SSC MOCK TEST - 422 (SOLUTION)

1. (1) 'Tripoli' is the capital of 'Libya', where as 'Dublin' is the capital of 'Ireland'.

2. (2) As, $21 \rightarrow (2 + 1)^{2+1} = 27$

Similarly, $24 \rightarrow (2 + 4)^{2+4} = 46656$

3. (2) (1) C F U X (+3, Reverse, +3)

(2) L O N Q (+3, Not Reverse, +3)

(3) A D W Z (+3, Reverse, +3)

(4) M P K N (+3, Reverse, +3)

4. (2) (1) $26 \rightarrow (2^2 \times 6^2) = 144$

(2) $43 \rightarrow (4^2 \times 3^2) = 144 \neq 154$

(3) $54 \rightarrow (5^2 \times 4^2) = 400$

(4) $36 \rightarrow (3^2 \times 6^2) = 324$

5. (2) U P R T Q S

Hence, S is at the right end.

6. (1) 95 + 16 = 111

111 + 32 = 143

143 + 64 = 207

207 + 128 = 335

335 + 256 = 591

7. (2) A L C N E P G (+2, +2, +2, +2, +2)

8. (2) As,

M E N T O R 13 25 14 20 75 18

13, 5×5, 14, 20, 15×5, 18

And,

C O W 3 75 23

3, 15×5, 23

Similarly,

S T Y L E 19 20 25 12 25

19, 20, 25, 12, 5×5

9. (4) As, (6 + 9) × (9 – 6) = 45

Similarly, (8 + 10) × (10 – 8) = 36

10. (4) ld**jk<u>m</u>**/l**<u>d</u>**jkm/l**<u>d</u>**jk**<u>m</u>**

11. (4)

12. (3) **In the first column,**

(36 – 16) × 4 = 80

In the second column,

(48 – 23) × 6 = 150

In the third column,

(54 – 36) × 7 = 126

13. (1) 52 ÷ 27 × 10 + 13 – 22 of 3 = 1

After changing 27 and 13,

52 ÷ 13 × 10 + 27 – 22 of 3 = 1

40 + 27 – 66 = 1

67 – 66 = 1

1 = 1

14. (1) 1. Trajectory → 4. Translate → 5. Translation → 3. Transverse → 2. Traveller

15. (3) Let the father's present age be x years.

Sumit's present are $= \frac{20}{100} \times (x - 15)$

Amit's present are $= \frac{60}{100} \times (x - 10)$

ATQ,

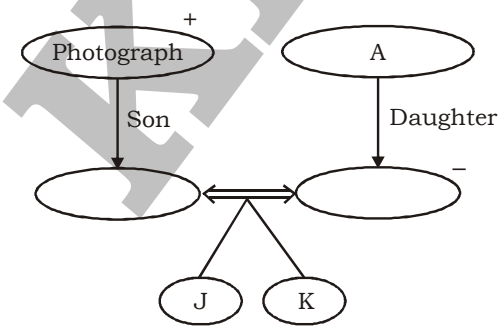
$$\frac{x-15}{5} + \frac{3x-30}{5} = 31$$

$$4x - 45 = 155$$

$4x = 200$

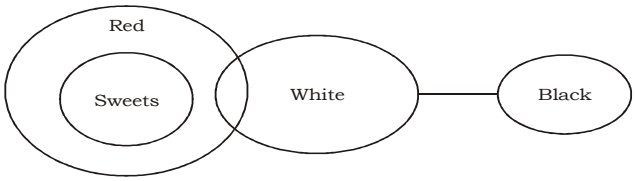
$x = 50$ years

16. (3)



Hence, the person in the photograph is the grandfather of K.

17. (3)



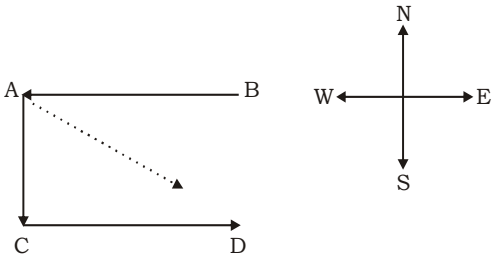
I. True II. Doubt III. Doubt

Hence, only conclusion I and either conclusion II or III follow.

