RRC Group D Previous Year Paper 35 (Held On: 8 Oct 2018 Shift 2)

RRB Group D • 2018 • 100 questions • 90 minutes • Answer key and solutions

Take this paper as a timed mock test

Practise under exam conditions, then review your answers after you submit.

yourmocktest.com/pyq/rrb-group-d/rrc-group-d-previous-year-paper-35-held-on-8-oct-2018-shif…

Scan the QR code or click the link to open it.

YourMockTest.com — Free Study Material

CBT

Q1. Birds have:

(a) two-chambered heart
(b) one-chambered heart
(c) four-chambered heart
(d) three-chambered heart

Q2. If the resistance is halved the current gets _____.

(a) remains same
(b) doubled
(c) tripled
(d) halved

Q3. As of September 2018, who is the Director General of Doordarshan?

(a) Supriya Sahu
(b) Deepa Chandra
(c) Deepak Ashish Kaul
(d) PK Subhash

Q4. Pinna is the external part of _____

(a) ears
(b) nose
(c) fingers
(d) eyes

Q5. What will be 0.008594, correct to three significant figures, be equal to?

(a) 0.00859
(b) 0.009
(c) 0.00860
(d) 0.008

Q6. Which of the following sport is Angha Deshpande related to?

(a) Athletics
(b) Cricket
(c) Archery
(d) Table Tennis

Q7. A bullet, of mass 40 g is horizontally fired with a velocity 150 ms^(-1) from a pistol of mass 3 kg. What is the recoil velocity of the pistol?

(a) • 1.25 ms^(-1)
(b) • 3.0 ms^(-1)

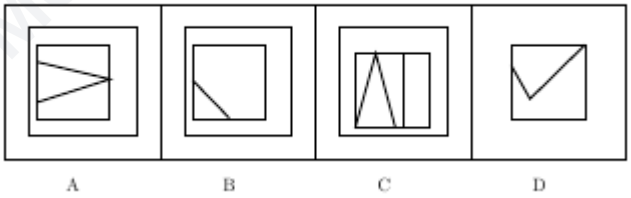
(c) • 1.5 ms^(-1)
(d) • 2.0 ms^(-1)

Q8. Which of the answer figure is formed from the shapes given in the problem figure?

Problem Figure



Answer Figure



(a) C
(b) D
(c) B
(d) A

Q9. Which of the following is India's fastest and first multi-petaflops (PF) supercomputer unveiled at Pune-based Indian Institute of Tropical Meteorology (IITM)?

(a) Pratyush
(b) Poonam
(c) Surya
(d) Aditya

Q10. Given below is a statement followed by two assumptions numbered I and II. You have to consider the statement and the following assumptions and decide which of the assumptions is implicit in the statement.

Statement: The healthiest cooking oil for the whole family an advertisement states.

Assumptions:

I. There are other cooking oils available in the Market.

II. The health of the family is the priority for any individual.

(a) Only assumption II is implicit
(b) Only assumption I is implicit
(c) Neither I nor II is implicit
(d) Both I and II are implicit.

YourMockTest.com — Free Study Material

Q11. If tan f + cot f = 5, then find the value of ($\tan^2$ f + $\cot^2$ f)

(a) 21
(b) 27
(c) 25
(d) 23

Q12. In _____, carbon atoms are arranged in the shape of a football.

(a) Fullerenes
(b) Methane
(c) Benzene
(d) Ethane

Q13. Who among the following has compiled 'Raghuvamsham'?

(a) Surdas
(b) Kabirdas
(c) Kalidas
(d) Tulsidas

Q14. The melting point of ice is:

(a) • 273 C
(b) 273 K
(c) 273 C
(d) • 273 K

Q15. The maximum permissible strength of the Rajya Sabha is:

(a) 250
(b) 260
(c) 300
(d) 225

Q16. Read the given statement and course of action carefully and select which action logically follow(s) for the statement.

Statement:

Footpath of few famous tourist places are filled with beggars.

Course of action:

1. With the help of police these beggars should be driven away.
2. The government should consider the beggars rehabilitation and improve their social status.

(a) Both 1 and 2 follows
(b) Only 1 follows
(c) Neither 1 nor 2 follows
(d) Only 2 follows

Q17. If 49 × 17 = 833, then the value of 0.0833 ÷ 4.9 is:

(a) 0.17
(b) 0.0017
(c) 1.7
(d) 0.017

Q18. Which of the following water bodies separates Australia from New Zealand?

