

—: SSC HS Level (Tier - 1) Exam. Practice Set :—

Answers with Explanation

1. (c) 'Gill' is the opening on the side of a fish's head through which it breathes. শ্রুতিভঙ্গি  
'Nose' is the part of the face above the mouth, used for breathing and smelling.
2. (c) Tanning is the process of manufacturing leather. Similarly, Pyrotechnics is the process of manufacturing fireworks.
3. (a) Jute growing areas lie along the Hooghly river. Similarly, Ahmedabad is related to cotton production.
4. (b)  $2 \times 7 = 14$   
and,  $2 \times 8 = 16$   
Similarly,  
 $3 \times 7 = 21$   
 $3 \times 8 = 24$
5. (a)  $2 + 3 = 5$ ,  $5 + 1 = 6$ ,  $1 + 7 = 8$   
 $6 - 5 = 1$ ,  $8 - 6 = 2$   
 $2 + 9 = 11 \Rightarrow 1 + 1 = 2$   
 $5 + 7 = 12 \Rightarrow 1 + 2 = 3$   
 $1 + 4 = 5$   
 $3 - 2 = 1$ ,  $5 - 3 = 2$  শ্রুতিভঙ্গি
6. (a) L is son of R and R is daughter of P.  
Therefore, L is grandson of P.
7. (b) The mothers of A and B are sisters. Therefore, A and B are cousins.
8. (b) Q A J Y N R  
↓ ↓ ↓ ↓ ↓ ↓  
0 6 4 1 7 3
9. (b) 

J $\Rightarrow$ +	K $\Rightarrow$ -
L $\Rightarrow$ $\div$	M $\Rightarrow$ $\times$

**Given expression**

$18 M 36 L 12 K 6 J 7 = ?$

**After conversion**

$? = 18 \times 36 \div 12 - 6 + 7$

or,  $? = 18 \times 3 - 6 + 7$

or,  $? = 54 - 6 + 7 = \boxed{55}$

10. (d) **Option (a)**  
 $15 C 15 B 8 F 4 B 6 C 3$   
 $\Rightarrow 15 \div 15 + 8 < 4 + 6 \div 3$   
 $\Rightarrow 1 + 8 < 4 + 2$   
**Option (b)**  
 $15 B 5 G 8 B 4 G 6 F 3$   
 $\Rightarrow 15 + 5 - 8 + 4 - 6 < 3$   
 $\Rightarrow 24 - 14 < 3$  শ্রুতিভঙ্গি

**Option (c)**

$15 A 5 E 8 C 4 B 6 E 3$  শ্রুতিভঙ্গি

$\Rightarrow 15 > 5 \times 8 \div 4 + 6 \times 3$

$\Rightarrow 15 > 10 + 18$

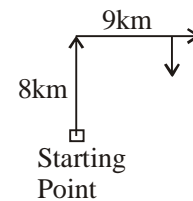
**Option (4)**

$15 C 5 F 8 C 4 B 6 C 3$

$\Rightarrow 15 \div 5 < 8 \div 4 + 6 \div 3$

$\Rightarrow 3 < 2 + 2$

11. (a) Travelling from south means movement from south to north.



It is clear from the diagram that it was facing south.

12. (d) D E X S A J শ্রুতিভঙ্গি  
↓ ↓ ↓ ↓ ↓ ↓  
7 4 5 6 1 3
13. (b) According to Hari, his father's birthday may be on 14th or 15th June.  
According to Hari's sister, their father's birthday may be on 15th, 16th or 17th June.  
Common Date  $\Rightarrow$  15th June
14. (c) The numbers 2, 4, 5 and 6 are on adjacent faces of the number 3. Therefore, number 1 lies opposite to 3.  
The numbers 2, 3 and 5 are on adjacent faces of the number 6. Therefore, the number 4 lies opposite to 6.  
Now, the number 5 lies opposite to 2.
15. (b) There is no 'L' letter in the given word. Therefore, the word THERMAL cannot be formed. শ্রুতিভঙ্গি  
G R A ND M O T H E R  $\Rightarrow$  TREND  
G R A NDMO T H E R  $\Rightarrow$  MODERN  
G RANDMO T H E R  $\Rightarrow$  RANDOM
16. (d) There is no 'E' letter in the given word. Therefore, the word MINISTER cannot be formed.  
A DM I N I STRA T O R S

