SSC CGL (Tier - I) Exam. Practice Set

Answers with Explanation

1. (b) Demographer studies the changing numbers of births, deaths, housing, civic amenities etc in a community over a period of time. In other words, a demographer collects various data about people. Similarly, Philatelist is a person who collects or knows a lot about postage stamps. অ্যাচিভার্স

2. (b) Sepal is leaf like part which supports the petals of a flower. Similarly, tyres of a bicycle are the outer most parts on which bicycle rests.

3. (b) Seismometer (Seismograph) is a scientific instrument for measuring the intensity of earthquakes. Similarly, thermometer is used for measuring temperature.

4. (c) Actors take part in play. Similarly, musicians perform concert. Concert is a musical entertainment given in public by one or more musicians. Play is a work written to be performed by actors.

5. (d) Red Blood Cells are also called Erythrocytes. Similarly, White Blood Cells are called Leucocytes. অ্যাচিভার্স

6-7

Member	Gender	Profession	Relationship
A	Female	Nurse	Wife of B ; Mother of C and E
B	Male	Doctor	Father of E and C; Son of D and F; Husband of A
C	—	Student	Grandchild of D and F; Child of A and B
D	Female	Housewife	Grandmother of E and C; Mother of B; Wife of F
E	—	Student	Grandchild of D and F; Child of A and B
F	Male	Contractor	Grandfather of C and E; Father of B; Husband of D

6. (c) A is a Nurse. অ্যাচিভার্স

7. (b) B is the husband of A.

8. (a) The wife of brother of woman in photograph is mother-in-law of Meera.
Meera is daughter-in-law of brother of that woman.
Therefore, the husband of Meera is nephew of that woman.

9. (c)

$-\Rightarrow+$	$+\Rightarrow\times$
$\div\Rightarrow-$	$\times\Rightarrow\div$

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Option (a)
$5 - 2 + 12 \times 6 \div 2 = 27$
$\Rightarrow 5 + 2 \times 12 \div 6 - 2 = 27$
$\Rightarrow 5 + 2 \times 2 - 2 = 27$
$\Rightarrow 5 + 4 - 2 \neq 27$

Option (b)
$5 + 2 - 12 \div 6 \times 2 = 13$
$\Rightarrow 5 \times 2 + 12 - 6 \div 2 = 13$
$\Rightarrow 10 + 12 - 3 = 13$
$\Rightarrow 19 \neq 13$

Option (c)
$5 + 2 - 12 \times 6 \div 2 = 10$
$\Rightarrow 5 \times 2 + 12 \div 6 - 2 = 10$
$\Rightarrow 10 + 2 - 2 = 10$

Option (d)
$5 \div 2 + 12 \times 6 - 2 = 6$
$\Rightarrow 5 - 2 \times 12 \div 6 + 2 = 0$ অ্যাচিভার্স
$\Rightarrow 5 - 2 \times 2 + 2 = 6$
$\Rightarrow 5 - 4 + 2 \neq 6$
Options (a) and (b) are wrong.

10. (c) $33 \times 11 \div 3 - 6 = 115$

$\Rightarrow \left(\frac{363}{3}\right) - 6 = 115$

$\Rightarrow 121 - 6 = 115$

11. (c)

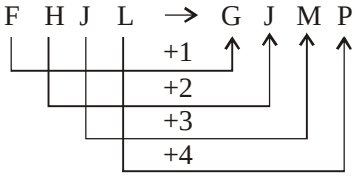
$-\Rightarrow\div$	$\div\Rightarrow\times$
$\times\Rightarrow+$	

$64 + 8 \times 32 \div 4 = ?$
$\Rightarrow ? = 64 \div 8 + 32 \times 4$
$\Rightarrow ? = 8 + 128 = 136$

12. (a) 1 2 3 4
3 2 1 4
T A L E ⇒ L A T E
The first and the third letters have been interchanged.
Therefore, অ্যাচিভার্স
3 2 1 4 1 2 3 4
C A F E ⇒ F A C E

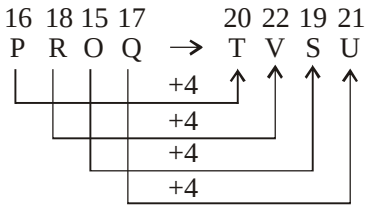
13. (a) E G I K → F I L O
+1
+2
+3
+4

Similarly,



14. (a) 6 8 5 7 10 12 9 11
F H E G → J L I K
+4
+4
+4
+4

Similarly,



15. (d) There is no 'C' letter in the given word. Therefore, the word PORTICO cannot be formed.

