

General Knowledge Sample Paper - 9

SECTION-III : GENERAL TEST

1. Which treaty concluded the first World War?
(a) Treaty of Tilsit
(b) Treaty of Versailles
(c) Treaty of Tashkent
(d) Treaty of Berlin
 2. In which language did Babur write his memoirs called 'Tuzuk-i-Baburi'?
(a) Persian (b) Arabic
(c) Mongol (d) Turkish
 3. The point on the Earth surface directly above the origin of an earthquake is known as
(a) Prime Centre
(b) Hypo Centre
(c) Epicentre
(d) Medi Centre
 4. The twin planet of the earth which resembles in size, density and mass is
(a) Mercury (b) Venus
(c) Mars (d) Jupiter
 5. Ornithology is the study of
(a) Insects (b) Crustaceans
(c) Birds (d) Bees
 6. Dengue fever is transmitted by the vector
(a) Anopheles culicifacies
(b) Culex fatigans
(c) Aedes aegypti
(d) Mansonia uniformis
 7. Lichens developing on rocky substrates are called
(a) Lignicolous (b) Corticolous
(c) Saxicolous (d) Terricolous
 8. The part of a transistor which is heavily doped to produce a large number of majority carriers is
(a) Base (b) Emitter
(c) Collector (d) Gate
 9. The conductivity of a superconductor is
(a) Infinite (b) Large
(c) Small (d) Zero
 10. Breaking logical memory into blocks of the same size is called as
(a) Frames (b) Packets
(c) Segments (d) Pages
 11. Sodium chloride or table salt occurs in nature as the mineral
(a) Talc (b) Halite
(c) Sphalerite (d) Sylvite
 12. Which one of the following gases has colour?
(a) Chlorine (b) Hydrogen
(c) Nitrogen (d) Oxygen
 13. Nagarjuna Sagar project is on the river
(a) Sutlej (b) Narmada
(c) Krishna (d) Kaveri
 14. Cement factory workers are prone to
(a) Leukemia
(b) Bone marrow disease
(c) Asbestosis
(d) Cytosilicosis
 15. May 8 is observed as
(a) World Red Cross Day
(b) World Standard Day
(c) World Telecommunication Day
(d) Commonwealth Day
 16. Mohiniattam dance form developed originally in which of the following states?
(a) Karnataka (b) Odisha
(c) Tamil Nadu (d) Kerala
 17. What is the number of players on each side in Baseball?
(a) 11 (b) 15
(c) 9 (d) 7
 18. Who is called the 'Grand Old Man' of India?
(a) Jawaharlal Nehru
(b) Dadabhai Naoroji
(c) Gopal Krishna Gokhale
(d) Mahatma Gandhi
 19. Which of the following is used as raw material for the manufacture of rayon?
(a) Coal (b) Plastic
(c) Cellulose (d) Petroleum
 20. Indian Banks have the maximum foreign branches in
(a) Bangladesh
(b) U.K.
(c) U.S.A.
(d) Sri Lanka
 21. CENVAT is related to
(a) Sales Tax
(b) Excise Duty
(c) Custom Duty
(d) Service Tax
 22. The Vice President of India may be impeached by
(a) Lok Sabha
(b) Rajya Sabha
(c) Vidhan Sabha
(d) Vidhan Parishad
 23. How many languages are there in the Eighth Schedule of the Constitution of India?
(a) 18 (b) 19
(c) 16 (d) 22
 24. The power of Supreme Court of India to decide the dispute between the Centre and States falls under its
(a) Advisory Jurisdiction
(b) Appellate Jurisdiction
(c) Original Jurisdiction
(d) Constitutional Jurisdiction
 25. Where was India-U.S. Ministerial 2+2 Dialogue held on September 6, 2018?
(a) New York, United States
(b) New Delhi, India
(c) Washington DC, United States
(d) Mumbai, India
- Directions (Q. 51-54): Select the related word/letters/number from the given alternatives.
26. Dissemble : Feign :: Divulge : ?
(a) Mollify
(b) Request
(c) Agree
(d) Disclose
 27. EF : OP :: ? : ST
(a) GH (b) LM
(c) JK (d) IJ
 28. TZ : GA :: QR : ?
(a) KN (b) RS
(c) NQ (d) JI
 29. 15 : 62 :: 16 : ?
(a) 66 (b) 64
(c) 32 (d) 56

Directions (Q. 30-33): Select the odd word/letters/number/number pair from the given alternatives.

30. (a) Narora
(b) Rawatbhata
(c) Tarapur
(d) Bhilai
31. (a) AIO (b) OEU
(c) UIO (d) BOI
32. (a) 5611 (b) 5492
(c) 8750 (d) 9911
33. (a) 289 (b) 484
(c) 784 (d) 1331

Directions (Q. 34-37): A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.

