

SAMPLE Question Paper

1

Maximum Marks : 300

Time : 60 Minutes

General Instructions :

- (i) This paper consists of 75 MCQs, attempt any 60 out of 75
- (ii) Correct answer or the most appropriate answer: Five marks (+5)
- (iii) Any incorrect option marked will be given minus one mark (-1)
- (iv) Unanswered/Marked for Review will be given no mark (0)
- (v) If more than one option is found to be correct then Five marks (+5) will be awarded to only those who have marked any of the correct options
- (vi) If all options are found to be correct then Five marks (+5) will be awarded to all those who have attempted the question.
- (vii) Calculator / any electronic gadgets are not permitted.

1. Name the Sikh Guru who developed the Gurmukhi script for writing the Punjabi language?
 - (1) Guru Hargobind
 - (2) Guru Tegh Bahadur
 - (3) Guru Angad
 - (4) Guru Ram Das
2. Fertile riverine alluvial soil is best suited for producing _____.
 - (1) Rice
 - (2) Tea
 - (3) Cotton
 - (4) Corn
3. Andaman and Nicobar Islands is a group of _____ islands/islets?
 - (1) 275
 - (2) 450
 - (3) 780
 - (4) 572
4. 49th Parallel is the boundary line between which two countries?
 - (1) USA and Canada
 - (2) North and South Vietnam
 - (3) Germany and France
 - (4) Brazil and Chile
5. In which part of the Indian Constitution are centre-state relations mentioned?
 - (1) Part IV (Article 227 to 234)
 - (2) Part XI (Article 245 to 255)
 - (3) Part X (Article 234 to 240)
 - (4) Part XII (Article 265 to 277)
6. Manipur, Meghalaya and Tripura became states under _____.
 - (1) North Eastern Retention (Reconstruction) Act, 1971
 - (2) North Eastern Republic of India Act, 1972
 - (3) North Eastern Region Nw State Act, 1972
 - (4) North-Eastern Areas (Reorganisation) Act, 1971
7. The amount of light entering into eye can be controlled and regulated by _____.
 - (1) Iris
 - (2) Cornea
 - (3) Pupil
 - (4) Retina
8. Tipu Sultan and British East India Company signed the Treaty of Mangalore in the year _____.
 - (1) 1792
 - (2) 1784
 - (3) 1764
 - (4) 1799
9. Who among the following gave the 'Gandhian Plan' in 1944?
 - (1) D. D. Dhar
 - (2) S. N. Agarwal
 - (3) M. N. Roy
 - (4) J. P. Narayan
10. 'Inclusive Growth' was the objective of which Five Year Plan?
 - (1) Tenth
 - (2) Eleventh
 - (3) Twelfth
 - (4) Ninth
11. Where is headquarters of European Union located?
 - (1) London
 - (2) Paris
 - (3) Brussels
 - (4) Bonn
12. The Aligarh Movement was started by _____.
 - (1) Dr. Maghroor Ahmad Ajazi
 - (2) Muhammad Ali Jinnah
 - (3) Maulana Manzoor Ahsan
 - (4) Syed Ahmed Khan

- 13.** Which of the following is not a computer language?
I. C++
II. Java
III. Linux
 (1) Only I (2) Only III
 (3) II and III (4) I and II
- 14.** Which one among the following is a main system board of a computer?
 (1) CPU (2) Keyboard
 (3) Microchip (4) Mother board
- 15.** Amartya Sen was awarded the Nobel Prize for his contribution to
 (1) Monetary Economics
 (2) Welfare Economics
 (3) Econometrics
 (4) Development Economics
- 16.** Surendranath Banerjee and Ananda Mohan Bose founded _____ in Bengal in 1876.
 (1) Bengal Association
 (2) Indian Association
 (3) Tathagat Association
 (4) Oriental Association
- 17.** Blood is a:
 (1) Connective tissue
 (2) Epithelial tissue
 (3) Muscular tissue
 (4) Reproductive tissue
- 18.** Beak is formed by
 (1) Cheeks (2) Jaws
 (3) Teeth (4) None
- 19.** In which calendar month of every year, each one of the first four dates (i.e., from 1st to 4th) is observed as a World/International Day for a specific purpose?
 (1) June (2) July
 (3) September (4) October
- 20.** A geostationary satellite revolves round the earth from
 (1) East to West
 (2) West to East
 (3) North to South
 (4) South to North
- 21.** Which of the following is the study of soil?
 (1) Mineralogy (2) Pedology
 (3) Glaciology (4) Cosmology
- 22.** Which one of the following is NOT a natural fiber?
 (1) Terylene (2) Jute
 (3) Flax (4) Wool
- 23.** Which of the following is good insulator?
 (1) Mercury (2) Cadmium
 (3) Germanium (4) Glass
- 24.** The term 'Pitcher' is associated with:
 (1) Wrestling (2) Boxing
 (3) Baseball (4) Basketball
- 25.** The Biraja Temple, the Rajarani Temple and the Samaleswari Temple are all located in _____
 (1) Odisha (2) Assam
 (3) Tamil Nadu (4) Kerala
- 26.** If the 8-digit number $789x531y$ is divisible by 72. Then the value of $(5x - 3y)$ is:
 (1) 0 (2) -1
 (3) 2 (4) 1
- 27.** A man wills 40% of his wealth to his wife and rest to his children. What percent of the wealth willed to the wife do the children get?
 (1) 150 (2) 66.6
 (3) 50 (4) 20
- 28.** The arithmetic mean of the following numbers
 1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 5, 5, 5, 5, 5, 6, 6, 6, 6, 6 and
 7, 7, 7, 7, 7, 7, 7, is
 (1) 4 (2) 5
 (3) 14 (4) 20
- 29.** A dealer sells a machine having marked price as Rs. 3840 at a discount of 20%. What is the selling price (in Rs.) of the machine?
 (1) 3072 (2) 3500
 (3) 4608 (4) 3240
- 30.** Two pipes of length 1.5 m and 1.2 m are to be cut into equal pieces without leaving any extra length of pipes. The greatest length of the pipe pieces of same size which can be cut from these two lengths will be
 (1) 0.13 metre (2) 0.4 metre
 (3) 0.3 metre (4) 0.41 metre
- 31.** If the simple interest on Re. 1 for 1 month is 1 paisa, then the rate per cent per annum will be
 (1) 10% (2) 8%
 (3) 12% (4) 6%
- 32.** Two numbers whose sum is 84 can not be in the ratio
 (1) 5 : 7 (2) 13 : 8
 (3) 1 : 3 (4) 3 : 2
- 33.** Profit obtained on selling an article for ₹ 310 is equal to the loss incurred on selling that article for ₹ 230. What will be the loss percentage when selling price is ₹ 180?