(a) Baltic Sea
(b) Tasman Sea
(c) Red Sea
(d) Bering Sea

YourMockTest.com — Free Study Material

Q19. From the top of a 150 m tall building A, the angle of elevation to the top of the building B is 45 degrees and the angle of depression to the bottom of the building B is 30 degrees. What is the height of the building B?

(a) 250 m
(b) 450/√3 m
(c) 150√3 m
(d) 150 (1 + √3) m

Q20. If the work done is zero, then the angle between the force and displacement is:

(a) 45 degrees
(b) 180 degrees
(c) 0 degree
(d) 90 degrees

Q21. A person driving at a speed of 42 km/h reaches office 1 minute early, whereas if driving at a speed of 36 km/h, the person reaches office 3 minutes late. What is the distance (in km) that the person is covering?

(a) 15.4
(b) 16.8
(c) 12.9
(d) 18.2

Q22. Which of the two conclusions can be concluded on basis of given statements?

Statement:

All parrots are camels.

All camels are wolves.

Conclusions:

1. Some parrots are not wolves

2. Some wolves are parrots

(a) Either (1) or (2) follows
(b) Neither (1) nor (2) follows
(c) Only (1) follows
(d) Only (2) follows

Q23. 15 experts can do as much work as 25 trainees in a given period of time. A piece of work is to be done by 8 experts and 15 trainees. How many trainees alongside 11 experts would one need to complete a similar work in the same duration of time?

(a) 10
(b) 9
(c) 11
(d) 12

Q24. Which of the following statements is/are true?

A. Rigidity: It is the property of matter to maintain its shape even if external force work on it and solids show this property.

B. Fluidity: It is the property of a substance to easily flow and allow change in its shape under external forces and this property is exhibited both by liquids and gasses.

(a) Only A is true
(b) A and B both are true
(c) A and B both are false
(d) Only B is true

Q25. While white washing, Ca(OH)2 reacts slowly with CO2 in air to form a thin layer of _____ on the walls.

(a) CaO
(b) CaSO4
(c) CaCl2

YourMockTest.com — Free Study Material

(d) $CaCO_3$

Q26. Who was included in Badminton association of India's coach panel in 2017?

(a) Saina Nehwal
(b) PV Sindhu
(c) KM Anisha
(d) Jwala Gutta

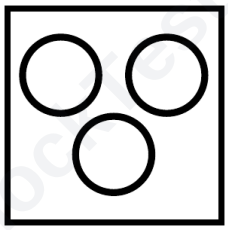
Q27. Who among the following is the current prime minister of China?

(a) Xi Jinping
(b) Li Keqiang
(c) Hu Jintao
(d) Wang Qishan

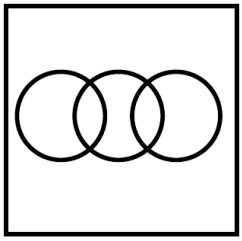
Q28. Choose the best suitable Venn diagram for the following words:

"Flowers, Fruits, Leaves"

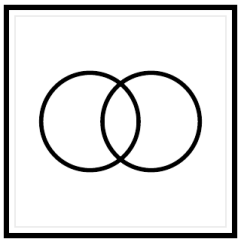
(a)



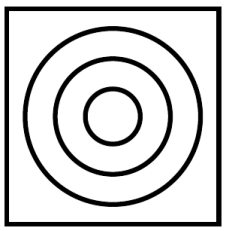
(b)



(c)



(d)



Q29. If the roots of the quadratic equation $x^2 + kx + 9$ are equal, then find the value of K?

(a) 81
(b) ± 8
(c) ± 6
(d) 1/81

YourMockTest.com — Free Study Material

Q30. In _____, each carbon atom is bonded to four other carbon atoms forming a rigid three dimensional structure.

(a) Graphite
(b) Ethane
(c) Diamond
(d) Methane

Q31. Which award is bestowed upon coaches for producing medal winners at prestigious international sport events?

(a) Arjuna Award
(b) Dronacharya Award
(c) Rajiv Gandhi Khel Ratna Award
(d) Dhyan Chand Award

Q32. The difference between the CI compounded annually and SI on a certain sum for 2 years at 15% per annum is Rs. 180. Find the sum.

