Q1. If P : Q = 5 : 2 then (2P – 3Q) : (3P – 5Q) is equal to.
(a) 5 : 6
(b) 2 : 7
(c) 4 : 5
(d) 3 : 4

Q2. What will be the compound interest on a sum of Rs. 1200 for 2 years at the rate of 20% per annum when the interest is compound yearly?
(a) Rs 624
(b) Rs 504
(c) Rs 576
(d) Rs 528

Q3. What is the HCF of $2^3 \times 3^4$ and $2^5 \times 3^2$
(a) $2^5 \times 3^3$
(b) $2^3 \times 3^4$
(c) $2^3 \times 3^2$
(d) $2^5 \times 3^4$

Q4. A number is first increased by 20% and then reduced by 15%. If the final value is 2040 then what is the initial value of the number?
(a) 2100
(b) 1800
(c) 2000
(d) 1900

Q5. The selling price of an article is $\frac{8}{7}$ of cost price. What is the profit percentage?
(a) $\frac{100}{9}$
(b) $\frac{100}{11}$
(c) $\frac{100}{8}$
(d) $\frac{100}{7}$

Q6. The average of 13 numbers is 42. If a 14th number is included then the average becomes 44. What is the 14th number?
(a) 70
(b) 62
(c) 66
(d) 68

Q7. The ratio of monthly incomes of A and B is 4 : 3 and the ratio of their monthly expenditures is 3 : 2. If A and B save Rs 4000 and Rs 6000 respectively per month, then what is the sum of their monthly incomes?
(a) Rs 60000
(b) Rs 70000
(c) Rs 50000
(d) Rs 36000

Q8. A travels 15 km with a speed of 30 km/h. He travels another 25km with a speed of 10 km/h. What is his average speed for the entire journey?
(a) $\frac{40}{3}$ km/h
(b) $\frac{80}{3}$ km/h
(c) 20 km/h
(d) 12 km/h

Q9. The simple interest on a sum is equal to the sum itself while the rate is same as the number of years for which it is invested. The number of years is equal to.
(a) 5 years
(b) 10 years
(c) 8 years
(d) 1 years

Q10. By Selling an article for Rs 320 a men incurs a loss of 20%. What should be the selling price of an article to gain 20%?
(a) Rs 450
(b) Rs 480
(c) Rs 420
(d) Rs 500

Q11. What is the value of $\frac{72\div 9+3-6-(2\times 3)+5\text{of } 3-(1+5\times 2-2)}{8\div 4+2-(6\times 8\div 2)+(7\times 4-2\times 2)}$ =?
(a) 11/4
(b) 5/4
(c) 0
(d) 15/4

Q12. The speed of a boat in still water is 8 km/h. If the speed of the stream is 2km/h, then how much distance can be boat travel in two hours going upstream?
(a) 16 km
(b) 14 km
(c) 20 km
(d) 12 km

Q13. A alone can do a work in 30 days, B alone can do the same work in 40 days. If they work on alternate days starting with A then in how many days the work will be completed?
(a) 16.33
(b) 17.25
(c) 32.33
(d) 34.25

Q14. If the sum of the two numbers is 120 and their quotient is 5 then the difference of the two numbers is.
(a) 115
(b) 100
(c) 80
(d) 72

Q15. 498 is 17% less than a number then the number is.
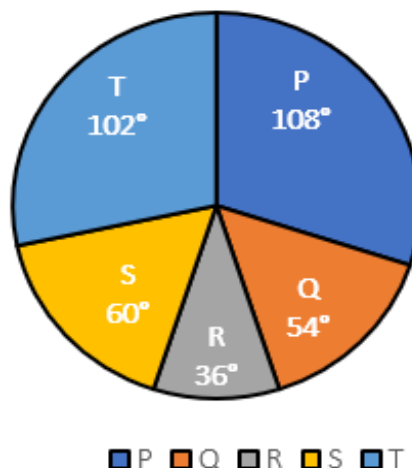(a) 610
(b) 580
(c) 600
(d) 620

Q16. A single discount equivalent to the successive discounts of 10%, 20%, and 25% is.
(a) 55%
(b) 45%
(c) 46%
(d) 60%

Q17. In 80 litres mixture of milk and water the ratio of amount of milk to that of amount of water is 7 : 3. In order to make this ratio 2 : 1 how many litres of water should be added?
(a) 5
(b) 6
(c) 8
(d) 4

Directions (18-20): The pie chart given below shows the number of students enrolled in 5 different subjects P, Q, R, S and T. The total number of students is 300.

Q18. What is the combined number of students enrolled in subject T and P?
(a) 175
(b) 105
(c) 54
(d) 210

Q19. What is the difference between the number of students enrolled in subject S and P?
(a) 24
(b) 60
(c) 40
(d) 48

Q20. How many students are enrolled in subject Q and T Together?
(a) 156
(b) 130
(c) 260
(d) 480

Q21. How many positive factors of 40 are there?
(a) 6
(b) 5
(c) 8
(d) 10

Q22. If $N = \sqrt{11} - \sqrt{3}$, then what is the value of $\frac{1}{N}$ is?
(a) $\frac{(\sqrt{3}-\sqrt{11})}{2}$
(b) $\frac{\sqrt{11}-\sqrt{3}}{8}$
(c) $\frac{\sqrt{11}+\sqrt{3}}{8}$
(d) $\sqrt{11} + 8\sqrt{3}$

Q23. For what value of P, 225P9, is completely divisible by 9?
(a) 1
(b) 0
(c) 3
(d) 4

Q24. Two pipes L and J can alone fill a tank in 12 hours and 15 hours respectively. Pipe P can alone empty the same tank in 20 hours. If all three pipes are opened together, then in how many hours will the tank be filled?
(a) 10
(b) 15
(c) 20
(d) 12

Q25. Akash purchased an article at a discount of 20% and solid it to Ram at 20% profit. What is the ratio between the marked price and the price for which Ram purchased the article?
(a) 27 : 31
(b) 25 : 22
(c) 24 : 23
(d) 25 : 24

Q26. In what ratio a man must mix rice at Rs. 12.30 per kg with rice at Rs. 16.70 per kg so as to make a mixture worth Rs. 14.40 per kg?
(a) 8 : 7
(b) 23 : 21
(c) 3 : 4
(d) 1 : 7

