SSC MOCK TEST - 415 (SOLUTION)

1. (1) As, $7^3 + 7^2 + 7 = 343 + 49 + 7 = 399$

   Similarly, $11^3 + 11^2 + 11 = 1331 + 121 + 11 = 1463$

2. (2) Second is the process of gradual disappearances of the first.

3. (2) All other three gives a sense of words (SAD, BACK and TRUE) by arranging the letters, but the word **'CFG'** does not have such meaning after arranging the letters.

4. (2) All except **'Rice'** are Kharif crops.

5. (4) (1) $12306 \Rightarrow 1 \times 2 \times 3 = 06$ (2) $24216 \Rightarrow 2 \times 4 \times 2 = 16$

   (3) $32424 \Rightarrow 3 \times 2 \times 4 = 24$ (4) $41206 \Rightarrow 4 \times 1 \times 2 = 08 \neq 06$

6. (4) S Q, R, X V, W, I K, **J**
   19 17, 18, 24 22, 23, 9 11, 10

   $\dfrac{19+17}{2}$ $\dfrac{24+22}{2}$ $\dfrac{9+11}{2}$

7. (1) 22   31   42   **55**   70   87

   $+9$ $+11$ $+13$ $+15$ $+17$

   $+2$ $+2$ $+2$ $+2$

8. (2) As,

M	A	D	N	E	S	S
@	!	^	%	*	?	?

   and,

L	O	V	E
>	&	$	*

   Similarly,

S	**E**	**L**	**D**	**O**	**M**
?	*****	**>**	**^**	**&**	**@**

9. (3) As, $32 + 23 \Rightarrow 55 - (5 + 5) = 45$

   Similarly, $39 + 19 \Rightarrow 58 - (5 + 8) = 45$

10. (3)

11. (2) **p**svy/b**e**hk/**n**qt**w**

12. (4) As, $36^2 = 1296$

   And, $64^2 = 4096$

   Similarly, $16^2 = 256$

13. (1) $(4 \times 6) + (7 \times 6) = 66$

   And, $(8 \times 9) + (14 \times 5) = 142$

   Similarly, $(11 \times 7) + (6 \times 9) = $ **131**

14. (4) 4. Admission $\rightarrow$ 2. College $\rightarrow$ 6. Class $\rightarrow$ 3. Learn $\rightarrow$ 5. Assessment $\rightarrow$ 1. Degree

15. (3)   Rohan = 10 years

Surbhi = 10 × 3 = 30 years

Lucky = 30 + 5 = 35 years

Father's age at time of his son's Rohan birth = 35 – 10 = 25 years

16. (4)   17 + 12 × 9 ÷ 3 – 8

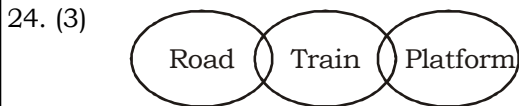After Changing the signs as per the given details,

$17 \div 12 - 9 \times 4 + 8 = \dfrac{17}{12} - 36 + 8$

$= \dfrac{17}{12} - 28 = \dfrac{17 - 336}{12} = -\dfrac{319}{12}$

17. (3)   Number of days from 27 February 2011 to 1 March 2012 = 368

∴   Required day = Sunday + 368 = Sunday + 52 + 4 = Thursday

18. (3)   19. (2)   20. (2)   21. (1)   22. (2)   23. (3)

24. (3)

Road ◯ Train ◯ Platform

I. Doubt   II. False   III. Doubt

Hence, either conclusion I or III follows.

25. (4)   As, $(7)^3 + (4)^3 = 343 + 64 \Rightarrow 407 - 11 = 396$

And, $(8)^3 + (6)^3 = 512 + 216 \Rightarrow 728 - 19 = 709$

Similarly, $(5)^3 + (3)^3 = 125 + 27 \Rightarrow 152 - 15 = $ **137**

26. (1)   Olfactory receptors are located in nose. In terrestrial vertebrates, including humans, the receptors are located on olfactory receptor cells, which are present in very large numbers (millions) and are clustered within a small area in the back of the nasal cavity, forming an olfactory epithelium.

28. (3)   The sky is blue due to a phenomenon called Raleigh scattering. This scattering refers to the scattering of electromagnetic radiation (of which light is a form) by particles of a much smaller wavelength.