⇒ STARDOM  
A D M I N I S T R A T O R S

⇒ TRAITOR  
A D M I N I S T R A T O R S

⇒ DORMANT

17. (d) Suppose the present age of son = x years  
Age of father = 2x years প্র্যাচিভর্স  
According to question  
 $x + 5 + 2x + 5 = 85$   
⇒  $3x + 10 = 85$   
⇒  $3x = 85 - 10 = 75$   
⇒ Present age of son

$= x = \frac{75}{3} = 25$  years and Father's present age  
 $= 2x = 50$  years

18. (d) The age of person is 6 years  
His father's age =  $6 \times 6 = 36$  years  
Therefore, the age of his mother  
 $36 - 4 = 32$  years

19. (c) Suppose the present age of the son is x years.  
Therefore, the present age of father will be 3x years.  
According to question প্র্যাচিভর্স  
 $5(x - 8) = 3x - 8$   
⇒  $5x - 40 = 3x - 8$   
⇒  $5x - 3x = 40 - 8$   
⇒  $2x = 32$

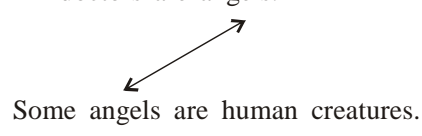
∴  $x = \frac{32}{2} = 16$  years

20. (a)  $1 \times 1 + 1 = 2$   
 $2 \times 2 + 1 = 5$   
 $5 \times 5 + 1 = 26$   
 $26 \times 26 + 1 = 677$

21. (b)  $0 + 6 = 6$   
 $6 + 18 = 24$   
 $24 + 36 = 60$   
 $60 + 60 = 120$   
 $120 + 90 = 210$   
 $210 + 126 = 336$

22. (d)  $> \square \times V \div$   
 $\downarrow \downarrow \downarrow \downarrow \downarrow$   
 $5 \ 9 \ 2 \ 8 \ 1$

23. (d) First Premise is Particular Affirmative (I-type).  
Second Premise is Universal Affirmative (A-type).  
All doctors are angels. প্র্যাচিভর্স



A + I = No Conclusion

24. (d)  $4 - 3 = 1, \quad 1 - 1 = 0$   
 $9 - 6 = 3, \quad 6 - 2 = 4$   
 $12 - 8 = 4, \quad 6 - 3 = 3$  প্র্যাচিভর্স  
 $12 - 10 = 2, \quad 4 - 1 = 3$

25. (d)  $5 + 4 = 9$  and  $9 \times 2 = 18$   
 $6 + 3 = 9$  and  $9 \times 3 = 27$   
 $12 + 4 = 16$  and ?  
 $= \frac{96}{16} = 6$

26. (b) The Kushanas were great patrons of art. It was under the rule of the Kushans that principles were formed for making sculptural images, which continued to influence making of sculptures ever after. During this time, Buddha was first shown in human form (earlier he was represented by symbols like lotus and footsteps). Other Hindu and Jain deities also began to be shown in human form. Mathura and Gandhara were the two main centers of art during the time of the Kushanas. The Gandhara School of Art and the Mathura School of Art developed their own distinct styles. The Gandhara School was highly influenced by Greco-Roman philosophies and mainly concentrated on depicting the image of the Buddha and the legends associated with his life, while the Mathura School drew inspiration from local folk deities and themes from day to day life. প্র্যাচিভর্স

27. (d) Allauddin Khan was a Bengali sarodiya and multiinstrumentalist, composer and one of the most renowned music teachers of the 20th century in Indian classical music. Hema Malini is an Indian actress, director and producer, Bharatanatyam dancerchoreographer, as well as a politician. Brijmohan Mishra popularly known as Pandit Birju Maharaj is currently the leading exponent of the Lucknow Kalka-Bindadin gharana of Kathak dance in India. Pandit Shivkumar Sharma is an Indian Santoor player. The Santoor is a folk instrument from Kashmir and Jammu. প্র্যাচিভর্স

28. (b) The Constitution was enacted by the Constituent Assembly on 26 November, 1949, and came into effect on 26 January, 1950. With its adoption, the Union of India officially became the modern and contemporary Republic of India and it replaced the Government of India Act 1935 as the country's fundamental governing document.