34. GH, LM, PQ, ST, ?
(a) UZ (b) UY
(c) UX (d) UV
35. SR, ON, ?, GF
(a) EF (b) HI
(c) KJ (d) HK
36. 60, 121, 243, ?
(a) 480 (b) 487
(c) 484 (d) 486

37. In the following question, two statements are given 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) Holidays are meant to relax, rejuvenate and recollect energy.

(II) People generally go for outing in holidays and get tired in those days as well.

Conclusions:

- (I) Holidays are meant for resting.
(II) Outing and different environment automatically rejuvenate.

- (a) Only conclusion II follows
(b) Conclusion I and II both follow
(c) Neither I nor II follows
(d) Only conclusion I follows

38. There are five boys P, Q, R, S and T standing in a line. Q is taller than T but shorter than P. S is shorter than T but taller than R. Who is the shortest?
(a) S (b) R
(c) T (d) P

39. Arrange the given words in the sequence in which they occur in the dictionary.
i. Catadrome
ii. Catagenesis
iii. Catabolic
iv. Catabolism

- (a) ii, iii, iv, i (b) iii, iv, i, ii
(c) iii, iv, ii, i (d) i, ii, iii, iv

40. In a certain code language, "TOMATO" is written as "023402" and "ORIONL" is written as "275269". How is "NORMAL" written in that code language?

- (a) 627340 (b) 627344
(c) 627349 (d) 627430

41. In the following question, select the missing number from the given series.

3	12	24
4	16	32
5	20	?

- (a) 17 (b) 50
(c) 40 (d) 25

42. If '+' means 'minus', '×' means 'divided by', '÷' means 'plus' and '-' means 'multiplied by', then $104 \times 13 + 9 - 5 \div 6 = ?$

- (a) -31 (b) -36
(c) -37 (d) -34

43. In the following question, which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?
a _ c _ a _ cb _ cb

- (a) cbca (b) abcd
(c) bdac (d) abdc

44. Arjun is facing south, then he turns 45° right and goes 50 m, then turns north-west to move 50m

and from there 50 m to west. In which direction/place is he from his original place?

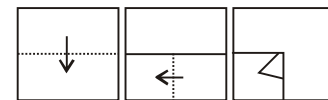
- (a) West (b) North
(c) East (d) North-west

45. Introducing to boy, a girl said, "He is the son of the sister of my mother's brother". How is that boy related to that girl?

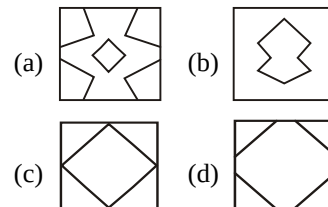
- (a) Cousin
(b) Uncle
(c) Father-in-law
(d) Niece

46. A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened.

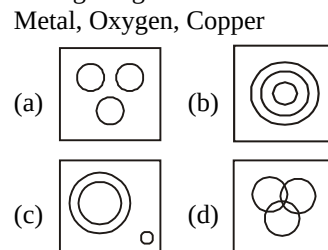
Question figures:



Answer figures:

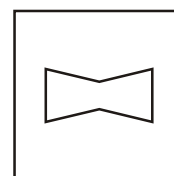


47. Identify the diagram that best represents the relationship among the given classes.
Metal, Oxygen, Copper

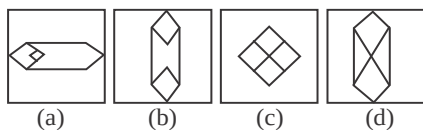


48. From the given answer figures, select the one in which the question figure is hidden/embedded.

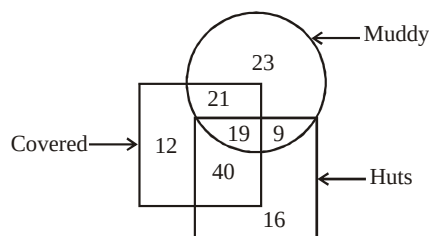
Question figure:



Answer figures:



49. In the given figure, how many huts are covered and muddy?



- (a) 28 (b) 40
(c) 33 (d) 19
50. A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as shown in the given two matrices. The columns and rows of Matrix-I are numbered from 0 to 4 and that of Matrix-II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, for example 'R' can be represented by 02, 11 etc. and U can be represented by 56, 65, etc. Similarly, you have to identify the set for the word 'ROUGH'.