18. (3)

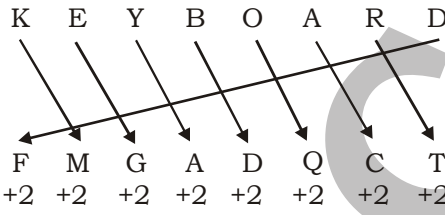
19. (1) Number of educated youth are poor = 11 + 3 = 14

20. (2) Given that A is to the west of B. Then draw C to the south of A and draw D to the east of C as shown in the given figures.

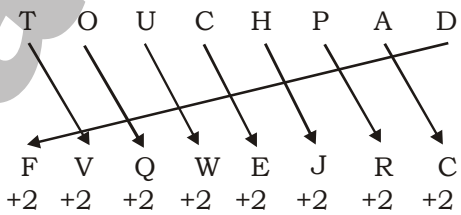


In the figures, we can see that D is towards the South-East of A.

21. (3) As,



Similarly,



22. (1) 23. (1) 24. (2) 25. (2)

27. (1) The chloroplast contains the wonder green pigment chlorophyll which is able to trap solar energy and use it for synthesis of food.

28. (3) Acid rain refers to rainfall with pH less than 5.6. This rain has an adverse effect on flora and fauna on which it falls. Primary causes of acid rain are sulfur dioxide and nitrogen oxides.

30. (4) The DNA is the genetic material. The DNA is made of several nucleotides. A nucleotide means, one nitrogenous base one sugar molecule and a phosphate molecule. These nucleotides occur in sequences and several nucleotides form one gene.

31. (3) An electric charge always flows from a body at higher potential to a body at a lower potential irrespective of the amounts of charges contained in them. In the question, no current flows. So there is no potential difference.

32. (1) The Chandubi Festival, an annual five-day celebration, recently took place along the Chandubi Lake in the Assam. This cultural extravaganza, starting on the first day of the New Year, showcases the rich local folk culture, ethnic cuisine, traditional handloom and dresses, as well as activities like boating.

33. (3) Alkaline phosphate is an anti-rust solution. Painting and galvanizing also prevent rusting.

35. (4) Sodium chloride, used as a general cleanser. It is also used as an antiseptic mouthwash.

37. (4) BRICS is a grouping acronym of leading emerging economies: Brazil, Russia, India and China. South Africa was included into the BRIC group in 2010. The acronym was coined by Jim O' Neill in a 2001 paper entitled Building Better Global Economic BRIC's. The BRIC countries met their first official summit on June 16, 2009 in Yekaterinburg, Russia.

38. (4) Abanindranath Tagore founded Bengal School of Art along with EB Havell. He led the neo-art movement, ie to regenerate ancient and medieval artist's supreme mental weapon in modern setting.

39. (3) India is set to chair UNESCO's World Heritage Committee and host its 46th session in New Delhi from July 21 to 31, 2024, marking a historic milestone for our nation. Vishal V Sharma, India's Permanent Representative to UNESCO, announced this decision.

43. (3) The Parliament can make laws on any subject of the three lists (including the State List) for the Union Territories. This power of Parliament also extends to Puducherry and Delhi, which have their own local legislatures.

44. (1) The specific gravity of sea water is more than that of river water. So less of sea water is needed to have the same weight as that of the ship. So the ship sinks less.

45. (2) A physical change is a temporary change which is reversible There may be a change in the state but not in the composition of the substance ie no new substance is formed. When potassium chlorate is heated, it decomposes to give two entirely different products - solid potassium chloride and oxygen gas. Decomposition of potassium chlorate is therefore a chemical change.

47. (3) Since Pluto is the farthest to the Sun so it takes about 248 years to complete one revolution. Mercury is nearest so it takes 88 days to complete one revolution. Our Earth revolves once in about 365 days and 6 hours.

48. (4) Radio waves are transmitted through Ionosphere.

49. (4) Tungabhadra Project is a joint undertaking of Andhra Pradesh and Karnataka. The project comprises a 2441 metres long and 50 metres high straight gravity masonry dam across the Tungabhadra (a tributary of Krishna river) at Mallapur in Bellary district of Karnataka, two irrigation canals and power houses on both sides of the dam.

50. (1) The Red Ant Chutney of Mayurbhanj in Odisha has recently been granted a Geographical Indication (GI) tag. The application for registration was submitted by The Mayurbhanj Kai Society Ltd in 2020 under Class 30, as per the Geographical Indications of Goods (Registration and Protection) Act, 1999.