Q27. B starts a business with Rs 15000. After 6 months D joints business by investing Rs 40000. At the end of the year, in what ratio will they share the profit?
(a) 4 : 5
(b) 11 : 14
(c) 33 : 16
(d) 3 : 4

Q28. Average of 9 consecutive even numbers is 18. Which number is the smallest of the 9 numbers?
(a) 8
(b) 10
(c) 12
(d) 6

Q29. By selling 90 litres of petrol, a person losses the cost price of 30 litres of petrol. What is his loss percent?
(a) 18.18%
(b) 28.56%
(c) 33.33%
(d) 22.22%

Q30. A sold a toy T.V to B at a profit of 20%. B sold the T.V to C at a profit of 15%. If C pays Rs 276 for T.V then for how much A bought the T.V?
(a) 250
(b) 200
(c) 300
(d) 320

Q31. Which of the following is the autobiography of Dr. Manmohan Singh, the ex-Prime Minister of India?
(a) A Shot at history
(b) Ace Against Odds
(c) Changing India
(d) My Country My Life

Q32. Which of the following is the autobiography of the first female judge of India, Anna Chandy?
(a) Atmavrittanta
(b) Majya Jalmachi Chittarkatha
(c) Ente Katha
(d) Atmakatha

Q33. 'The Wings of Fire' is an autobiography of which of the following Presidents of India?
(a) Ram Nath Kovind
(b) Pranab Mukherjee
(c) APJ Abdul Kalam
(d) Kocheril Raman Narayanan

Q34. Who among the following Khayal singers of 19th century was given the title of 'Tanras" by Bahadur Shah Jaffar, the last Mughal Emperor of India?
(a) Bade Ustad Ghulam Ali Khan
(b) Meer Qutub Baksh
(c) Ustad Amir Khan
(d) Sadarang

Q35. Which Articles of the Indian Constitution deal with the Union Executive?
(a) Articles 38 to 50
(b) Articles 52 to 78
(c) Articles 80 to 86
(d) Articles 112 to 118

Q36. GDP that takes into account the costs in terms of environmental pollution and exploitation of natural resources is called _____.
(a) white GDP
(b) green GDP
(c) brown GDP
(d) blue GDP

Q37. In which track and field event is the baton used?
(a) Hammer throw
(b) Relay race
(c) High jump
(d) Steeple chase

Q38. Which outside layer of the Earth is less dense, thick, and andesitic to granite composition?
(a) Oceanic crust
(b) Continental crust
(c) Mantle
(d) Outer core

Q39. Sandalwood is found in which type of forests in India?
(a) Tropical thorn forests and scrubs
(b) Tropical deciduous forests
(c) Mangrove forests
(d) Tropical evergreen forests

Q40. To whom can the Judge of the Supreme Court address his/her resignation letter?
(a) The Prime Minister of India
(b) The President of India
(c) The Chief Justice of India
(d) The Law Minister of India

Q41. What is the theme for World Press Freedom Day 2023?
(a) Shaping a Future of Rights: Freedom of Expression as a Driver for all other human rights
(b) Preserving the Environment through Journalism
(c) Protecting Human Rights through Free and Fair Media
(d) Promoting Love and Understanding through Media

Q42. Which inaugural exercise has India participated in with its two frontline warships, INS Satpura and INS Delhi?
(a) ASEAN-India Maritime Exercise
(b) Malabar
(c) SLINEX
(d) Hand-in-Hand

Q43. Which state recently launched the Facial Recognition System (FRS) for Inner Line Permit (ILP) system and flagged off two camera-mounted mobile FRS vehicles?
(a) Nagaland
(b) Mizoram
(c) Manipur
(d) Arunachal Pradesh

Q44. Who has released the "Best Practices in Social Sector: A Compendium, 2023" in collaboration with the UNDP?
(a) NITI Aayog
(b) UNICEF
(c) World Health Organization
(d) World Bank

Q45. What is StarBerrySense, which was recently developed by the Indian Institute of Astrophysics (IIA)?
(a) A solar panel for space stations
(b) A space telescope
(c) A satellite tracking device
(d) A low-cost star sensor

Q46. Darwin's theory of natural selection is based on
(a) Overproduction
(b) Struggle for existence and variation
(c) Survival of the fittest
(d) All of the above

Q47. A drop of water is spherical in shape. This is due to
(a) Surface Tension
(b) Low temperature
(c) Air resistance
(d) Viscosity of water

Q48. An Endoscope is a
(a) Narrow telescope
(b) Type of Camera
(c) Simple Microscope
(d) diagnostic tool

Q49. The common name of sodium tetraborate decahydrate is ____.
(a) Epsom salt
(b) Gypsum
(c) Borax
(d) galena

Q50. Adding which substance gives a blue color to glass?
(a) Manganese oxide
(b) Cobalt oxide
(c) Chromium oxide
(d) Iron oxide

Q51. What is used to prevent the freezing of fuel in space crafts?
(a) Benzene
(b) Glycol
(c) Acetylene
(d) Ester

Q52. Which of the following is present in Nail polish remover?
(a) Citric acid
(b) Acetone
(c) Ethylene
(d) Benzene

Q53. The thallophytes, the bryophytes, and the pteridophytes have naked embryos that are called _____.
(a) Spores
(b) Buds
(c) Sprout
(d) Cotyledon

Q54. The arrangement of leaves on an axis or stem is called
(a) Phyllotaxy
(b) Vernation
(c) Venation
(d) Phytotaxy

Q55. Mendel is known as
(a) Father of Physiology
(b) Father of Geology
(c) Father of Genetics
(d) Father of Biology

Q56. Which of the following is man-made fiber?
(a) Cotton
(b) Wool
(c) Silk
(d) Nylon

Q57. Leeuwenhoek discovered free-living cells for the first time in _____.
(a) Pond water
(b) Seawater
(c) Soil
(d) Human body

Q58. Halophytes are plants that grow in -
(a) Fresh Water
(b) Cold Water
(c) Ponds
(d) Salt Water

Q59. Who discovered that plants and trees also have life?
(a) Robert Koch
(b) J.C. Bose
(c) Benjamin Franklin
(d) Louis pasture

Q60. In a _____ wave particles of the medium vibrate in a direction parallel to the direction of wave propagation.
(a) Transverse
(b) Longitudinal
(c) Surface
(d) Field

Q61. The following question, select the number which can be placed at the sign of question mark from the given alternatives.
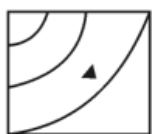
2	3	7	17
5	6	8	?
7	6	3	27

(a) 40
(b) 42
(c) 46
(d) 58

Q62. Which answer figure will complete the pattern in the question figure?