Matrix-I

	0	1	2	3	4
0	A	Q	R	V	W
1	S	R	K	G	O
2	R	E	J	O	Y
3	F	T	O	E	L
4	G	O	L	D	F

Matrix-II

	5	6	7	8	9
5	D	U	L	G	H
6	U	K	G	R	S
7	T	G	E	P	H
8	G	A	A	H	I
9	V	S	H	O	K

- (a) 02, 23, 65, 31, 97
(b) 02, 23, 56, 13, 78
(c) 02, 23, 56, 13, 97
(d) 02, 33, 56, 13, 97
51. A cylindrical vessel of radius 8 cm is partially filled with water. By how much will the water level rise if a sphere of radius 7 cm is completely immersed in water?
(a) 7.15 cm (b) 14.3 cm
(c) 21.45 cm (d) 28.6 cm
52. If $a - b = 6$ and $ab = 16$, then $a^3 - b^3$ is :
(a) 504 (b) 702
(c) 728 (d) 511
53. Jaikishan can do a piece of work in 15 hours. If he is joined by Jhanvi who is 50% more efficient, in what time will they together finish the work?
(a) 6 hours (b) 12 hours
(c) 3 hours (d) 9 hours
54. When a number is increased by 34, it becomes 117% of itself. What is the number?
(a) 408 (b) 200
(c) 510 (d) 306
55. An angle is smaller than its supplementary angle by 70° . What is the measure of the angle ?
(a) 125° (b) 55°
(c) 80° (d) 10°
56. The effective annual rate of interest corresponding to a nominal rate of 7% per annum payable half yearly is :
(a) 14 percent (b) 14.25 percent
(c) 7 percent (d) 1.72 percent
57. When a discount of 50% is given on a shirt, the profit is 25%. If the discount is 10%, then the profit is
(a) 35 percent
(b) 55 percent
(c) 215 percent
(d) 125 percent
58. In the first 36 overs of a cricket match, the run rate was 4.3 runs/over. Calculate the required run rate in the remaining 14 overs to reach the target of 271 runs:
(a) 8.9 (b) 9.5
(c) 8.3 (d) 7.7
59. Profit of ₹ 187200 has to be divided among three partners Amit, Brijmohan and Chiranjeev in the

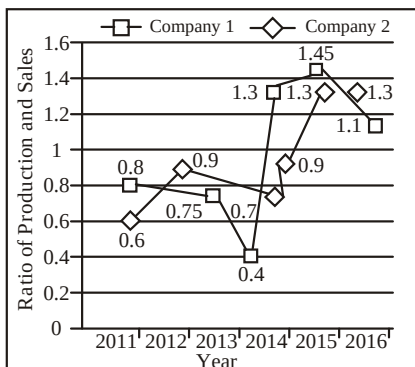
ratio 1 : 2 : 5. How much does Chiranjeev get?

- (a) ₹ 46800 (b) ₹ 23400
(c) ₹ 117000 (d) ₹ 58500

60. In a rhombus
(a) Adjacent sides are not equal
(b) Opposite angles are supplementary
(c) Diagonals bisect opposite angles
(d) Consecutive angles are equal
61. If $\sin 240^\circ = x$, then the value of x is:
(a) $2/\sqrt{3}$ (b) $\sqrt{2}$
(c) 2 (d) $\sqrt{3}/2$
62. The simplest form of $3774/2958$ is:
(a) 43/19 (b) 37/29
(c) 31/13 (d) 31/23
63. If 1 shirt is offered free on purchase of 3 shirts priced ₹ 500 each, then what is the effective discount on each shirt?
(a) 30 % (b) 33 %
(c) 20 % (d) 25 %
64. If $x = \sqrt{\frac{2+\sqrt{3}}{2-\sqrt{3}}}$, then what is the value of $x^2 + x - 9$?
(a) 0 (b) $3\sqrt{2}$
(c) $3\sqrt{3}$ (d) $5\sqrt{3}$
65. If $x + y = 5$, $x^3 + y^3 = 35$, then what is the positive difference between x and y ?
(a) 0 (b) 1
(c) 5 (d) 6
66. A man made four trips of equal distance. His speed on first trip was 60 km/hr and in each subsequent trip his speed was half of the previous trip. What is the average speed (in km/hr) of the man in these four trips?
(a) 16 (b) 30
(c) 28.125 (d) 27.5
67. Raman spends 80% of his income. If his income is increased by 25% and the expenditure increases by 10%, then what will be the percentage increase in his savings?
(a) 17 (b) 70
(c) 77 (d) 85

68. By selling 90 pens for ₹ 80 a man loses 20%. What should be the selling price (in ₹) of 90 pens for 20% profit?
 (a) 90 (b) 100
 (c) 110 (d) 120
69. The average weight of 100 students is 32 kg. The average weight of first 49 students is 30 kg and that of last 50 students is 34 kg. what is the weight (in kg.) of the 50th student?
 (a) 25 (b) 30
 (c) 32 (d) 33
70. The price of a diamond is directly proportional to square of its weight. A man broke the diamond accidentally in three pieces in the ratio of 3 : 5 : 7 and thus lost ₹ 42600. What was the original price (in ₹) of the diamond?
 (a) 11786 (b) 60000
 (c) 67500 (d) 75000
71. A trader allows a discount of 15% on a trolley bag having list price of ₹ 1360 and earns a profit of 15.6%. What is the cost price (in ₹) of the trolley bag?
 (a) 1000 (b) 1005
 (c) 1050 (d) 1156
72. What is the sum of all prime numbers between 60 and 80?
 (a) 272 (b) 284
 (c) 351 (d) 414

Directions (Q. 73–75): The line chart given below shows the ratio of production to sales of two bike-manufacturing firms over the period of 6 years.