P O [R T F] O L [I] O ⇒ RIFT

P [O R] T [F O] L I O ⇒ ROOF

P O [R T F O] L I O ⇒ FORT

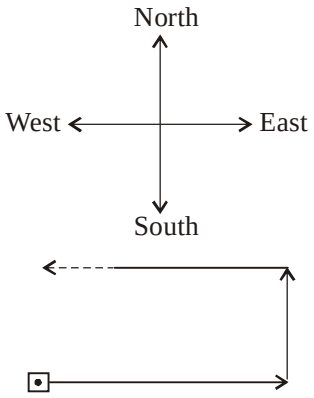
16. (a) There is no 'R' letter in the given word. Therefore, the word ALERT cannot be formed.

[L E G A] L I Z [A T I O N]
⇒ A L E G A T I O N

[L] E [G A L] I Z [A T] I O [N]
⇒ G A L L A N T

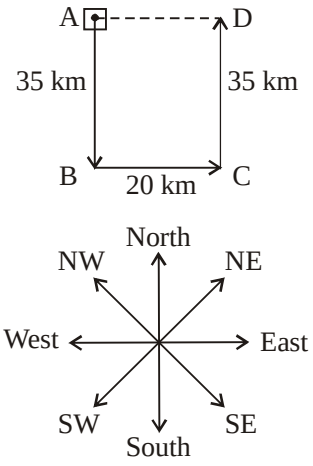
[L] E G [A] L I Z [A T] I O [N]
⇒ N A T A L

17. (d)



Now, Raju is facing West.

18. (a)



19. (b) When it appears 6 : 30 in mirror, the real time would be 5 : 30.

20. (a) The given number series is based on the following pattern :
6 × 1 + 1 = 7
7 × 2 + 1 = 15
15 × 3 + 1 = 46
46 × 4 + 1 = 185
185 × 5 + 1 = [926]

21. (d) From the third number onwards, each number is the sum of the previous two numbers.
2 + 6 = 8, 6 + 8 = 14,
8 + 14 = 22, 14 + 22 = 36,
22 + 36 = [58], 36 + 58 = 94

22. (a) A = 1, i.e., Position Number of A in the English alphabet.
A S S
1+ 19+ 19 = 39, i.e., Sum of the position numbers of the letters.
Therefore,

G R [ASS]
↓ ↓ ↓
7+ 18+ 39 = 64

23. (a) Both the Premises are Universal Affirmative (A-type).
All dogs are books.

All books are pictures.
A + A ⇒ A-type of Conclusion
"All dogs are pictures."
This is Conclusion I.

Conclusion IV is Converse of the second Premise.

24. (d) 5+0 = 5 4+0 = 4 4+3 = 7
3+1 = 4 2+1 = 3 1+1 = 2
(5+4) = 9 (4+3) = 7 (7+2) = 9

25. (c) 12 + 13 = 25
27 + 24 = 51
∴ ? = 64 – 27 = 37 অ্যাচিভার্স

26. (a) Ajivika ("living" in Sanskrit) was a system of ancient Indian philosophy and an ascetic movement of the Mahajanapada period in the Indian subcontinent. Ajivika was primarily a heterodox Hindu (Nastika) or atheistic system. The Ajivikas may simply have been a more loosely-organized group of wandering ascetics (shramanas or sannyasins). One of their prominent leaders was Makkhali Gosal. Ajivikas are is thought to be contemporaneous to other early Hindu nastika philosophical schools of thought, such as Charvaka, Jainism and Buddhism, and may have preceded the latter two systems.

27. (a) Papeti is one of the auspicious days of Parsi Calendar. It stands for the new start and new beginning. It comes in the month of Navroj by the Parsis. On Pateti day, the Parsis visit the fire temple.

28. (c) The first temporary 2-day president of the Constituent Assembly was Dr Sachidanand Sinha. Later, Rajendra Prasad was elected president of the Constituent Assembly.

29. (d) The equator receives equal day and night throughout the year because it does not tilt in relation to the sun's location. Because of the tilted axis of the Earth, the poles and locations away from the equator lean towards or away from the sun as an orbit is completed, while the equator stays in essentially the same location relative to the sun. অ্যাচিভার্স

30. (b) Sunil Agrawal has been appointed as the chief financial officer (CFO) of the Life Insurance Corporation (LIC).