(a) a
(b) b
(c) c
(d) d

Q63. If 4 # 3 @ 1 = 13 and 5 #2@ 2 = 12 then 6 @ 1 # 4 = ?
(a) 11
(b) 10
(c) 12
(d) 8

Q64. In a following question, select the missing number from the given series.
3, 3, 6, 18, 72, ?
(a) 320
(b) 360
(c) 480
(d) 540

Q65. Select the correct alternative from the given ones that will complete the series.
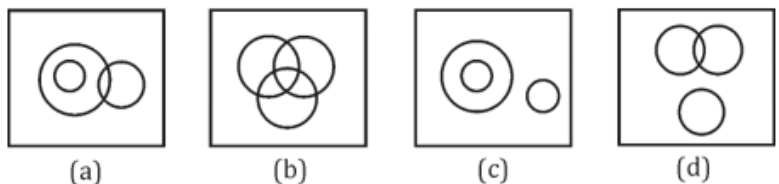E, H, K, N, Q, ?
(a) V
(b) T
(c) U
(d) S

Q66. In the following question, select the odd word from the given alternatives.
(a) Bus
(b) Car
(c) Truck
(d) Aeroplane

Q67. Identify the diagram that best represents the relationship among the given classes.
Milk, Liquid, Pen

(a) a
(b) b
(c) c
(d) d

Q68. In the following question select the related word from the given alternative.
Summer : Hot :: Winter : ?
(a) Cold
(b) Ice
(c) Cotton
(d) Jacket

Q69. Pointing to a lady, Vikas said "She is the daughter of the wife of my father". How is the lady related to Vikas.
(a) Aunt
(b) Sister
(c) Daughter
(d) Wife

Q70. In a certain code language "TIMBER" is written as "UKPFJX". How is "TRAIL" written in that code language?
(a) VTMEF
(b) UTDMQ
(c) QTUMD
(d) FMUQT

Q71. In a certain code language TIN is written as 47 and TAX is written as 49. How is TOPS written in that code language?
(a) 72
(b) 69
(c) 73
(d) 74

Q72. By interchanging which two signs the equation will be correct?
4 + 9 ÷ 18 × 11 − 6 = 7
(a) × and ÷
(b) + and ×
(c) ÷ and −
(d) − and +

Q73. Arrange the given words in the sequence in which they occur in the dictionary.
1. Modest 2. Monkey 3. Modern 4. Modular 5. Monger
(a) 34125
(b) 31425
(c) 34152
(d) 31452

Q74. In the following question, select the related word from the given alternative.
Den : Lion :: Stable : ?
(a) Tiger
(b) Car
(c) Bird
(d) Horse

Q75. A is taller than B. C is taller than A. D is taller than E but shorter than B. Who is the tallest?
(a) C
(b) A
(c) D
(d) B

Q76. From the given alternative words, select the word which can be formed using the letters of the given word.
SOMNAMBULISM
(a) NAMES
(b) BASALT
(c) SOUL
(d) BIOME

Q77. Ram walks 3km towards East and takes a left turn and walks for one km before he turns left and walks 2km to take another left turn to walk for another one km. How many km is he away from his starting point?
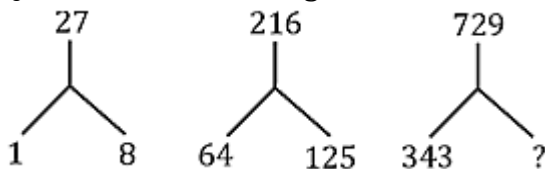(a) 1 km
(b) 2 kms
(c) 3 kms
(d) 4 kms

Q78. Find the odd number from the given alternatives.
(a) 443
(b) 633
(c) 821
(d) 245

Q79. The age of Rakhi is twelve times that of her daughter Anubha. If age of Anubha is 3 years now, then what was the age of Rakhi, 2 years earlier?
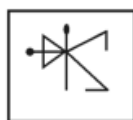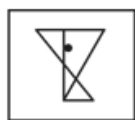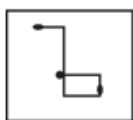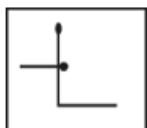(a) 20 years
(b) 34 years
(c) 30 years
(d) 36 years

Q80. Select the missing number from the given responses.

27   216   729

1   8   64   125 343   ?

(a) 432
(b) 334
(c) 512
(d) 501

Q81. From the given answer figures, select the one in which the question figure is hidden.

(a) a
(b) b
(c) c
(d) d

Q82. In the following question select the related group of letters from the given alternatives.
STAR : TSRA :: ROSE : ?
(a) ORES
(b) ESOR
(c) SORE
(d) ORSE

Q83. Select the related word/letters from the given alternatives.
9 : 8 : 16 : ?
(a) 17
(b) 13
(c) 27
(d) 19

Q84. Select the combination of letters that when sequentially placed in the gaps of the given letter series will complete the series.
ac __ d __ b __ cbdd __ a __ bddb
(a) bdabc
(b) bdbca
(c) bdcab
(d) cbdbc

Q85. In the following question select the odd number from the given alternatives.
(a) 17
(b) 19
(c) 13
(d) 15

Q86. A man walks from a point towards south. He turns to his right then again turns right. In what direction is he walking now?
(a) North
(b) South
(c) East
(d) West

Q87. At a college party 5 girls are sitting in a row. P is to the left of M and to the right of O. R is sitting to the right of N, but to the left of O. Who is sitting in the middle?
(a) O
(b) R
(c) P
(d) M

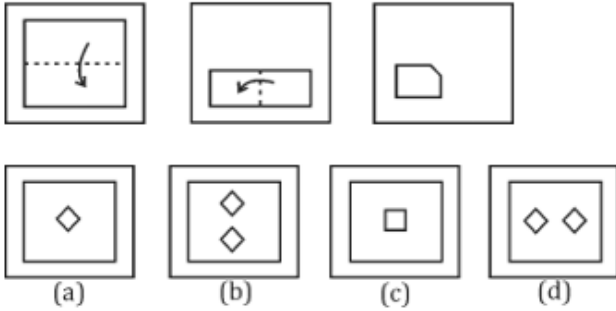**Q88.** Which answer figure will complete the pattern in the question figure?