(a) Rs. 7000
(b) Rs. 8000
(c) Rs. 9000
(d) Rs. 6000

Q33. In some females, due to some problem, fertilization cannot take place. In such cases, freshly released egg and sperms are kept together for few hours for fertilization to occur outside the body. This is called:

(a) Regeneration
(b) Vegetative reproduction
(c) In vitro fertilisation
(d) Fertilisation

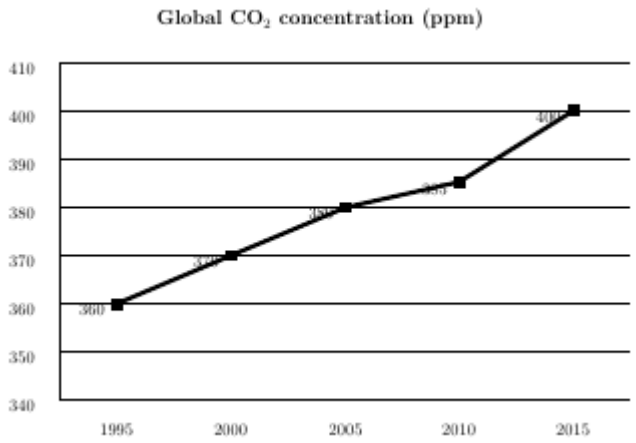
Q34. The value of 'g' decreases with _____.

(a) mass
(b) amplitude
(c) weight
(d) altitude

Q35. Two numbers differ by 2. The difference of squares of both is 100. The sum of the number is:

(a) 38
(b) 40
(c) 50
(d) 48

Q36.



Based on the given graph, which statement correctly describes the pattern?

(a) There is increase in CO2 concentration over the years.
(b) There is decrease in CO2 concentration over the years.

(c) There is no change in CO2- concentration over the years.
(d) The CO2 concentration fluctuates over these years.

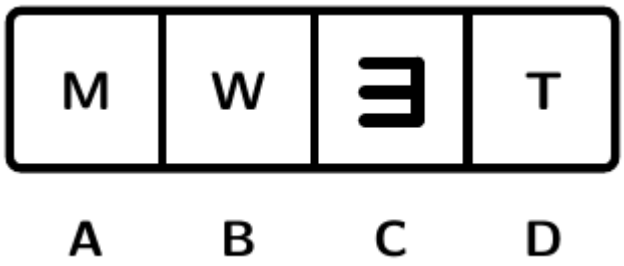
Q37. Two numbers are such that the ratio between them is 3 : 4 if 3 is added to each of them becomes 10 : 13. The original numbers are:
(a) 9, 12
(b) 20, 25
(c) 12, 16
(d) 27, 36

Q38. A tank has two inlets which can fill it in 6 hours and 8 hours, respectively. An outlet can empty the full tank in 10 hours, if all three pipes are opened together in an empty tank how much time will they take to fill the tank completely?
(a) 55/46 hours
(b) 65/23 hours
(c) 65/46 hours
(d) 55/23 hours

Q39. _____ instrument is used to measure potential difference.
(a) Thermometer
(b) Ammeter
(c) Galvanometer
(d) Voltmeter

Q40. _____ is NOT a compound.
(a) Hydrogen sulfide
(b) Chalk
(c) Sulphur dioxide
(d) Lead

Q41. Find the odd one out.



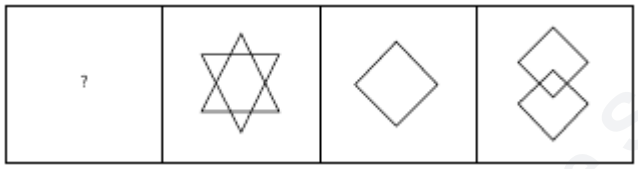
(a) D
(b) A
(c) C
(d) B

Q42. A car accelerates uniformly from 18 kmh^(-1) to 72 kmh^(-1) in 10 s. Calculate the acceleration of the car.
(a) 1.5 ms²
(b) 15 ms^(-2)
(c) 15 ms^(-1)
(d) 1.5 ms^(-2)

