

SSC Solution

1. (A) $78 \Rightarrow 7 \times 8 = 56 \Rightarrow \frac{56}{2} = 28$

$84 \Rightarrow 8 \times 4 = 32 \Rightarrow \frac{32}{2} = 16$

2. (B) M N C O P O R S
1 2 3 4 1 2 3 4
N C O M O R S P
2 3 4 1 2 3 4 1

3. (B) Physics is related to science and History is related to **Social science**.

4. (B) $34 \Rightarrow 3^4 = 81$
 $25 \Rightarrow 2^5 = 32$

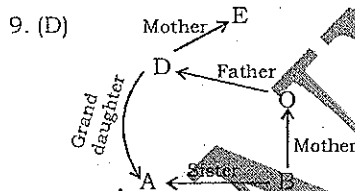
5. (D) $328 \Rightarrow 8^2 \times 3 = 64 \times 3 = 192 \Rightarrow 328 - 192$
 $215 \Rightarrow 5^1 \times 2 = 10 \Rightarrow 215 - 10$
 $342 \Rightarrow 2^4 \times 3 = 16 \times 3 = 48 \Rightarrow 342 - 48$

$235 \Rightarrow 5^3 \times 2 = 125 \times 2 = 250 \neq 258 \Rightarrow 235 - 258$

6. (C) Except **Anil Kapoor**, others are from the same family group.

7. (A) Except PQRS, in others atleast one vowel is present.

8. (D) **256** is the only number for which cube root is not possible.



10. (D) Neither conclusion (1) nor (2) follows

11. (D) $12 \times 18 = 24 \times 9$, $16 \times 24 = 8 \times 48$

$15 \times 8 = 24 \times 5$

12. (B) $83 \Rightarrow 8^3 = 512 \Rightarrow \frac{512}{2} = 256$

$42 \Rightarrow 4^2 = 16 \Rightarrow \frac{16}{2} = 8$

$63 \Rightarrow 6^3 = 216 \Rightarrow \frac{216}{2} = 108$

13. (B) $12 \times 6 + 18 \times 4 = 144 \Rightarrow \sqrt{144} = 12$

$18 \times 8 + 36 \times 5 = 144 + 180 = 324 \Rightarrow \sqrt{324} = 18$

$5 \times 8 + 10 \times 6 = 40 + 60 = 100 \Rightarrow \sqrt{100} = 10$

14. (D)

15. (D) As, we can see 2 R's in the word **RIVER**, which is not present in the given word **ENVIRONMENT**.

16. (C) $2 \times 1 + 3 = 5$

$5 \times 2 + 6 = 16$

$16 \times 3 + 9 = 57$

$57 \times 4 + 12 = 240$

17. (D) $8 + \frac{8}{2} = 12$, $12 + \frac{12}{2} = 18$, $18 + \frac{18}{2} = 27$,

$27 + \frac{27}{2} = 40.5$

18. (A) $\frac{12}{\times 2} \frac{24}{\times 3} \frac{72}{\times 3} \frac{288}{\times 5} \frac{1440}{\times 5}$

19. (B) 5, 2, 3, 1, 4

20. (D) PQRS/PSQR/PRSQ/SPQR

21. (B) After changing the signs, we have

$$\frac{52 - 3 \times 6 + 2}{16 + 12 + 6 + 3 - 18} = \frac{52 - 3 \times 3}{16 + 6 - 18}$$

$$= \frac{52 - 24}{4} = \frac{28}{4} = 7$$

22. (B)

23. (A)

$A = 1^2 + 1 = 2$, $B = 2^2 + 2 = 6$, $C = 3^2 + 3 = 12$, $D = 4^2 + 4 = 20$, $E = 5^2 + 5 = 30$, $F = 6^2 + 6 = 42$ and $G = 7^2 + 7 = 56$

then, $F + G = 42 + 56 = 104$

24. (C)

25. (B) 89, 33, 57, 43

F A B E

26. (C) Vinayak Damodar Savarkar was an Indian revolutionary and politician. He wrote more than 10,000 pages in the Marathi language. When in the Cellular Jail, Savarkar was denied pen and paper, he composed and wrote his poems on the prison walls with thorns and pebbles, memorized thousand lines of his poetry for years till other prisoners returned home and brought them to India.