31. (b) The best way for a bank to avoid loss is to accept only sound collateral. In lending agreements, collateral is a borrower's pledge of specific property to a lender, to secure repayment of a loan. The collateral serves as protection for a lender against a borrower's default - that is, any borrower failing to pay the principal and interest under the terms of a loan obligation. If a borrower does default on a loan (due to insolvency or other event), that borrower forfeits (gives up) the property pledged as collateral - and the lender then becomes the owner of the collateral. In a typical mortgage loan transaction, for instance, the real estate being acquired with the help of the loan serves as collateral. Should the buyer fail to pay the loan under the mortgage loan agreement, the ownership of the real estate is transferred to the bank. The bank uses a legal process called foreclosure to obtain real estate from a borrower who defaults on a mortgage loan. Collateral, especially within banking, traditionally refers to secured lending (also known as asset-based lending). অ্যাচিভার্স

32. (b) Upagupta was a Buddhist monk. According to some stories in the Sanskrit Avadana he was the spiritual teacher of Asoka the great Mauryan emperor. Upagupta's teacher was Sanavasi who was a disciple of Ananda, the Buddha's attendant. Due to the absence of his name in Theravada literature it is assumed that Upagupta was a Sarvadin monk.

33. (b) The Constitution has made the Supreme Court as the custodian and protector of the Constitution. The Supreme Court decides disputes between the Centre and the Units as well as protects the Fundamental Rights of the citizens of India. অ্যাচিভার্স

34. (d) The prospect of producing electricity from the hydrological resources of the Plateau region lies not, as has been suggested, in the 'region's fast flowing rivers'. The flow rate of most rivers in the region is relatively slow. However, the sloped topography of the plateau itself provides enormous capacity to generate electricity. All existing and planned hydropower projects in the region are based on the simple engineering principle of utilizing gravity to generate energy from the region's rivers. The steep escarpments found in the south-eastern portion of the region provide the natural topographical mechanism to subject the region's water resources to the energy-producing force of gravity. অ্যাচিভার্স

35. (b) The Great Granary of Harappa was the largest building of the Indus Valley Civilization. It was about 45 meters long and 15 meters wide. It was meant to store food grains. It had lines of circular brick platforms for pounding grain. There were barrack like quarters for workmen.

The granary also had smaller halls and corridors. It was used to store surplus food grains. There were two rows of granaries. Each row had six granaries. A similar granary has been found in Mohanjodaro. All the granaries were built close to the river bank so that grains could be easily transported with the help of boats. অ্যাচিভার্স

36. (d) Film critic, writer Jaiprakash Chouksey passed away due to cardiac arrest at the age of 82 years at his home in Madhya Pradesh's Indore city.

37. (b) Sonar (originally an acronym for Sound Navigation And Ranging) is a technique that uses sound propagation (usually underwater, as in submarine navigation) to navigate, communicate with or detect objects on or under the surface of the water, such as other vessels. Two types of technology share the name "sonar": passive sonar is essentially listening for the sound made by vessels; active sonar is emitting pulses of sounds and listening for echoes. Sonar may be used as a means of acoustic location and of measurement of the echo characteristics of "targets" in the water.

38. (b) In 1967, in Golak Nath vs. The State of Punjab, a bench of eleven judges (such a large bench constituted for the first time) of the Supreme Court deliberated as to whether any part of the Fundamental Rights provisions of the constitution could be revoked or limited by amendment of the constitution. This question had previously been considered in Shankari Prasad v. Union of India and Sajjan Singh v. State of Rajasthan. In both cases, the power to amend the rights had been upheld on the basis of Article 368. Six years later in 1973, thirteen judges of the Supreme Court, including then Chief Justice Sikri, heard arguments in Kesavananda Bharati v. The State of Kerala and thus considered the validity of the 24th, 25th and 29th amendments, and more basically the correctness of the decision in the Golak Nath case. This time, the court held, by the thinnest of margins of 7-6, that although no part of the constitution, including fundamental rights, was beyond the amending power of Parliament (thus overruling the 1967 case), the "basic structure of the Constitution could not be abrogated even by a constitutional amendment". অ্যাচিভার্স

39. (c) The Moti Masjid in Agra was built by Shah Jahan. During the rule of Shah Jahan the Mughal emperor, numerous architectural wonders were built. Most famous of them is the Taj Mahal. Moti Masjid earned the epithet Pearl Mosque for it shined like a pearl. It is held that this mosque was constructed by Shah Jahan for his members of royal court. The Moti Masjid boasts of extensive white marble facing, a typical stylistic feature of architecture during the reign of Shah Jahan. অ্যাচিভার্স

40. (c) The southern part of the Western Ghats mountain ranges harbour the Nilgiri hills, which serve as the meeting point of the Western and Eastern Ghats. The hills are separated from the Karnataka plateau to the north by the Moyar River and from the Anaimalai Hills and Palni Hills to the south by the Palghat Gap.