29. (a) The Deccan Traps are a large igneous province located on the Deccan Plateau of west-central India (between 17°–24°N, 73°–74°E) and one of the largest volcanic features on Earth. They consist of multiple layers of solidified flood basalt that together are more than 2,000 m (6,562 ft) thick and cover an area of 500,000 km<sup>2</sup> (193,051 sq mi) and a volume of 512,000 km<sup>3</sup> (123,000 cu mi). The term “trap”, used in geology for such rock formations, is derived from the Swedish word for stairs and refers to the steplike hills forming the landscape of the region. অ্যুচিভর্স
30. (b) Norwegian grandmaster Magnus Carlsen created a unique feat when he won both the World Rapid and World Blitz chess titles in Almaty. The 32-year-old became the holder of all three world chess championship titles – in Classical, Rapid and Blitz – for the third time in his career. As of 2022, no other player has ever won both the Rapid and Blitz titles in the same year. অ্যুচিভর্স
31. (b) The Employment Guarantee Scheme (EGS) underlying the National Rural Employment Guarantee Act is by far one of the largest social safety-net programmes launched anywhere in the developing world. Maharashtra became the first state in India to guarantee work in 1979 following a severe drought. The EGS began in 1972 during the drought period. However, it received statutory basis in 1977 when the Maharashtra Legislative Assembly unanimously voted it as a law of the land. The law became operative from January 26, 1979 with the consent of the President of India.
32. (a) The Battle of the Hydaspes River was fought by Alexander the Great in 326 BC against King Porus of the Hindu Paurava kingdom on the banks of the Hydaspes River (Jhelum River) in the Punjab near Bhera in what is now modern-day Pakistan. The battle resulted in a complete Macedonian victory and the annexation of the Punjab, which lay beyond the confines of the defeated Persian Empire, into the Alexandrian Empire. The battle is historically significant for opening up India for Greek political (Seleucid Empire, Indo-Greeks) and cultural influence (Greco-Buddhist art) which was to continue for many centuries. অ্যুচিভর্স
33. (b) The Constitution declares India to be a sovereign, socialist, secular, democratic republic, assuring its citizens of justice, equality, and liberty, and endeavours to promote fraternity among them. The words “socialist” and “secular” were added to the definition in 1976 by the 42nd constitutional amendment. The word ‘secular’, though was specifically added in the Preamble in the year 1976, yet the original spirit of the Constitution was completely secular in nature. Its insertion into the Preamble has ensured that secularism has now become a source from which the constitutional provisions on secularism draw their authority and it has now become the central object which the Constitution seeks to establish. It is also one of the basic structures of our Constitution and no compromise can be made on this by any government. অ্যুচিভর্স
34. (c) Lakes which form inside calderas (a cauldron-like volcanic feature usually formed by the collapse of land following a volcanic eruption) are called caldera lakes. These lakes form as the created depression is filled by water. For example, Lake Pinatubo, Philippines, formed after the 1991 eruption of Mount Pinatubo filled the depression with water from monsoon rains.
35. (a) Dantidurga (735–756 CE), also known as Dantivarman or Dantidurga II was the founder of the Rashtrakuta Empire of Manyakheta. His capital was based in Gulbarga region of Karnataka. He was succeeded by his uncle Krishna I who extended his kingdom to all of Karnataka. অ্যুচিভর্স
36. (a) Amazon Future Engineer is a program aimed at increasing access to computer science education for children and young adults. It was launched in India in the year 2021. National Education Society for Tribal Students (NESTS), Ministry of Tribal Affairs has partnered with Amazon to empower teachers and students in the field of digital education.
37. (c) Glass transmits visible light but blocks infrared thermal radiation from escaping. This amplifies the heat trapping effect. A solar cooker, or solar oven, is a device which uses the energy of direct sunlight to heat food or drink to cook it or sterilize it. The vast majority of the solar cookers presently in use are relatively cheap, low-tech devices. Because they use no fuel and cost nothing to operate, many nonprofit organizations are promoting their use worldwide to help reduce fuel costs for low-income people, reduce air pollution and slow