30. (3)   The Chief Justice and Judges of the High Courts are to be appointed by the President under clause (1) of Article 217 of the Constitution.

31. (2)   Manipur Indian states does not have a common international border with Bangladesh. India enjoys close relations with Bangladesh and shares a 4,096-km-long border which touches Assam, Tripura, Mizoram, Meghalaya and West Bengal.

32. (2)   The Battle of Chausa was a notable military engagement between the Mughal emperor, Humayun, and the Afghan, Sher Shah Suri. It was fought on 26 June 1539 at Chausa, 10 miles southwest of Buxar in modern-day Bihar, India.

33. (2)   The study of viruses is known as virology, and those who study viruses are known as virologists. It has been argued extensively whether viruses are living organisms.

34. (3)   Humans can detect sounds in a frequency range from about 20 Hz to 20 kHz. (Human infants can actually hear frequencies slightly higher than 20 kHz, but lose some high-frequency sensitivity as they mature; the upper limit in average adults is often closer to 15-17 kHz.)

36. (3)   Megasthenes visited India sometime during the reign of Chandragupta Maurya.

37. (1)   The 14th Emissions Gap Report 2023 was released by the United Nations Environment Programme (UNEP).

38. (1)   Indian economy is a mixed economy because it consists of both private and public sectors go side by side. Mixed economy implies demarcation and harmonization of the public and private sectors.

41. (4) The opinion of the Chief Justice of India for appointment of a Judge of the Supreme Court should be formed in consultation with a collegium of the four seniormost puisne Judges of the Supreme Court.

42. (3) Fertilization usually takes place in a fallopian tube that links an ovary to the uterus. If the fertilized egg successfully travels down the fallopian tube and implants in the uterus, an embryo starts growing.

45. (3) The monuments of Khajuraho are denotions of the Chandela dysnasty. The monuments were built by the Chandela dynasty between 950 and 1050 AD.

46. (2) Pakyong is the first greenfield airport to be constructed in the northeastern region of India. It is located about 31 kilometres south of Gangtok, capital of Sikkim.

50. (2) Vajra Prahar 2023 is a joint exercise of the special forces of India and the United States. It is being organized in Meghalaya's Umroi Cantonment.

51. (2) Let the speed of train and speed of man be 9x m/s and 2x m/s respectively.

Length of train = 720 m

Time taken to cross a pole = 1 minute 30 seconds = 90 seconds

Speed of train = $\dfrac{720}{90}$ = 8 m/s

Now, speed of man = $\dfrac{8}{9} \times 2 = \dfrac{16}{9}$ m/s

Time taken by train to cross the platform = $\dfrac{720 + 480}{8} = \dfrac{1200}{8}$ = 150 seconds

Time taken by man to cross the platform = $\dfrac{480}{16} \times 9$ = 270 seconds

∴ Required difference = 270 – 150 = 120 seconds = 2 minutes

52. (1) Quantity of sugar = $\dfrac{40}{8} \times 5$ = 25 litres

Quantity of water = $\dfrac{40}{8} \times 3$ = 15 litres

Let x litres of water should be added in the mixture.
ATQ,

$\dfrac{25}{15 + x} = \dfrac{3}{5}$

125 = 45 + 3x

3x = 80

∴ $x = \dfrac{80}{3}$ litres $= 26\dfrac{2}{3}$ litres

53. (4) 6 women can complete the work in 3 days.

Therefore 4 women can complete the work in $\dfrac{3 \times 6}{4} = \dfrac{9}{2}$ days

Work done by 4 women in 3 days = $\dfrac{3}{9} \times 2 = \dfrac{2}{3}$

Remaining work = $1 - \dfrac{2}{3} = \dfrac{1}{3}$

16 children do $\dfrac{1}{3}$ work in 3 days.

Now, $\dfrac{M_1 D_1}{W_1} = \dfrac{M_2 D_2}{W_2}$

$\dfrac{16 \times 3}{\dfrac{1}{3}} = 9 \times D_2$

$\therefore$ $D_2 = \dfrac{16 \times 3 \times 3}{9} = 16 \, \text{days}$

54. (4) Let the speed of man in still water be x km/hr.