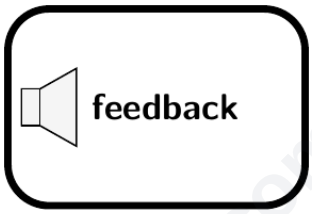
Q43. In the center of square room with sides 10 m, there is a square of turkey carpet and the rest of the floor is covered with oil cloth. The carpet and the oil cloth cost Rs. 15 Rs. 6.50 respectively per square meter and the total cost of the carpet and the oil cloth is 1,338.50. What is the width of the Oil cloth border?
(a) 2 meter
(b) 1 meter
(c) ½ meter

(d) 5 meter

Q44. Find the similar pair:



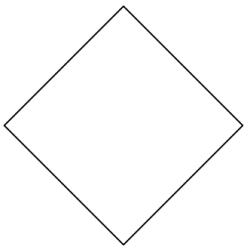
(a)



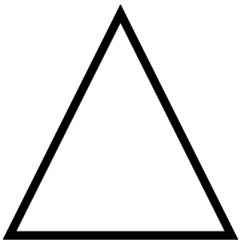
(b)



(c)



(d)



Q45. Find the word that does NOT belong to the group.

Blanket, Sheet, Pillow, Cot

(a) Blanket
(b) Sheet
(c) Cot
(d) Pillow

Q46. 18 people could complete the task in 12 days. After 4 days of work, 2 of the workers left. How many days from the time the worker left will it take to complete the task now?

(a) 6
(b) 9
(c) 10
(d) 8

YourMockTest.com — Free Study Material

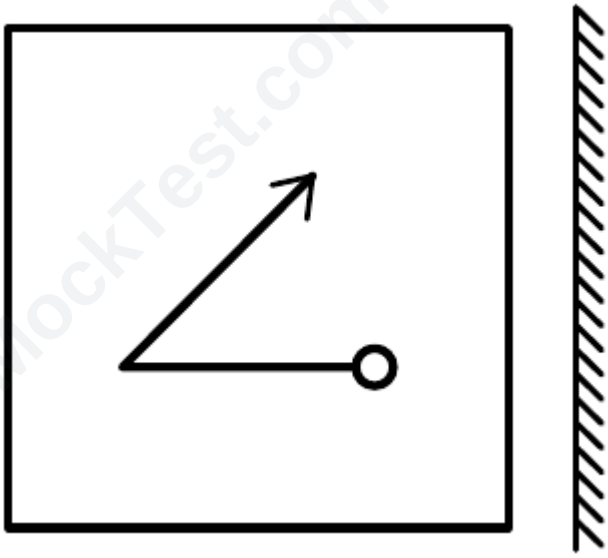
Q47. Which of the following is a physical change?

(a) Melting of ice
(b) Milk is set into curd
(c) Ripening of frutis
(d) Grapes get fermented

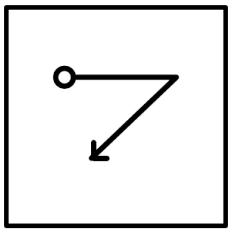
Q48. The _____ character is recessive in garden pea plants.

(a) yellow seed
(b) green pod
(c) wrinkled seed
(d) round seed

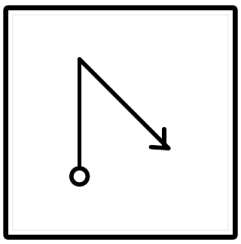
Q49. Choose the mirror image for the following figure



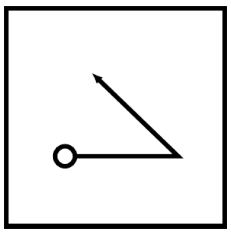
(a)



(b)

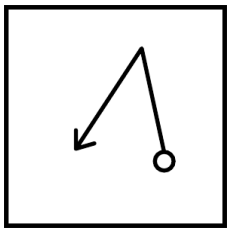


(c)



YourMockTest.com — Free Study Material

(d)



Q50. _____ is the only non-metal placed with alkali metals.

(a) Francium
(b) Hydrogen
(c) Rubidum
(d) Caesium

Q51. The number of diagonals in a 19 – gon is:

(a) 152
(b) 76
(c) 144
(d) 304

Q52. The author of the book 'Ace against Odds' is:

(a) Rohan Bopanna
(b) Leander Paes
(c) Yuki Bhambri
(d) Sania Mirza

Q53. Find the next letter in the series:

JR, KS, LT, ?