27. (B) Hazaribagh: Mica and Coal are the major minerals found in this district of Jharkhand.

- Neyveli: It was developed after mining of lignite started under the Neyveli Lignite Corporation (NLC) in 1956.

- Jharia: It is famous for its rich coal resources used to make Coke.

- Rourkela: They are rich in Iron Ores, Manganese and Limestone.

28. (C) The first Law Commission was established in 1834 under the Charter Act of 1833 under the Chairmanship of Lord Macaulay which recommended codification of the Penal Code, the Criminal Procedure Code and a few other matters. Thereafter, the second, third and fourth Law Commissions were constituted in 1853, 1861 and 1879 respectively.

29. (D) **In national accounts definitions**

Personal disposable income = personal income – direct taxes

30. (B) Michael Faraday invented the first electric generator in 1831. This British chemist and physicist did extensive work in the field of electricity that paved the way for the inventions of the electric motor and transformer.
31. (D) Polonium is the most radioactive element. When Polonium is radioactive it glows blue, which is caused by excitation of the gas particles by radiation. A single milligram of polonium emits as many alpha particles as 5 grams of radium. It decays to release energy at the rate of 140 W/g. The decay rate is too high that it can raise the temperature of a half gram sample of polonium to over 500°C.
33. (A) The Satavahanas, were an Indian dynasty based on the Deccan region. The beginning of the Satavahana rule is 271 BCE to 30 BCE. Satavahanas dominated the Deccan region from 1st century BCE to 3rd century CE. Satavahanas minted their coins predominantly in lead.
34. (A) Srinath Narayanan from Chennai will soon become India's 46th Grandmaster after he defeated Spanish GM David Anton Guijarro at the 2017 Sharjah Masters chess tournament. He became India's youngest FIDE-rated player in 2002 when he was just 8 years old and also finished as joint winner in the Under-12 World Championship in 2005 in France. Srinath became an International Master at the age of 14 and crossed the 2500 Elo rating in 2016. He had already secured five GM norms.
35. (C) In photolithography, ultraviolet light is shined onto a photosensitive film on a piece of silicon to create a pattern of conducting and isolating layers as it breaks apart. The circuit is built up with many of these silicon layers and covered in metal. Finally, another photosensitive film is used to form a pattern for the wires. The silicon used in computer circuits is pure silicon crystal to ensure perfection. Silicon is used because it is a cheap and abundant semiconductor.

36. (C) Raja Todar Mal was a warrior, an able administrator and an exemplary finance minister. He was one of the 'Navratnas' of Akbar's courts. He introduced an excellent land revenue system. In 1582, the title Diwan-I-Asrafi was bestowed upon him by the Emperor.

39. (B) Finance Bill means a Bill ordinarily introduced every year to give effect to the financial proposals of the Government of India for the next following financial year and includes a Bill to give effect to supplementary financial proposals for any period. The Finance Bill is introduced immediately after the presentation of the Budget. The introduction of the Bill cannot be opposed.

40. (C) Mean fundamental frequency, which is associated with the perceptual notion of pitch, is commonly considered as the major difference between adult male and female voices. Pitch of a man's voice falls under low frequency, whereas woman's voice is of the high pitch type.

41. (D) Lithium is strongest Reducing agent because of lowest standard reduction potential. When something is oxidized, it reduces another substance, becoming a reducing agent. Hence lithium is the strongest reducing agent and Fluorine is the strongest oxidizing agent.

43. (B) Bob Dylan, the renowned US musician and poet, will finally accept his Nobel Literature Prize at a meeting with the Swedish Academy in Stockholm, Sweden in April 2017. He has become the first songwriter to win the prestigious award and the first American since novelist Toni Morrison in 1993.