41. (b) The fibre least prone to catch fire is cotton. Fabrics with more of the fiber surface area exposed to air have more oxygen available to support burning and therefore burn more easily. Thus, thin, gauzy fabrics, lace, or brushed fabrics can be very flammable. Fabrics with a napped or brushed surface of fine fibers can catch fire easily because of the greater amount of fiber surface exposed to oxygen in the air. অ্যাচিভার্স

42. (a) Monopolistic competition is a type of imperfect competition such that many producers sell products that are differentiated from one another as goods but not perfect substitutes (such as from branding, quality, or location). In monopolistic competition, a firm takes the prices charged by its rivals as given and ignores the impact of its own prices on the prices of other firms. There are six characteristics of monopolistic competition (MC): (a) Product differentiation; (b) many firms; (c) Free entry and exit in the long run; (d) Independent decision making; (e) market power; and (f) Buyers and Sellers do not have perfect information. Toothpastes, toilet papers, computer software and operating systems are examples of differentiated products. অ্যাচিভার্স

43. (d) Indian boxers Nikhat Zareen (52kg) and Nitu (48kg) has won gold medals at the 73rd Strandja Memorial Boxing Tournament, held in Sofia, Bulgaria. The bronze medal was won by Nandini (+81kg).

44. (b) Tear gas, formally known as a lachrymatory

agent or lachrymator (from lacrima meaning "tear" in Latin), is a non-lethal chemical weapon that stimulates the corneal nerves in the eyes to cause tears, pain, and even blindness. Common lachrymators include OC, CS, CR, CN (phenacyl chloride), nonivamide, bromoacetone, xylyl bromide and syn-propanethial-S-oxide (from onions). Tear gas works by irritating mucous membranes in the eyes, nose, mouth and lungs, and causes crying, sneezing, coughing, difficulty breathing, pain in the eyes, temporary blindness, etc. Lachrymators are thought to act by attacking sulphydryl functional groups in enzymes. The compound 2-chlorobenzalmalononitrile (also called o-chlorobenzylidenemalononitrile) (chemical formula: $C_{10}H_5ClN_2$), a cyanocarbon, is the defining component of a "tear gas" commonly referred to as CS gas, which is used as a riot control agent. CS gas is generally accepted as being non-lethal.

45. (d) At its Lahore Session (December 29-31, 1929) the Indian National Congress adopted the resolution of Complete Independence for India as its goal. অ্যাচিভার্স

46. (d) Raja Ravi Varma was closely related to the royal family of Travancore of present day Kerala. Later in his life, two of his granddaughters were adopted into that royal family, and their descendants comprise the totality of the present royal family of Travancore. Varma was a celebrated Indian painter and artist, considered as the greatest painter in the history of Indian art.

47. (c) Penicillin is a group of antibiotics derived from Penicillium fungi. They include penicillin G, procaine penicillin, benzathine penicillin, and penicillin V. Penicillin antibiotics are historically significant because they are the first drugs that were effective against many previously serious diseases, such assyphilis, and infections caused by staphylococci and streptococci. Penicillins are still widely used today, though many types of bacteria are now resistant. All penicillins are â-lactam antibiotics and are used in the treatment of bacterial infections caused by susceptible, usually Gram-positive, organisms. অ্যাচিভার্স

48. (c) The World Wildlife Day is observed every year on 3 March to raise awareness about the world's wild fauna and flora. Theme of this Day_ "Recovering key species for ecosystem restoration". অ্যাচিভার্স

49. (d) Godwin Austen is a peak in Pak occupied territory. Its height is 8,611 metres.