51. (1) Let the cost price of milk be ₹ 100/litre.

Selling price of milk at 15% profit = ₹100 + 15% of ₹100 = ₹115/litre

$$\text{Quantity of milk ₹100 at ₹115/litre} = \frac{1000}{115} \times 100 \text{ ml} = \frac{20000}{23} \text{ ml}$$

$$\text{Quantity of water} = 1000 - \frac{20000}{23} \text{ ml} = \frac{3000}{23} \text{ ml}$$

$$\therefore \quad \text{Required ratio} = \frac{3000}{23} : \frac{20000}{23} = 3 : 20$$

52. (2) Dimension of cuboid = 24 cm × 18 cm × 6 cm

Sides of cube = HCF of 24, 18 and 6 = 6 cm

Total surface are of cuboid = 2(lb + bh + lh)

= 2 (24 × 18 + 18 × 6 + 24 × 6) cm^2

= 2(432 + 108 + 144) cm^2

= 2 × 684 cm^2 = 1368 cm^2

Total surface area of cube = 6 × $(side)^2$ = 6 × $(6)^2$ = 216 cm^2

Total surface area of both cubes = (2 × 216) cm^2 = 432 cm^2

Require ratio = (1368 : 432) = 19 : 6

53. (4) Let the radius of playground be r m.

Circumference of playground = $(\pi r + d)$

Speed of man = $\frac{\text{Distance}}{\text{time}} = \frac{60}{40}$ m/s = 1.5 m/s

ATQ,

$$\frac{\pi r}{1.5} - \frac{d}{1.5} = 60$$

$$\frac{\pi r}{1.5} + \frac{d}{1.5} - \frac{d}{1.5} = 60$$

$\pi r = 60 \times 1.5$

$r = \frac{90 \times 7}{22} = \frac{315}{11} = 28\frac{7}{11}$ m/s

54. (4) Total surface are of prism having base as an equilateral Triangles
= 2 × area of base + (perimeter of base × height)
Side of equilateral Triangles = 12 cm
Height of prism = 10 cm

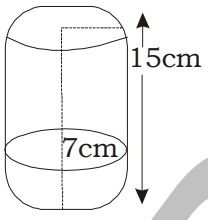
Area of equilateral Triangles = $\frac{\sqrt{3}}{4} \times \text{side}^2$

Perimeter of equilateral Triangles = 3 × side = 3 × 12

Hence, total surface area = $2 \times \frac{\sqrt{3}}{4} \times 12^2 + (3 \times 12) \times 10$

$= 72\sqrt{3} + 360 = 72\left(5 + \sqrt{3}\right) \text{cm}^2$

55. (1)



Height of vessel = 15 cm
Height of cylindrical part = (15 – 7) = 8cm

Volume of cylinder = $\pi r^2 h = \left(\frac{22}{7} \times 7 \times 7 \times 8\right) cm^3 = 1232 \text{ cm}^3$

Volume of hemi-spherical part = $\frac{2}{3}\pi r^3 = \frac{2}{3} \times \frac{22}{7} \times 7 \times 7 \times 7 = \frac{2156}{3} cm^3$

Total volume of vessel = $\left(1232 + \frac{2156}{3}\right) cm^3 = \left(\frac{3696 + 2156}{3}\right) cm^3 = \left(\frac{5852}{3}\right) cm^3$

1000 cm^3 = 1 litres

$\frac{5852}{3} \text{ cm}^3 = \frac{5852}{3000}$ litre

$= 1.9567 \approx 1.957$ litres

56. (3) Capacity of tank = 50 litres

Time taken by both pipe to fill the tank = 10 minutes

Combined efficiency of both pipes = $\frac{50}{10}$ = 5 litres/minute

The net flow rate is 5 litres/minutes.

When outflow rate is doubled, then tank never gets filled.

Hence outlet flow rate should be more than 5.

