SSC MOCK TEST - 456 (SOLUTION)

1. (2) As,
$7 \Rightarrow 7^3 + 7^2 + 7 = 343 + 49 + 7 = 399$
Similarly,
$14 \Rightarrow 14^3 + 14^2 + 14 = 2744 + 196 + 14 =$ **2954**

2. (3) As on melting solid, liquid is formed, similarly on freezing liquid, **solid** is formed.

3. (3) $52673 \Rightarrow 5 + 2 + 6 + 7 + 3 = 23$
$34646 \Rightarrow 3 + 4 + 6 + 4 + 6 = 23$
45476 $\Rightarrow 4 + 5 + 4 + 7 + 6 = 26 \neq 23$
$65552 \Rightarrow 6 + 5 + 5 + 5 + 2 = 23$

4. (4) Except Transparent, others are synonym of one another.

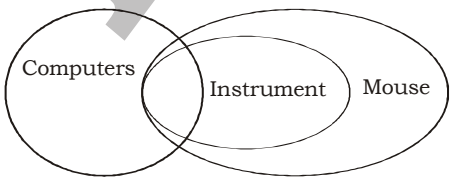
5. (2) X Z B A C E **L M P** E G I
+2 +2 +2 +2 +1 +3 +2 +2

6. (2) 2 20 **56** 110 182
+18 +36 +54 +72
+18 +18 +18

7. (2) As,
$$\frac{8}{7} : \frac{79}{69} = \frac{8 \times 10 - 1}{7 \times 10 - 1}$$
Similarly,
$$\frac{5}{6} : \frac{49}{59} = \frac{5 \times 10 - 1}{6 \times 10 - 1}$$

8. (2) T M J, Q N L, N O N, K P P, H Q R
−3 +1 +2 −3 +1 +2 −3 +1 +2 −3 +1 +2

9. (4) As,
P R A C T I C E
C A R P E C I T
Similarly,
D I S O R D E R
O S I D R E D R

10. (4)


I. True II. False III. True
Hence, only conclusion I and III follow.

11. (2) 15 + 7 + 4 = 26

F + **L** + H = 26
6 **12** 8

14 + 3 + 9 = 26

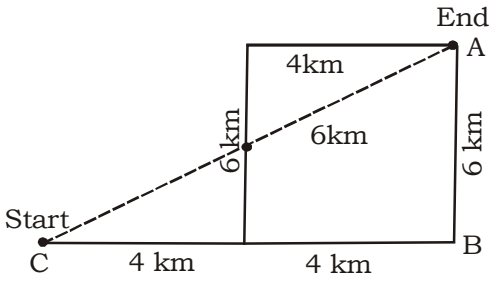
12. (3) 8 × 8 = 64 ⇒ 46

6 × 8 = 48 ⇒ 84

9 × 11 = 99 ⇒ **99**

13. (4) 5. School → 3. Education → 2. Recruitment → 6. Employment → 1. Salary → 4. Promotion

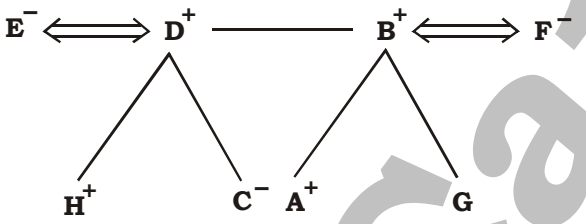
14. (4)



In Δ ABC,

Required distance = $\sqrt{8^2+6^2}$ = 10 km

15. (1)



Hence, H is the nephew of F.

16. (3) 8 * 7 * 9 * 11 * 58

From the option (3),

8 × 7 – 9 + 11 = 58

56 – 9 + 11 = 58

67 – 9 = 58

58 = 58

17. (2) As,

7 × 12 = 84

7 × 11 = 77

7 × 10 = 70

Similarly,

9 × 10 = 90

9 × 9 = 81

9 × 8 = 72

18. (2) 21 Villagers are both Land-owners and Employment.

19. (3) 3 will be at the top, if 6 is at the buttom.

20. (3) **x**yza/a**zyx**/xy**z**a/azy**x**/x**yza**

21. (4) 22. (2) 23. (3) 24. (1) 25. (3)

26. (1) The Earth rotates through 15° each hour so to rotate through 30° degrees it would take 2 hours.

28. (1) 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.