- deforestation and desertification, caused by use of firewood for cooking. Solar cooking is a form of outdoor cooking and is often used in situations where minimal fuel consumption is important, or the danger of accidental fires is high. অ্যাচিভার্স
38. (b) Freedom of the press or freedom of the media is the freedom of communication and expression through mediums including various electronic media and published materials. The concept of freedom of speech is often covered by the same laws as freedom of the press, thereby giving equal treatment to spoken and published expression. অ্যাচিভার্স
39. (a) Babur died on December 26, 1530 at Agra. Though he wished to be buried in his favourite garden in Kabul, a city he had always loved, he was first buried in a mausoleum in the capital city of Agra. His remains were later moved to Bagh-e Babur (Babur Gardens) in Kabul, Afghanistan. The Persian inscription on his tomb there translates as “If there is a paradise on earth, it is this, it is this, it is this!” অ্যাচিভার্স
40. (c) Farakka Barrage is a barrage across the Ganges River, located in the Indian state of West Bengal, roughly 16.5 kilometres from the border with Bangladesh near Chapai Nawabganj District. The Tehri Dam is a multi-purpose rock and earth-fill embankment dam on the Bhagirathi River near Tehri in Uttarakhand. The Ranjit Sagar Dam, also known as the Thein Dam, is part of a hydroelectric project constructed by the Government of Punjab on the Ravi River in the state of Punjab. Nagarjuna Sagar Dam is the world’s largest masonry dam at the time of its construction, which is built across Krishna River at Nagarjuna Sagar in Guntur district & Nalgonda district of Andhra Pradesh. অ্যাচিভার্স
41. (d) Lactic acid, also known as milk acid, is a chemical compound that plays a role in various biochemical processes and was first isolated in 1780 by the Swedish chemist Carl Wilhelm Scheele. Lactic acid is a carboxylic acid with the chemical formula  $C_3H_6O_3$ . Lactic acid is found primarily in sour milk products, such as koumiss, laban, yogurt, kefir, and some cottage cheeses. The casein in fermented milk is coagulated (curdled) by lactic acid. Lactic acid is also responsible for the sour flavor of sour dough breads. This acid is used in beer brewing to lower the wort pH in order to reduce some undesirable substances such as tannins without giving off-flavors such as citric acid and increase the body of the beer. অ্যাচিভার্স
42. (b) Marginal cost is the change in total cost that arises when the quantity produced changes by one unit. That is, it is the cost of producing one more unit of a good. In general terms, marginal cost at each level of production includes any additional costs required to produce the next unit.
43. (d) Luiz Inácio Lula da Silva took office for a third term as Brazil’s President, after the divisive election in October. The outgoing leader of the Latin America’s biggest economy is Jair Bolsonaro. The 77-year-old ex-metalworker Lula da Silva previously led Brazil from 2003 to 2010. অ্যাচিভার্স
44. (b) Formic acid is the simplest carboxylic acid. Its chemical formula is  $HCOOH$  or  $HCO_2H$ . It is an important intermediate in chemical synthesis and occurs naturally, most notably in the venom of bee and ant stings. Citric acid is a weak organic acid. It is a natural preservative/conservative and is also used to add an acidic, or sour, taste to foods and soft drinks. Citric acid exists in greater than trace amounts in a variety of fruits and vegetables, most notably citrus fruits. Lemons and limes have particularly high concentrations of the acid; it can constitute as much as 8% of the dry weight of these fruits. Tartaric acid is a white crystalline diprotic organic acid. It occurs naturally in many plants, particularly grapes, bananas, and tamarinds, is commonly combined with baking soda to function as a antioxidant.
45. (d) Through the mediation of Sir Tej Bahadur Sapru and Sri Jayakar, a pact was concluded between Gandhiji and Lord Irwin on March 5, 1931. According to this Pact, the Government agreed: অ্যাচিভার্স
- (a) to withdraw all ordinances and cases pending against the political workers.
- (b) to release all political prisoners except those who were guilty of violence
- (c) to permit the persons living within a certain distance from the sea-shores to collect and or manufacture salt without being tax and so on.
46. (b) Garba is an Indian form of dance that originated in the Gujarat region. The name is derived from the Sanskrit term Garbha (“womb”) and Deep (“a small earthenware lamp”).

