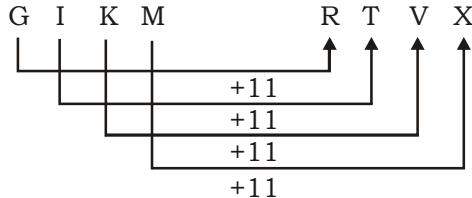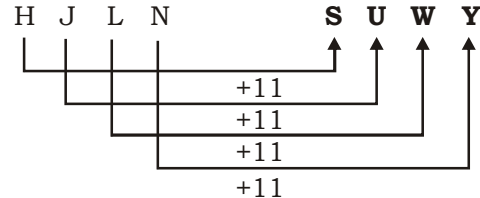## SSC MOCK TEST - 396 (SOLUTION)

1. (2) As,   Similarly,

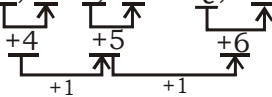2. (1) Japan is the land of rising Sun and Bhutan is the land of the Thunder Dragon.

3. (4) As, $135 \to 1^3 3^3 5^3 \to 127125$
    Similarly, $678 \to 6^3 7^3 8^3 \to 216343512$

4. (4) (1) $\sqrt{4489} = 67$ (2) $\sqrt{3025} = 55$ (3) $\sqrt{625} = 25$ (4) $\sqrt[3]{1331} = 11$

5. (4) Except Acoustics, others are related to each others.

6. (3) BC, GHI, NOPQ, **WXYZA**

7. (1) 2, 10, 30, 68, **130**

8. (4) 7 V 42 M 56 L 8 S 5
    After putting the value,
    $7 - 42 + 56 \div 8 \times 5$
    $= 7 - 42 + 7 \times 5$
    $= 7 - 42 + 35 = 0$

9. (1) As, $12 \times 2.5 = 30$
    $30 \times 2 + 1 = 61$
    Similarly, $18 \times 2.5 = 45$
    $45 \times 2 + 1 = 91$

10. (4)

11. (1) **From Column Iˢᵗ,**
    $17 \times (1 + 7 = 8) = 136$
    From Column IIⁿᵈ,
    $19 \times (1 + 9 = \textbf{10}) = 190$
    From Column IIIʳᵈ,
    $44 \times (4 + 4 = 8) = 352$

12. (1)

13. (3) l g cht lg c h̲ t lg c̲ht l̲ gc h̲ t lg ch t̲

14. (3)

15. (1)

    I. True   II. False

    Hence, only conclusion I is true.

16. (3)

17. (3) As, $25 \times 25 + \sqrt{25} = 630$

    And, $\mathbf{36} \times 36 + \sqrt{36} = 1302$

    Similarly, $64 \times 64 + \sqrt{64} = 4104$

18. (1)   19. (4)

20. (1) 5. Fraud → 2. Freedom → 1. Freeze → 6. Fringe → 4. Frozen → 3. Fryer

21. (4) As,   Similarly,

22. (1)

23. (3) Jatin > Amit > Madan > Uday   .....(i)

    Arpit > Madan   .....(ii)

  ∴ Madan got 4ᵗʰ rank out of five.

24. (3) The word 'Solve' cannot be formed using the letters of the given word because the word 'ABSOLUTE' does not have letter 'V'.

25. (1)

27. (2) Ornithology, a branch of zoology dealing with the study of birds.

28. (3) It marks the day on which Lord Buddha gave his first sermon on the Four Noble Truths to his first five disciples in the Deer Park at Sarnath, more than 2500 years ago, after attaining enlightenment.

29. (1) The Battles of Tarain, also known as the Battles of Taraori, were series of two battles fought in 1191 and 1192 A.D between Prithviraj Chauhan III of Ajmer and Ghurid ruler Mu'izz al-Din Muhammad or Mohd. Ghori. The battles were fought near the town of Tarain (Taraori), near Thanesar in present-day Haryana.

30. (4) Article 371H vests the governor of Arunachal Pradesh with special responsibility with respect to the law and order siatuation in the state and in the discharge of his functions in relation thereto. It also states that the Legislative Assembly shall consist of not less than thirty members.