44. (D) Rajatarangini ("The River of Kings") is a metrical legendary and historical chronicle of the north-western Indian subcontinent, particularly the kings of Kashmir. It was written in Sanskrit by Kashmiri Brahman Kalhana in 12th century CE. The Rajatarangini provides the earliest source on Kashmir that can be labelled as a "historical" text on this region.

45. (C) An equinox is the moment in which the plane of Earth's equator passes through the center of the Sun, which occurs twice each year, on 21st March and 23rd September.

47. (C) Economic liberalization is a very broad term that usually refers to fewer government regulations and restrictions in the economy in exchange for greater participation of private entities. The doctrine is associated with classical liberalism. The arguments for economic liberalization include greater efficiency and effectiveness that would translate to a "bigger pie" for everybody. Thus, liberalization in short refers to "the removal of controls", to encourage economic development.

50. (C) Montenegro is set to become the 29th member of the North Atlantic Treaty Organization (NATO) after US Senate ratify its entry into NATO. Though, ratification from Spain and the Netherlands is still pending ahead of a NATO summit in May 2017. The move was strongly opposed by Russia because it considers Montenegro and other western Balkan states part of its sphere of interest. Thus, Russia opposes the Western military alliance's expansion in the Balkans. It must be noted that Montenegro was the former ally of Russia.

51. (B)
$$\frac{\sqrt{36} - \sqrt{24} + \sqrt{24} - \sqrt{16}}{5 + \sqrt{9}}$$

$$\frac{6 - 4}{\sqrt{5+9}} = \frac{2}{\sqrt{14}}$$

52. (C) Let the highest score be x
Then, lowest score = $(x - 150)$
Then, $50(40) - [x + (x - 150)] = 38 \times 48$
 $\Rightarrow 2x = 2000 + 150 - 1824$
 $\Rightarrow 2x = 326$
 $\Rightarrow x = 163$

\therefore Lowest score = $163 - 150 = 13$

53. (D) Let original income = ₹ 100
Then, expenditure = ₹ 75
and savings = ₹ 25
New income = ₹ 150

$$\text{New expenditure} = ₹ \left(\frac{110}{100} \times 75 \right) = ₹ \frac{165}{2}$$

$$\text{New savings} = ₹ \left(150 - \frac{165}{2} \right) = ₹ \frac{135}{2}$$

$$\text{Increase in savings} = ₹ \left(\frac{135}{2} - 25 \right) = ₹ \frac{85}{2}$$

$$\therefore \text{Increase \%} = \left(\frac{85}{2} \times \frac{1}{25} \times 100 \right) \% = 170\%$$

54. (A) $5 \tan \theta = 4 \Rightarrow \tan \theta = \frac{4}{5}$

$$\text{Now, } \frac{7 \sin \theta - 4 \cos \theta}{7 \sin \theta + 4 \cos \theta} = \frac{7 \tan \theta - 4}{7 \tan \theta + 4}$$

$$= \frac{7 \times \frac{4}{5} - 4}{7 \times \frac{4}{5} + 4} = \frac{\frac{28}{5} - 4}{\frac{28}{5} + 4} = \frac{\frac{28 - 20}{5}}{\frac{28 + 20}{5}} = \frac{8}{48} = \frac{1}{6}$$

55. (C) Originally, let the number of boys and girls in the college be $7x$ and $8x$ respectively. Their increased numbers are (120% of $7x$) and (110% of $8x$)

$$\text{i.e. } \left(\frac{125}{100} \times 7x \right) \text{ and } \left(\frac{115}{100} \times 8x \right)$$