(a) MU
(b) UG
(c) MP
(d) UK

Q54. A pearl set broke, with one-eighth of pearls falling onto the floor, a fourth going under a chair, two-fifths staying on the sofa, and eighteen pieces staying on the strand. How many pearls fell on the floor?

(a) 8
(b) 9
(c) 10
(d) 12

Q55. Two cubes each of volume 343 cu. cm are joined end to end. The total surface area of the resulting cuboid is:

(a) 346 sq cm
(b) 490 sq cm
(c) 466 sq cm
(d) 436 sq cm

Q56. Which of the following Union Ministries launched 'Mission Fingerling' in March 2017 to achieve Blue Revolution?

(a) Ministry of Defence
(b) Ministry of Agriculture & Farmers, Welfare
(c) Ministry of Finance
(d) Ministry of Home Affairs

YourMockTest.com — Free Study Material

Q57. Select the term that relates to the third term in the same way that the second term relates to the first term.

Players: Team ? Minister: ?

(a) Mob
(b) Council
(c) Chest
(d) Colony

Q58. A statement is followed by two arguments. Decide which of the arguments is/are strong with respect to the statement.

Statement:

Should Bihar ban alcohol?

Argument:

1. Yes, government should not promote alcohol and consider the development of state.

2. No, government will lose large revenue from beaming and banning cannot be implemented 100%.

(a) Only argument 1 is strong
(b) Both argument 1 and 2 is strong
(c) Only argument 2 is strong
(d) Either argument 1 or 2 is strong

Q59. Who became the Chief Justice of the Madras High court in March 2017?

(a) Chief Justice Askok Kumar Ganguly
(b) Chief Justice Sanjay Kaul
(c) Chief Justice Indira Banerjee
(d) Chief Justice Rajesh Kumar Agrawal

Q60. Name the late Kannada journalist who was awarded the prestigious Reach All Women in WAR (RAW in WAR) Anna Polikovskya Award on 7^(th) October 2017.

(a) Kusum Nair
(b) Sucheta Dalal
(c) Gauri Lankesh
(d) Malini Parthasarathy

Q61. Where is the Yellowstone National Park situated?

(a) United Kingdom
(b) United States
(c) France
(d) South Africa

Q62. A frequency of ____ is NOT audible to human beings.

(a) 100 Hz
(b) 18000 Hz
(c) 20000 Hz
(d) 22000 Hz

Q63. The value of acceleration due to gravity does not depend upon:

(a) Mass of the earth 'M'
(b) Constant of gravitation 'G'
(c) Radius of the earth 'R'
(d) Mass of the falling object 'm'

Q64. Evaluate the below expression.

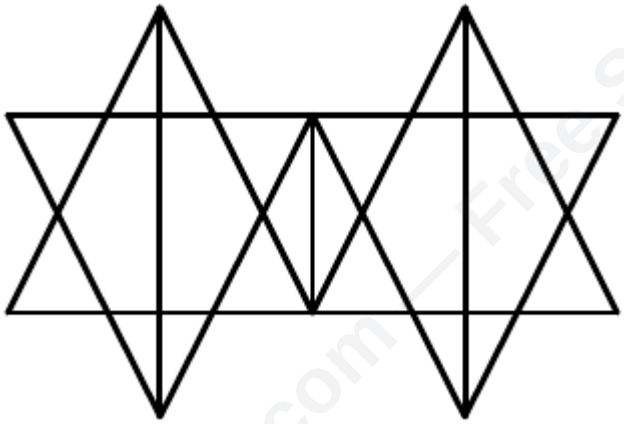
21 + [5 of {15 + (18 – 17)}]

(a) 100
(b) 99

YourMockTest.com — Free Study Material

(c) 102
(d) 101

Q65. How many triangles are there in the following figure?



(a) 29
(b) 38
(c) 40
(d) 30

Q66. Sundar earns by conducting coaching classes. 10% of his income goes into varied costs involved in running his classes. Below is the table showing his 5-year income (in lakh)

Year	Sundar's Yearly Income in (lakh) Rs.
2012	2.5
2013	3
2014	3
2015	2.5
2016	4

On an average, how much does Sundar spend in a year as varied cost in maintaining his classes?

(a) Rs. 40,000
(b) Rs. 20,000
(c) Rs. 25000
(d) Rs. 30,000

Q67. Name the city which was recently included in the United Nations Educational, Scientific and Cultural Organization's (UNESCO's) Creative Cities Network for contribution in Music.

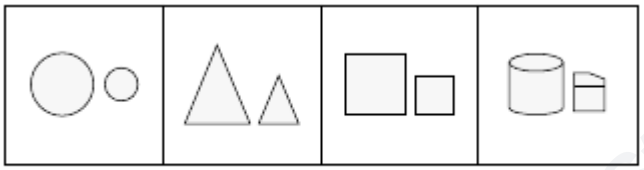
(a) Bengaluru
(b) Chennai
(c) Kolkata
(d) Mumbai

Q68. If 31 × 23 = 713, then what is value of 3100 × 0.00023?

(a) 7.13
(b) 0.0713
(c) 71.3
(d) 0.713

YourMockTest.com — Free Study Material

Q69. Find the ODD one:



(a) A
(b) B
(c) C
(d) D

Q70. Who is the author of 'Panchatantra'?

(a) Kalidas
(b) Valmiki
(c) Vishnu Sharma
(d) Sri Harhsa

Q71. The foundation of Buddhism are the __ noble truths and the ___ fold path.

(a) six, four
(b) eight, six
(c) two, eight
(d) four, eight

Q72. Taps A and B can fill a tank in 2 and 8 hours, respectively. Tap C can empty the filled tank in 4 hours. If all the three taps are turned on simultaneously, how much time will it take to fill the tank completely?

(a) 3 hours
(b) 9/2 hours
(c) 3/8 hours
(d) 8/3 hours

Q73. Sunder and Prakash are playing carom. If Prakash faces south – east direction, then his opponent Sunder is facing which direction?

(a) South – west
(b) South – east
(c) North – east
(d) North – west

Q74. Which of the following does NOT possess kinetic energy?

(a) A rolling stone
(b) A falling coconut
(c) A raised hammer
(d) A speeding car

Q75. Find the missing term in the give series:

L - 169, J - 196, ?, F - 256

(a) F - 140
(b) H - 225
(c) T - 92
(d) S - 101

Q76. Atomic numbers of Actinoides are from _____.

(a) 57 - 70
(b) 58 - 71
(c) 89 - 103

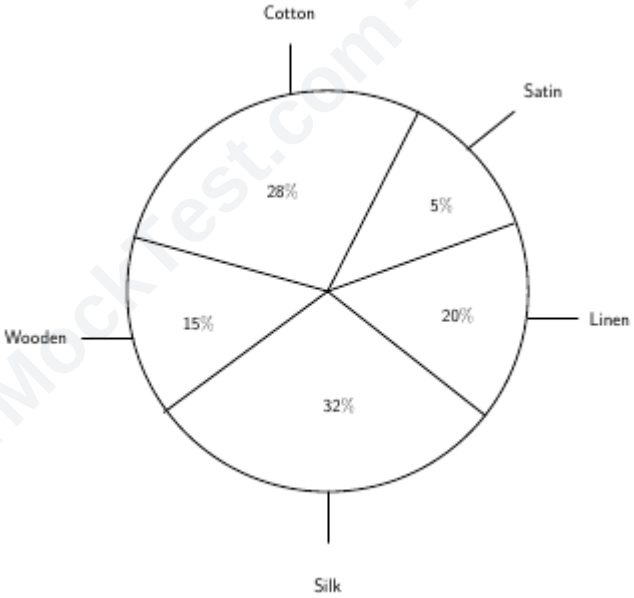
YourMockTest.com — Free Study Material

(d) 89 - 102

Q77. You want to decorate your house with 300 light bulbs of four selected colors. You already have 32 red, 26 green and 9 yellow bulbs. You have no blue bulbs, each bulb costs Rs. 15 and you get 20% discount if you purchase 50 or more bulbs of the same color and 30% discount when you purchase 70 or more bulbs of new color. How much would you spend if you decorated your house with an equal number of bulbs of each color?