47. (d) The first enzyme molecule to be isolated in pure crystalline form was urease, prepared from the jack bean in 1926 by American biochemist J. B. Sumner, who suggested, contrary to prevailing opinion, that the molecule was a protein. In the period from 1930 to 1936, pepsin, chymotrypsin, and trypsin were successfully crystallized; it was confirmed that the crystals were protein, and the protein nature of enzymes was thereby firmly established. Urease is found in bacteria, yeast, and several higher plants. শ্রুতিভঙ্গি
48. (b) Nepal Prime Minister Pushpa Kamal Dahal Prachand inaugurated the country's third international airport in Pokhara built with Chinese assistance. The Pokhara Regional International Airport (PRIA), a flagship project of Nepal-China Belt and Road Initiative (BRI) cooperation, was constructed with Chinese loan assistance. Besides the Tribhuvan International Airport in Kathmandu, Gautam Buddha International Airport was upgraded as international airport in May 2022.
49. (a) Guru Shikhar Peak is the highest peak of the state of Rajasthan (1722 metres).
50. (b) The Indian constitution under Article 123 gives special legislative powers to President of India for promulgating ordinance under certain circumstances. If a legislation is warranted at a time when the legislature is not in session, the President on the request of the executive can issue an ordinance having the force and effect of an Act. However every such ordinance must be laid before both the Houses of Parliament and shall cease to operate, on the expiry of six weeks from the date of its reassembly, unless approved by the Parliament. The ordinance also becomes in operative if before the expiry of six weeks a resolution is passed by Parliament against it. The ordinance remains in force for 6 months. শ্রুতিভঙ্গি
51. (a) Let the number be  $10x + y$   
 After interchanging the digits, the number obtained =  $10y + x$   
 According to the question,  
 Resulting number  
 =  $10x + y + 10y + x$   
 =  $11x + 11y$   
 =  $11(x + y)$  which is exactly divisible by 11.
52. (c) Here, the first divisor 192 is a multiple of second divisor 16.

- ∴ Required remainder  
 = remainder obtained by dividing 54 by 16 = 6
53. (b)  $\frac{6}{7} = \frac{6 \times 8}{7 \times 8} = \frac{48}{7}$  শ্রুতিভঙ্গি  
 $\frac{6}{8} = \frac{6}{7 \times 8} = \frac{3}{28}$   
 ∴ Required difference  
 =  $\frac{48}{7} - \frac{3}{28}$   
 =  $\frac{192 - 3}{28} = \frac{189}{28} = \frac{27}{4} = 6\frac{3}{4}$
54. (b) LCM of 4, 6, 8, 9  

2	4, 6, 8, 9
2	2, 3, 4, 9
3	1, 3, 2, 9
	1, 1, 2, 3

 ∴ LCM =  $2 \times 2 \times 3 \times 2 \times 3 = 72$   
 ∴ Required number = 72, because it is exactly divisible by 4, 6, 8 and 9 and it leaves remainder 7 when divided by 13.
55. (a) LCM of 15, 20 and 35 = 420  
 ∴ Required least number  
 =  $420 + 8 = 428$
56. (b)  $\left[ \frac{13}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left( \frac{5}{2} - \frac{3-2}{12} \right) \right\} \right] \div \frac{13}{6}$   
শ্রুতিভঙ্গি  
 =  $\left[ \frac{13}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left( \frac{5}{2} - \frac{1}{12} \right) \right\} \right] \div \frac{13}{6}$   
 =  $\left[ \frac{13}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \left( \frac{30-1}{12} \right) \right\} \right] \div \frac{13}{6}$   
 =  $\left[ \frac{13}{4} \div \left\{ \frac{5}{4} - \frac{1}{2} \times \frac{29}{12} \right\} \right] \div \frac{13}{6}$   
 =  $\left[ \frac{13}{4} \div \left\{ \frac{30-29}{24} \right\} \right] \div \frac{13}{6}$   
 =  $\left[ \frac{13}{4} \div \frac{1}{24} \right] \div \frac{13}{6}$   
শ্রুতিভঙ্গি  
 =  $\left[ \frac{13}{4} \times 24 \right] \div \frac{13}{6}$   
 =  $13 \times 6 \times \frac{6}{13} = 36$

57. (d)  $3\overline{.36} - 2\overline{.05} + 1\overline{.33}$

$$= 3\frac{36}{99} - 2\frac{05}{99} + 1\frac{33}{99}$$

$$= 3 + \frac{36}{99} - 2 - \frac{5}{99} + 1 + \frac{33}{99}$$

$$= (3 - 2 + 1) + \left(\frac{36}{99} - \frac{5}{99} + \frac{33}{99}\right)$$

$$= 2 + \left(\frac{36 - 5 + 33}{99}\right)$$

$$= 2 + \frac{64}{99} = 2\frac{64}{99} = 2.\overline{64}$$

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58. (a) Expression

$$= \frac{16}{3} \div \frac{11}{9} \times \frac{1}{4} \left(10 + \frac{3}{5-1}\right)$$

$$= \frac{16}{3} \div \frac{9}{11} \times \frac{1}{4} \left(10 + \frac{15}{4}\right)$$

$$= \frac{16}{3} \div \frac{9}{11} \times \frac{1}{4} \left(\frac{40+15}{4}\right)$$

$$= \frac{16}{3} \times \frac{9}{11} \times \frac{1}{4} \times \frac{55}{4} = 15$$

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59. (b) Sum of remaining 10 numbers

$$= 12 \times 15 - 2 \times 14$$

$$= 180 - 28 = 152$$

∴ Required average =  $\frac{152}{10} = \frac{76}{5} = 15\frac{1}{5}$

60. (b) Required average

$$= \frac{3+5+7+9+11+13+15+17+19+21}{10}$$

$$= \frac{120}{10} = 12$$

61. (c) Original number of boys = 5x  
Original number of girls = 3x

∴  $\frac{5x - 50}{3x + 50} = \frac{9}{7}$

$$\Rightarrow 35x - 350 = 27x + 450$$

$$\Rightarrow 35x - 27x = 350 + 450$$

$$\Rightarrow 8x = 800$$

$$\Rightarrow x = 100$$

Number of boys = 5x  
= 5 × 100 = 500

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62. (b) Boys : Girls = 7 : 5

Number of boys =  $\frac{7}{12} \times 720 = 420$

Number of girls =  $\frac{5}{12} \times 720 = 300$

Let x girls be admitted.  
According to the question, 420 = 300 + x  
⇒ x = 420 - 300 = 120

প্র্যাচিভর্স

63. (c)  $80 \times \frac{y}{100} \times \frac{x}{100} = \frac{900 \times 25}{100}$

$$\Rightarrow \frac{xy \times 80}{10000} = 9 \times 25$$

$$\Rightarrow xy = \frac{9 \times 25 \times 10000}{80} = 28125$$

64. (a) Percentage of children  
= (100 - 54 - 32)% = 14%

According to the question,  
∴ 14% = 196

∴ 1% =  $\frac{196}{14} = 14$

∴ 54% = 54 × 14 = 756 men

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65. (b)  $\frac{1}{(a+b)(b+c)} + \frac{1}{(a+c)(b+a)} + \frac{1}{(c+a)(c+b)}$

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

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

= 0 [∵ a + b + c = 0]

66. (d) x = 3 + 2√2

$$\therefore \frac{1}{x} = \frac{1}{3+2\sqrt{2}}$$

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

$$= \frac{3-2\sqrt{2}}{9-8}$$

$$= 3-2\sqrt{2}$$

x +  $\frac{1}{x}$  = 3 + 2√2 + 3 - 2√2 = 6

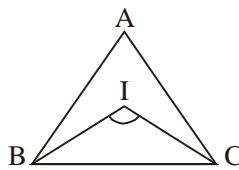
$$\therefore x^2 + \frac{1}{x^2} = \left(x + \frac{1}{x}\right)^2 - 2$$

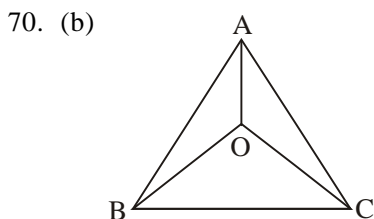
$$= (6)^2 - 2 = 36 - 2 = 34$$

প্র্যাচিভর্স

67. (c)  $a \sin\theta + b \cos\theta = c \dots$  (i)  
 $a \cos\theta - b \sin\theta = x$  (let) ... (ii)  
 On squaring equations (i) and (ii) and adding,  
 $a^2 \sin^2\theta + b^2 \cos^2\theta + 2ab \sin\theta$   
 $\cos\theta + a^2 \cos^2\theta + b^2 \sin^2\theta - 2ab - \sin\theta \cdot \cos\theta = c^2 + x^2$   
 $\Rightarrow a^2 (\sin^2\theta + \cos^2\theta) + b^2 (\cos^2\theta + \sin^2\theta) = c^2 + x^2$   
 $\Rightarrow a^2 + b^2 = c^2 + x^2$  প্র্যাচিভার্স  
 $\Rightarrow x^2 = a^2 + b^2 - c^2$   
 $\Rightarrow x = \pm \sqrt{a^2 + b^2 - c^2}$

68. (c)  $\sin\theta + \cos\theta = \sqrt{2} \sin(90^\circ - \theta)$   
 $\Rightarrow \sin\theta + \cos\theta = \sqrt{2} \cos\theta$   
 $\Rightarrow \sin\theta = \sqrt{2} \cos\theta - \cos\theta$   
 $\Rightarrow \sin\theta = \cos\theta (\sqrt{2} - 1)$   
 $\Rightarrow \frac{\cos\theta}{\sin\theta} = \frac{1}{\sqrt{2} - 1}$   
 $\Rightarrow \cot\theta = \frac{1}{\sqrt{2} - 1}$   
 $\Rightarrow \cot\theta = \frac{1}{\sqrt{2} - 1} \times \frac{(\sqrt{2} + 1)}{(\sqrt{2} + 1)}$   
 $\Rightarrow \frac{\sqrt{2} + 1}{2 - 1} = \sqrt{2} + 1$  প্র্যাচিভার্স