Assume if in any year sales is more than production then both the companies have sufficient stock to meet such instances.

73. If the sales of company 1 in year 2015 was 50000 units, then what was its production (in units) in year 2015?
 (a) 38460 (b) 45000
 (c) 52000 (d) 65000
74. The production of company 2 in year 2012 is 30000. If sales of company 2 in year 2012 and 2013 are same, then what was its production (in units) in year 2013?
 (a) 100000 (b) 16000
 (c) 30000 (d) 20000
75. The production of company 1 in year 2014 is 18000 and sales of company 2 in year 2012 is 15000. What is the ratio of difference in sales and production of company 1 in year 2014 and that of company 2 in year 2012?
 (a) 8 : 15 (b) 7 : 16
 (c) 9 : 11 (d) 3 : 8

Answers with Explanations

SECTION-III : GENERAL TEST

1. (b) The Treaty of Versailles was one of the peace treaties at the end of World War I. Signed at the Hall of Mirrors in Versailles, France, on 28 June 1919, it ended the state of war between Germany and the Allied Powers. The other Central Powers on the German side of World War I were dealt with in separate treaties.

2. (d) Tuzuk-i-Baburi (Letters of Babur) is an autobiographical work of Babur written in the Chagatai or Turkish language which was his native tongue. Turkish was the spoken language of the Andijan-Timurids. The book is also known as Baburnama.

3. (c) The epicenter is the point on the Earth's surface that is directly above the focus, the point where an earthquake originates. In seismology, the epicenter is the point on the Earth's surface directly above the point where the fault begins to rupture, and is the area of greatest damage.

4. (b) Venus is sometimes called Earth's twin because Venus and Earth are almost the same size, have about the same mass, and have a very similar composition. They are also neighboring planets. However, according to recent NASA reports, a new planet, named Kepler 452b, is "the closest twin to Earth."

5. (c) Ornithology is a branch of zoology that concerns the study of birds. The origins of the word ornithology come from the Greek ornithologos and late 17th-century Latin ornithologia meaning "bird science". Ornithologists may study the behavior, physiology, and conservation of birds and bird habitats.

6. (c) Dengue fever, also known as breakbone fever, is a mosquito borne tropical disease caused by the dengue virus. It is transmitted by several species of mosquito within the genus *Aedes*, principally *A. aegypti*. The female *Aedes aegypti* mosquito becomes a vector or carrier of the virus when it bites an infected human.

7. (c) Lichen communities developed on rocky substratum are called as Saxicolous. The type of rock and pH are important factors responsible for colonization of the rock by lichen communities. The species like *Caloplaca*, *Aspicilia* grow on hard lime stones; *Verrucaria* species can be seen on well-lit areas; *Lepraria*, *Cystocleus* community grows on siliceous rocks.

8. (b) The section of the transistor that supplies a large number of majority carriers is called the emitter. The emitter is always forward biased with respect to the base so that it can supply a large number of majority carriers to its junction with the base. Since the

emitter is to supply or inject a large amount of majority carriers into the base, it is heavily doped but moderate in size.

9. (a) Superconductors are materials that conduct electricity with no resistance. This means a superconductor can carry a current indefinitely without losing any energy. So a superconductor has the property of being a perfect conductor, or having infinite conductivity, or zero resistance. Resistivity is the reciprocal of conductivity.

10. (d) Paging is a memory management scheme that allows processes physical memory to be discontinuous, and which eliminates problems with fragmentation by allocating memory in equal sized blocks known as pages (size is power of 2, between 512 bytes and 8192 bytes). External fragmentation is avoided by using paging technique.

11. (b) Sodium chloride (NaCl), also known as Common Salt, occurs in nature in cubic crystals of rock salt or halite. Halite are evaporite deposits formed by the evaporation of saline water in partially enclosed basins. They are characteristically associated with beds of limestone, dolomite, and shale.

12. (a) Chlorine is a yellow-green gas under standard conditions, where it forms diatomic molecules. It has a distinctive strong odor, familiar to most from common household bleach. Chlorine is an element of the halogen group. It has the highest electron affinity and the third highest electronegativity of all the reactive elements.

13. (c) Nagarjuna Sagar Dam is built across the Krishna river at Nagarjuna Sagar where the river forms boundary between Nalgonda district of Telangana state and Guntur district of Andhra Pradesh. It is one of the earliest multi-purpose irrigation and hydro-electric projects in India.