(a) a
(b) b
(c) c
(d) d

Q89. 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?

(a) a
(b) b
(c) c
(d) d

Q90. Arrange the given words in the sequence in which they occur in the dictionary.
1. Ringer 2. Restore 3. Range 4. Rapid 5. Reptile
(a) 34521
(b) 43521
(c) 34251
(d) 43251

Q91.IRCTC Stands for?
(a) Indian Railway Connecting Tourism Corporation
(b) Indian Railway Catering & Tourism Corporation
(c) Indian Railway Catering & Traversing Corporation
(d) Indian Railway Corporation of Tourism & Catering

Q92. Which railway station received the first green Platinum rating in September 2019?
(a) New Delhi
(b) Mumbai
(c) Secunderabad
(d) Coimbatore

Q93. In which color are the railway lines and telephone lines shown in the topographic map?
(a) Yellow
(b) Blue
(c) Black
(d) Red

Q94. Which one of the following States does NOT have the Headquarters of any Railway Zone?
(a) Jharkhand
(b) Chhattisgarh
(c) Odisha
(d) Bihar

Q95. Which one of the following is NOT one of the railway zones?
(a) Western Railway
(b) Central Railway
(c) Metro Railway
(d) North Southern Railway

Q96. Which Railway Zone has launched the project "Operation My Saheli" for safety of lady passengers?
(a) Western Railway
(b) South East Central Railway
(c) North Western Railway
(d) South Eastern Railway

Q97. Who of the following was the first Railway Minister of independent India?
(a) John Mathai
(b) Lal Bahadur Shastri
(c) Jawaharlal Nehru
(d) Shanmugham Shetty

Q98. Shatabdi Express trains were introduced in 1988 to commemorate the 100th anniversary of which of the following personalities?
(a) Swami Vivekanand
(b) Mahatma Gandhi
(c) Jawaharlal Nehru
(d) Rabindranath Tagore

Q99. Who was the Governor General of India when Railways were first introduced in India?
(a) Lord Canning
(b) Lord William Bentick
(c) Lord Dalhousie
(d) Lord Ripon

Q100. Which Metro Rail Corporation is set to open India's first underwater metro rail services by december 2023?
(a) Delhi Metro Rail Corporation (DMRC)
(b) Kolkata Metro Rail Corporation (KMRC)
(c) Bangalore Metro Rail Corporation (BMRC)
(d) Lucknow Metro Rail Corporation (LMRC)

Solutions

S1. Ans.(c)
Sol. Given P : Q = 5 : 2
Let P = 5K, Q = 2K
$\Rightarrow$ (2P – 3Q) : (3P – 5Q)
$\Rightarrow$ (2 × 5K – 3 × 2K) : (3 × 5K – 5 × 2K)
$\Rightarrow$ (10K – 6K) : (15K – 10K)
$\Rightarrow$ 4K : 5K
= 4 : 5

S2. Ans.(d)
Sol.
Principal = 1200 Rs, Rate of interest = 20%
Time = 2 year
Compound Interest (CI) = $\left[P \left[1 + \frac{r}{100} \right]^2 - P \right]$
$= 1200 \left[1 + \frac{20}{100} \right]^2 - 1200$
$= 1728 - 1200$
= 528 Rs.

S3. Ans.(c)
Sol.
HCF = highest common factor of given numbers
$\Rightarrow$ HCF $(2^3 \times 3^4, \quad 2^5 \times 3^2)$
HCF $= 2^3 \times 3^2$

S4. Ans.(c)
Sol.
Let the number = 100x
$\Rightarrow$ Number after increase = 100x + 100x × $\frac{20}{100}$ = 120x
$\Rightarrow$ Number after 15% decrease = 120x – 120x × $\frac{15}{100}$ = 102x
$\Rightarrow$ 102x = 2040 (given)
$\Rightarrow$ x = 20
Initial value of the number = 100x = 100 × 20 = 2000

S5. Ans.(d)
Sol.
According to question
SP $= \frac{8}{7} \times$ CP
$\Rightarrow \frac{SP}{CP} = \frac{8}{7}$
Let SP and CP be 8x and 7x respectively
$\Rightarrow$ Profit percentage $= \frac{SP - CP}{CP} \times 100$
$= \frac{8x - 7x}{7x} \times 100 = \frac{1}{7} \times 100 = \frac{100}{7}$

S6. Ans.(a)
Sol.
⇒ Sum of 13 numbers = 13 × 42 = 546
⇒ Sum of 14 numbers = 14 × 44 = 616
14th number = 616 – 546 = 70

S7. Ans.(b)
Sol.
Let the monthly income of A and B = 4x and 3x
Let the monthly expenditure of A and B = 3y and 2y
According to question,
4x – 3y = 4000   ...... (i)
3x – 2y = 6000   ....(ii)
= (i) ×2 – (ii) ×3
⇒ 8x – 6y – (9x – 6y) = 8000 – 18000
⇒ x = 10000
Sum of their monthly income = 4x + 3x = 7x
= 7 × 10000 = 70000 Rs

S8. Ans.(a)
Sol.
According to question
D_1 = 15 km, S_1 = 30 km/h
D_2 = 25 km, S_2 = 10 km/h
Average Speed = $\frac{D_1+D_2}{\frac{D_1}{S_1}+\frac{D_2}{S_2}}$
⇒ $\frac{15+25}{\frac{15}{30}+\frac{25}{10}}$ = $\frac{40}{0.5+2.5}$ = $\frac{40}{3}$ km/h

S9. Ans.(b)
Sol.
Let the sum invested be Rs. P
And Time = X years
SI = $\frac{P×R×T}{100}$
⇒ P = $\frac{P×x×x}{100}$
⇒ x^2 = 100 ⇒ x = 10
Hence, T = 10 years.