69. (c)   
 $\angle IBC = \frac{70^\circ}{2} = 35^\circ;$   
 $\angle ICB = \frac{50^\circ}{2} = 25^\circ;$   
 $\therefore \angle BIC = 180^\circ - 35^\circ - 25^\circ$   
 $= 180^\circ - 60^\circ = 120^\circ$  প্র্যাচিভার্স



BO, CO and AO are internal bisectors of  $\angle B$ ,  $\angle C$  and  $\angle A$  respectively.

$$\therefore \angle BOC = 90^\circ + \frac{\angle A}{2}$$

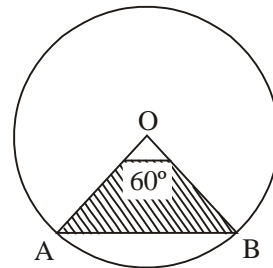
$$\Rightarrow 120^\circ = 90^\circ + \frac{\angle A}{2}$$

$$\Rightarrow \frac{\angle A}{2} = 120^\circ - 90^\circ = 30^\circ$$

$$\therefore \angle A = 30^\circ \times 2 = 60^\circ$$
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71. (d)  $l + b + h = 24$  [given]  
 $l^2 + b^2 + h^2 = 225$  [given]  
 $\therefore (l + b + h)^2$   
 $= l^2 + b^2 + h^2 + 2(lb + bh + hl)$   
 $\Rightarrow (24)^2 = 225 + 2(lb + bh + hl)$   
 $\Rightarrow 2(lb + bh + hl)$   
 $= 576 - 225 = 351 \text{ sq. cm.}$

72. (a) Let the radius of the circle be  $r$  cm.



According to the question,

$$2\pi r = 11 \Rightarrow 2 \times \frac{22}{7} r = 11$$
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$$\Rightarrow r = \frac{11 \times 7}{2 \times 22} = \frac{7}{4} \text{ cm}$$

$\therefore$  Area of the sector AOB

$$= \frac{\theta}{360^\circ} \times \pi r^2$$

$$= \frac{60^\circ}{360^\circ} \times \frac{22}{7} \times \frac{7}{4} \times \frac{7}{4} \text{ sq.cm}$$

$$= \frac{77}{48} = 1 \frac{29}{48} \text{ sq.cm.}$$

73. (b) Expression =  $\frac{x^4 - \frac{1}{2}}{3x^2 + 5x - 3}$  প্র্যাচিভার্স

Dividing numerator and denominator by  $x$ ,

$$= \frac{x^3 - \frac{1}{3}}{x} = \frac{x^3 - \frac{1}{3}}{\frac{x}{3}}$$

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

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

$$= \frac{1+3}{3+5} = \frac{4}{8} = \frac{1}{2}$$

74. (c)  $x^2 - 3x + 1 = 0$   
 $\Rightarrow x^2 + 1 = 3x$

$$\Rightarrow \frac{x^2 + 1}{x} = 3$$

$$\Rightarrow x + \frac{1}{x} = 3 \quad \dots\dots(i)$$

$$\therefore \frac{x^6 + x^4 + x^2 + 1}{x^3}$$

$$= \frac{x^6}{x^3} + \frac{x^4}{x^3} + \frac{x^2}{x^3} + \frac{1}{x^3}$$

$$= x^3 + x + \frac{1}{x} + \frac{1}{x^3}$$

$$= \left(x^3 + \frac{1}{x^3}\right) + \left(x + \frac{1}{x}\right)$$

$$= \left(x + \frac{1}{x}\right)^3 - 3 \cdot x \cdot \frac{1}{x} \left(x + \frac{1}{x}\right) + \left(x + \frac{1}{x}\right)$$