29. (2) Ozone at the higher levels of the atmosphere is a product of UV radiation acting on oxygen (O2) molecule. The higher energy UV radiations split apart some molecular oxygen (O2) into free oxygen atoms.

32. (2) Meghalaya does NOT share its boundary with Bhutan. The Indian states of West Bengal, Arunachal Pradesh, Sikkim, and Assam share their boundaries with Bhutan.

34. (1) The SASTRA Ramanujan Prize, founded by Shanmugha Arts, Science, Technology & Research Academy (SASTRA) located near Kumbakonam, India, Srinivasa Ramanujan's hometown, is awarded every year to a young mathematician judged to have done outstanding work in Ramanujan's fields of interest.

35. (4) The Arid Forest Research Institute is located in Jodhpur. In the hot arid and semi-arid regions of Rajasthan and Gujarat, the Institute conducts scientific research in forestry to provide technologies to increase the vegetative cover and to preserve biodiversity.

38. (1) The Brahmani is one of the major inter-state east flowing rivers amongst the Peninsular rivers in India. The basin covers Jharkhand, Madhya Pradesh and Odisha states and drains an area of 39033 Sq. Km.

39. (4) The structure commonly called the food tube is the esophagus; it is the tube that connects the throat to the stomach.

40. (3) Article 368 of the Constitution of India grants constituent power to make formal amendments and empowers Parliament to amend the Constitution by way of addition, variation or repeal of any provision according to the procedure laid down therein, which is different from the procedure for ordinary legislation.

42. (3) Copper is the only metal that is antibacterial. It is also called "germ-killer" because its alloys show antibacterial, antiviral and anti-fungal properties. It is scientifically proven that copper continuously kills more than 99.9% of the microbes that have caused infections within two hours of contact.

44. (2) Haemoglobin performs the task of capturing oxygen in the blood. They are basically the proteins inside RBCs and carry oxygen to cells. They also carry carbon dioxide to the lungs.

45. (2) In the sequence of planets in the Solar system, Venus comes in between Mercury and Earth.

46. (3) DNA can be considered as a natural flame retardant and suppressant.

49. (4) The clock speed measures the number of cycles your CPU executes per second, measured in GHz (gigahertz). A "cycle" is technically a pulse synchronized by an internal oscillator, but for our purposes, they're a basic unit that helps understand a CPU's speed.

51. (1) Let the length of train A and B be 7x and 3x respectively.

Speed of train A = $\frac{7x}{8}$ m/s

Length of one bogie of train A = $\frac{7x}{4}$ m

Relative speed of trains = $\left(\frac{7x}{8}+40\right)$ m/s

ATQ,

$$\frac{3x+\frac{7x}{4}}{\frac{7x}{8}+40}=4$$

$$\frac{\frac{12x+7x}{4}}{\frac{7x+320}{8}}=4$$

$$\frac{19x}{4}\times\frac{8}{7x+320}=4$$

$$\frac{38x}{7x+320}=4$$

$38x = 28x + 1280$

$10x = 1280$

$$x=\frac{1280}{10}=128\,m/s$$

∴ Speed of train A = $7\times\frac{128}{8}$ = 112 m/s

52. (2) Let the speed of boat be u km/hr and speed of stream be v km/hr.

ATQ,

$$\frac{32}{u+v}+\frac{32}{u-v}=6$$

$$\frac{1}{u+v}+\frac{1}{u-v}=\frac{3}{16} \qquad \text{.....(i)}$$

And, $\frac{4}{u+v}=\frac{2}{u-v}$

$4u – 4v = 2u + 2v$

$2u = 6v$

$u = 3v$ .....(ii)

Put the value of u in equation (i),

$$\frac{32}{u+v}+\frac{32}{u-v}=6$$

$$\frac{32}{3v+v}+\frac{32}{3v-v}=6$$

$$\frac{8}{v}+\frac{16}{v}=6$$

$$\frac{24}{v}=6$$

$v = 4$ km/hr

Put the value of v in equation (ii),

$u = 3v$

$u = 3 \times 4 = 12$ km/hr

∴ Speed of boat = 12 km/hr

53. (1) Let the capacity of tank = 144 litres

Pipe A filled in 1 minute = $\frac{144}{24}$ = 6 litres

Pipe B filled in 1 minute = $\frac{144}{18}$ = 8 litres

Pipe C empty in 1 minutes = $\frac{144}{16}$ = 9 litres

Pipe (A + B) filled in 6 minutes = (6 + 8)× 6 = 84 litres
Remaining part = 144 – 84 = 60 litres
Pipe (A + C) empty in x mintues = (9 – 6) × x = 3x litres
Part of tank filled by pipe A = (60 + 3x) litres
ATQ,