S10. Ans.(b)
Sol.
Let CP = x Rs.
⇒ According to question
⇒ CP – CP × $\frac{20}{100}$ = 320
⇒ x – $\frac{x×20}{100}$ = 320 ⇒ $\frac{80x}{100}$ = 320
x = 400 Rs
Required S.P = x + $\frac{x×20}{100}$ = 400 + $\frac{400×20}{100}$
SP = 400 + 80 ⇒ SP = 480 Rs.

S11. Ans.(b)
Sol.

Given $\rightarrow \dfrac{72\div 9+3-6-(2\times 3)+5\,of\,3-(1+5\times 2-2)}{8\div 4+2-(6\times 8\div 2)+(7\times 4-2\times 2)}$

$\Rightarrow \dfrac{72\div 9+3-6-6+5\,of\,3-(1+10-2)}{8\div 4+2-\left(6\times\frac{8}{2}\right)+(28-4)}$

$\Rightarrow \dfrac{\frac{72}{9}+3-6-6+15-9}{\frac{8}{4}+2-24+24}$

$\Rightarrow \dfrac{8+3-12+6}{2+2}$

$=\dfrac{5}{4}$

S12. Ans.(d)
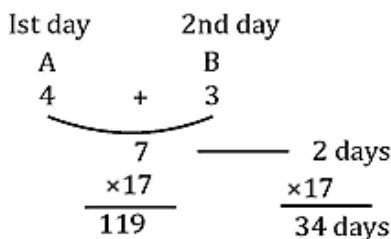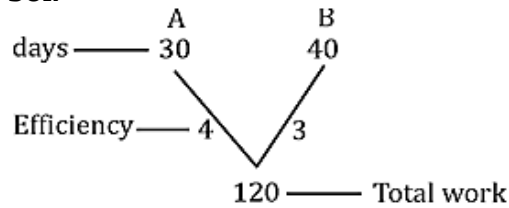**Sol.** Speed of a boat in still water = 8 km/h

The speed of steam = 2 km/h

Speed of boat in upstream = 8 – 2 = 6 km/h

Distance = Speed × time = 6 × 2 = 12 km

Boat can travel 12 km in two hours.

S13. Ans.(d)
Sol.

days ——
A
30

B
40

Efficiency —— 4 \ / 3

120 —— Total work

Ist day   2nd day
A   B
4   +   3

7 —— 2 days

×17   ×17

119   34 days

$\Rightarrow$ Remaining work will be done by A $= \dfrac{120-119}{4} = \dfrac{1}{4}$ day

Total Time $= 34 + \dfrac{1}{4} = 34.25$ days

S14. Ans.(c)
Sol.

Let the two numbers be x and y

$\Rightarrow$ According to question

x + y = 120 ...... (i), $\dfrac{x}{y} = 5$ .... (ii)

x = 5y put in eqⁿ

$\Rightarrow$ 5y + y = 120 $\Rightarrow$ 6y = 120 = y = 20

Then x + 20 = 120 $\Rightarrow$ x = 100

Difference = x – y = 100 – 20 = 80

S15. Ans.(c)
Sol.

Let the number = x
According to the question
$x - \frac{17x}{100} = 498$
$100x - 17x = 49800$
$83x = 49800$
$x = \frac{49800}{83} = 600$
$x = 600$

S16. Ans.(c)
Sol.

Successive discount of 10% of 20% is
$= 10 + 20 - \frac{10 \times 20}{100} = 28\%$
Then successive discount of 28% and 25%
$= 28 + 25 - \frac{28 \times 25}{100} = 46\%$

S17. Ans.(d)
Sol.

According to question

	Milk		water
Initial →	7	:	3
Final →	2	:	1

Water is added not milk so make milk equal

	milk		water
Initial →	14	:	6
Final →	14	:	7

$1 \Rightarrow 1 - 20$ unit

20 unit = 80 litres
1 unit = 4 litres
Water added = 4 litres.

S18. Ans.(a)
Sol.

Total students = 300
In T and P = 102° + 108° = 210
$\Rightarrow \frac{210}{360} \times 300$
$= 175$

S19. Ans.(c)
Sol.

Total = 300
In S $= \frac{300}{360} \times 60 = 50$
In P $= \frac{300}{360} \times 108 = 90$
Difference = 90 − 50 = 40

S20. Ans.(b)

Sol.

Total students = 300

In Subject Q = $\frac{300}{360} \times 54 = 45$

In subject T = $\frac{300}{360} \times 102 = 85$

Total in Q and T = 85 + 45 = 130

S21. Ans.(c)

Sol.

Factors of 40 = 2 × 2 × 2 × 5

= $2^3 \times 5^1$

= (3 + 1) (1 + 1)

= 4 × 2 = 8

Hence, positive factors of 40 are 8.

S22. Ans.(c)

Sol.

We are given

$N = \sqrt{11} - \sqrt{3}$

$\frac{1}{N} = \frac{1}{\sqrt{11}-\sqrt{3}} \times \frac{\sqrt{11}+\sqrt{3}}{\sqrt{11}+\sqrt{3}} = \frac{\sqrt{11}+\sqrt{3}}{(\sqrt{11})^2-(\sqrt{3})^2}$

$\frac{1}{N} = \frac{\sqrt{11}+\sqrt{3}}{11-3} = \frac{\sqrt{11}+\sqrt{3}}{8}$

$\Rightarrow \frac{1}{N} = \frac{\sqrt{11}+\sqrt{3}}{8}$

S23. Ans.(b)
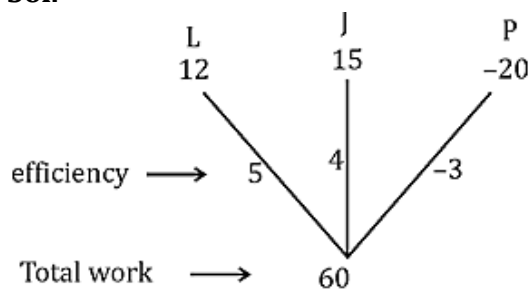
Sol. For divisible by sum of numbers also divisible by 9.

Then 225P9 divisible by 9 if P = 0

= 22509

Hence, 0 is correct answer.