32. (1) Minhaj Siraj al-Din Juzjani is probably best known as the author of the Tabaqat-i Nasiri, a universal Islamic history (tarikh) in Persian.

33. (1) The Tibetan Plateau, also known as the Qinghai-Tibetan Plateau or Himalayan Plateau is a vast, elevated plateau covering most of the Tibet Autonomous Region and Qinghai Province in Western China, as well as part of Ladakh in Jammu and Kashmir.

34. (1) The time along the Standard Meridian of India (82°30'E) passing through Mirzapur (in Uttar Pradesh) is taken as the standard time for the whole country. The latitudinal extent influences the duration of day and night, as one moves from south to north.

35. (3) All of the energy from the Sun that reaches the Earth arrives as solar radiation, part of a large collection of energy called the electromagnetic radiation spectrum.

36. (4) The atomic number is the number of protons in the nucleus of an atom.

39. (4) The increasing order of u is water 1.33; crown glass 1.51; flint glass 1.56 and diamond 2.4.

40. (3) The aqueous solution of vinegar is called acetic acid which is represented by formula CH_3COOH.

42. (3) The European Union (EU) is an economic and political union of 27 member-countries (Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden and the United Kingdom) located in Europe.

43. (4) Infectious plant diseases are caused by living (biotic) agents, or pathogens. These pathogens can be spread from an infected plant or plant debris to a healthy plant. Microorganisms that cause plant diseases include nematodes, fungi, bacteria, and mycoplasmas.

44. (3) Indian National Army: The Japanese after defeating the British in South East Asia, took a number of Indian soldiers as prisoners of war eg Captain Mohan Singh. In March 1942, a conference of Indian was held in Tokyo, and they formed the Indian Independence League. At the Bangkok conference (June, 1942), Rash Behari Bose was elected President of the League. INA was formed by Mohan Singh. Subhas Chandra Bose had escaped to Berlin in 1941 and set up Indian Legion there. In July 1943, he joined the INA at Singapore. There Rash Behari Bose handed over the leadership to him.

45. (3) Sun is the nearest star and the Alpha Centauri is the second near-est. Alpha Centauri is also called Proximo Centauri.

48. (2) Tata Institute of Fundamental Research (TIFR), through its Homi Bhabha Centre for Science Education (HBCSE), Mumbai has started the summer programme "Vigyan Vidushi" for girl students pursuing Physics at M.Sc. level.

50. (3) A USD 130 million loan agreement was signed recently between the Asian Development Bank (ADB) and the Indian Government.

51. (2) Total investment by A = 40000 + 18000 + 27000 = ₹ 85000

    Total investment by B = 50000 × 2 = ₹ 100000

    Total investment by C = ₹ 60000

    Ratio of profit of A, B and C = 85000 : 100000 : 60000 = 17 : 20 : 12

    $\therefore$ Profit of B = $\dfrac{36750}{17+20+12} \times 20 = \dfrac{36750}{49} \times 20$ = ₹ 15000

52. (3) $\left(2a + \dfrac{3}{a} - 1\right) = 1$
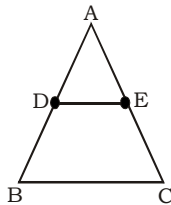
$\left(2a + \dfrac{3}{a}\right) = 12$

Squaring both sides

$\left(2a + \dfrac{3}{a}\right)^2 = (12)^2$

$4a^2 + \dfrac{9}{a^2} + 2 \times 2a \times \dfrac{3}{a} = 144$

$4a^2 + \dfrac{9}{a^2} = 144 - 12 = 132$

53. (1)

Area of ADE = Area of BCDE

So, $\dfrac{AD}{AB} = \sqrt{\dfrac{\text{Area of } \Delta ADE}{\text{Area of } \Delta ABC}} = \dfrac{1}{\sqrt{2}}$