14. (d) Workers in cement industry suffer from silicosis, a form of

occupational lung disease caused by inhalation of crystalline silica dust. Silicosis causes slowly progressive fibrosis of the lungs, impairment of lung function and a tendency to tuberculosis of the lungs. Besides, cement plant workers are also prone to asbestosis.

15. (a) World Red Cross and Red Crescent Day is celebrated on 8 May each year. This date is the anniversary of the birth of Henry Dunant, the founder of International Committee of the Red Cross (ICRC) and the recipient of the first Nobel Peace Prize. The first Red Cross Day was celebrated on 8 May 1948.

16. (d) Mohiniattam is a classical dance form from Kerala, India. Believed to have originated in 16th century CE, it is one of the eight Indian classical dance forms recognized by the Sangeet Natak Akademi. It is a very graceful form of dance performed as solo recitals by women.

17. (c) Baseball is a bat-and-ball game played between two teams of nine players each who take turns batting and fielding. Each team take turns playing offense (batting and base running) and defense (pitching and fielding). A pair of turns, one at bat and one in the field, by each team constitutes an inning.

18. (b) Dadabhai Naoroji is known as the "Grand Old Man of India" and the "Father of Indian Nationalism". He played a key role in founding the Indian National Congress in 1885 along with A.O. Hume and D.E. Wacha. His book Poverty and Un-British Rule in India brought attention to the draining of India's wealth into Britain.

19. (c) Rayon is a manufactured regenerated cellulose fiber. It is made from purified cellulose, primarily from wood pulp, which is chemically converted into a soluble compound. Because rayon is manufactured from naturally occurring polymers, it is considered a semisynthetic fiber.

20. (b) As per the RBI report on 'Country-wise branches of Indian

Banks at Overseas Centres as on October 31, 2015,' the United Kingdom is the most preferred destination for Indian banks with 30 offices, followed by Hong Kong (19) and Singapore (17). There was a total of 182 overseas branches of Indian banks. State Bank of India leads Indian banks in this respect with 52 overseas branches, with Bank of Baroda coming second with 51 branches.

21. (b) Central Value Added Tax (CENVAT) is a tax levied on the manufacture or production of movable and marketable goods in India. Popularly known as Central Excise Duty, CENVAT is a duty on the manufacture/ production of goods in India. An excise duty is charged on goods produced within the country.

22. (b) The Vice President cannot be formally impeached, unlike the President. The Constitution states that the Vice President can be removed by a resolution of the Rajya Sabha passed by an effective majority (more than 50% of effective membership (total membership – Vacant seats)) and agreed to by a simple majority (50% of present and voting members) of the Lok Sabha (Article 67(b)).

23. (d) The Eighth Schedule to the Indian Constitution contains a list of 22 scheduled languages. Via the 92nd Constitutional amendment 2003, four new languages - Dogri, Maithili, Santali and Bodo - were added to the 8th Schedule of the Indian Constitution.

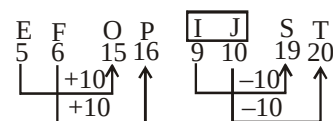
24. (c) As per Article 131 of Indian Constitution, the Supreme Court has exclusive original jurisdiction in any dispute between the Government of India and one or more States or between the Government of India and any State or States on one side and one or more States on the other or between two or more States, if and insofar as the dispute involves any question (whether of law or of fact) on which the existence or extent of a legal right depends.

25. (b) On September 6, 2018, Minister of External Affairs Sushma Swaraj and Minister of Defence Nirmala

Sitharaman welcomed Secretary of State Michael R. Pompeo and Secretary of Defence James N. Mattis to India for the inaugural U.S. India Ministerial 2 + 2 Dialogue.

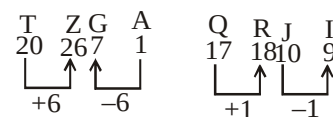
26. (d) As, Dissemble is related to feign. Similarly, Divulge is related to disclose.

27. (d) As, Similarly,



Finally, the missing word is JJ.

28. (d) As, Similarly,



The missing term is JJ.

29. (a) As, $15 \times 4 + 2 = 62$

Similarly, $16 \times 4 + 2 = 66$

Finally the missing number is 66.

30. (d) Narora, Rawatbhata and Tarapur are the atomic centres and Bhilai is a place of manufacturing of steel.

So, Bhilai is odd word.

31. (d) A E O

$1 + 9 + 15 = 25 = \text{Odd number}$

O E U

$15 + 5 + 21 = 41 = \text{Odd number}$

U I O

$21 + 9 + 15 = 45 = \text{Odd number}$

B O I

$2 + 15 + 9 = 26 = \text{Even number}$

Finally, BOI is odd term in the given alternative.

32. (a) $5611 = (5 + 6 + 1 + 1) = 13$

$5492 = (5 + 4 + 9 + 2) = 20$

$8750 = (8 + 7 + 5 + 0) = 20$

$9911 = (9 + 9 + 1 + 1) = 20$

Finally, 5611 is odd number.