S24. Ans.(a)

Sol.

$\frac{\text{Total work}}{\text{efficiency}}$ = Total time

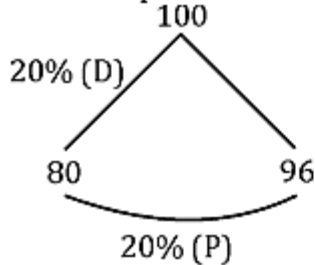$\Rightarrow$ Total time = $\frac{60}{5+4-3} = \frac{60}{6} = 10$

= 10 hours.

S25. Ans.(d)
Sol.
Discount = 20%, Profit = 20%
Let mark price of article (MP) = 100

MP   SP$_1$ SP$_2$
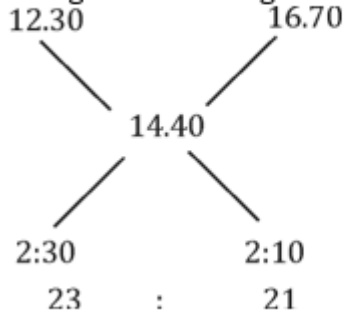100 : 80   : 96
MP   SP$_2$ (SP for Ram)
100 : 96
25   : 24
Hence, MP and Price for Ram purchased the article = 25 : 24

S26. Ans.(b)
Sol.
According to question
Using mixture Allegation method

23   :   21
Hence option (b) is correct answer.

S27. Ans.(d)
Sol.
We are given
B   :   D
15000 × 12   :   40000 × 6
        30   :   40
        3   :   4
Hence, they share the profit in 3 : 4.

S28. Ans.(b)
Sol. 9 consecutive even numbers
= x + x + 2 + x + 4 + x + 6 + x + 8 + x + 10 + x + 12 + x + 14 + x + 16
= 9x + 72 = 18 × 9 (Average)
= x + 8 = 18 ⇒ x = 10
⇒ Smallest number = x = 10, greatest number = x + 16 = 10 + 16 = 26
Hence, 10 is answer.

S29. Ans.(c)
Sol.
Let CP of 1 Litre = Rs. 1
Then CP of 90 litres petrol = Rs. 90
CP of 30 litres petrol = Rs 30
After selling 90 litres, loss% = $\frac{30}{90} \times 100 = 33.33\%$ Loss answer.

S30. Ans.(b)
Sol.
$20\% = \frac{1}{5}$, $15\% = \frac{3}{20}$

A	:	B	:	C
5		6		6
20		20		23
100		120		138	→ 276 Rs (given)

1 unit = 2
A = 100 × 2 = 200 Rs
A bought T.V at 200 Rs.

S31. Ans.(c)
Sol. Changing India is the autobiography of Dr. Manmohan Singh, the ex-Prime Minister of India.
He is an Indian economist and politician who served as the Prime Minister of India from 2004 to 2014.
He was the 15th Governor of the Reserve Bank of India.

S32. Ans.(d)
Sol. Atmakatha the autobiography of the first female judge of India, Anna Chandy.
Justice Anna Chandy, also known as Anna Chandi, was the first female judge and then High Court judge in India.

S33. Ans.(c)
Sol. 'The Wings of Fire' is an autobiography of Dr. APJ Abdul Kalam.
Avul Pakir Jainulabdeen Abdul Kalam was an Indian aerospace scientist and statesman who served as the 11th President of India from 2002 to 2007.
He is also known as the Missile Man of India for his work on the development of ballistic missile and launch vehicle technology

S34. Ans.(b)
Sol. Meer Qutub Baksh known as Tanras Khan, was an Indian musician of the Hindustani Classical tradition known for being a luminary of the Delhi Gharana.
He was a court musician and music teacher to the last Mughal emperor Bahadur Shah Zafar II.

S35. Ans.(b)
Sol. Articles 52 to 78 in Part V of the Constitution deal with the Union Executive. The union executive consists of the president, the vice president, the prime minister, the council of ministers, and the Attorney General of India.

S36. Ans.(b)
Sol. The Green Gross Domestic Product, or Green GDP for short, is an indicator of economic growth with environmental factors taken into consideration along with the standard GDP of a country. Green GDP factors biodiversity losses and costs attributed to climate change

S37. Ans.(b)
Sol. In Relay race Baton is used. Relay race, also called Relay, a track-and-field sport consisting of a set number of stages (legs), usually four, each leg run by a different member of a team.
The runner finishing one leg is usually required to pass on a baton to the next runner while both are running in a marked exchange zone.

S38. Ans.(b)
Sol. Continental crust is less dense, thicker, and mainly composed of granite. It is also called Sial (the most abundant minerals being silicate and aluminum).
• The interior of the earth can be divided into 3 different layers – crust, mantle, and core.
• The crust is the outermost layer of the earth, and the core is the innermost layer of the earth, located at a depth of 2900 Km.

S39. Ans.(b)
Sol. Sandalwood is found in Tropical deciduous forests.
• Temperate deciduous or temperate broad-leaf forests are a variety of temperate forest 'dominated' by trees that lose their leaves each year.
• The six major areas of this forest type occur in the Northern Hemisphere: North America, East Asia, Central and Western Europe

S40. Ans.(b)
Sol. Article 124 (2) of the constitution - A judge of the Supreme Court can resign by writing to the President.
• The tenure of the Supreme Court judge is 65 years whereas a high court judge 62 years.
• The Supreme Court is established by Part V, Chapter IV of the Indian constitution.

S41. Ans.(a)
Sol. The theme for World Press Freedom Day 2023 is "Shaping a Future of Rights: Freedom of Expression as a Driver for all other human rights."
• World Press Freedom Day is observed annually on May 3 to raise awareness about the importance of freedom of the press, and it was first proclaimed by UNESCO in 1991.
• In 1993, the United Nations General Assembly (UNGA) declared May 3 as World Press Freedom Day.

S42. Ans.(a)
Sol. India has participated in the inaugural edition of the ASEAN-India Maritime Exercise with its two frontline warships, INS Satpura and INS Delhi. The exercise is being held in two phases, one at the Changi Naval Base in Singapore, and the other in the South China Sea.