$AD = \dfrac{AB}{\sqrt{2}}$

$\sqrt{2} \, AD = AD + DB$

$DB = AD(\sqrt{2} - 1)$

$\dfrac{DB}{AB} = \dfrac{AB}{\sqrt{2}} \times \dfrac{1}{AB} (\sqrt{2} - 1)$

$DB : AB = (\sqrt{2} - 1) : \sqrt{2}$

54. (1) Sister's age = 18 years

My age = 18 + 4 = 22 years

My younger brother's age = 22 – 7 = 15 years

My father's age = 3 × 15 = 45 year

My mother's age = 45 – 3 = 42 years

55. (2) $\dfrac{9}{20} - \left[\dfrac{1}{5} + \left\{ \dfrac{1}{4} + \left(\dfrac{5}{6} - \dfrac{1}{3} + \dfrac{1}{2} \right) \right\} \right]$

$= \dfrac{9}{20} - \left[\dfrac{1}{5} + \left\{ \dfrac{1}{4} + \left(\dfrac{5 - 2 + 3}{6} \right) \right\} \right]$

$= \dfrac{9}{20} - \left[\dfrac{1}{5} + \left\{ \dfrac{1}{4} + 1 \right\} \right] = \dfrac{9}{20} - \left[\dfrac{1}{5} + \dfrac{5}{4} \right]$

$= \dfrac{9}{20} - \left[\dfrac{4 + 25}{20} \right] = \dfrac{9}{20} - \dfrac{29}{20} = \dfrac{-20}{20} = -1$

56. (4) Only the option (4) gives the difference of votes between two candidates as 308.

57. (3) Let the length of each train be x m.

Speed of first train = $\dfrac{x}{6}$ m/s

Speed of second train = $\dfrac{x}{8}$ m/s

Now, Relative speed = $\dfrac{x}{6} + \dfrac{x}{8} = \dfrac{4x + 3x}{24} = \dfrac{7x}{24}$ m/s

∴ Required time to pass each other = $\dfrac{x + x}{\dfrac{7x}{24}} = \dfrac{2x \times 24}{7x} = \dfrac{48}{7}$ seconds

58. (4) $\dfrac{\left[2\cot \left(\dfrac{\pi - \theta}{2} \right) \right]}{\left[1 + \tan^2 \left(\dfrac{2\pi - \theta}{2} \right) \right]} = \dfrac{2\cot \left(90° - \dfrac{\theta}{2} \right)}{\left[1 + \tan^2 \left(180° - \dfrac{\theta}{2} \right) \right]}$

$= \dfrac{2\tan \dfrac{\theta}{2}}{1 - \tan^2 \dfrac{\theta}{2}}$ [∵ cot(90° – θ) = tanθ and tan (180° – θ) = –tanθ]

$= \sin \dfrac{2\theta}{2} = \sin\theta$

59. (3) Monthly income of Sapna = ₹ 25000
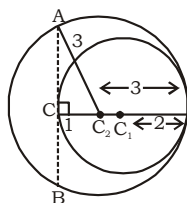
Savings = $25000 \times \dfrac{45}{100}$ = ₹ 11250

Expenditure = 25000 – 11250 = ₹ 13750

Monthly income after 16% increament = $25000 \times \dfrac{116}{100}$ = ₹ 29000

Expenditure after 25% increament = $13750 \times \dfrac{125}{100}$ = ₹ 17187.50

Now, savings = 29000 – 17187.50 = ₹ 11812.50

∴ Increase% = $\left(\dfrac{11812.50 - 11250}{11250} \times 100 \right)$% = 5%

60. (4)

Draw a line SU parallel to PQ.

$\angle PQR = \angle SUT$

$\tan \angle PQR = \tan \angle SUT$

$\tan \angle SUT = \dfrac{ST}{TU} = 4.4$

$\dfrac{22}{TU} = 4.4$

$TU = \dfrac{22}{4.4} = 5\,cm$

$RU = RT + TU = RT + RT = 2RT$ $\qquad \left(\tan \angle SRT = \dfrac{22}{5} = 4.4 \right)$

In ΔSUR and ΔPQR,

$\angle R = \angle R\,(common)$

$\angle RSU = \angle RPQ\,(SU \parallel PQ)$

Hence, $\Delta SUR \sim \angle PQR$
(By AA property)

$\therefore$ $PR : RS = \dfrac{QR}{UR} = \dfrac{QR}{2RT} = QR : 2RT$

61. (2)