$$\text{i.e. } \frac{875x}{100} \text{ and } \frac{920x}{100}$$

$$\therefore \text{Required ratio} = 875 : 920 = 175 : 184$$

56. (C) Let cost price = ₹ 100

$$\text{Then, } \frac{1}{3} \text{ of (Marked Price)} = 80$$

$$\Rightarrow \text{Marked Price} = ₹ 240$$

$$\therefore \text{Required ratio} = 240 : 100 = 12 : 5$$

57. (A) Let the speed of the stream be x m/h. Then,

$$\text{Speed downstream} = (8 + x) \text{ m/h,}$$

$$\text{Speed upstream} = (8 - x) \text{ m/h}$$

$$\therefore \frac{60}{(8 - x)} - \frac{60}{(8 + x)} = 4$$

Put $x = 2$, then it will satisfy the equation

$$\Rightarrow \frac{60}{8-2} - \frac{60}{8+2} = \frac{60}{6} - \frac{60}{10}$$

$$\Rightarrow 10 - 6 = 4$$

$$\Rightarrow 4 = 4$$

\therefore Speed of Stream = 2 miles/hr

58. (B) Product of numbers = $11 \times 385 = 4235$

Let the numbers be $11a$ and $11b$.

$$\text{Then, } 11a \times 11b = 4235$$

$$\Rightarrow ab = 35$$

Now, co-primes with product 35 are (1, 35) and (5, 7)

So, the numbers are $\{11 \times 1, 11 \times 35\}$ and $\{11 \times 5, 11 \times 7\}$

Since one number lies between 75 and 125, the suitable pair is (55, 77)

Required number = 77.

Hence, Sum of the digits = $7 + 7 = 14$

59. (B) Let the price be 100

$$\begin{array}{ccccccc} 100 & & 140 & & 126 & & 113.40 \\ & \nearrow & & \searrow & & \nearrow & \\ & +40\% & & -10\% & & -10\% & \end{array}$$

So, increase in price = 13.4%

60. (B) Let speed of the car be x km/h

Then, speed of the train = $\frac{150}{100}x$

= $\left(\frac{3}{2}x\right)$ km/h

$\therefore \frac{60}{x} - \frac{60}{\frac{3}{2}x} = \frac{125}{10 \times 60}$

$\Rightarrow \frac{60}{x} - \frac{40}{x} = \frac{5}{24}$

$\Rightarrow x = \left(\frac{20 \times 24}{5}\right) = 96$ km/h

\therefore Speed of the car = **96 km/h**

61. (B) Let the base of triangle be decreased by $x\%$
ATQ,

$20 - x - \frac{20x}{100} = 0$

$\Rightarrow x + \frac{x}{5} = 20$

$\Rightarrow \frac{6x}{5} = 20 \Rightarrow x = \frac{50}{3} = 16\frac{2}{3}\%$

\therefore Required percentage = $16\frac{2}{3}\%$

62. (D) Volume of the new cube = Sum of volumes of all five cubes

$\therefore a^3 = a_1^3 + a_2^3 + a_3^3 + a_4^3 + a_5^3$

$\Rightarrow a = \sqrt[3]{a_1^3 + a_2^3 + a_3^3 + a_4^3 + a_5^3}$

= $\sqrt[3]{9^3 + 6^3 + 3^3 + 3^3 + 1^3}$ cm

= $\sqrt[3]{729 + 216 + 27 + 27 + 1}$ cm = $\sqrt[3]{1000}$ cm

= 10 cm
 \therefore Required Area = $6 \times 10^2 = 600$ cm²

63. (C) Given $x = \frac{\sqrt{3}}{2}$

then, $\frac{\sqrt{1+x}}{1+\sqrt{1+x}} \times \frac{1-\sqrt{1+x}}{1-\sqrt{1+x}} + \frac{\sqrt{1-x}}{1-\sqrt{1-x}} \times$

$\frac{1+\sqrt{1-x}}{1+\sqrt{1-x}}$

= $\frac{\sqrt{1+x}-1-x}{1-1-x} + \frac{\sqrt{1-x}+1-x}{1-1+x}$

= $\frac{\sqrt{1-x}+1-x}{x} - \frac{\sqrt{1+x}-1-x}{x}$

= $\frac{\sqrt{1-x}+1-x-\sqrt{1+x}+1+x}{x}$

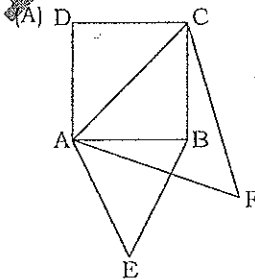
= $\frac{2+\sqrt{1-x}-\sqrt{1+x}}{x}$

= $\frac{2+\sqrt{\frac{1-\sqrt{3}}{2}}-\sqrt{\frac{1+\sqrt{3}}{2}}}{\frac{\sqrt{3}}{2}}$