57. (3) $10\% = \frac{1}{10} \Rightarrow \frac{11-A}{10 \to P}$

	Principal	**Instalments**
1st year	10×11 =110	11×11=121
2nd year	$(10)^2$ =100	$(11)^2$ = 121

Total Principal = 210 units

If 210 units = ₹ 21000

1 unit = $\frac{21000}{210}$ = ₹ 100

$\therefore$ 121 units = (121× ₹ 100) = ₹ 12100

58. (1) $5\sin^2\theta - 4\cos\theta - 4 = 0$

$5(1 - \cos^2\theta) - 4\cos\theta - 4 = 0$

$5 - 5\cos^2\theta - 4\cos\theta - 4 = 0$

$5\cos^2\theta + 4\cos\theta - 1 = 0$

$5\cos^2\theta + 5\cos\theta - \cos\theta - 1 = 0$

$5\cos\theta(\cos\theta + 1) - 1(\cos\theta + 1) = 0$

$(5\cos\theta - 1)(\cos\theta + 1) = 0$

$\cos\theta = \frac{1}{5}$ or -1

$\sin\theta = \sqrt{1 - \frac{1}{25}} = \sqrt{\frac{24}{25}} = \frac{2\sqrt{6}}{5}$

$\cot\theta = \frac{1}{5} \times \frac{5}{2\sqrt{6}} = \frac{1}{2\sqrt{6}}$

$\operatorname{cosec}\theta = \frac{5}{2\sqrt{6}}$

$\therefore$ $\cot\theta + \operatorname{cosec}\theta = \frac{1}{2\sqrt{6}} + \frac{5}{2\sqrt{6}}$

$= \frac{6}{2\sqrt{6}} = \frac{3}{\sqrt{6}} \times \frac{\sqrt{6}}{6} = \frac{3\sqrt{6}}{6} = \frac{\sqrt{6}}{2}$

59. (3) Income of B = ₹ 100

Income of A = ₹ 80

Income of C = $(100 + 80) \times \frac{70}{100}$ = ₹ 126

Income of D = $126 \times \frac{125}{100}$ = ₹ 157.50

ATQ,

$(157.50 - 100) \rightarrow 23000$

$\therefore \quad 80 \rightarrow \frac{23000}{57.5} \times 80$ = ₹ 32000

60. (4) $\tan R = \frac{1}{3}$

$\frac{PQ}{QR} = \frac{1}{3}$

$PR = \sqrt{1^2 + 3^2} = \sqrt{10}$

Now, $\frac{\sec P\,(\cos R + \sin P)}{\text{cosec}\,R\,(\sin R - \cos ecP)}$

$$= \frac{\frac{\sqrt{10}}{1}\left(\frac{3}{\sqrt{10}} + \frac{3}{\sqrt{10}}\right)}{\frac{\sqrt{10}}{1}\left(\frac{1}{\sqrt{10}} - \frac{\sqrt{10}}{3}\right)} = \frac{\sqrt{10}\left(\frac{6}{\sqrt{10}}\right)}{\sqrt{10}\left(\frac{3-10}{3\sqrt{10}}\right)}$$

$= \frac{6}{-7} \times 3 = -\frac{18}{7}$

61. (1)

Book **Pen**

P = 25% = $\frac{1}{4}$ L = –20% = $\frac{-1}{5}$

0 No profit, No loss

Ratio of C.P $\frac{1}{5}$ $\frac{1}{4}$

4 : 5

↓ Multiply by 100

400 : 500

↓10%P ↓7%P

40 35

\+

75

↓×40

3000

C.P of Book = 400 × 40 = ₹ 16000

C.P of Pen = 500 × 40 = ₹ 20000

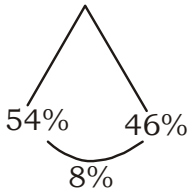
62. (1) $100 \leftarrow$ Total voters

$\downarrow -10\%$ (votes not cast)

$90 \leftarrow$ votes cast

$\downarrow -10\%$ (invalid votes)

$81 \leftarrow$ valid votes



8% of 81 $\rightarrow$ 1620

$\frac{8}{100} \times 81 \rightarrow 1620$

$100 \rightarrow \frac{1620}{8 \times 81} \times 100 \times 100 = 25{,}000$

$\therefore$ The number of voters enrolled in voter list = 25000

63. (4) Area of field = 31684 sq m

Perimeter = $\sqrt{31684} \times 4$ m = 178×4 m

Length of each circuit = $178 \times 4 \times \frac{105}{100}$ m

Since the wire goes round 4 times,

$\therefore$ Total length of wire required = $178 \times 4 \times \frac{105}{100} \times 4$ m = 2990.4 m