A	B	C	D
15 × 4	12 × 2	18 × 6	16 × 5
60	24	108	80

A's share of rent = ₹ 1020 = 60 unit

108 units = $\dfrac{1020}{60} \times 108$

Now, C's rent = ₹ 1836

62. (2)

C_1 = Centre of small circle

C_2 = Centre of bigger circle

$AB = 2AC = 2 \times 2\sqrt{2} = 4\sqrt{2}\,cm$

63. (4) 14 person work for (5 + 1) days = 6 days

$M_1D_1 = M_2D_2$

Let 8 person work for x days

14 × 18 = 14 × 6 + 8 × x

252 – 84 = 8x

8x = 168

∴ x = 21 days

64. (4) Let the numbers be 5x and 8x

ATQ,

$\dfrac{5x + 5}{8x + 5} = \dfrac{2}{3}$

15x + 15 = 16x + 10 x = 5

Difference between A and B = 8x – 5x = 3x = 3 × 5 = 15

65. (4) $\dfrac{\cos^4 \alpha}{\cos^2 \beta} + \dfrac{\sin^4 \alpha}{\sin^2 \beta} = 1$

By taking $\alpha = \beta$, it satisfies the above equation

∴ $\dfrac{\cos^4 \beta}{\cos^2 \alpha} + \dfrac{\sin^4 \beta}{\sin^2 \alpha} = 1$

66. (3) $N = a^p \times b^q \times c^r$

The total number of factors = (p + 1) × (q + 1) × (r + 1)

When 732 is divided by a positive integer x, the remainder is 12.

So, 732 – 12 = 720

So 720 will be completely divisible by x

720 = 24 × 32 × 51

Total number of factors of 720 = (4 + 1) × (2 + 1) × (1 + 1) = 5 × 3 × 2 = 30

Number of factors 12 or less than 12 are (10) = 1, 2, 3, 4, 5, 6, 8, 9, 10, 12

So, x cannot have these values because x is greater than 12

Possible values of x = 30 – 10 = 20

67. (3) A's profit as remuneration in a year = 120 × 12 = ₹ 1440

Let the annual profit be ₹ x.

Then, ₹(x – 1440) will be distributed between A and B as their share of profit.

Ratio of their profit = 40000 : 50000 = 4 : 5

A's share in the profit $= 1440 + \left(x - 1440\right) \times \dfrac{4}{9}$

$3600 = 1440 + \left(x - 1440\right) \times \dfrac{4}{9}$

$3600 - 1440 = \dfrac{4x}{9} - 640$

$\dfrac{4x}{9} = 2160 + 640$

$\dfrac{4x}{9} = 2800$

$x = \dfrac{2800 \times 9}{4}$ = ₹ 6300

∴ B's share in the profit = $\dfrac{5}{9} \times (6300 - 1440)$ = $\dfrac{5}{9} \times 4860$ = ₹ 2700

68. (4) P = ₹ 15000
     R = 12%
     T = 5 years

     SI = $\dfrac{15000 \times 12 \times 5}{100}$ = ₹ 9000

     Amount for both A and B = 15000 + 9000 = ₹ 24000
     For A,
     P = ₹ 24000
     R = 15%
     T = 2 years

     A = 24000 $\times \left(1 + \dfrac{15}{100}\right)^2$ = 24000 $\times \dfrac{115}{100} \times \dfrac{115}{100}$ = ₹ 31740

     CI = 31740 – 24000 = ₹ 7740
     For B,
     P = ₹ 24000
     R = 20%
     T = 2 years

     A = 24000 $\times \left(1 + \dfrac{20}{100}\right)^2$

     A = 24000 $\times \dfrac{120}{100} \times \dfrac{120}{100}$ = ₹ 34560

     CI = 34560 – 24000 = ₹ 10560

     ∴ Required difference = 10560 – 7740 = ₹ 2820

69. (2) Let the breadth be x cm.
     Length of rectangle = 2x cm
     Now, Area = L × B
     228 = 2x × x