50. (d) In democratic systems of governance based on the trias politica, a fundamental parallel and a fundamental difference exists between presidential systems and constitutional monarchic parliamentary system of government. The parallel is that the three branches of government (legislative, executive, judicial) exist largely independent of each other, with their own prerogatives, domains of activity, and exercises of control over each other. In presidential systems, the incumbent of the Head-of-state is elected to office and, after transfer of power, appoints his administration (like in the United States, with unitary executive) or a government headed by a prime minister is formed within the parliament, based on the elected majority (like in France). The latter might lead to a "cohabitation" where a president and his government belonging to different parties or coalitions.

51. (b) $0.9 = \frac{9}{10}; 0.\overline{9} = \frac{9}{9} = 1,$ অ্যাচিভার্স

$0.0\overline{9} = \frac{9}{90} = \frac{1}{10};$

$0.\overline{09} = \frac{9}{99} = \frac{1}{11}$

52. (a) Let number (dividend) be X.
$\therefore$ X = 296 × Q + 75 where Q is the quotient and can have the values 1, 2, 3 etc.
= 37 × 8 × Q + 37 × 2 + 1
= 37 (8Q + 2) + 1
Thus we see that the remainder is 1.
Remark : When the second divisor is a factor of the first divisor, the second remainder is obtained by dividing the first remainder by the second divisor.
Hence, divide 75 by 37, the remainder is 1].

53. (d) $\frac{1}{2}$ of 1% $= \frac{1}{2} \times \frac{1}{100} = \frac{0.01}{2} = 0.005$

54. (b) First number × second number = HCF × LCM অ্যাচিভার্স
$\Rightarrow$ 84 × second number = 12 × 336
$\therefore$ Second number $= \frac{12 \times 336}{84} = 48$

55. (d) LCM = 2 × 2 × 2 × 3 × 5
Hence, HCF = 4, 8, 12 or 24
According to question
35 cannot be H.C.F. of 120.

56. (c) Expression

$$=1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\cfrac{3+2}{3}}}}} \quad =1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{3}{5}}}}$$

$$=1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{1}{\cfrac{5+3}{5}}}} \quad =1+\cfrac{1}{1+\cfrac{1}{1+\cfrac{5}{8}}}$$

$$=1+\cfrac{1}{1+\cfrac{1}{\cfrac{8+5}{8}}} \quad =1+\cfrac{1}{1+\cfrac{8}{13}}$$

$$=1+\cfrac{1}{\cfrac{13+8}{13}}$$

$$=1+\frac{13}{21}=\frac{21+13}{21}=\frac{34}{21}$$

57. (b) $8\frac{1}{2}-\left[3\frac{1}{4}\div\left\{1\frac{1}{4}-\frac{1}{2}\left(1\frac{1}{2}-\frac{1}{3}-\frac{1}{6}\right)\right\}\right]$

$$=\frac{17}{2}-\left[\frac{13}{4}\div\left\{\frac{5}{4}-\frac{1}{2}\left(\frac{3}{2}-\frac{1}{3}-\frac{1}{6}\right)\right\}\right]$$

$$=\frac{17}{2}-\left[\frac{13}{4}\div\left\{\frac{5}{4}-\frac{1}{2}\left(\frac{9-2-1}{6}\right)\right\}\right]$$

$$=\frac{17}{2}-\left[\frac{13}{4}\div\left\{\frac{5}{4}-\frac{1}{2}\times\frac{6}{6}\right\}\right]$$

$$=\frac{17}{2}-\left[\frac{13}{4}\div\left\{\frac{5}{4}-\frac{1}{2}\right\}\right]$$

$$=\frac{17}{2}-\left[\frac{13}{4}\div\left\{\frac{5-2}{4}\right\}\right]$$

$$=\frac{17}{2}-\left[\frac{13}{4}\div\frac{3}{4}\right]$$

$$=\frac{17}{2}-\left[\frac{13}{4}\times\frac{4}{3}\right]=\frac{17}{2}-\frac{13}{3}$$

$$=\frac{51-26}{6}=\frac{25}{6}=4\frac{1}{6}$$

58. (b) $\left[\frac{13}{4}\div\left\{\frac{5}{4}-\frac{1}{2}\left(\frac{5}{2}-\frac{3-2}{12}\right)\right\}\right]\div\frac{13}{6}$

$$=\left[\frac{13}{4}\div\left\{\frac{5}{4}-\frac{1}{2}\left(\frac{5}{2}-\frac{1}{12}\right)\right\}\right]\div\frac{13}{6}$$