$$\frac{60+3x}{6} = (46-6-x)$$

60 + 3x = 6(40 – x)
60 + 3x = 240 – 6x
9x = 180

$$x = \frac{180}{9} = 20$$

54. (2) Dilshad was travelling to Delhi from Jaipur by car. His car broke down 80 km away from Jaipur, after which he continued at $\frac{4}{5}$ of his usual speed and reached 1 hour 24 minute late.
Let the distance between Delhi and Jaipur be 'd' km.
Let the usual speed be 's' km/hr and usual time taken be 't' hour.

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

Thus, d = s × t .....(i)
Increased time = t + 1 hour 24 min = t + 1.4 hours
Total distance travelled remained the same.
Thus,

$$t+1.4 = \frac{80}{s} + \frac{d-80}{\frac{4s}{5}} = \frac{5d-80}{4s} \quad \text{.....(ii)}$$

Now, had his car broken down, 40 km further he would have been an hour late.

$$\text{So, } t+1 = \frac{120}{s} + \frac{d-120}{\frac{4s}{5}} = \frac{5d-120}{4s} \quad \text{.....(iii)}$$

Subtracting equation (ii) from (iii),

$$0.4 = \frac{5d-80}{4s} - \frac{5d-120}{4s}$$

1.6s = 40
s = 25 km/hr

Substituting the value of s in equation (i),

$t = \frac{d}{25}$

Substituting the value of t in equation (ii),

$\frac{d}{25} + 1.4 = \frac{5d - 80}{100}$

$4d + 140 = 5d - 80$

$d = 220$ km

55. (3) Let the vessel I, vessel II and vessel III has 3x, 4x and 5x litres respectively.

$$\text{Required ratio} = \frac{3x \times \frac{3}{7} + 4x \times \frac{2}{5} + 5x \times \frac{4}{11}}{3x \times \frac{4}{7} + 4x \times \frac{3}{5} + 5x \times \frac{7}{11}}$$

$$= \frac{\frac{9x}{7} + \frac{8x}{5} + \frac{20x}{11}}{\frac{12x}{7} + \frac{12x}{5} + \frac{35x}{11}} = \frac{\frac{495x + 616x + 700}{385}}{\frac{660x + 924x + 1225x}{385}}$$

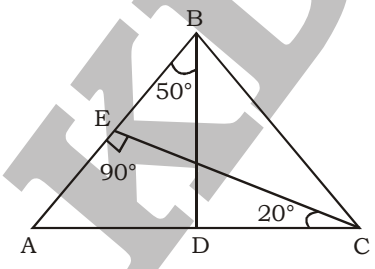
$$= \frac{1811x}{2809x} = 1811 : 2809$$

56. (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 = $\frac{36750}{17 + 20 + 12} \times 20 = \frac{36750}{49} \times 20 =$ ₹ 15000

57. (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
$\therefore$ My mother's age = 45 – 3 = 42 years

58. (2)



In ΔCAE,

$\angle CAE = 180° - (90° + 20°) = 70°$

In ΔABD,

$\angle BDA = 180° - (70° + 50°) = 60°$

59. (2) $(x-a)^3 - \frac{1}{(x-a)^3} = \left(x-a-\frac{1}{x-a}\right)^3 + 3\left(x-a-\frac{1}{x-a}\right)$

$= (x-a-x+b)^3 + 3(x-a-x+b)^3 \qquad \left(\because \frac{1}{x-a} = x-b\right)$

$= (b-a)^3 + 3(b-a)$

$= (5)^3 + 3 \times 5 \qquad (\because b-a=5)$

$= 125 + 15 = 140$

60. (2) Interest earned by Sunil = $\frac{x \times 18 \times 3}{100}$ = ₹ 0.54 x

Interest earned by Vivek = $(2x-3000)\left[1+\frac{10}{100}\right]^3 - (2x-3000)$

$= (2x-3000) \times 1.331 - (2x-3000) =$ ₹ $(0.662x-993)$

ATQ,

$0.54x - (0.662x - 993) =$ ₹ 187.80

$0.122x = 805.20$

$\therefore \quad x = \frac{805.20}{0.122} =$ ₹ 6600

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

$= \frac{9}{20} - \left[\frac{1}{5} + \left\{\frac{1}{4}+1\right\}\right] = \frac{9}{20} - \left[\frac{1}{5}+\frac{5}{4}\right] = \frac{9}{20} - \left[\frac{4+25}{20}\right]$

$= \frac{9}{20} - \frac{29}{20} = \frac{-20}{20} = -1$

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

$= \frac{2\tan\frac{\theta}{2}}{1-\tan^2\frac{\theta}{2}}$ $\qquad [\because \cot(90° - \theta) = \tan\theta \text{ and } \tan(180° - \theta) = -\tan\theta]$

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

63. (3) Monthly income of Shalini = ₹ 25000

Savings = $25000 \times \frac{45}{100}$ = ₹ 11250

Expenditure = 25000 – 11250 = ₹ 13750

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

Expenditure after 25% increment = $13750 \times \frac{125}{100}$ = ₹ 17187.50

Now, savings = 29000 – 17187.50 = ₹ 11812.50

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

64. (1) Total number of pens sold by a shopkeeper from Monday to Thursday = 155 × 4 = 620

Total number of pens sold by same shopkeeper from Thursday to Sunday = 270 × 4 = 1080

Total number of pens sold by that shopkeeper from Monday to Sunday = 225 × 7 = 1575

∴ Number of pens sold by Thursday = (620 + 1080) – 1575 = 125

65. (2) R = 24 m and r = 11

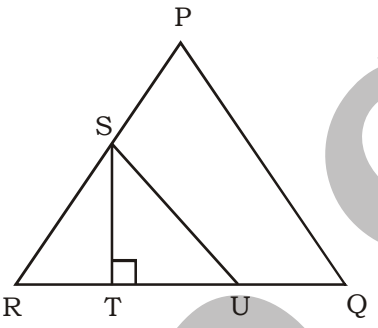
Decreased in area = $\pi R^2 - \pi r^2$

= $\pi(R^2 - r^2) = \pi(R + r)(R - r)$

$= \frac{22}{7}(24 + 11)(24 - 11)$

$= \frac{22}{7} \times 35 \times 13$ = 1430 m^2

66. (4)



Draw a line SU parallel to PQ.

$\angle PQR = \angle SUT$

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

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

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

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

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

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)

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

67. (1) Selling price = ₹ 5600

Loss = 20%

Cost price = $\frac{5600}{80} \times 100$ = ₹ 7000

Now, selling price to gained a profit of 15% = $7000 \times \frac{115}{100}$ = ₹ 8050

68. (2) P = ₹ 22000

Rate of interest for first year = 15%

Rate of interest for next two years = 20%

Rate of interest for last year = 12%

$$A = 22000\left(1+\frac{15}{100}\right)\left(1+\frac{20}{100}\right)^2\left(1+\frac{12}{100}\right)$$

$$= 22000 \times \frac{23}{20} \times \frac{6}{5} \times \frac{6}{5} \times \frac{28}{25} = ₹\ 40803.84$$

$\therefore$ CI = 40803.84 – 22000 = ₹ 18803.84

69. (3) $\frac{\tan\theta + \sec\theta - 1}{\tan\theta - \sec\theta + 1}$

$$= \frac{\tan\theta + \sec\theta - \left(\text{sen}^2\theta - \tan^2\theta\right)}{\tan\theta - \sec\theta + 1} \qquad \left(\because \sec^2\theta - \tan^2\theta = 1\right)$$

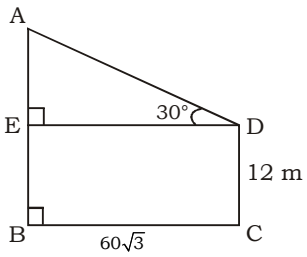
$$= \frac{\tan\theta + \sec\theta - (\sec\theta - \tan\theta)(\sec\theta + \tan\theta)}{\tan\theta - \sec\theta + 1}$$

$$= \frac{(\tan\theta + \sec\theta)\left[1 - (\sec\theta - \tan\theta)\right]}{\tan\theta - \sec\theta + 1}$$

$$= \frac{(\tan\theta + \sec\theta)(1 - \sec\theta + \tan\theta)}{\tan\theta - \sec\theta + 1} = \tan\theta + \sec\theta$$

$$= \frac{\sin\theta}{\cos\theta} + \frac{1}{\cos\theta} = \frac{1+\sin\theta}{\cos\theta}$$

70. (2)



Let AB is the height of tower.