33. (d) $289 = 17 \times 17 = 17^2$

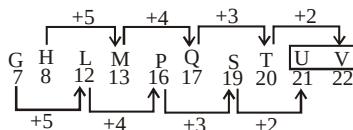
$484 = 22 \times 22 = 22^2$

$784 = 28 \times 28 = 28^2$

$1331 = 11 \times 11 \times 11 = 11^3$

Finally 1331 is odd number.

34. (d)



Finally, the missing term is UV.

35. (c)

S $\xrightarrow{-4}$ O $\xrightarrow{-4}$ K $\xrightarrow{-4}$ G

R $\xrightarrow{-4}$ N $\xrightarrow{-4}$ J $\xrightarrow{-4}$ F

Finally, the missing term is KJ.

36. (b)

60 $\xrightarrow{\times 2 + 1}$ 121 $\xrightarrow{\times 2 + 1}$ 243 $\xrightarrow{\times 2 + 1}$ 487

Finally the missing number is 487.

37. (d) According to statement of the question only conclusion I follows.

38. (b) According to question.

R < S < T < Q < P

Finally, R is the shortest among five boys.

39. (b) According to dictionary the sequence of the words:

(iii) Catabolic, (iv) Catabolism,

(i) Catadrome, (ii) Catagenesis.

40. (c) As,

T O M A T O
↓ ↓ ↓ ↓ ↓ ↓
0 2 3 4 0 2

and O R I O N L
↓ ↓ ↓ ↓ ↓ ↓
2 7 5 2 6 9

Similarly,

N O R M A L
↓ ↓ ↓ ↓ ↓ ↓
6 2 7 3 4 9

Finally, 'NORMAL' is written as 627349.

41. (c) $(3)^2 + (4)^2 \rightarrow (9 + 16) = 25$

$\rightarrow \sqrt{25} = 5$

$(12)^2 + (16)^2 \rightarrow (144 + 256)$

$= 400 \rightarrow \sqrt{400} = 20$

$(24)^2 + (32)^2 \rightarrow (576 + 1024) \rightarrow 1600$

$= \sqrt{1600} = 40$

Finally the missing number is 40.

42. (a)

+	$\rightarrow$	-
$\times$	$\rightarrow$	$\div$
$\div$	$\rightarrow$	+
-	$\rightarrow$	$\times$

$\therefore 104 \times 13 + 9 - 5 \div 6$

$104 \div 13 - 9 \times 5 + 6$

$= 8 - 9 \times 5 + 6$

$= 8 - 45 + 6$

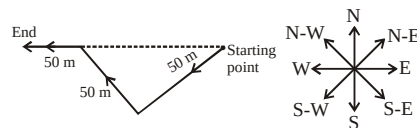
$= 14 - 45 = -31$

43. (a) a $\square$ c $\square$ b / $\square$ c c b / $\square$ c c b

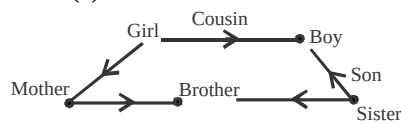
The series will become accb accb accb.

So, the required set of letters is cbca.

44. (a) According to question, Arjun is in west direction from his original place.

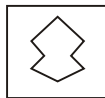


45. (a)

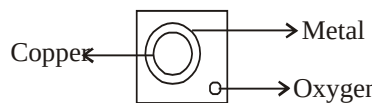


According to question the boy is cousin to that girl.

46. (b) A piece of paper is folded and pinched, when opened it will appear as given below—



47. (c) Copper is the metal and oxygen is gas.



48. (b)

49. (d) The huts that are covered and muddy can be represented by the region common to all the three geometrical figures. Such region is marked '19'.

50. (c) R = 02, 11, 20, 68

O = 14, 23, 32, 41

U = 56, 65

G = 13, 40, 58, 76, 85

H = 59, 79, 88, 97

For "ROUGH" the set of letters are 02, 23, 56, 13, 97.

51. (d) Volume rises in cylinder = Volume of sphere

$$\Rightarrow 2\pi rh = \frac{4}{3}\pi R^3$$

$$\Rightarrow h = \frac{\frac{4}{3}\pi R^3}{2\pi r}$$

$$= \frac{2R^3}{3r} = \frac{2 \times 7 \times 7 \times 7}{3 \times 8}$$

$$= \frac{343}{12} = 28.6 \text{ cm}$$

Hence, water level will rise in cylinder upto height = 28.6 cm.

52. (a) $a - b = 6$

Squaring both side

$$(a - b)^2 = (6)^2$$

$$\Rightarrow a^2 + b^2 - 2ab = 36$$

$$\Rightarrow a^2 + b^2 - 2 \times 16 = 36$$

$$\Rightarrow a^2 + b^2 = 68$$

$$\therefore a^3 - b^3 = (a - b)(a^2 + b^2 + ab) \\ = 6 \times (68 + 16) \\ = 6 \times 84 = 504.$$

53. (a) Jaikishan can do a piece of work = 15 hours

Jhanvi who is 50% more efficient can do the same work

$$= \frac{15}{150\%} = \frac{15 \times 2}{3} = 10 \text{ hours}$$

$$\text{Work done in 1 day} = \frac{1}{15} + \frac{1}{10}$$

$$= \frac{2 + 3}{30} = \frac{5}{30} = \frac{1}{6}$$

Time taken by both = 6 hours.

54. (b) Let the number be x

According to question

$$x + 34 = \frac{117}{100} \text{ of } x$$

$$\Rightarrow \frac{117}{100}x - x = 34$$

$$\Rightarrow \frac{17x}{100} = 34$$

$$\Rightarrow x = \frac{3400}{17} = 200$$

55. (b) Let the angle be x
 Its supplementary angle = $180^\circ - x$
 According to question

$$x = 180^\circ - x - 70^\circ$$

$$2x = 110^\circ$$

$$x = \frac{110^\circ}{2} = 55^\circ$$

56. (d) Difference of S.I. and C.I.

$$= P \left[\left(1 + \frac{R}{100} \right)^n - 1 \right] - \frac{P \times 7 \times 1}{100}$$

$$= P \left[\left(1 + \frac{3.5}{100} \right)^2 - 1 \right] - \frac{7P}{100}$$

$$= P \left[\left(\frac{103.5}{100} \right)^2 - 1 \right] - \frac{7P}{100}$$

$$= P \left[\frac{(103.5)^2 - (100)^2}{(100)^2} - \frac{7}{100} \right]$$

$$= P \left[\frac{203.5 \times 3.5}{(100)^2} - \frac{7}{100} \right]$$

$$= P \left[\frac{712.25 - 700}{(100)^2} \right]$$

$$= P \frac{12.25}{(100)^2}$$

Effective % of S.I. and C.I.

$$\frac{P \times 12.25}{(100)^2} \times 100\%$$

$$= \frac{12.25}{712.25} \times 100\%$$

$$= \frac{12.25}{712.25} \times 100\%$$

$$= \frac{12.25}{712.25} \times 100\% = 1.72\%$$

57. (d) By tricky method

Profit % =

$$\left[(100 + P\%) \left(\frac{100 - d_2}{100 - d_1} \right) - 100 \right] \%$$

(where d_1 and d_2 are discounts percents)

$$= \left[(100 + 25\%) \left(\frac{100 - 10}{100 - 50} \right) - 100 \right] \%$$

$$= \left[125 \times \frac{90}{50} - 100 \right] \%$$

$$= (25 \times 9 - 100)\%$$

$$= (225 - 100)\% = 125\%.$$

58. (c) Number of runs in 36 overs

$$= 36 \times 4.3 = 154.8$$

Number of runs to be made in 14 overs

$$= 271 - 154.8 = 116.2$$

$$\text{Required run rate} = \frac{116.2}{14} = 8.3$$

59. (c) Given Ratio = 1 : 2 : 5

Sum of ratio = 1 + 2 + 5 = 8

$$\text{Profit of Chiranjeet} = \frac{5 \times 187200}{8}$$

$$= 5 \times 23400 \text{ ₹ } 117000$$

60. (c) Diagonals bisect opposite angles.

$$61. (d) x = \sin 240^\circ = \sin (180^\circ + 60^\circ)$$

$$\therefore \sin (\pi + \theta) = \sin \theta$$

$$= \sin 60^\circ = \frac{\sqrt{3}}{2}$$

62. (b) The simplest form = 3774/2958

$$= \frac{1887}{1479} = \frac{37}{29}$$

63. (d) Selling price of three shirts

$$= 3 \times 500 \text{ ₹ } 1500$$

Selling price of four shirts

$$= 4 \times 500 \text{ ₹ } 2000$$

$$\text{Discount} = 2000 - 1500 = 500$$

$$\text{Effective \%} = \frac{500 \times 100}{2000} = 25\%$$

$$64. (d) x = \sqrt{\frac{2 + \sqrt{3}}{2 - \sqrt{3}}}$$

On squaring both sides,

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

$$\Rightarrow x^2 = \frac{(2 + \sqrt{3})^2}{4 - 3}$$

$$\Rightarrow x^2 = 4 + 3 + 4\sqrt{3}$$

$$\therefore x = \sqrt{4 + 3 + 2 \times 2 \times \sqrt{3}}$$

$$= \sqrt{(2 + \sqrt{3})^2} = 2 + \sqrt{3}$$

$$\therefore = x^2 + x - 9$$

$$= 7 + 4\sqrt{3} + 2 + \sqrt{3} - 9 = 5\sqrt{3}$$

65. (b) $x + y = 5 = 2 + 3$ or $3 + 2$

$$x^3 + y^3 = 35 = 8 + 27$$

$$\Rightarrow x^3 + y^3 = 2^3 + 3^3$$

$$\Rightarrow x = 2 \text{ or } 3, y = 3 \text{ or } 2$$

$$\therefore x - y = 3 - 2 = 1$$

66. (a) Let each distance be x km.