$$= 3^3 - 3 \times 3 + 3 = 27 - 9 + 3 = 21$$

75. (d)  $x = 997$

$y = 998$

$z = 999$

$\therefore x - y = 997 - 998 = -1$

$y - z = 998 - 999 = -1$

$z - x = 999 - 997 = 2$

$\therefore x^2 + y^2 + z^2 - xy - yz - zx$

$$= \frac{1}{2}(2x^2 + 2y^2 + 2z^2 - 2xy - 2yz - 2zx)$$

$$= \frac{1}{2}(x^2 + y^2 - 2xy + y^2 + z^2 - 2yz + x^2 + z^2 - 2zx)$$

$$= \frac{1}{2}[(x - y)^2 + (y - z)^2 + (z - x)^2]$$

$$= \frac{1}{2}[(-1)^2 + (-1)^2 + (2)^2]$$

$$= \frac{1}{2}(1 + 1 + 4) = \frac{1}{2} \times 6 = 3$$

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76. (c) Here, **Future Perfect Continuous** i.e. **I will have been** is the right usage. The sentence shows future time.

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77. (a) **No error**

78. (b) **Structure in Future Continuous Tense is as follows :**

**Sub. + will/shall + be + Pr.Part.(V.)**

$\downarrow \qquad \qquad \downarrow \qquad \qquad \downarrow \qquad \qquad \downarrow$   
 I \qquad \qquad Shall \qquad \qquad be \qquad \qquad looking

79. (d) **leave behind (Phr. V.)** : to have family remaining after your death  
 Here, **behind** is the right usage.

80. (c) Here, **stands as** is the right usage.

81. (c) Here, **as well as of a** is the right usage.

82. (d) **prejudices (Noun)** : unreasonable dislike of or preferences for a person, group, custom, etc.  
 Here, **prejudices** is the right usage.

83. (a) **averted (Verb)** : turned away; prevented; kept from happening

**controlled (Verb)** : restrained or managed or kept within certain bounds

**restrained (Adj.)** : kept under control

Here, **averted** is the right usage.

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84. (d) **stubborn**

**obdurate (Adj.)** : refusing to change your mind; stubborn, obstinate.

85. (a) **sluggishness**

**lassitude (N.)** : feeling very tired.

86. (c) **plentiful**

**Copious (Adjective)** = in large amount; abundant

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**Look at the sentence :**

He supports his theory with copious evidence.

87. (d) **a man of letters** : a scholar and a writer

- He was a distinguished statesman and a **man of letters**.

The best option is **proficient in literary art**.

88. (b) **to pay off old scores** : get revenge on someone for some grievance

- Rishabh was satisfied as he had **paid off old scores** by beating Rohan's little sister.

The best option is **to take revenge**.

89. (c) **red - letter day** : an important day

- 15th August is a **red-letter day** in the history of India.

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The best option is **a day memorable for some joyful event**.

90. (a) **scapegoats** : a person blamed for something bad that somebody else has done or for some failure; fall guy

- Her supporters see her as a **scapegoat** for a policy that failed.



The best option is **punished for others misdeeds.**

91. (c) **Amiable (Adjective)** = having or displaying a friendly and pleasant manner; amicable; cordial; friendly.

**Irascible (Adjective)** = irritable; short-tempered; showing a tendency to be easily angered; easily provoked

**Look at the sentences :**

He has an irascible disposition. The amiable young man greeted me enthusiastically.

92. (a) **Joyful (Adjective)** = very happy; cheerful, joyous delightful.

**Forlorn (Adjective)** = appearing lonely and unhappy; abandoned.

**Look at the sentences :**

She looked so forlorn, standing there in the rain.

The news of the child's safe return made us all joyful.

93. (a) **Docile (Adjective)** = ready to accept instruction; submissive; dutiful; obedient; compliant.

**Obstinate (Adjective)** = stubbornly refusing to change one's opinions; wilful; unyielding; obdurate.

**Look at the sentences :**

She nurses an obstinate determination to pursue a career in television.

This company has cheap and docile workforce.

94. (b) **effeminate**

**effeminate (Adj.)** : looking, behaving or sounding like a woman or a girl (of a man/ boy)

**unmanly (Adj.)** : not having the qualities that are admired/ expected in a man

**womanish (Adj.)** : behaving in a way that is more suitable for a woman (of a man)

**delicate (Adj.)** : fragile; easily damaged/broken

95. (c) **illegible**

**illegible (Adj.)** : impossible/ difficult to read

**unintelligible (Adj.)** : impossible to understand

**eligible (Adj.)** : a person who is able to have/ do something because he has the right qualifications, is the right age, etc.

**illogical (Adj.)** : not sensible/ thought out in a sensible way.

96. (d) **the most resourceful**

97. (d) **knack of saving up**

98. (b) **when they begin**

99. (a) **see them scampering**

100. (a) **their nest is secure**