$$=\left[\frac{13}{4}\div\left\{\frac{5}{4}-\frac{1}{2}\left(\frac{30-1}{12}\right)\right\}\right]\div\frac{13}{6}$$

$$=\left[\frac{13}{4}\div\left\{\frac{5}{4}-\frac{1}{2}\times\frac{29}{12}\right\}\right]\div\frac{13}{6}$$

$$=\left[\frac{13}{4}\div\left\{\frac{30-29}{24}\right\}\right]\div\frac{13}{6}$$

$$=\left[\frac{13}{4}\div\frac{1}{24}\right]\div\frac{13}{6}$$

$$=\left[\frac{13}{4}\times24\right]\div\frac{13}{6}$$

$$=13\times6\times\frac{6}{13}=36$$

59. (b) Required average price

$$=\frac{13\times70+15\times60+12\times65}{13+15+12}$$

$$=\frac{910+900+780}{40}=\frac{2590}{40}=₹64.75$$

60. (a) If the average of remaining numbers be x, then
20 × 15 = 5 × 12 + 15x
$\Rightarrow$ 300 = 60 + 15x
$\Rightarrow$ 15x = 300 – 60 = 240
$\Rightarrow x=\frac{240}{15}=16$

61. (b) Given, $\frac{x}{y}=\frac{2}{3}$ ..... (i)

Expression $=\frac{3x+2y}{9x+5y}$

$$=\frac{3.\frac{x}{y}+2}{9\frac{x}{y}+5}=\frac{3\times\frac{2}{3}+2}{9\times\frac{2}{3}+5}$$ [from (i)]

$$=\frac{2+2}{11}=\frac{4}{11}$$

62. (a) $\frac{W_1}{W_2}=\frac{2}{3}$

$\Rightarrow \frac{W_2}{W_1}=\frac{3}{2}$ and $\frac{W_1}{W_3}=\frac{1}{2}$

$\therefore \frac{W_2}{W_1}\times\frac{W_1}{W_3}=\frac{W_2}{W_3}=\frac{3}{2}\times\frac{1}{2}=\frac{3}{4}=3:4$ অ্যাচিভার্স

63. (b) $A\times\frac{90}{100}=\frac{B\times 30}{100}$

$\Rightarrow A\times 3=B$

$\Rightarrow A\times x\%=A\times 3$

$\Rightarrow \frac{x}{100}=3\Rightarrow x=300$

64. (c) After taking away respective balls,
Number of balls in the box
$= 75 + 25 + 50 = 150$
$\therefore$ Percentage of black balls

$=\frac{50}{150}\times 100=\frac{100}{3}=33\frac{1}{3}\%$

65. (a) $x + y = 2z$

$\Rightarrow x = 2z - y$

$\Rightarrow x - z = 2z - y - z = z - y$ অ্যাচিভার্স

$\therefore \frac{x}{x-z}+\frac{z}{y-z}$

$=\frac{x}{x-z}-\frac{z}{z-y}$

$=\frac{x}{x-z}-\frac{z}{x-z}=\frac{x-z}{x-z}=1$

66. (b) $a=\frac{\sqrt{5}+1}{\sqrt{5}-1}=\frac{\sqrt{5}+1}{\sqrt{5}-1}\times\frac{\sqrt{5}+1}{\sqrt{5}+1}$

$=\frac{\left(\sqrt{5}+1\right)^2}{5-1}=\frac{5+1+2\sqrt{5}}{4}=\frac{3+\sqrt{5}}{2}$

$\therefore b=\frac{\sqrt{5}-1}{2}=\frac{3-\sqrt{5}}{2}$

$\therefore a + b$

$=\frac{3+\sqrt{5}}{2}+\frac{3-\sqrt{5}}{2}=3$

and $ab=\frac{\sqrt{5}+1}{\sqrt{5}-1}\times\frac{\sqrt{5}-1}{\sqrt{5}+1}=1$ অ্যাচিভার্স

$\therefore$ Expression

$=\frac{a^2+ab+b^2}{a^2-ab+b^2}=\frac{(a+b)^2-ab}{(a+b)^2-3ab}$

$=\frac{9-1}{9-3}=\frac{8}{6}=\frac{4}{3}$

67. (d) $\frac{1}{2}\sqrt{1+\sin\theta}+\frac{1}{2}\sqrt{1-\sin\theta}$

$=\frac{1}{2}\sqrt{1+\sin 60^\circ}+\sqrt{1-\sin 60^\circ}$

$=\frac{1}{2}\left(\sqrt{1+\frac{\sqrt{3}}{2}}+\sqrt{1-\frac{\sqrt{3}}{2}}\right)$ অ্যাচিভার্স