$$\text{Average speed} = \frac{\text{Total distance}}{\text{Time taken}}$$

$$= \frac{4x}{\frac{x}{60} + \frac{x}{30} + \frac{x}{15} + \frac{x}{7.5}}$$

$$= \frac{4x}{\frac{x}{60} + \frac{x}{30} + \frac{x}{15} + \frac{10x}{75}}$$

$$= \frac{4x}{\frac{x}{60} + \frac{x}{30} + \frac{3x}{15}}$$

$$= \frac{4x}{\frac{x + 2x + 12x}{60}} = \frac{4x \times 60}{15x}$$

$$= 16 \text{ kmph}$$

67. (d) Raman's initial income ₹ 100

$$\text{Expenditure} = ₹ 80$$

$$\therefore \text{Saving ₹ } (100 - 80) = ₹ 20$$

Again, new income of Raman = ₹ 125

$$\text{Expenditure} = ₹ \left(\frac{80 \times 110}{100} \right) = ₹ 88$$

$$\text{Savings} = ₹ (125 - 88) = ₹ 37$$

$$\begin{aligned} \therefore \text{Percentage increase in savings} \\ &= \left(\frac{37 - 20}{20} \right) \times 100 \\ &= 17 \times 5 = 85\% \end{aligned}$$

$$\begin{aligned} 68. (d) \text{ C.P. of 90 pens} &= \frac{100 \times 80}{80} \\ &= ₹ 100 \end{aligned}$$

$\therefore$ To gain 20%,

$$\text{Required S.P.} = ₹ 120$$

$$\begin{aligned} 69. (b) \text{ Weight of the 50th student} \\ &= (100 \times 32 - 49 \times 30 - 50 \times 34) \text{ kg.} \\ &= (3200 - 1470 - 1700) \text{ kg} = 30 \text{ kg.} \end{aligned}$$

$$\begin{aligned} 70. (c) \text{ Weight of original diamond} \\ &= 3x + 5x + 7x = 15x \text{ units} \\ \text{Its value} &\propto (15x)^2 = 225kx^2 \end{aligned}$$

where k = constant of proportionality

$\therefore$ Total value of all pieces

$$\begin{aligned} &= k(9x^2 + 25x^2 + 49x^2) \\ &= ₹ 83kx^2 \end{aligned}$$

$$\begin{aligned} \text{Loss} &= ₹ (225kx^2 - 83kx^2) \\ &= ₹ 142kx^2 \end{aligned}$$

$$\therefore 142kx^2 = 42600$$

$$kx^2 = \frac{42600}{142} = 300$$

$$\begin{aligned} \therefore \text{Original price of diamond} &= 225kx^2 \\ &= ₹ (225 \times 300) = ₹ 67500 \end{aligned}$$

71. (a) S.P. of trolley bag

$$= ₹ \left(\frac{1360 \times 85}{100} \right) = ₹ 1156$$

$$\text{Profit percent} = 15.6\%$$

$$\begin{aligned} \therefore \text{C.P. of bag} &= \frac{100 \times 1156}{115.6} \\ &= ₹ 1000 \end{aligned}$$

72. (c) Prime numbers between 60 and 80 are = 61, 67, 71, 73 and 79

$$\therefore \text{Required Sum} = (61 + 67 + 71 + 73 + 79) = 351$$

73. (d) For company-1 in 2015,

$$\frac{\text{Production}}{\text{Sales}} = 1.3$$

$$\Rightarrow \text{Production} = 1.3 \times 50000 = 65000$$

74. (b) For company-2 in 2012.

$$\frac{\text{Production}}{\text{Sales}} = 0.75$$

$$\Rightarrow \frac{30000}{\text{Sales}} = 0.75$$

$$\Rightarrow \text{Sales} = \frac{30000}{0.75} = 40000$$

For company-2 in 2013.

$$\frac{\text{Production}}{40000} = 0.4$$

$$\Rightarrow \text{Production} = 0.4 \times 40000 = 16000$$

75. (a) Sales of company-1 in 2014

$$= \frac{18000}{0.9} = 20000$$

$$\begin{aligned} \therefore \text{Sales} - \text{Production} \\ &= 20000 - 18000 = 2000 \end{aligned}$$

For company-2 in 2012,

$$\begin{aligned} \text{Sales} - \text{Production} &= 0.25 \times 15000 \\ &= 3750 \end{aligned}$$

$$\therefore \text{Required ratio} = 2000 : 3750 = 8 : 15$$

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