- INS Delhi is India's first indigenously-built guided missile destroyer, while INS Satpura is an indigenously-built guided missile stealth frigate.

Exercise Name	Countries Involved
Malabar	India, USA
SLINEX	India, Sri Lanka
Hand-in-Hand	India, China

S43. Ans.(c)
Sol. Manipur Chief Minister N Biren Singh launched the Facial Recognition System (FRS) for Inner Line Permit (ILP) system and flagged off two camera-mounted mobile FRS vehicles.
- The system will help in the effective checking of ILP holders whose validity has expired and in better management of the system.
- The FRS system has been implemented on a trial basis.
- Manipur is a state in Northeast India, bordered by Nagaland to the north, Mizoram to the south, and Assam to the west.

S44. Ans.(a)
Sol. NITI Aayog has released the "Best Practices in Social Sector: A Compendium, 2023" in collaboration with the UNDP.
- The aim of this compendium is to highlight and laud the efforts of Union Ministries and State Governments and synthesize lessons for the future to expand, enhance and improve life at the grassroots level.
- NITI Aayog (National Institution for Transforming India) is a policy think tank of the Government of India.

S45. Ans.(d)
Sol. StarBerrySense is a low-cost star sensor developed by the Indian Institute of Astrophysics (IIA) using off-the-shelf components.
- It was put into space by Isro's PSLV C-55 on April 22, 2023, and its function is to quickly and accurately calculate where a satellite is pointing in space for any space mission.
- The sensor can find its pointing direction in space by identifying the stars in its field of view.

S46. Ans.(d)
Sol. Darwinism is an evolutionary theory proposed by Charles Robert Darwin, an English Naturalist. He believed that evolution is a gradual, rather than a sudden biological event. His theory was based on several facts, observations, and inferences.
They are 1) overproduction, 2) constancy in population, 3) struggle for existence, and 4) natural selection.

S47. Ans.(a)
Sol. Surface tension is responsible for the shape of liquid droplets. Although easily deformed, droplets of water tend to be pulled into a spherical shape by the cohesive forces of the surface layer. In the absence of other forces, including gravity, drops of virtually all liquids would be approximately spherical.

S48. Ans.(d)
Sol. An endoscopy is a diagnostic tool. Endoscopy is a nonsurgical procedure used to examine a person's digestive tract. Using an endoscope, a flexible tube with a light and camera attached to it, your doctor can view pictures of your digestive tract on a color TV monitor.

S49. Ans.(c)
Sol. The common name of Sodium Tetraborate Decahydrate is Borax.

S50. Ans.(b)
Sol. Cobalt oxide is added to glass to give it blue colour.

S51. Ans.(b)
Sol. Glycol is an organic compound with the formula $(CH_2OH)_2$. It is used to prevent the freezing of fuel in space crafts.

S52. Ans.(b)
Sol. Acetone is a colorless, flammable liquid that evaporates easily. In cosmetics, the most common use of acetone is in nail polish remover.

S53. Ans.(a)
Sol. The thallophytes, the bryophytes, and the pteridophytes have naked embryos that are called Spores.

S54. Ans.(a)
Sol. The pattern of arrangement of leaves on the stem is called Phyllotaxy. As a stem grows at its apex, new leaf buds form along the stem by a highly controlled developmental process.

S55. Ans.(c)
Sol. Gregor Mendel is known as the "father of modern genetics".

S56. Ans.(d)
Sol. All except Nylon are natural fibres while Nylon is a man-made polymer.

S57. Ans.(a)
Sol. Anton van Leeuwenhoek, in 1674 with the improved microscope, discovered free-living cells of algae Spirogyra in pond water for the first time.

S58. Ans.(d)
Sol. Halophytes are plants adapted to saline soils, and occur naturally in environments ranging from maritime estuaries to remnant salt lakes in arid zones.

S59. Ans.(b)
Sol. Indian scientist Jagadish Chandra Bose discovered that plants and trees also have a life.

S60. Ans.(b)
Sol. Longitudinal waves in which the particles of the medium vibrate in a direction parallel to the direction of propagation of the waves.

S61. Ans.(c)
Sol. The pattern followed here is
I → 7 × 2 + 3 = 17
II → 8 × 5 + 6 = 46
III → 7 × 3 + 6 = 27
Hence 46 is Answer.

S62. Ans.(a)
Sol.

S63. Ans.(b)
Sol. The pattern is
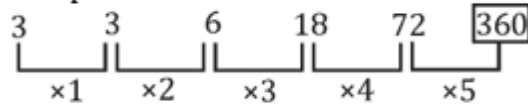4# 3@ 1 = 4 × 3 + 1 = 13
5# 2@ 2 = 5 × 2 + 2 = 12
Similarly, 6@ 1#4 = 6 + 1 × 4 = 10
Hence 10 is correct Answer.

S64. Ans.(b)
Sol.

The pattern is

Hence 360 is correct Answer.
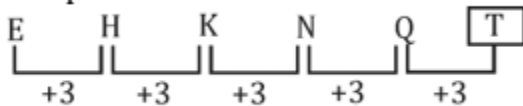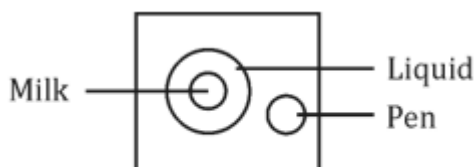
S65. Ans.(b)
Sol.

The pattern is

Hence T is Answer.

S66. Ans.(d)
Sol. Bus, Car, Truck all are land vehicles except Aeroplane.
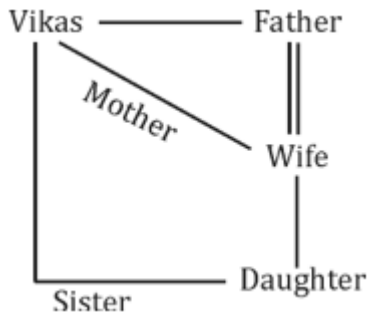
S67. Ans.(c)
Sol.

Option (c) is correct Answer.

S68. Ans.(a)
Sol. As, Hot is related to summer.
Similarly, Cold is related to winter.

S69. Ans.(b)
Sol.

Hence, lady is the sister of Vikas.

S70. Ans.(b)
Sol.

The pattern is

Hence, UTDMQ is correct Answer.