- (1) $16\frac{1}{3}$ (2) $16\frac{2}{3}$
 (3) $33\frac{1}{3}$ (4) $33\frac{2}{3}$
- 34.** The cost price of a chair is 25% less than the cost price of a table. If a man sells 5 chairs at the cost price of 7 tables, what is his profit per cent?
 (1) 33.33 (2) 45
 (3) 86.66 (4) 96
- 35.** A boat moves downstream at the rate of 8 km per hour and upstream at 4 km per hour. The speed of the boat in still waters is:
 (1) 4.5 km per hour (2) 5 km per hour
 (3) 6 km per hour (4) 6.4 km per hour
- 36.** If $(1101)^2 = 1212201$, find the value of $\sqrt{121.2201}$.
 (1) 110.1 (2) 11.01
 (3) 1.101 (4) 11.001
- 37.** Three men A, B and C working together can do a job in 6 hours less time than A alone, in 1 hour less time than B alone and in one half the time needed by C when working along. Then A and B together can do the job in
 (1) $\frac{2}{3}$ (2) $\frac{3}{4}$
 (3) $\frac{3}{2}$ (4) $\frac{4}{3}$
- 38.** A takes three times as long as B and C together to do a job. B takes four times as long as A and C together to do the work. If all the three, working together can complete the job in 24 days, then the number of days. A alone will take to finish the job is
 (1) 100 (2) 96
 (3) 95 (4) 90
- 39.** If p, q, r are in Geometric Progression, then which is true among the following?
 (1) $q = \frac{p+r}{2}$ (2) $p^2 = qr$
 (3) $q = \sqrt{pr}$ (4) $\frac{p}{r} = \frac{r}{q}$
- 40.** ABC is an isosceles triangle where $AB = AC$ which is circumscribed about a circle. If P is the point where the circle touches the side BC, then which of the following is true?
 (1) $BP = PC$ (2) $BP > PC$
 (3) $BP < PC$ (4) $BP = \frac{1}{2} PC$
- 41.** In an isosceles triangle ABC, $AB = AC$, $XY \parallel BC$. If $\angle A = 30^\circ$, then $\angle BXY = ?$
 (1) 75° (2) 30°
 (3) 150° (4) 105°
- 42.** Between 10 pm and 6 am, a fitness band records the following data. Refer the following data table and answer the question.
- | | |
|-----------------------|----|
| Deep sleep | 15 |
| Dreaming | 15 |
| Light sleep | 5 |
| Extremely light sleep | 30 |
| Awake | 35 |
- How long was the user in Deep Sleep or was Awake?
 (1) 3.5 hours (2) 2.5 hours
 (3) 4.5 hours (4) 4 hours
- 43.** The milk and water in two vessels A and B are in the ratio 4 : 3 and 2 : 3 respectively. In what ratio, the liquids in both the vessels be mixed to obtain a new mixture in vessel C containing half milk and half water?
 (1) 7 : 5 (2) 5 : 2
 (3) 3 : 11 (4) 1 : 2
- 44.** If a, b are rational numbers and $(a - 1)\sqrt{2} + 3 = b\sqrt{2} + a$, the value of $(a + b)$ is
 (1) -5 (2) 3
 (3) -3 (4) 5
- 45.** If $x = 3 - 2\sqrt{2}$, then $\sqrt{x} + \frac{1}{\sqrt{x}}$ is equal to
 (1) 0 (2) 1
 (3) 2 (4) $2\sqrt{2}$
- 46.** The radius of the incircle of an equilateral $\triangle ABC$ of side $2\sqrt{3}$ units is x cm. The value of x is:
 (1) $\frac{1}{3}$ (2) $\frac{1}{2}$
 (3) 1 (4) $\sqrt{3}$
- 47.** If diagonals of a rhombus are 16 cm and 30 cm. What is the perimeter (in cm) of the rhombus?
 (1) 32 (2) 64
 (3) 34 (4) 68
- 48.** Two trains leave Varanasi for Lucknow at 11:00 AM and at 11:30 AM respectively and travel at speeds of 110 km/h and 140 km/h, respectively. How many kilometres from Varanasi will both trains meet?
 (1) $256\frac{2}{3}$ km (2) $255\frac{1}{3}$ km
 (3) $246\frac{1}{3}$ km (4) $238\frac{2}{3}$ km

49. A person goes to his office by scooter at the speed of 50 km/hr and reaches 10 minutes earlier. If he goes at the speed of 40 km/hr, then he reaches 20 minutes late. What will be the speed (in km/hr) of the scooter to reach on time?

- (1) $47\frac{4}{13}$ (2) $46\frac{2}{13}$
 (3) $48\frac{2}{13}$ (4) $47\frac{2}{13}$

50. In how many years will a sum of ₹ 800 at 10% per annum compounded semi-annually become ₹ 926.10?

- (1) $2\frac{1}{2}$ years (2) 3 years
 (3) 2 years (4) $1\frac{1}{2}$ years

51. Select the option in which the words share the same relationship as that shared by the given pair of words.

Dentist : Doctor

- (1) Biology : Astrology
 (2) Chemistry : Science
 (3) Algebra : Geometry
 (4) Line : Circle

52. In a code language, if 'I like chocolates' is written as '958', 'we bought chocolates' is written as '153' and 'we like them' is written as '816', then how would 'I bought them' be written in this language?