64. (2) Here a = 50 metres, b = 78 metres, c = 112 metres

$s = \frac{1}{2}(50 + 78 + 112) = \frac{1}{2} \times 240$ m = 120 m

$s - a = (120 - 50) = 70$ m

$s - b = (120 - 78) = 42$ m

$s - c = (120 - 112) = 8$ m

Area = $\sqrt{120 \times 70 \times 42 \times 8}$ = 1680 sq m

$\therefore$ Perpendicular = $\frac{2 \times \text{Area}}{\text{Base}} = \frac{1680 \times 2}{112} = 30$ m

65. (2) Length of journey = 150 km

$\frac{1}{3}$rd of journey = $150 \times \frac{1}{3} = 50$ km

Remaining $\frac{2}{3}$ of journey = 150 – 50 = 100 km

$\therefore$ Average speed = $\frac{\text{Total Distance}}{\text{Total Time}} = \frac{150}{\frac{50}{30} + \frac{100}{45}} = \frac{150}{\frac{5}{3} + \frac{20}{9}} = \frac{150}{35} \times 9$

$= \frac{270}{7} = 38\frac{4}{7}$ kmph

66. (4) $x_1 = 2$, $x_2 = 3$ and $y_1 = 5$, $y_2 = 9$, $m = 3$, $n = 4$

$$P = \frac{(mx_2 + nx_1)}{m+n}, \frac{(my_2 + ny_1)}{m+n} = \frac{[(3\times 3 + 4\times 2)]}{7}, \frac{[(3\times 9 + 4\times 5)]}{7}$$

$$= \frac{9+8}{7}, \frac{27+20}{7} = \left(\frac{17}{7}, \frac{47}{7}\right)$$

67. (4) Let the number of ₹ 2 rupee coins is $6x$ and number of ₹ 5 Rupees coin is $11x$.
If the number of ₹ 5 coins is halved, then he will have an amount of ₹ 395.
ATQ,

$$6x \times 2 + \left(\frac{11}{2}x\right)5 = 395$$

$39.5\,x = 395$

$x = 10$

∴ Number of ₹ 2 coins that Shweta has = $6x = 6 \times 10 = 60$

68. (1) 12 men can complete the work in 36 days.
12×36 men can complete the work in 1 day.
Again,
18 women can complete the work in 60 days.
18×60 women can complete the work in 1 day.
Now, 12×36 men = 18×60 women
2 men = 5 women
Now, 8 men + 20 women = $(4 \times 5 + 20)$ women = 40 women
18 women complete the work in 60 days.

40 womens' 20 days work = $\frac{40\times 20}{18\times 60} = \frac{20}{27}$

Remaining work = $1 - \frac{20}{27} = \frac{7}{27}$

18×60 women do 1 work in 1 day.

1 woman does = $\frac{1}{18\times 60}$ Work in 1 day

1 woman does in 4 days = $\frac{4}{18\times 60} = \frac{1}{18\times 15}$ Work

$\frac{1}{18\times 15}$ work is done in 4 days by 1 woman.

∴ $\frac{7}{27}$ work is done in 4 days by $\frac{18\times 15\times 7}{27}$ = 70 women

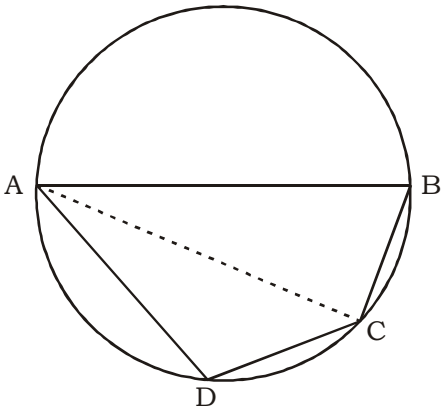
69. (4) We have $\frac{1}{x+1}+\frac{2}{y+2}+\frac{1009}{z+1009}=1$

$$\frac{1}{x+1}-1+\frac{2}{y+2}-1+\frac{1009}{z+1009}-1=1-3$$

$$-\frac{x}{x+1}-\frac{y}{y+2}-\frac{z}{z+1009}=-2$$

$\therefore$ $\frac{x}{x+1}+\frac{y}{y+2}+\frac{z}{z+1009}=2$

70. (3)



$\angle ADC = 136°$

Since, ABCD is a cyclic quadrilateral.