= $\frac{2+\frac{\sqrt{4-2\sqrt{3}}}{2}-\frac{\sqrt{4+2\sqrt{3}}}{2}}{\frac{\sqrt{3}}{2}}$

= $\frac{4+\sqrt{3}-\sqrt{3}-1}{\sqrt{3}} = \frac{2}{\sqrt{3}}$

$\therefore \left(\frac{\sqrt{1+x}}{1+\sqrt{1+x}} + \frac{\sqrt{1-x}}{1-\sqrt{1-x}}\right)^2 = \left(\frac{2}{\sqrt{3}}\right)^2 = \frac{4}{3}$



Here $AC^2 = 2AB^2$
As $\triangle ABE$ and $\triangle ABC$ are equiangular
 $\Rightarrow \triangle ABE \sim \triangle ABC$

\therefore Required ratio = $\frac{\text{area of } (\triangle ABE)}{\text{area of } (\triangle ACF)} = \frac{AB^2}{AC^2}$

= $\frac{AB^2}{2AB^2} = \frac{1}{2}$

\therefore Square of the ratio = $\left(\frac{1}{2}\right)^2 = \frac{1}{4}$

65. (D) Number of diagonals = $\frac{6(6-3)}{2} = 9$

66. (C) Let the ratio be $x : (x + 60)$

Then, $\frac{x}{(x+60)} = \frac{2}{7}$

$\Rightarrow 7x = 2x + 120$

$\Rightarrow x = 24$

\Rightarrow Required ratio = $24 : 84 = 2 : 7$

MEANINGS IN ALPHABETICAL ORDER

WORDS	MEANING IN ENGLISH	MEANING IN HINDI
abalone	a shellfish that is a mollusk which has a flattened shell with a pearly lining	सोती का सीप
antidotes	a substance that stops the harmful effects of a poison	विष नोशक
assimilate	take in and understand fully (information or ideas)	आत्मसात करना
bindingly	the action of one that binds	बाध्यकारी
carnivorous	flesh eating animals	मांसभक्षी जानवर
chivalrous	showing respect and politeness especially toward women	नारियों की तरफ सम्मान भाव
consummation	the point at which something is complete or finalized.	समापन, पूर्ण करना
deviate	to stray especially from a standard or principle	भटक जाना
drudgery	hard menial or dull work.	नीरस काम
effectuation	put into force or operation.	कार्यन्वयन करना
emaciated	to waste away physically	शक्तिहीन
emeritus	retired from an office or position	अवकाशप्राप्त
encomium	a speech or piece of writing that praises someone or something highly.	गुणगाथा
encumber	to weigh down, burden	भारग्रस्त करना
fluster	make (someone) agitated or confused.	घबरा देना
hypocaust	an ancient Roman central heating system with underground furnace and tile flues to distribute the heat	भूमिगत अग्निकोष्ठ
hypochondria	excessive concern about one's health.	रोग भ्रम
infrequent	seldom happening or occurring	कभी-कभी होने वाला
inimical	tending to obstruct or harm.	हानिकारक
mandatory	required by law or mandate, compulsory	अनिवार्य
minstrel	a musical entertainer in the Middle Ages	मध्य युग के लोक गायक
possessed	(Of a person) completely controlled by an evil spirit.	भूतग्रस्त
privileged	having special rights or advantage that most people don't have.	विशेषाधिकृत
providence	God or nature as providing protective care.	दिव्यसंरक्षण
sanctuary	a place where injured or unwanted animals of a specified kind are cared for.	अभयारण्य
scanty	very small in size or amount	अपर्याप्त
scarce	almost not at all, hardly	ना के बराबर
strangle	to die from interference with breathing	दम घुटना
sway	to fluctuate between one point or position,	हिलना
tranquility	the quality or state of being tranquil, calm.	शांति
turmoil	a state of great disturbance, confusion, or uncertainty.	हलचल
wanton	merciless, inhumane	निर्दयतापूर्ण व्यवहार