- (1) 859 (2) 251
 (3) 936 (4) 951

53. In a class of 42 students, Swati's rank is 19th from the bottom. Purshottam is 6 ranks below Swati. What is Purshottam's rank from the top?

- (1) 30th (2) 32nd
 (3) 33rd (4) 34th

54. If the minute hand of a clock points towards the South at 12 : 00 a.m., then in which direction will the minute hand point at 3 : 00 a.m. in the same clock?

- (1) North (2) South
 (3) West (4) East

55. Select the option in which the number set shares the same relationship as that shared by the given number set.

(17, 24, 45)

- (1) (19, 26, 34) (2) (18, 23, 46)
 (3) (15, 20, 43) (4) (12, 19, 40)

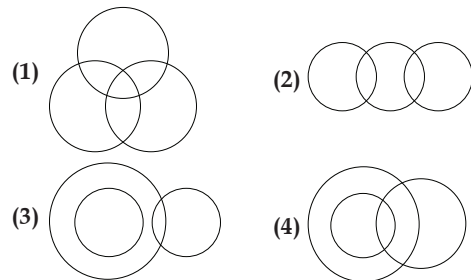
56. In a code language 'BLOCK' is written as '31316412'. How will 'SUPREME' be written in that language?

- (1) 202217196146 (2) 192116185605
 (3) 202317206146 (4) 192217196156

57. There are two couples in a family. Komali has two children, Madhurima is the wife of Omprakash, who is the brother of Mani. Pinky is the daughter of Komali. Urmila is the sister of Sanju, who is the son of Omprakash. Tarun is the son of Mani, who is a male. How is Madhurima related to Komali?

- (1) Sister
 (2) Aunt
 (3) Mother
 (4) Sister-in-law

58. Select the Venn diagram that best illustrates the relationship among the following classes: Uncle, Relatives, Rich



59. Read the given statements and conclusions carefully. Assuming that the information given in the statements is true, even if it appears to be at variance with commonly known facts, decide which of the given conclusions logically follow(s) from the statements.

Statements:

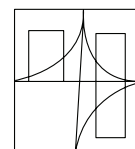
- I. All polygons are angles.
 II. All angles are diagonals.
 III. All cones are cubes.
 IV. All cubes are decagons.
 V. No diagonal is a cube.

Conclusions:

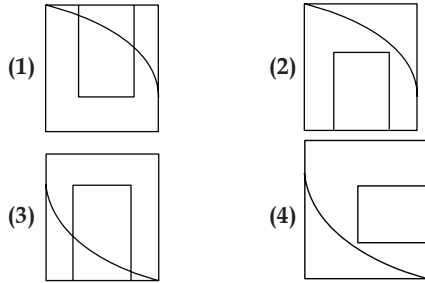
- I. Some diagonals are polygons.
 II. All diagonals are decagons.
 III. No polygon is a cone.
 IV. Some cubes are angles.
 (1) Both conclusions II and IV follow.
 (2) Only conclusion I follows.
 (3) Both conclusions I and II follow.
 (4) Both conclusions I and III follow.

60. Which answer figure will complete the pattern in the question figure?

Question Figure:



Answer Figures:



61. Which number will follow next in the given series?
3, 16, 29, 42, ?

- (1) 57 (2) 55
(3) 54 (4) 61

62. Six friends A, B, C, D, E and F are sitting around a round table facing the centre. C is seated between A and B, B is in immediate left of D. If C is facing E, who is facing F?

- (1) E (2) A
(3) D (4) B

63. Select the correct option that will fill in the blank and complete the series.
dmt, fkv, ihy, mdc,

- (1) ryh (2) rzh
(3) qzl (4) rxi

64. In the following question, two statements are given each followed by two conclusions I and II. You have to consider the statements to be true even if they seem to be at variance from commonly known facts. You have to decide which of the given conclusions, if any, follows from the given statements.

Statements:

- (I) Major companies are nowadays surviving because of the strong supply chain system.
(II) Supply chain comprises of logistics, retailers and distributors.

Conclusions:

- (I) Retailers play most important role because they interact with customers on first hand.
(II) If an organization has strong logistics, then product can easily be available to the customers in such an era of competition.

- (1) Only Conclusion II follows
(2) Conclusion I and II both follow
(3) Neither I nor II follow
(4) Only Conclusion I follows

65. Select the correct option that is related to the third term in the same way as the second term is related to the first term.

Television : Telecast :: Radio : ?

- (1) Broadcast (2) Friendship
(3) Compose (4) Talking

66. Mohini is taller than Nita but not shorter than Sarita. Sarita and Malini are of same height. Mohini is shorter than Hema. Among them, who is the second tallest?

- (1) Mohini
(2) Nita
(3) Hema
(4) Cannot be determined

67. Ramesh is the father of Manideep. Ramesh has only two children. Manideep is the brother of Niharika. Niharika is the daughter of Kavita. Ananya is the granddaughter of Kavita. Sujit is the father of Ananya. How is Sujit related to Manideep?

- (1) Soni (2) Brother
(3) Brother-in-law (4) Son-in-law

68. Which two signs/numbers need to be interchanged to make the given equation correct?

$$8 \div 2 + 4 = 10$$

- (1) \div and $+$, 8 and 4
(2) \div and $+$
(3) $+$ and \div , 8 and 2
(4) $+$ and \div , 2 and 4

69. From a point D Sarita Walked 50 metres to the North, then after turning to right walked 50 metres. She again turned right and walked another 70 metres and finally turned to right and walked 50 metres. In which direction and at what distance is she from the starting point D?