Speed of stream = 3 km/hr

Speed of man in upstream = (x – 3) km/hr

Speed of man in downstream = (x + 3) km/hr

ATQ,

$\dfrac{D}{x-3} = 9$ ......(i)

$\dfrac{D}{x+3} = 6$ .....(ii)

Dividing equation (i) by (ii), we get

$\dfrac{x+3}{x-3} = \dfrac{9}{6}$

6x + 18 = 9x – 27

3x = 45

$\therefore$ $x = \dfrac{45}{3}$ = 15 km/hr

55. (3) sinθ + cosecθ = 4

$\sin\theta + \dfrac{1}{\sin\theta} = 4$

Squaring both sides,

$\sin^2\theta + \dfrac{1}{\sin^2\theta} + 2\sin\theta . \dfrac{1}{\sin\theta} = 16$

$\sin^2\theta + \dfrac{1}{\sin^2\theta} = 16 - 2$

$\therefore$ $\dfrac{\sin^4\theta + 1}{\sin^2\theta} = 14$

56. (2) $\dfrac{2}{3} \div \dfrac{3}{10}$ of $\dfrac{4}{9} - \dfrac{4}{5} \times 1\dfrac{1}{9} \div \dfrac{8}{15} - \dfrac{3}{4} + \dfrac{3}{4} \div \dfrac{1}{2}$

$= \dfrac{2}{3} \div \dfrac{12}{90} - \dfrac{4}{5} \times \dfrac{10}{9} \div \dfrac{8}{15} - \dfrac{3}{4} + \dfrac{3}{4} \div \dfrac{1}{2}$

$= \dfrac{2}{3} \times \dfrac{90}{12} - \dfrac{4}{5} \times \dfrac{10}{9} \times \dfrac{15}{8} - \dfrac{3}{4} + \dfrac{3}{4} \times \dfrac{2}{1}$

$= 5 - \dfrac{5}{3} - \dfrac{3}{4} + \dfrac{3}{2}$

$= \dfrac{60 - 20 - 9 + 18}{12} = \dfrac{49}{12} = 4\dfrac{1}{12}$

57. (1) Let the Amount A be ₹x.
Amount B = ₹(36000 – x)
ATQ,

$\dfrac{x \times 15 \times 4}{100} = \dfrac{(36000 - x) \times 15 \times 6}{100}$

2x = 108000 – 3x
5x = 108000

$x = \dfrac{108000}{5}$ = ₹21600

Amount B = 36000 – 21600 = ₹14400

∴ Total interest received $= \dfrac{21600 \times 15 \times 4}{100} + \dfrac{14400 \times 15 \times 6}{100}$

= 12960 + 12960 = ₹25920

58. (2) $\dfrac{\sin(A+B) - 2\sin A + \sin(A-B)}{\cos(A+B) - 2\cos A + \cos(A-B)}$

$= \dfrac{\sin A.\cos B + \cos A.\sin B + \sin A.\cos B - \cos A.\sin B - 2\sin A}{\cos A.\cos B - \sin A.\sin B + \cos A.\cos B + \sin A.\sin B - 2\cos A}$

$= \dfrac{2\sin A\cos B - 2\sin A}{2\cos A\cos B - 2\cos A} = \dfrac{2\sin A(\cos B - 1)}{2\cos A(\cos B - 1)} = \dfrac{\sin A}{\cos A} = \tan A$

59. (4) Let the present age of Raghav and Ravi be 3x and 4x respectively.
ATQ,

$\dfrac{3x - 12}{4x - 12} = \dfrac{2}{3}$

9x – 36 = 8x – 24
x = 12 years

∴ Required difference = (4x – 3x) = x = 12 years

60. (2) (a + b)³ = a³ + b³ + 3ab(a + b)
7^3 = 217 + 3ab(7)
343 – 217 = 21ab
21ab = 126

∴ $ab = \dfrac{126}{21} = 6$

61. (2)   Let the first number be x.

Second number = $(25 – x)$

ATQ,

LCM × HCF = First number × Second number

$30 × 5 = x × (25 – x)$

$x^2 – 25 + 150 = 0$

$x^2 – 15x – 10x + 150 = 0$

$x(x – 15) – 10(x – 15) = 0$

$(x – 10) (x – 15) = 0$

$x = 10$ and 15

∴   Required difference = $15 – 10 = 5$

62. (3) $(2a – 5)^2 + (2b + 3)^2 + (c + 1)^2 = 0$

$(2a – 5)^2 = 0$

$a = \dfrac{5}{2}$

$(2b + 3)^2 = 0$

$b = \dfrac{-3}{2}$

$(c + 1)^2 = 0$

$c = –1$

Now, $a + b + c = \dfrac{5}{2} - \dfrac{3}{2} - 1 = \dfrac{5 - 3 - 2}{2} = 0$

∴ $a^3 + b^3 + c^3 – 3abc = 0$

Now, $\dfrac{a^3 + b^3 + c^3 - 3abc}{a^3 + b^3 + c^3} + 4 = \dfrac{0}{a^3 + b^3 + c^3} + 4 = 4$

63. (2)   When A gets 100 paise, B gets 90 paise

When B gets 100 paise, C gets 110 paise

When B gets 90 paise, C gets $\dfrac{110}{100} \times 90 = 99$ paise

Now, A : B : C = 100 : 90 : 99

∴   Required difference = $\dfrac{115600}{289} \times 1 = ₹400$

64. (2)   QR is direct common tangent of circle O and O'.

$QR = PR = PQ = 2\sqrt{r_1 r_2} = 2\sqrt{9 \times 4} = 12$ cm

In radius of $\Delta PQR = \dfrac{12}{2\sqrt{3}} = 2\sqrt{3}$ cm

Area of $\Delta PQR = \dfrac{\sqrt{3}}{4} \times 12 \times 12 = 36\sqrt{3}$ cm^2

Required area of shaded portion = Area of ΔPQR – Area of circle

$= 36\sqrt{3} - \pi \times \left(2\sqrt{3}\right)^2 = 36\sqrt{3} - \dfrac{22}{7} \times 12$

$= 12\left(3\sqrt{3} - \dfrac{22}{7}\right) = 12\left(\dfrac{21\sqrt{3} - 22}{7}\right)$ cm^2

65. (2) The smallest 3 digit number divisible by 6 is 102 and the largest one is 996.

Let there be n such numbers.

The set of numbers forms an arithmetic sequence:

$t_n = a + (n - 1)d$

Here, d = 6, a = 102

$996 = 102 + (n - 1) 6$

$(n - 1)6 = 996 - 102 = 894$

$n - 1 = \dfrac{894}{6} = 149$

∴ n = 149 + 1 = 150

66. (3) Let the speed of the current be a km/hr and speed of boat in still water be 5a km/hr.

ATQ,

$$\dfrac{x}{\dfrac{5a + a}{5}} = \dfrac{x - 75}{\dfrac{5a - a}{4}}$$

$$\dfrac{5x}{6a} = \dfrac{4x - 300}{4a}$$

$20x = 24x - 1800$

$4x = 1800$

∴ $x = \dfrac{1800}{4} = 450$

67. (1) Let the breadth be x cm

Length = (4 + x)cm

ATQ,

$x(4 + x) = (4 + x - 2) (x + 1)$

$4x + x^2 = (2 + x) (x + 1)$

$4x + x^2 = 2x + 2 + x^2 + x$

$4x = 3x + 2$

$x = 2$

Breadth = 2 cm

Length = (2 + 4) = 6 cm

∴ Perimeter of rectangle = 2(2 + 6) = 2 × 8 = 16 cm

68. (4) Let the total marks be x.

ATQ,

$$x \times \dfrac{45}{100} + 45 = x \times \dfrac{50}{100} + 25$$

$$\dfrac{50x}{100} - \dfrac{45x}{100} = 45 - 25$$

$$\dfrac{5x}{100} = 20$$

$$x = \dfrac{20 \times 100}{5} = 400$$

Now, passing marks = $400 \times \dfrac{45}{100} + 45 = 225$

Marks scored by Shashi, when he scored 58% = $400 \times \dfrac{58}{100} = 232$

∴ Shashi passed the exam by 7 marks.

69. (2) Required amount a customer has to paid = $25000 \times \dfrac{80}{100} \times \dfrac{95}{100} = ₹19000$

70. (1) Let the first term be a and common difference be d.

ATQ,

a + (3 −1)× d = 15

a + 2d = 15   ......(i)

and a + (5 − 1)× d = 23

a + 4d = 23   ......(ii)

By subtracting equation (i) from (ii), we get

a + 2d – a – 4d = 15 – 23

2d = 8

d = 4

Put the value of d in equation (i),

a + 2 × 4 = 15

a = 15 – 8 = 7

∴ a_{15} = a + (15 – 1) × d

= 7 + 14 × 4 = 7 + 56 = 63

71. (3) Total number of items sold by shop A in May and June together = 36 + 54 = 90

Total number of items sold by shop A in February and March together = $90 \times \dfrac{80}{100}$ = 72

Number of items sold by shop A in February = 72 – 48 = 24

∴ Number of items sold by shop A in January = 150 – 24 = 126

72. (1) Total number of items sold by shop C in April and May together = 48 + 64 = 112

Total number of items sold by shop B in February and March together = $\dfrac{112}{2} \times 1$ = 56

∴ The total number of items sold by shop B in March = 56 – 42 = 14

73. (2) Total number of items sold in April by all the shop = 32 + 28 + 48 + 56 = 164

Total number of items sold in March by all the shop = 32 + 28 + 48 + 56 = 164

Number of item sold by shop B in March = 164 – (48 + 24 + 74) = 18

∴ Required percentage = $\left(\dfrac{18}{36} \times 100 \right)$% = 50%

74. (4) Number of items sold by shop D in June = $64 \times \dfrac{150}{100} = 96$

Total number of items sold by shop D in May and June together = 32 + 96 = 128

Total number of items sold by shop A in March and April together = 48 + 32 = 80

∴ Required difference = 128 – 80 = 48

75. (4)   Number of items sold by shop C in May = $81 \times \dfrac{1}{3} = 27$

Total number of items sold by shop B in February and June together = 42 + 81 = 123

Total number of items sold by shop C in May and June together = 27 + 36 = 63

∴   Required ratio = 123 : 63 = 41 : 21

MEANINGS IN ALPHABETICAL ORDER

Abstain from	to shy away from something acceptable reason	परहेज करना
Admonish	to scold or criticize	डाँटना, सावधान करना
Affluent	having an abundance of goods or riches	धनी
Allowance	the fact of allowing something	आज्ञा
Confront	to face especially in challenge	सामना करना
Destitute	a poor	निर्धन
Ethnomania	a passion for ethnic or racial autonomy	जातीय या नस्लीय स्वायत्ता का जुनून
Exonerate	to relieve	मुक्त करना
Fallacy	a false belief	भ्रांति
Grievance	a complaint	शिकायत
Idolomania	an excessive adoration of idols	मूर्ति की प्रति अत्यधिक धुन
Inception	a beginning of something	आरंभ
Islomania	a fascination with islands	द्वीपों के प्रति अत्यधिक आकर्षण
Laud	to praise	प्रशंसा
Legitimacy	the quality of being based on a fair or	वैधता
Nuisance	anything that annoys or is unpleasant	विघ्न, खलल
Plump	a sudden plunge or fall	पतन
Profane	showing a lack of respect for god or religion	अपवित्र, नापाक
Puppet	a person or thing controlled by something else	कठपुतली
Quagmire	a difficult, complicated or unpleasant situation	एक कठिन, जटिल या अप्रिय स्थिति
Reproach	to blame or criticize	दोष लगाना, निंदा करना
Resemblance	the fact/state of being or looking similar	समानता
Splendour	grand and impressive beauty	शान, वैभव
Supremacy	the state or condition of being superior to all others in authority, power, or status to something	सर्वोच्चता
Virtue	behaviour or attitudes showing high moral standards	गुण

SSC MOCK TEST - 415 (ANSWER KEY)

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

76. (3) Change 'were' into 'was'. When 'amount of' is used with uncountable nouns, it is followed by a singular verb.

77. (2) Change 'their' into 'his'. 'Each' takes singular pronoun.

89. (4) The correct spelling of 'Legitemacy' is 'Legitimacy', 'Suprimacy' is 'Supremacy' and 'Idiosy' is 'Idiocy'.

90. (1) The correct spelling of 'Grivence' is 'Grievance', 'Resemblence' is 'Resemblance' and 'Allowence' is 'Allowance'.