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

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

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

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

$=\frac{2\sqrt{3}}{4}=\frac{\sqrt{3}}{2}=\cos 30^\circ=\cos\frac{\theta}{2}$

68. (b) $\sin\theta=\frac{3}{5}$ অ্যাচিভার্স

$\therefore \cos\theta=\sqrt{1-\sin^2\theta}$

$=\sqrt{1-\left(\frac{3}{5}\right)^2}=\sqrt{1-\frac{9}{25}}=\sqrt{\frac{16}{25}}=\frac{4}{5}$

$\tan\theta=\frac{\sin\theta}{\cos\theta}=\frac{\frac{3}{5}}{\frac{4}{5}}=\frac{3}{4}$

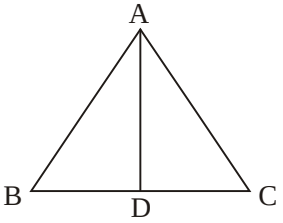
$\cot\theta=\frac{1}{\tan\theta}=\frac{4}{3}$

$\operatorname{cosec}\theta=\frac{1}{\sin\theta}=\frac{5}{3}$

$\therefore \frac{\tan\theta+\cos\theta}{\cot\theta+\operatorname{cosec}\theta}=\frac{\frac{3}{4}+\frac{4}{5}}{\frac{4}{3}+\frac{5}{3}}$

$=\frac{\frac{15+16}{20}}{\frac{4+5}{3}}=\frac{31}{20}\times\frac{3}{9}=\frac{31}{60}$ অ্যাচিভার্স

69. (b)



D, is the mid–point of BC.
AB = AC = 10 cm.
AD ⊥ BC
From ΔABD,

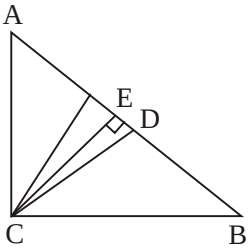
$BD = \sqrt{AB^2 - AD^2}$

$= \sqrt{10^2 - 8^2} = \sqrt{100 - 64}$

$= \sqrt{36} = 6$ cm.

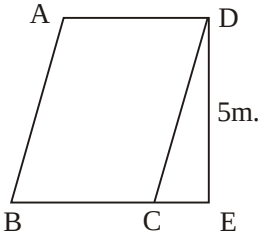
∴ BC = 2 BD = 2 × 6 = 12 cm.

70. (b)



$AC^2 + CB^2 = AB^2$
$\Rightarrow 2BC^2 = (AD + DB)^2$
$\Rightarrow 2BC^2$
$= AD^2 + DB^2 + 2AD.BD$ ..... (i)
ΔCEB and ΔCED are right angles.
$CD^2 = CE^2 + ED^2$
and, $BC^2 = CE^2 + BE^2$
$BC^2 - CD^2 = BE^2 - DE^2$
$= (BE + DE)(BE - DE)$
$= (AE + DE)(BE - DE)$
$= AD.BD$ ..... (ii)
∴ From equations (i) and (ii)
$AD^2 + DB^2 = 2CD^2$

71. (b)



Perimeter of rhombus
= 4 × side
∴ 4 × side = 40

$\Rightarrow$ Side $= \frac{40}{4} = 10$ m.

As, rhombus is a parallelogram of equal sides, its area = base × height = 10 × 5 = 50m².

72. (a) Area of regular hexagon

$= \frac{3\sqrt{3}}{2} \times (\text{side})^2$

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

$= 18\sqrt{3}$ cm².

73. (d) $x - \frac{1}{x} = 2$

On squaring both sides,

$x^2 + \frac{1}{x^2} - 2 = 4$

$\Rightarrow x^2 + \frac{1}{x^2} = 6$

74. (a) $\frac{a^2}{b+c} = \frac{b^2}{c+a} = \frac{c^2}{a+b} = 1$

$\Rightarrow \frac{a^2}{b+c} = 1$

$\Rightarrow a^2 = b + c$
$\Rightarrow a^2 + a = a + b + c$
$\Rightarrow a(a + 1) = a + b + c$