- (1) 20 metres to the North
(2) 40 metres to the South
(3) 20 metres to the South
(4) 30 metres to the South

70. Select the correct option that will fill in the blank and complete the series.

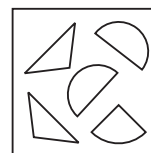
cab, gef, ljk, rpq,

- (1) ywx (2) yxw
(3) zxy (4) wvu

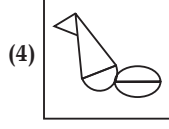
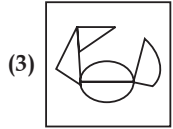
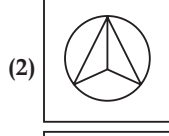
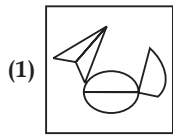
71. Pointing to a lady, Diwakar said, "Her mother's only grandson is my son." How is that lady related to Diwakar?

- (1) Aunt (2) Sister
(3) Mother (4) Wife

72. Question figure



Answer figures



- 73.** Kamal starts walking from his home facing West direction. After walking 10 km he takes a right turn and walks another 10 km. He takes another right turn and walks 10 km to reach his school. How far (in km) and in which direction is he from his home?
- (1) 10, North (2) 10, South
 (3) 20, North-East (4) 20, South-West

- 74.** Select the term that will come next in the following series.

YCL, MQZ,, OSB

- (1) AEN (2) BFQ
 (3) ADM (4) BEM

- 75.** Select the fraction that will next in the following series.

2, 4, 6, 8, 10, 12,

3, 5, 7, 9, 11, 13,

- (1) $\frac{14}{15}$ (2) $\frac{14}{16}$
 (3) $\frac{13}{15}$ (4) $\frac{13}{14}$





SOLUTIONS OF Question Paper

1

1. Option (3) is correct.

Explanation: According to Sikh tradition, Gurumukhi was developed by Guru Angad. He was the second Sikh Guru. Gurumukhi script was modified from the Lahnda script, which was used to write Punjabi, Sindhi and Lahnda language.

2. Option (1) is correct.

Explanation: Fertile riverine alluvial soil is best suited for producing sugarcane, rice and plantain. Alluvial soil is rich in potassium. Red soil is ideal for crops like corn, red gram, Bengal gram, green gram, groundnut and castor seed.

3. Option (4) is correct.

Explanation: Andaman and Nicobar is a group of 572 islands out of which 37 are inhabited at the junction of the bay of Bengal and the Andaman sea.

4. Option (1) is correct.

Explanation: 49th Parallel is the frontier between Canada and USA. It is a barrier between the US states of Idaho, Minnesota, North Dakota, Washington, and Montana in the South and the Canadian territory of Alberta, British Columbia, Manitoba, and Saskatchewan in the north.

5. Option (2) is correct.

Explanation: Articles 245 to 255 in Part XI of the Constitution deal with the legislative relations between the Centre and the states.

Constitution of India, being federal in structure, divides all powers (legislative, executive and financial) between the Centre and the states.

6. Option (4) is correct.

Explanation: On 21st January, 1972, all the three states (Manipur, Meghalaya and Tripura) became full-fledged states under the North-Eastern Areas (Reorganisation) Act 1971.

7. Option (1) is correct.

Explanation: Iris is a potency in our eye that regulates the measure of the pupil. It widens and lessens because of which extent of the pupil changes. Iris controls the size of the pupil.

8. Option (2) is correct.

Explanation: The correct answer is 1784. The treaty was signed by Tipu Sultan and British East India Company. The treaty was signed on 11 March 1784. Anglo-Mysore wars were a series of four wars between the British and the Kingdom of Mysore.

9. Option (2) is correct.

Explanation: S.N. Agarwal authored 'The Gandhian Plan' in 1944 in the light of the basic principles of Gandhian economics. He emphasized the accumulation of trim crew exhibition and husbandry.

10. Option (2) is correct.

Explanation: Leading goals of an eleventh five-year scheme (2007–12): strived to raise the signup in loftier schooling of 18–23 years of era level by 2011–12, fast and inclusive blossoming.

11. Option (3) is correct.

Explanation: The European Union (EU) is economically and politically connected with 27 member states, most of which are located in Europe. The headquarters of European Union is located in Brussels. The European Union operates on the basis of intergovernmental decisions agreed by the member states and transnational system of independent bodies. The European Parliament is elected by the citizens of the European Union every five years. In 2020, the United Kingdom became the only member state to leave the EU.

12. Option (4) is correct.

Explanation: Sir Syed Ahmad Khan found the Muslim society to be educationally, socially and culturally backward. The movement came to be known as the Aligarh movement after Sir Syed established his school at Aligarh which later became the center of the movement.

13. Option (2) is correct.

Explanation: Linux is not a computer language, it is a Unix-like computer operating system assembled under the model of free and open-source software development and distribution. Among all general-purpose operating systems, Linux has the largest installed base. Also, it is the leading operating system on servers and other big iron systems (such as mainframe computers).

14. Option (4) is correct.

Explanation: A motherboard is a main system board of a computer. It is also known as baseboard, planar board or logic board. It is the main printed circuit board (PCB) found in general purpose microcomputers and other expandable systems. It holds and allows communication between many of crucial electronic components of a system, and provides connectors for other peripherals.

15. Option (2) is correct.

Explanation: Amartya Sen is an Indian Bengali economist who received the 1998 Nobel Prize in Economics for his contributions to welfare economics and social choice theory, and for his concern for the problems faced by the poorest members of society.

16. Option (2) is correct.

Explanation: Surendranath Banerjee founded the Indian National Association with Ananda Mohan Bose on 26 July 1876. Surendranath Banerjee later joined the Indian National Congress, he supported the Montagu-Chelmsford reforms in contrast to Congress. Later, he left Congress and formed Indian National Liberation Federation in 1919.

17. Option (1) is correct.

Explanation: Blood is considered as a connective tissue, because it consists of blood cells surrounded by a non-living fluid matrix called blood plasma. Embryologically, it has the same origin (mesodermal) as do the other connective tissue types and blood connects

the body systems together bringing the needed oxygen nutrients, hormones and other signaling molecules and removing the wastes.