67. (B) Remaining distance = 3 km

and Remaining time = $\left(\frac{1}{5} \times 50\right)$ min

= 10 min = $\frac{1}{6}$ hr

∴ Required speed = (3×6) km/hr = **18 km/hr**

$$68. (A) \frac{\sin 2\theta + \sin \theta}{\cos 2\theta + \cos \theta + 1} = \frac{2 \sin \theta \cdot \cos \theta + \sin \theta}{2 \cos^2 \theta - 1 + \cos \theta + 1}$$

$$= \frac{\sin \theta (2 \cos \theta + 1)}{2 \cos^2 \theta + \cos \theta} = \frac{\sin \theta (2 \cos \theta + 1)}{\cos \theta (2 \cos \theta + 1)} =$$

$$\frac{\sin \theta}{\cos \theta} = \tan \theta = \sqrt{\tan^2 \theta} = \sqrt{\sec^2 \theta - 1}$$

$$69. (C) \left[18000 \times \left(1 + \frac{R}{100}\right)^2 - 18000 \right] =$$

$$\left(\frac{18000 \times R \times 2}{100} \right)$$

$$\Rightarrow 18000 \left[\left(1 + \frac{R}{100}\right)^2 - 1 - \frac{2R}{100} \right] = 135$$

$$\Rightarrow 18000 \left[\frac{(100 + R)^2 - 10000 - 200R}{10000} \right] =$$

135

$$\Rightarrow R \cdot \frac{135 \times 5}{9} = 75 \Rightarrow R = \mathbf{8.66\%}$$

70. (A) 60% of $(x - y) = 40\%$ of $(x + y)$

$$\Rightarrow \frac{50}{100} (x - y) = \frac{30}{100} (x + y)$$

$$\Rightarrow 5(x - y) = 3(x + y)$$

$$\Rightarrow 2x = 10y \Rightarrow x = 5y$$

$$\therefore \text{Required percentage} = \left(\frac{y}{x} \times 100\right)\%$$

$$= \left(\frac{y}{5y} \times 100\right)\% = \mathbf{20\%}$$

$$71. (A) \frac{\text{Area of } \triangle BDF}{\text{Area of hexagon}} = \frac{1}{2}$$

∴ Area of hexagon = 6 × area of equilateral

$$\text{triangle} = 6 \times \frac{\sqrt{3}}{4} \times 2^2 = 6\sqrt{3} \text{ cm}^2$$

$$\therefore \text{Area of } \triangle BDF = 3\sqrt{3} \text{ cm}^2 = \mathbf{5.2 \text{ cm}^2}$$

72. (C) Total profit required = ₹ (42×18) = ₹ 756

Profit on 22 sarees = ₹ $(460 + 144)$ = ₹ 604

Profit on 20 sarees = ₹ $(756 - 604)$ = ₹ 152

Average profit on these sarees

$$= ₹ \left(\frac{152}{24}\right) = ₹ \mathbf{6.33}$$

73. (A) Required percentage Increase

$$\left(\frac{9-4}{4} \times 100\right)\% = \mathbf{125\%}$$

74. (B) Number of students getting at least 60% marks in Geography

Number of students getting 30 and above marks in Geography = 21

= Number of students getting 20 and above marks in aggregate = 63

$$\text{Required percentage} = \left(\frac{21}{63} \times 100\right)\%$$

$$= \mathbf{33.33\%}$$

75. (B) Let the required percentage be $x\%$

Then, 80 - 80 off $x\%$ = 66

$$\Rightarrow 80 - \frac{4x}{5} = 66$$

$$\Rightarrow \frac{4x}{5} = 14$$

$$\Rightarrow x = 17.5\%$$

Required percentage = **17.5%**

SSC Answer Key

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



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