$\Rightarrow \frac{1}{a+1} = \frac{a}{a+b+c}$

Similarly,

$\frac{b^2}{c+a} = 1 \Rightarrow b^2 = c + a$
$\Rightarrow b^2 + b = a + b + c$
$\Rightarrow b(b + 1) = a + b + c$

$\Rightarrow \frac{1}{b+1} = \frac{b}{a+b+c}$

and $\frac{c^2}{a+b} = 1 \Rightarrow c^2 = a + b$
$\Rightarrow c^2 + c = a + b + c$
$\Rightarrow c(c + 1) = a + b + c$

$\Rightarrow \frac{1}{c+1} = \frac{c}{a+b+c}$

$\therefore \frac{1}{1+a} + \frac{1}{1+b} + \frac{1}{1+c}$

$= \frac{a}{a+b+c} + \frac{b}{a+b+c} + \frac{c}{a+b+c}$

$= \frac{a+b+c}{a+b+c} = 1$

75. (c) $a^2 + 1 = a$
$\Rightarrow a^2 - a + 1 = 0$

$\Rightarrow (a + 1)(a^2 - a + 1) = 0$
$\Rightarrow a^3 + 1 = 0$
$\Rightarrow a^3 = -1$ অ্যাচিভার্স

76. (c) **historic (Adj) :** It is usually used to describe something that is so important that it is likely to be remembered.
historical is used to describe a past event. Hence,
that historic first meeting with Roosevelt is the right usage.
77. (c) It is a **double negatives** related error.
Hence, **you won't forget/you will never forget** is the right usage.
78. (a) Here, **Subject (Fifty years)** is **Plural**. Hence, **Fifty years have passed** is the right usage.
79. (a) **Simple Present Tense-is** is the right usage.
80. (b) **brisk (Adj.) :** quick
Here, **brisk** is the right usage. অ্যাচিভার্স
81. (d) **excessive (Adj.) :** greater than what seems reasonable or appropriate
Here, **excessive** is the right usage.
82. (b) **determination (Noun) :** the quality that makes one to continue trying to do something even when this is difficult
Here, **determination** is the right usage.
83. (a) **overwhelming (Adj.):** very great; so powerful that you cannot resist or decide how to react
Here, **overwhelming** is the right usage.
84. (a) sleep
snooze (Verb) : to have a short light sleep
85. (b) dishonour
humiliation (Noun) : to make somebody feel ashamed or stupid and lose the respect of other people; dishonour. অ্যাচিভার্স
86. (b) simplicity
gullibility (Noun) : naiveness; too willing to believe or accept what other people tell you.
87. (c) **a red-letter day :** an important day
- 15th August is a **red-letter day** in the history of India.
The best option is **an important or joyful occasion in one's life.**

88. (d) **birds of the same feather :** people of the same sort
- Chayanika and Aadya are **birds of the same feather**. They get along very well.
The best option is **persons of same character.**

89. (a) **to call a spade a spade :** to say exactly what you think without trying to hide your opinion
- Vinay is a person who **calls a spade a spade** and is fearless. অ্যাচিভার্স
The best option is **to be frank.**

90. (d) **a white elephant :** costly and useless possession
- The new office block has become an expensive **white elephant**.
The best option is **costly and troublesome possession, useless to its owner.**

91. (b) **quietly (Adverb) :** with very little noise; peacefully.
noisily (Adverb) : extremely unpleasantly or offensively.
92. (b) **contempt (Noun) :** a feeling that something is without value and deserves no respect at all.
admiration (Noun) : a feeling of respect and liking for somebody/something.
93. (d) **ugly (Adjective) :** unpleasant to look at; unattractive.
beautiful (Adjective) : having beauty; very good. অ্যাচিভার্স
94. (d) **alumnus**
alumnus (N.) : a former male student of a school, college/university
genius (Adj.) : unusually great intelligence, skill/artistic ability
scholar (N.): a person who knows a lot about a particular subject
learner (N.) : a peson who is finding about a subject or how to do someting
95. (d) **hangar**
hangar (N.) : a large building in which aircraft is kept
granary (N.) : a building where grain is stored
dockyard (N.) : an area with docks (the place where ships are loaded and unloaded in a port) and equipment for building and repairing ships
garage (N.) : a building for keeping one/ more cars or other vehicles in.
96. (a) **sale (Noun)**
97. (d) **approved (Adj.)** অ্যাচিভার্স
98. (a) **bid (Verb)**
99. (b) **highest (Adj.)**
100. (a) **bangs (Verb)**

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