18. Option (2) is correct.

Explanation: All beaks without teeth are composed of two jaws, generally known as the upper mandible (maxilla) and lower mandible (mandible). Beak consists of a protein also known as Keratin. Beaks vary significantly in size and shape from species to species, while their underlying structures have a similar pattern.

19. Option (4) is correct.

Explanation: The first four dates (from 1st to 4th) of the month of October are observed as a World/International Day for a specific purpose. As on October 1: World Vegetation Day, International Day of the Elderly; October 2: International Day of Non-Violence; October 3: World Habitat Day and on October 4: World Animal Welfare Day.

20. Option (2) is correct.

Explanation: Geostationary satellites are satellites orbiting the Earth and located at an altitude of about 35,800 km (22,300 miles) just above the equator rotate in the direction of the Earth from west to east. At this altitude orbit the Earth rotates on its own axis once every 24 hours. The term geostationary orbit derives from the fact that when viewed by a ground-based observer, such satellite appear to be nearly stationary in the sky.

21. Option (2) is correct.

Explanation: Pedology is the study of soils in their natural environment. There are two main branches of soil science Pedology and edaphology. Edaphology studies the way soils influence plants, fungi and other living things while Pedology deals with soil morphology, pedogenesis and soil classification.

22. Option (1) is correct.

Explanation: Terylene is not a raw fiber. It is an artificial polyester fiber assembled by petroleum-derived polymerizing ethylene glycol and terephthalic acid. Terylene is the trademark of the first polyester fabric ever created for synthetic material. It was first made by Chemist JR Whinfield in 1941.

23. Option (4) is correct.

Explanation: An insulator is a significance that accomplishes not permitting electricity to

hand via it. Glass is a fine insulator as it does not enable an outpour of electricity.

24. Option (3) is correct.

Explanation: The term 'Pitcher' is associated with baseball. In baseball, the pitcher is the player who throws the baseball from the pitchers's mound towards the catcher to began each play. With the goal of retiring a batter, who attempts to either make contact with the pitched ball or draw a walk.

25. Option (1) is correct.

Explanation: The Biraja Temple, the Rajarani Temple and the Samaleswari Temple are all located in Odisha. Biraja Temple or Biraja Kshetra is one of the most famous Hindu temples located in the Jajpur District of Odisha, India. Rajarani temple was built during the later stages of the Somavamshi rule in the 11th century A.D. The Samaleswari temple is located in Sambalpur, Odisha.

26. Option (2) is correct.

Explanation:

$789x531y$ is divisible by 72

So, $789x531y$ is divisible by 8 and 9.

Given number is divisible by 8.

$31y$ is divisible by 8.

$\therefore y = 2$

Given number is divisible by 9

$7 + 8 + 9 + x + 5 + 3 + 1 + 2 = 36$

$\Rightarrow x + 35 = 36 \Rightarrow x = 36 - 35 = 1$

$\therefore 5x - 3y = 5 \times 1 - 3 \times 2 = 5 - 6 = -1$

27. Option (1) is correct.

Explanation: Let the total amount of will be = Rs. 100

Amount given to the wife = ₹ 40

Amount given to the children = ₹ 60

So, the required percent = $\frac{60}{40} \times 100 = 150\%$

28. Option (2) is correct.

Explanation:

Average = $\frac{A_1x_1 + A_2x_2 + \dots + A_nx_n}{x_1 + x_2 + \dots + x_n}$

Where, $A_1, A_2, A_3 \dots A_n$ are frequencies.

\therefore Required mean

$= \frac{1 \times 1 + 2 \times 2 + 3 \times 3 + 4 \times 4 + 5 \times 5 + 6 \times 6 + 7 \times 7}{1 + 2 + 3 + 4 + 5 + 6 + 7}$

$= \frac{1 + 4 + 9 + 16 + 25 + 36 + 49}{28} = \frac{140}{28} = 5$

29. Option (1) is correct.

Explanation: S.P. of machine = 80% of ₹ 3840

$$= ₹ \left(\frac{3840 \times 80}{100} \right) = ₹ 3072$$

30. Option (3) is correct.

Explanation: Maximum length of each pipe = HCF of 1.5 m and 1.2 m = 0.3 m

$$\begin{array}{r} 12 \overline{) 15} \quad (1 \\ \underline{12} \\ 3 \overline{) 12} \quad (4 \\ \underline{12} \\ \hline x \end{array}$$

\therefore HCF of 1.5 and 1.2 metre = 0.3 metre.

Hence, the greatest length of each pipe is 0.3m

31. Option (3) is correct

Explanation:

$$\text{Rate} = \frac{S.I. \times 100}{\text{Principal} \times \text{Time}} = \frac{\frac{1}{100} \times 100}{1 \times \frac{1}{12}} = 12\% \text{ p.a.}$$

32. Option (4) is correct.

Explanation: As per question,

The number 84 must not be a multiple of sum of the terms of ratio.

For ratio 3 : 2.

Sum of the terms of ratio = 3 + 2 = 5 which is not a factor of 84

33. Option (3) is correct.

Explanation: Let the C.P. of the article be ₹ x .

According to the question,

$310 - x = x - 230$

$\Rightarrow 2x = 310 + 230 = 540$

$\Rightarrow x = \frac{540}{2} = ₹ 270$

So the required loss %

$$= \left(\frac{270 - 180}{270} \right) \times 100 = \frac{90}{270} \times 100 = \frac{100}{3} = 33 \frac{1}{3}\%$$

34. Option (3) is correct.

Explanation: Let the C.P. of 1 table be ₹ 100.