So, $\angle ADC + \angle ABC = 180°$

$\angle ABC = 180° - 136° = 44°$

Since, AB is a diameter, so angle mode on circumference is 90°.

Here, $\angle BCA = 90°$

In ΔABC,

$\angle BCA + \angle BAC + \angle ABC = 180°$

$44° + \angle BAC + 90° = 180°$

$\therefore$ $\angle BAC = 180° - 134° = 46°$

71. (2) $x + y = 14$ and $xy = 33$

$(x - y)^2 = (x + y)^2 - 4xy$

$(x - y)^2 = 14^2 - 4 \times 33$

$(x - y)^2 = 64$

$x - y = 8$

$(x + y)^2 = 196$

$x^2 + y^2 + 2xy = 196$

$x^2 + y^2 = 196 - 2 \times 33 = 130$

$\therefore$ $x^3 - y^3 = (x - y)(x^2 + y^2 + xy)$

$= 8 \times (130 + 33) = 8 \times 163 = 1304$

72. (1) Expenditure = $\frac{\text{Income}}{\left[\frac{\text{Profit \%}}{100}+1\right]}$

ATQ,

$$\frac{I_1}{\frac{35}{100}+1} = \frac{I_2}{\frac{40}{100}+1}$$

$$\frac{I_1}{I_2} = \frac{135}{140}$$

$\therefore$ $I_1 : I_2 = 27 : 28$

73. (3) Required total = $450 \times \frac{2}{5} + 540 \times \frac{5}{9} + 140 \times \frac{2}{5} + 250 \times \frac{3}{10} + 850 \times \frac{8}{17} + 480 \times \frac{5}{8}$

$= 180 + 300 + 56 + 75 + 400 + 300 = 1311$

74. (4) Total employees in D_3

$$9000 \times \frac{12.2}{100} = 1098$$

Females in $D_3 = 1098 \times \frac{5}{9} = 610$

$\therefore$ Required % = $\frac{610}{1098} \times 100 = 55.55\% \approx 55.5\%$

75. (3) Annual sales of all companies in FY 2006–07 = (150 + 200 + 225 + 250 + 300) = 1125 lakh
Annual sales of all companies in FY 2011–12 = (325 + 350 + 400 + 450 + 500) = ₹ 2025 lakh

$\therefore$ Percentage increase = $\frac{2025-1125}{1125} \times 100 = 80\%$

MEANINGS IN ALPHABETICAL ORDER

Altruistic	showing a disinterested and selfless concern for the well-being of others	परोपकारी
Anaerobic	an absence of free oxygen	अनाक्सीय
Blatant	(of bad behavior) done openly and unashamedly	मुखर
Commensurate	corresponding in size or degree; in proportion	(किसी वस्तु) के अनुरूप
confined	limited to a certain extent	सीमित
Constituent	a component part of something	घटक
Desultory	lacking a plan, purpose, or enthusiasm	असंगत
Exemplary	serving as a desirable model	अनुकरणीय
Fallacy	a false belief;	भ्रांति
Fiasco	a complete failure	असफलता
Grievance	a complaint;	शिकायत
Idiotic	very stupid;	मूर्खतापूर्ण
Immaculate	perfectly clean, neat, or tidy	बेदाग
Innocuous	not harmful or offensive;	हानि न करने वाला
Magnitude	the great size or extent of something	परिमाण, मात्रा
Nuisance	anything that annoys or is unpleasant;	विघ्न, खलल
Optometrist	A person who has a profession of examining the eyes for visual defects and prescribing corrective lenses	आँखों के लिए लेंस बनाने वाला
Parity	the state or condition of being equal	समता
Parsimony	extreme unwillingness to spend money or use resources	मितव्ययिता
Perennial	lasting or existing for a long or apparently infinite time	चिरस्थायी
Venerable	accorded a great deal of respect	आदरणीय
Visceral	of or relating to the viscera	आंत संबंधी

SSC MOCK TEST - 422 (ANSWER KEY)

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

76. (1) Replace 'is living' by 'has been living', as this is an example of Present Continuous tense since the time is given in the sentence.

77. (3) Change 'did' into 'had done'.

90. (4) The correct spelling of 'Comensurate' is 'Commensurate'.

91. (4) The correct spelling of 'Grievence' is 'Grievance'.