In ΔADE,

$$\tan 30° = \frac{AE}{ED}$$

$$\frac{1}{\sqrt{3}} = \frac{AE}{60\sqrt{3}} \quad (\because BC = ED)$$

AE = 60 m

$\therefore$ Height of tower = AE + BE = 60 + 12 = 72 m

71. (2) Seats in executive class = 10% of 500 = 50

Seats in chair car = 500 – 50 = 450

Booking seats in total = 85% of 500 = 425

Booking in executive class = 96% of 50 = 48

Booking in chair class = (425 – 48) = 377

Empty seats in chair class = 450 – 377 = 73

72. (3) Let the side of the square be x.

Then, $\left(\sqrt{2}x\right)^2 = \left(12\sqrt{2}\right)^2$

$x = 12$

Now, perimeter of equilateral triangle = 12 × 4 = 48 cm

Side of equilateral triangle = $\frac{48}{3}$ = 16 cm

Area of equilateral triangle = $\frac{\sqrt{3}}{4} \times (16)^2 = 64\sqrt{3}$ cm^2

73. (3) The number of students going to school A on Monday and Tuesday together
=240 + 120 = 360

The number of students going to school B on Monday and Tuesday together
=180 + 220 = 400

$\therefore$ Required less% = $\left(\frac{400 - 360}{400} \times 100\right)\% = 10\%$

74. (4) $\frac{I_Q}{E_Q} = 1.05$

$\frac{I_P}{E_P} = 0.75$

$\therefore$ Required% = $\frac{1.05}{0.75} \times 100 = 140\%$

75. (1) Difference = $8.6 \times \frac{22}{100} - 5.4 \times \frac{15}{100} = 1.892 - 0.81 = 1.082$ lakh = 108200

MEANINGS IN ALPHABETICAL ORDER

Affliction	something that causes pain or suffering	यातना
Aggravate	make (a problem, injury, or offense) worse or more serious	भड़काना
Alleviate	make (suffering, deficiency, or a problem) less severe	कम करना
Distrust	the feeling that someone or something cannot be relied upon	संदेह
Ferocious	savagely fierce, cruel, or violent	क्रूर
Intensity	the quality of being intense	तीव्रता
Irrational	not logical or reasonable	तर्कहीन
Irrefutable	impossible to deny or disprove	अखंडनीय
Irreparable	(of an injury or loss) impossible to rectify or repair	अपूरणीय
Irresistible	too attractive and tempting to be resisted	अथक
Loyalty	the quality of being loyal	निष्ठ
Magnify	make (something) appear larger than it is especially with a lens or microscope	वृद्धि करना
Mitigate	make less severe, serious, or painful	कम करना
Obscure	not discovered or known about; uncertain	अस्पष्ट
Overcome	succeed in dealing with (a problem or difficulty)	काबू पा लेना
Pachyderm	a very large mammal with thick skin, especially an elephant, rhinoceros, or hippopotamus	मोटे चमड़े का जानवर
Paltry	(of an amount) small or meager	तुच्छ
Pertinent	relevant or applicable to a particular matter; apposite	उचित
Plight	a dangerous, difficult, or otherwise unfortunate situation	दुर्दशा
Prehensile	(chiefly of an animal's limb or tail) capable of grasping	समझदार
Prominent	important; famous	प्रसिद्ध
Relevant	closely connected or appropriate to what is being done or considered	प्रासंगिक
Souvenir	a thing that is kept as a reminder of a person, place, or event	यादगार
Surmount	overcome (a difficulty or obstacle)	बढ़ना
Thwart	prevent (someone) from accomplishing something	विफल
Treason	the crime of betraying one's country, especially by attempting to kill the sovereign or overthrow the government	राज-द्रोह
Tremble	(of a person, a part of the body, or the voice) shake involuntarily, typically as a result of anxiety, excitement, or frailty	घबराना

SSC MOCK TEST - 456 (ANSWER KEY)

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

76. (1) Replace 'had been gained' with 'has gained', as the given sentence is in active voice. Active voice structure: "has + V_3" or "has + been + V + ing". Passive voice structure: "has + been + V_3".

77. (3) Replace 'his' with possessive case of 'one' – "one's"

90. (3) The correct spelling of 'Afliction' is 'Affliction'.

91. (2) The correct spelling of 'Arrivel' is 'Arrival'.