So, C.P. of 1 Chair = ₹ 75

C.P. of 5 Chairs = ₹ (5 × 75) = ₹ 375

S.P. of 5 chairs = ₹ 7 × 100 (Given)

Their S.P. = ₹ 700

\therefore Required profit % =

$$= \left(\frac{700 - 375}{375} \right) \times 100 = \frac{32500}{375} = \frac{1300}{15} = 86.66\%$$

35. Option (3) is correct.**Explanation:**

Speed of boat in still water

$$= \frac{1}{2} (\text{Downstream rate} + \text{Upstream rate})$$

$$= \frac{1}{2} (8 + 4) \text{ kmph} = \frac{12}{2} \text{ kmph} = 6 \text{ kmph}$$

36. Option (2) is correct.**Explanation:** Given: $(1101)^2 = 1212201$

$$\Rightarrow 1101 = \sqrt{1212201}$$

$$\therefore \sqrt{121.2201} = \sqrt{\frac{1212201}{10000}} = \frac{1101}{100} = 11.01$$

37. Option (4) is correct.**Explanation:** Let A, B and C can do the work together = x hours

Now according to question, we have

Time taken by A = $(x + 6)$ hoursTime taken by B = $(x + 1)$ hoursand time taken by C = $2x$ hours

$$\text{None } \frac{1}{x+6} + \frac{1}{x+1} + \frac{1}{2x} = \frac{1}{x}$$

$$\text{or } \frac{1}{x+6} + \frac{1}{x+1} = \frac{1}{x} - \frac{1}{2x} = \frac{2-1}{2x} = \frac{1}{2x}$$

$$\text{or } \frac{1}{x+6} = \frac{1}{2x} - \frac{1}{x+1} = \frac{x+1-2x}{2x(x+1)} = \frac{1-x}{2x(x+1)}$$

$$\text{or } \frac{1}{x+6} = \frac{1-x}{2x^2+2x}$$

$$\text{or } 2x^2 + 2x = x + 6 - x^2 - 6x$$

$$\text{or } 3x^2 + 7x - 6 = 0$$

$$\text{or } 3x^2 + 9x - 2x - 6 = 0$$

$$\text{or } 3x(x+3) - 2(x+3) = 0$$

$$\text{or } (3x-2)(x+3) = 0$$

$$\text{or } 3x-2 = 0 \text{ and } x+3 = 0$$

$$\text{or } 3x = 2 \text{ or } x = \frac{2}{3}$$

So, Time taken by A will be

$$A = 6 + \frac{2}{3} = \frac{18+2}{3} = \frac{20}{3} \text{ hours}$$

$$\text{Times taken by B} = 1 + \frac{2}{3} = \frac{5}{3} \text{ hours}$$

Now (A + B)'s 1 hour's work

$$= \frac{3}{20} + \frac{3}{5} = \frac{3+12}{20} = \frac{15}{20} = \frac{3}{4} \text{ hours}$$

So, time taken by A & B

$$\text{together to finish job} = \frac{1}{\frac{3}{4}} = \frac{4}{3} \text{ hours}$$

38. Option (2) is correct.**Explanation:** Let time taken by B and C be x daysSo, time taken by A = $3x$ days

Part of work done by A, B and C in 1 day

$$= \frac{1}{3x} + \frac{1}{x} = \frac{3+1}{3x} = \frac{4}{3x}$$

As per the question,

$$\therefore \frac{4}{3x} = \frac{1}{24} \text{ or } 3x = 4 \times 24$$

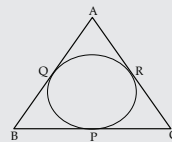
$$\text{or } x = \frac{4 \times 24}{3} = 32 \text{ days}$$

Thus, time taken by A = $3x = 3 \times 32 = 96$ days**39. Option (3) is correct****Explanation:** p, q, r are in G.P.

$$\text{So, } \frac{q}{p} = \frac{r}{q}$$

$$\text{or } q^2 = pr$$

$$\text{or } q = \sqrt{pr}$$

40. Option (1) is correct.**Explanation:**

According to the question,

$$AQ = AR$$

$$\therefore AB = AC$$

(Given)

$$\text{So, } BQ = RC$$

$$\text{Now, } BQ = BP,$$

$$CP = CR$$

$$\therefore BP = PC$$

41. Option (4) is correct.**Explanation:**

Given that,

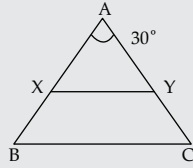
 $\triangle ABC$ is an isosceles triangle.

$$AB = AC,$$

$$XY \parallel BC$$

and

$$\angle A = 30^\circ$$



$$\begin{aligned}\text{Now, } \angle ABC = \angle ACB &= \frac{180^\circ - 30^\circ}{2} \\ &= \frac{150^\circ}{2} = 75^\circ\end{aligned}$$

$$\begin{aligned}\therefore & \quad XY \parallel BC \\ \therefore & \quad \angle AXY = \angle ABC = 75^\circ \\ \therefore & \quad \angle BXY = 180^\circ - 75^\circ = 105^\circ\end{aligned}$$

42. Option (4) is correct.

Explanation: Time from 10 p.m., to 6 a.m. = 8 hours

\therefore Required time (15 + 35)% of 8 hours

$$\begin{aligned}&= \left(\frac{8 \times 50}{100} \right) \text{ hours} \\ &= 4 \text{ hours}\end{aligned}$$

43. Option (1) is correct.

Explanation: By using the alligation rule, we get

Milk in Vessel A	1 2	Milk in Vessel B
$\frac{4}{7}$ litre	/ \	$\frac{2}{5}$ litre
$\frac{1}{2} - \frac{2}{5}$	/ \	$\frac{4}{7} - \frac{1}{2}$
$= \frac{5-4}{10} = \frac{1}{10}$	/ \	$= \frac{8-7}{14} = \frac{1}{14}$

$$\begin{aligned}\text{So, the required ratio} &= \frac{1}{10} : \frac{1}{14} \\ &= 14 : 10 = 7 : 5\end{aligned}$$

44. Option (4) is correct.

Explanation:

Given that:

$$(a-1)\sqrt{2} + 3 = b\sqrt{2} + a$$

$$\text{or } a = 3; a - 1 = b$$

$$\text{or } 3 - 1 = b \text{ or } b = 2$$

$$\therefore a + b = 3 + 2 = 5$$

45. Option (4) is correct.

Explanation: Given: $x = 3 - 2\sqrt{2}$

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

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

$$\begin{aligned}\text{Now, } \left(\sqrt{x} + \frac{1}{\sqrt{x}} \right)^2 &= x + \frac{1}{x} + 2 \\ &= 3 - 2\sqrt{2} + 3 + 2\sqrt{2} + 2 = 8\end{aligned}$$

$$\therefore \sqrt{x} + \frac{1}{\sqrt{x}} = \sqrt{8} = \sqrt{2 \times 2 \times 2} = 2\sqrt{2}$$

46. Option (3) is correct.

Explanation:

We know that,

radius of the incircle (x) of an equilateral triangle

$$= \frac{\text{side}}{2\sqrt{3}}$$

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

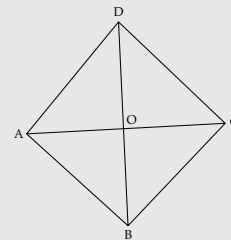
$$= 1 \text{ cm.}$$

47. Option (4) is correct.

Explanation:

Given that,

Diagonals of a rhombus = 16 cm and 30 cm



$$\text{Now, } \quad AC = 16 \text{ cm}$$

$$\therefore \quad OA = 8 \text{ cm}$$

$$BD = 30 \text{ cm}$$

$$\therefore \quad OB = 15 \text{ cm}$$

$$\angle AOB = 90^\circ$$

\therefore In $\triangle OAB$

$$AB = \sqrt{OA^2 + OB^2}$$

$$= \sqrt{(8)^2 + (15)^2}$$

$$= \sqrt{64 + 225}$$

$$= \sqrt{289}$$

$$= 17 \text{ cm}$$

\therefore Perimeter of rhombus = $4 \times l$

$$= 4 \times 17$$

$$= 68 \text{ cm}$$

48. Option (1) is correct.

Explanation: Distance covered by the train that started at 11 AM in half an hour

$$= 110 \times \frac{1}{2} = 55 \text{ km}$$

Relative speed

$$= (140 - 110) \text{ km/hr}$$

$$= 30 \text{ km/hr}$$

Time Taken in meeting from 11:30 AM

$$= \frac{55}{30} = \frac{11}{6} \text{ hours.}$$

Distance covered by the train that started at 11:30 a.m.

$$= \left(140 \times \frac{11}{6}\right) \text{ km}$$

$$= \frac{770}{3} \text{ km}$$

$$\Rightarrow 256\frac{2}{3} \text{ km}$$

49. Option (2) is correct.

Explanation: Difference between time

$$= (10 + 20) \text{ minutes}$$

$$= 30 \text{ minutes} = \frac{1}{2} \text{ hour}$$

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\Rightarrow 46\frac{2}{13} \text{ km/hr}$$

According to the question

$$\frac{x}{40} - \frac{x}{50} = \frac{1}{2} \quad \text{where } x = \text{distance of office}$$

$$\Rightarrow \frac{5x - 4x}{200} = \frac{1}{2}$$

$$\Rightarrow \frac{x}{200} = \frac{1}{2}$$

$$x = \frac{200}{2} = 100 \text{ km}$$

Time taken at 50 km/hr

$$= \frac{100}{50} = 2 \text{ hours}$$

So standard time to reach office

$$= 2 \text{ hours } 10 \text{ min}$$

$$= 2\frac{10}{60} \text{ hour} = \frac{13}{6} \text{ hour}$$

$$\text{So Required speed} = \frac{100}{\frac{13}{6}} = \frac{600}{13}$$

50. Option (4) is correct.

Explanation: Rate = 10% per annum = 5% per half year

Time = T years

$$A = P \left(1 + \frac{R}{100}\right)^{2T}$$

$$926.10 = 800 \left(1 + \frac{5}{100}\right)^{2T}$$

$$\Rightarrow \frac{926.10}{800} = \left(1 + \frac{1}{20}\right)^{2T}$$

$$\Rightarrow \frac{9261}{8000} = \left(\frac{21}{20}\right)^{2T}$$

$$\Rightarrow \left(\frac{21}{20}\right)^3 = \left(\frac{21}{20}\right)^{2T}$$

On comparing the powers on both sides, we get

$$2T = 3 \Rightarrow T = \frac{3}{2} \text{ years} = 1\frac{1}{2} \text{ years}$$

51. Option (2) is correct.

Explanation: As Dentist comes under the category of Doctor, in the same way Chemistry comes under the category of Science.

52. Option (3) is correct.

Explanation: According to the questions,

I like chocolates 9 5 8 (i)

We bought chocolates 1 5 3 (ii)

We like them 8 1 6 (iii)

From equation (i), (ii) and (iii)

I = 9, bought = 3 and them = 6

\therefore I bought them = 936

53. Option (1) is correct.

Explanation: Given, total students = 42

Swati's rank from bottom = 19

So, Purshottam's rank from bottom

$$= 19 - 6 = 13$$

We know that,

Total students = Position from top + Position from bottom - 1

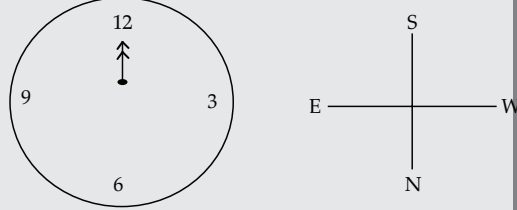
$$\Rightarrow 42 = \text{Position from top} + 13 - 1$$

$$\therefore \text{Position from top} = 42 - 12 = 30$$

Hence, Purshottam's rank from the top = 30th

54. Option (2) is correct.

Explanation:

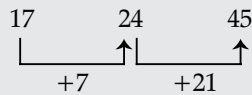


As per the question, at 12 a.m., the minute hand towards South. So, at 3 a.m. also the minute hand would at 12 and so it would be point at South.