     $x^2 = \dfrac{288}{2}$

     $x = \sqrt{144}$
     x = 12 cm
     Diameter of circle = 7 × 12 = 54 cm

     Radius = $\dfrac{84}{2}$ = 42 cm

     ∴ Area of circle = πr² $= \dfrac{22}{7} \times 42 \times 42 = 5544\,\text{cm}^2$

70. (3) Amount of water in first liquid = $8 \times \dfrac{30}{100} = \dfrac{12}{5}$ litres

Amount of water in second liquid = $6 \times \dfrac{40}{100} = \dfrac{12}{5}$ litres

Total amount of water = $\dfrac{12}{5} + \dfrac{12}{5} = \dfrac{24}{5}$ litres

Required % = $\left(\dfrac{\dfrac{24}{5}}{8+6} \times 100 \right)\%$ = $\left(\dfrac{24}{5 \times 14} \times 100 \right)\% = 34\dfrac{2}{7}\%$

71. (2) Required% = $\dfrac{\dfrac{18560}{800}}{\dfrac{4500}{300}} \times 100 = \left(\dfrac{23.2}{15} \times 100 \right)\% \approx 155\%$

72. (3) Production of vegetables per hectare in tones

Pea : = $\dfrac{72792}{7200} = 30.42$

Tomato : = $\dfrac{20895}{2100} = 9.95$

Onion & Garlic : $\dfrac{29490}{1500} = 19.66$

Cabbage : $\dfrac{42670}{1700} = 25.1$

Cauliflower : = $\dfrac{13790}{700} = 19.7$

Root vegetables : = $\dfrac{18560}{800} = 23.20$

Brinjal : = $\dfrac{4500}{300} = 15$

Leafy vegetables = $\dfrac{28600}{2900} = 9.86$

Tomato, Cabbage and root vegetables are more than 20 tonnes.

73. (3) Required Area = $\dfrac{7200 + 800}{1500 + 300} = \dfrac{80}{18} = 40 : 9$

74. (3) Required average production = $\dfrac{310389}{9} = 34487.67$

75. (1) Required tonnes per hectare = $\dfrac{42670}{1700} - \dfrac{13790}{700} = 25.1 - 19.7 = 5.4$

MEANINGS IN ALPHABETICAL ORDER

Agriculturist	Cultivator, Farmer	किसान
Ambiguous	(of language) open to more than one interpretation; having a double meaning	अस्पष्ट
Botanist	an expert in or student of the scientific study of plants	वनस्पति-विज्ञानिक
Cartographer	a person who draws or produces maps	मानचित्रकार
Climax	the most intense, exciting, or important point of something; a culmination or apex	उत्कर्ष
Commemorate	recall and show respect for (someone or something)	मनाना
Culmination	the highest or climactic point of something, especially as attained after a long time	परिणति
Decisive	settling an issue; producing a definite result	निर्णयात्मक
Directory	a book listing individuals or organizations alphabetically or thematically with details such as names, addresses, and phone numbers	निर्देशिका
Draftsman	a person who makes detailed technical plans or drawings	नक्शानवीस
Epilogue	a section or speech at the end of a book or play that serves as a comment on or a conclusion to what has happened	उपसंहार
Florist	a person who sells and arranges plants and cut flowers	फूलवाला
Handbook	a book giving information such as facts on a particular subject or instructions for operating a machine	पुस्तिका
Manual	relating to or done with the hands	नियमावली
Nutritionist	a person who studies or is an expert in nutrition	पोषण
Preface	an introduction to a book, typically stating its subject, scope, or aims	प्रस्तावना
Prologue	a separate introductory section of a literary or musical work	प्रस्ताव
Reeked	smell strongly and unpleasantly; stink	धूंआ देना
Thesaurus	a book that lists words in groups of synonyms and related concepts	शब्दकोश
Trace	find or discover by investigation	निशान
Undeniable	unable to be denied or disputed	निर्विवाद

SSC MOCK TEST - 396 (ANSWER KEY)

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

76. (B) Replace 'amusing' with 'amused'. Amused at/by something- thinking that someone or something is interesting, so that you smile or laugh.

77. (B) Replace 'on' with 'up'.

Pick on- to harass or bother.

Pick up- to grasp something (as with one's hands).

90. (D) The correct spelling is 'Manageable'.

91. (B) The correct spelling is 'Commemorate'.