S71. Ans.(d)
Sol. The pattern followed here is
TIN = 20 + 9 + 14 = 43 + 4 = 47
TAX = 20 + 1 + 24 = 45 + 4 = 49
Similarly, TOPS = 20 + 15 + 16 + 19 = 70 + 4 = 74
Hence Answer is 74.

S72. Ans.(b)
Sol.

Given 4 + 9 ÷ 18 × 11 − 6 = 7
Interchange + and ×
⇒ 4 × 9 ÷ 18 + 11 − 6 = 7
⇒ $4 \times \frac{1}{2} + 11 - 6 = 7$
⇒ 2 + 11 − 6 = 7
⇒ 13 − 6 = 7
⇒ 7 = 7
Option (b) is Answer.

S73. Ans.(d)
Sol. The sequence is
3. Modern 1. Modest 4. Modular 5. Monger 2. Monkey
⇒ 31452.

S74. Ans.(d)
Sol. The logic follows
Den is a living place of Lion.
Similarly, Stable is a living place of Horse.
Hence "Horse" is correct Answer.

S75. Ans.(a)
Sol. According to question
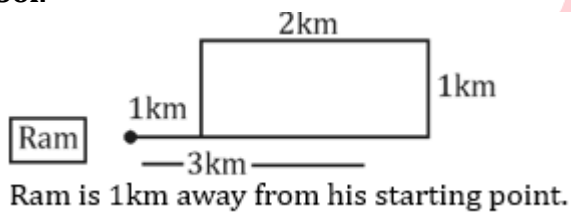A > B, C > A, B > D > E
C > A > B > D > E
Hence, the tallest is C.

S76. Ans.(c)
Sol. SOMNAMBULISM → SOUL (can be formed)

S77. Ans.(a)
Sol.

Ram is 1km away from his starting point.

S78. Ans.(b)
Sol.
The pattern is
I → 443 = 4 + 4 + 3 = 11
II → 6 + 3 + 3 = 12
III → 8 + 2 + 1 = 11
IV → 2 + 4 + 5 = 11
Hence 633 is correct Answer.

S79. Ans.(b)
Sol.
Age of Rakhi = 12x (Let)
Age of Anubha = x
x = 3 (given)
Age of Rakhi = 12 × 3 = 36
2 year before age of Rakhi = 36 − 2 = 34 years.

S80. Ans.(c)
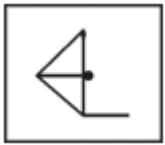
Sol.

The pattern is
I → $1^3, 2^3, 3^3 = 1, 8, 27$
II → $4^3, 5^3, 6^3 = 64, 125, 216$
Similarly, III → $7^3, 8^3, 9^3 = 343, 512, 729$
Hence, 512 is the Answer.

S81. Ans.(b)

Sol.

Hence option (b) is correct Answer.

S82. Ans.(a)

Sol. The pattern followed here is

Hence, ORES is the correct answer.

S83. Ans.(c)

Sol.

The logic here is
$9 : 8 = (3)^2 : (2)^3$
Similarly, $16 : 27 = (4)^2 : (3)^3$
Hence, 27 is the correct answer.

S84. Ans.(a)

Sol.

The sequence is
ac**bdd**b / **a**cbdd**b** / a**c**bddb
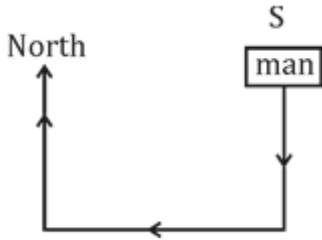Hence bdabc is the correct answer.

S85. Ans.(d)

Sol. 17, 19, 13 all are prime numbers except 15.

Hence 15 is the correct answer.

S86. Ans.(a)
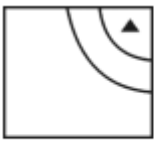**Sol.**

So, man walk in North direction.

S87. Ans.(a)
Sol.
According to question
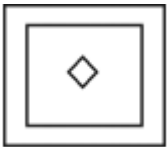⇒ N R O P M
Hence, O is sitting in the middle.

S88. Ans.(a)
Sol.

Option (a) is correct answer.

S89. Ans.(a)
Sol.

is the correct answer.

S90. Ans.(a)
Sol. The sequence is
3. Range 4. Rapid 5. Reptile 2. Restore 1. Ringer
34521 is correct sequence.

S91. Ans.(b)
Sol. IRCTC Stands for Indian Railway Catering and Tourism Corporation (IRCTC)

S92. Ans.(c)
Sol. The Secunderabad railway station became the country's first railway station to receive the CII-IGBC Platinum Rating.

S93. Ans.(c)
Sol. The colors of the lines usually indicate similar classes of information: topographic contours (brown); lakes, streams, irrigation ditches, and other hydrographic features (blue); land grids and important roads (red); and other roads and trails, railroads, boundaries, and other cultural features (black).

S94. Ans.(a)
Sol. Jharkhand does NOT have the Headquarters of any Railway Zone

S95. Ans.(d)
Sol. North Southern is NOT one of the railway zones.

S96. Ans.(d)
Sol. The South Eastern Railway (SER) has launched a project called "Operation My Saheli" to boost the security of women passengers in trains during their entire journey.

S97. Ans.(a)
Sol. The first railway minister of independent India was John Mathai. He joined the office on 15 Aug 1947, the day India became independent.

S98. Ans.(c)
Sol. The name "Shatabdi" means centenary in Sanskrit. The first Shatabdi Express train was introduced on 10 July 1988, by then Railways Minister Madhavrao Scindia to commemorate the birth centenary of Jawaharlal Nehru the first Prime Minister of India, between New Delhi and Gwalior Junction.

S99. Ans.(c)
Sol. Lord Dalhousie came to India in 1848 to serve as Governor General of India. He annexed many states like Satara, Sambhalgarh, Nagpur, and Jhansi under the 'Doctrine of Lapse'. He introduced railways in India and the first railway line from Mumbai to Thane was opened in 1853.

S100. Ans.(b)
Sol. Kolkata Metro Rail Corporation (KMRC) is set to complete its East-West Project, which runs partly under the Hooghly River, West Bengal, by December 2023. It will be India's first underwater metro.