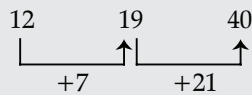
55. Option (4) is correct.

Explanation:

As,

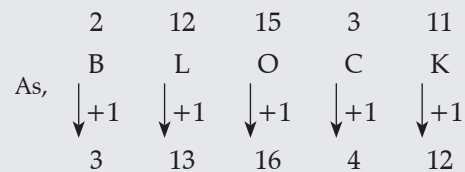


Same as,

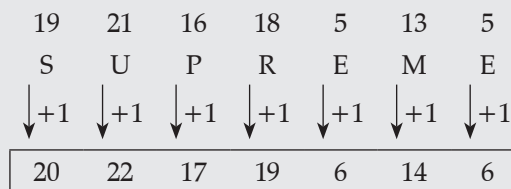


56. Option (1) is correct.

Explanation:

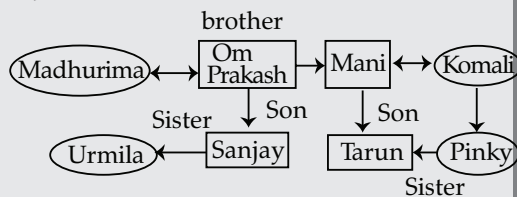


Similarly,



57. Option (4) is correct.

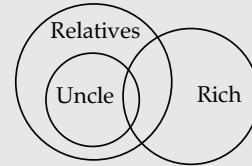
Explanation:



Therefore, Madhurima is the sister-in-law of Komali.

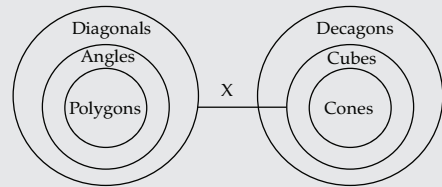
58. Option (4) is correct.

Explanation: Correct relation between the given classes



59. Option (4) is correct.

Explanation: According to the statements,



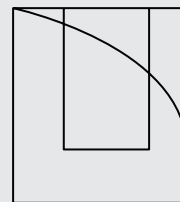
I. (✓) II. (✗) III. (✓) IV. (✗)

Hence, conclusions I and III follow.

60. Option (1) is correct.

Explanation:

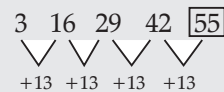
So,



will complete the given figure.

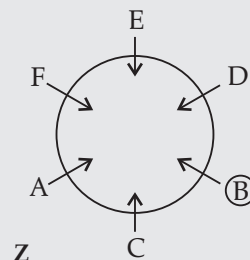
61. Option (2) is correct.

Explanation:



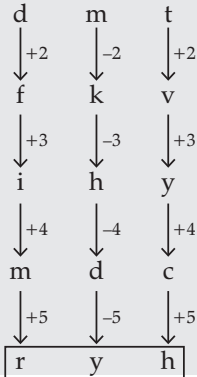
62. Option (4) is correct.

Explanation: First arrange the position of A, B, C and D. Then, fix the position of the remaining friends.



63. Option (1) is correct.

Explanation:



64. Option (1) is correct.

Explanation: According to the given statements, only conclusion II follows. Conclusion I does not follow because there is no information about the importance of retailers and distributors.

65. Option (1) is correct.

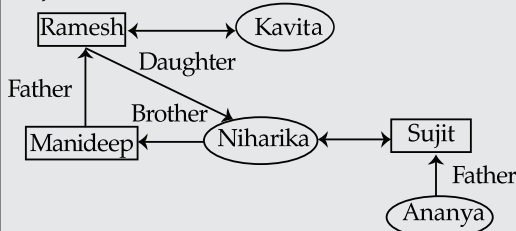
Explanation: Television signal to be telecast
Similarly,
Radio signal to be broadcast.

66. Option (4) is correct.

Explanation: Given, Mohini > Nita;
Mohini ≥ Sarita = Malini and Mohini < Hema
So, Hema > Mohini ≥ Sarita = Malini
Hence, second tallest cannot be determined.

67. Option (3) is correct.

Explanation:



Therefore, Sujit is the brother-in-law of Manideep.

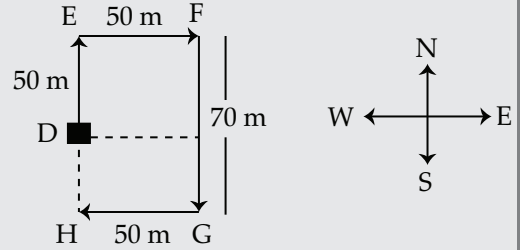
68. Option (4) is correct.

Explanation:

Given : $8 \div 2 + 4 = 10$
 $\downarrow \downarrow \downarrow \downarrow$
 $8 + 4 \div 2 = 10$
 $\therefore + \xrightarrow[\text{to}]{\text{changed}} \div$
 $2 \xrightarrow[\text{to}]{\text{changed}} 4$

69. Option (3) is correct.

Explanation:

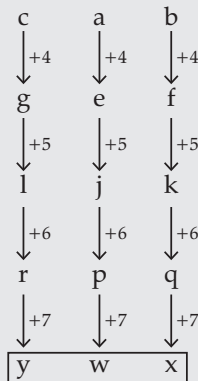


\therefore Required distance = $DH = FG - ED$
 $= 70 - 50 = 20$ m

So, she is 20 m far at H from point D, in South direction.

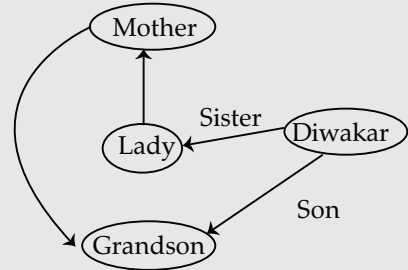
70. Option (1) is correct.

Explanation:



71. Option (2) is correct.

Explanation:



The lady is Diwakar 's sister.

72. Option (2) is correct.

Explanation:

