2)

27. Answer (4)

28. Answer (4)

29. Answer (2)

30. Answer (1)

31. Answer (3)

32. Answer (3)

33. Answer (4)

34. Answer (1)

35. Answer (2)

36. Answer (4)

37. Answer (2)

38. Answer (3)

39. Answer (1)

40. Answer (2)

$Na_2CO_3(s) + 2HCl(aq) \longrightarrow 2NaCl(aq) + \underset{\text{'A'}}{H_2O(l)} + \underset{\text{'M'}}{CO_2(g)}$

$\underset{\text{Lime water}}{Ca(OH)_2} + \underset{\text{'M'}}{CO_2(g)} \longrightarrow \underset{\text{'P'}}{CaCO_3(s)} + \underset{\text{'A'}}{H_2O(l)}$

$\underset{\text{'P'}}{CaCO_3(s)} + \underset{\text{'A'}}{H_2O(l)} + \underset{\text{'M'}}{CO_2(g)} \longrightarrow \underset{\text{'Q'}}{Ca(HCO_3)_2(aq)}$

41. Answer (3)

42. Answer (4)

43. Answer (3)

44. Answer (2)

Auxin and gibberellin induced parthenocarpy.

45. Answer (2)

Plasmodium causes malaria.

46. Answer (3)

47. Answer (4)

48. Answer (2)

49. Answer (4)

50. Answer (3)

51. Answer (4)

Vasectomy is the process by which transport of gametes is blocked.

52. Answer (2)

53. Answer (3)

54. Answer (4)

55. Answer (4)

Sensory neuron is the afferent nerve fibre whereas motor neuron is the efferent nerve fibre.

56. Answer (3)

57. Answer (4)

58. Answer (2)

59. Answer (4)

60. Answer (3)

61. Answer (4)

62. Answer (3)

63. Answer (1)

64. Answer (3)

65. Answer (2)

66. Answer (1)

Let $N = a^p b^q c^r d^s$ ----

Formula for sum of all factors

$$= \frac{\left(a^{p+1}-1\right)}{(a-1)} \times \frac{\left(b^{q+1}-1\right)}{(b-1)} \times \frac{\left(c^{r+1}-1\right)}{(c-1)} \text{----}$$

67. Answer (3)

68. Answer (4)

Let $P(x)$ be $-3x^2 + 5x - 4$.

On comparing $-3x^2 + 5x - 4$ with $ax^2 + bx + c$, we get

$a = -3$, $b = 5$ and $c = -4$.

So, using the formula $\left(\frac{-b}{2a}, \frac{-D}{4a}\right)$, we get the vertex of given polynomial.

69. Answer (3)

First find the third vertex of equilateral triangle, then find centroid.

Third vertex formula

$$= \left(\frac{x_1 + x_2 \mp \sqrt{3}(y_2 - y_1)}{2}, \frac{y_1 + y_2 \pm \sqrt{3}(x_2 - x_1)}{2}\right)$$

70. Answer (2)

71. Answer (3)

Here, possible values of r are 0, 1, 2, 3, 4, -----, 16.

$\therefore \quad \Sigma r = 1 + 2 + 3 + 4 + 5 + \text{-----} + 16$

$$= \frac{16 \times (16+1)}{2} = 136$$

72. Answer (2)

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73. Answer (2)

Let the polynomial be $P(x) = (x - 13)(x - 17) + ax + b$

$\therefore$ Use $P(13) = 15$ and $P(17) = 35$, we get a and b.

After that we get our required result.

74. Answer (4)

75. Answer (2)

76. Answer (3)

Let $a - 2d$, $a - d$, a, $a + d$ and $a + 2d$ be five numbers in an A.P.

Using above result, we can solve.

77. Answer (3)

78. Answer (4)

79. Answer (2)

By using angle bisector theorem, we get

$PT \times QU \times SR = QT \times UR \times PS$

80. Answer (3)

81. Answer (2)

82. Answer (3)

83. Answer (4)

84. Answer (2)

85. Answer (4)

$a @ b = a^2 + b^2 + 5$ (Given)

$6 @ 5 = 6^2 + 5^2 + 5 = 66$

86. Answer (1)

$a * b = a^2 - b^2 + 4$

$12 * 7 = 12^2 - 7^2 + 4 = 99$

87. Answer (3)

$(7 @ 4) * (5 @ 3) = (70) * (39) = 3383$

88. Answer (2)

a d j h 3 a s d g 6 4 8 @ a i s d 6 a s & j 2 k 4 %

89. Answer (2)

a d j h 3 a s d g 6 4 8 @ a i s d 6 a s & j 2 k 4 %

90. Answer (1)

91. Answer (3)

Required Persons = 50 – (15 + 12 – 1) = 24

92. Answer (4)

Rank of Mohan from the last = 70 – 16 + 1 = 55

Solutions for (Q.93 to Q.96)

A - Red - Pizza, B - Green - Pasta, C - Yellow - Samosa, D - White - Burger, E - Blue- Chips

93. Answer (3)

94. Answer (4)

95. Answer (2)

96. Answer (3)

97. Answer (1)

98. Answer (4)

99. Answer (3)

100. Answer (4)

SECTION-II (Code-E)

1. Answer (2)

2. Answer (4)

3. Answer (2)

4. Answer (3)

5. Answer (4)

6. Answer (2)

7. Answer (4)

8. Answer (2)

9. Answer (3)

10. Answer (2)

11. Answer (2)

12. Answer (3)

Hypothalamus maintains the body temperature at 37°C by means of a complex thermostat mechanism. Due to which it is called the thermoregulatory centre of the body.

13. Answer (4)

Organisms such as *Euglena* and *Leishmania* undergo longitudinal binary fission whereas organisms such as *Paramecium* and diatoms undergo transverse binary fission.

14. Answer (3)

15. Answer (1)

16. Answer (3)

17. Answer (3)

During cardiac cycle, ventricular systole lasts for about 0.3 s.

18. Answer (4)

19. Answer (3)

Cowper's gland is situated one on either side of the urethra and helps in neutralization of the acidity of male urethra.

20. Answer (2)

21. Answer (4)

22. Answer (3)

23. Answer (3)

24. Answer (4)

25. Answer (2)

26. Answer (4)

27. Answer (1)

28. Answer (3)

29. Answer (2)

30. Answer (4)

SECTION-III (Code-F)

1. Answer (3)

Here, $\alpha - \beta + \alpha + \alpha + \beta = -\frac{(-15)}{1}$

$\Rightarrow$ $3\alpha = 15$

$\Rightarrow$ $\alpha = 5$

Given, $f(x) = x^3 - 15x^2 + ax + b$

$\therefore$ $f(5) = 125 - 15(25) + 5a + b$

$\Rightarrow$ $5a + b = 25(15 - 5)$

$\Rightarrow$ $5a + b = 250$

Squaring both sides, we get

$25a^2 + b^2 + 10ab = 62500$

$\therefore$ $\frac{25a^2}{4} + \frac{5ab}{2} + \frac{b^2}{4} = 15625$

2. Answer (3)

3. Answer (1)

$203 = 126 \times 1 + 77$

$126 = 77 \times 1 + 49$

$77 = 49 \times 1 + 28$

$49 = 28 \times 1 + 21$

$28 = 21 \times 1 + 7$

$21 = 7 \times 3 + 0$

$\therefore$ HCF = 7

Now, $7 = 28 - 21 \times 1$

$\Rightarrow$ $7 = 28 - (49 - 28 \times 1)$

$\Rightarrow$ $7 = 2 \times 28 - 49$

$\Rightarrow$ $7 = 2 \times 77 - 49 \times 2 - 49$

$\Rightarrow$ $7 = 2 \times 77 - 3 \times 49$

$\Rightarrow$ $7 = 2 \times 77 - 3 \times 126 + 3 \times 77$

$\Rightarrow$ $7 = 5 \times 77 - 3 \times 126$

$\Rightarrow$ $7 = 5 \times 203 - 5 \times 126 - 3 \times 126$

$\Rightarrow$ $7 = 5 \times 203 - 8 \times 126$ ...(i)

On comparing the equation (i) with $203x + 126y$, we get

$x = 5$ and $y = -8$

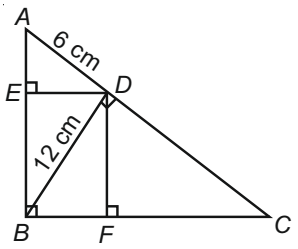
$\therefore$ $(x + y) = 5 - 8 = -3$

4. Answer (2)

5. Answer (4)

6. Answer (1)

7. Answer (3)



In ΔABC,

$\angle ABC = 90°$ and $BD \perp AC$.

$\therefore$ $BD^2 = AD \times CD$

$\Rightarrow$ $144 = 6 \times CD$

$\Rightarrow$ $CD = 24$ cm

$\therefore$ $BC^2 = BD^2 + CD^2 = (12)^2 + (24)^2$

$= (12)^2[1 + 4]$

$BC^2 = (12)^2 \times 5$

$\Rightarrow$ $BC = 12\sqrt{5}$ cm

Also, $\frac{CD}{AD} = \frac{CF}{BF}$ [$\because \Delta CDF \sim \Delta DAE$]

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$\Rightarrow \frac{4}{1} = \frac{CF}{BF}$

$\Rightarrow CF = \frac{BC \times 4}{5} = \frac{48\sqrt{5}}{5}$

In ΔABD,

$AB^2 = AD^2 + BD^2$

$\therefore \quad AB^2 = 36 + 144$

$\Rightarrow AB = \sqrt{36 \times 5}$

$\Rightarrow AB = 6\sqrt{5}$ cm

We know $AE : AB = AD : AC$ [$\because \Delta AED \sim \Delta ABC$]

$\Rightarrow \frac{AE}{6\sqrt{5}} = \frac{6}{30}$

$\Rightarrow AE = \frac{6\sqrt{5}}{5}$

Now, required sum $= \frac{48\sqrt{5}}{5} + \frac{6\sqrt{5}}{5}$

$= \frac{54\sqrt{5}}{5}$ cm

8. Answer (1)

Given, $\sin\theta + \cos\theta = \sqrt{2}$

$\Rightarrow \sin^2\theta + \cos^2\theta + 2\sin\theta\cos\theta = 2$ [On squaring]

$\Rightarrow 2\sin\theta\cos\theta = 1$

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

$\Rightarrow 2\tan\theta = \sec^2\theta$

$\Rightarrow 2\tan\theta - \sec^2\theta = 0$

9. Answer (2)

10. Answer (2)

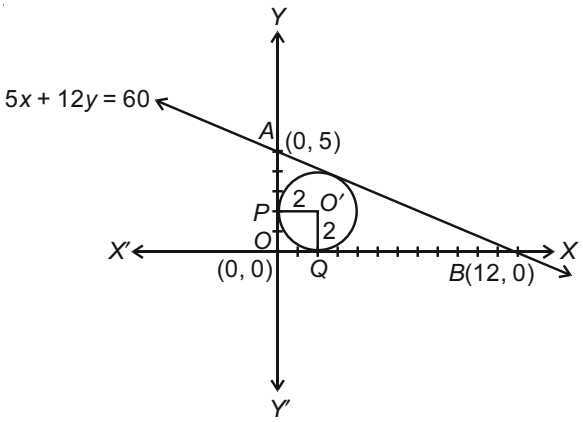
Use : AM $\geq$ GM

$\therefore \quad \frac{3x + 5y + z + \frac{1}{15x} + \frac{25}{y} + \frac{1}{36z}}{6} \geq$

$\left(3x \times 5y \times z \times \frac{1}{15x} \times \frac{25}{y} \times \frac{1}{36z}\right)^{\frac{1}{6}}$

$\therefore \quad \left(3x + 5y + z + \frac{1}{15x} + \frac{25}{y} + \frac{1}{36z}\right) \geq 6\left(\frac{5}{6}\right)^{\frac{1}{3}}$

11. Answer (2)



Let O' be the centre of the circle.

ΔOAB is right angled.

So, radius of incircle $= \frac{5 + 12 - 13}{2}$

$= 2$

Here, $O'P = O'Q = 2$ units

So, incentre of the triangle = (2, 2)

12. Answer (1)

$x^2 - 21x + 54 < 0$

$(x - 3)(x - 18) < 0$

$\Rightarrow 3 < x < 18$

So, possible integral values of x are 4, 5, 6, 7, ----, 16, 17.

$\therefore \quad 4 + 5 + 6 + 7 + \text{----} + 16 + 17$

$\Rightarrow (1 + 2 + 3 + 4 + \text{----} + 17) - (1 + 2 + 3)$

$\Rightarrow \frac{17 \times 18}{2} - 6$

$\Rightarrow 147$

13. Answer (3)

14. Answer (2)

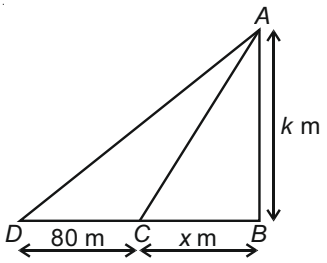
Let y be $\sqrt{21 + \sqrt{12 + \sqrt{12 + \sqrt{12 + \text{----}\infty}}}}$.

Also, $x = \sqrt{12 + \sqrt{12 + \sqrt{12 + \text{----}\infty}}}$ (Let)

Solve, x from here and then we find our required result.

15. Answer (2)

Let the height of tower be k m and the distance of the foot of the tower from the point C be x m.



$\therefore$ In ΔADB,

$$\tan D = \frac{k}{(x+80)}$$

$$\Rightarrow \quad \frac{5}{12} = \frac{k}{(x+80)}$$

$$\Rightarrow \quad k = \frac{5(x+80)}{12} \qquad ...(i)$$

In ΔABC,

$$\cot C = \frac{4}{3} = \frac{x}{k}$$

$$\Rightarrow \quad k = \frac{3x}{4} \qquad ...(ii)$$

On solving equation (i) and (ii), we get

k = 75 m

$\therefore$ The height of the tower is 75 m.

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