(a) Rs. 2959.50
(b) Rs. 2970
(c) Rs. 2680.50
(d) Rs. 2780

Q78. The following pie diagram shown information about different types of the cloth material produced in company XYZ in 2015



If the total fabric produced is 1,50,000 tones in the year 2015

How much fabric of satin (in tons) was produced in 2015?

(a) 7500
(b) 1500
(c) 30,000
(d) 60,000

Q79. Select the option that is related to the third word on the same basis as the second word is related to the first word.

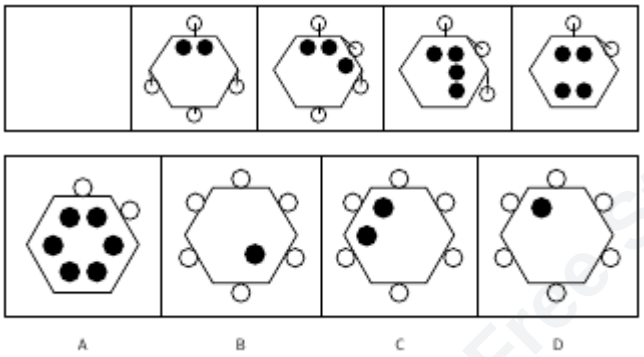
Embroidery : Beautiful :: Moonlight : ?

(a) Day
(b) Dark
(c) Cool
(d) Dense

Q80. Which Indian city was ranked first in the 2018 Ease of Living Index prepared by the Ministry of Housing and Urban Affairs?

(a) Chennai
(b) Navi Mumbai
(c) Pune
(d) Kochi

Q81. The missing figure in the above sequence is



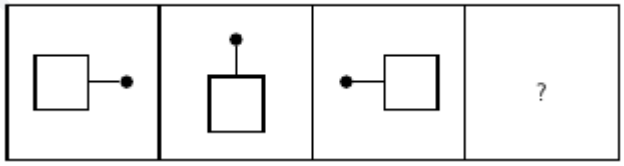
(a) D
(b) A
(c) B
(d) C

Q82. The Government of India has launched the Pradhan Mantri Krishi Sinchai Yojana (PMKSY) with an investment of _____ aiming at the development of irrigation sources for providing a permanent solution form drought.

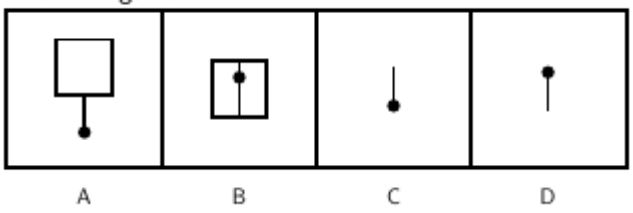
(a) Rs. 50,00,000 crore
(b) Rs. 500,000 crore
(c) Rs. 5,000 crore
(d) Rs. 50,000 crore

Q83. Pick the figure that will complete the given series.

Problem Figures



Answer Figures



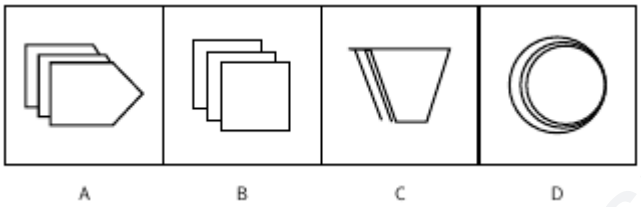
(a) C
(b) A
(c) B
(d) D

Q84. The Union Ministry of Personnel, Public Grievances and Pensions launched the electronic - Human Resource Management System (e - HRMS) on the occasion of ____ on 25th December.

(a) Good Governance Day
(b) Good Behaviour Day
(c) Good Conduct Day
(d) Good Management Day

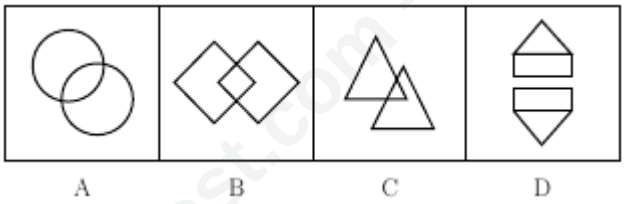
Q85. Find the odd one out:

YourMockTest.com — Free Study Material



(a) C
(b) D
(c) A
(d) B

Q86. Find the odd one out:



(a) A
(b) D
(c) C
(d) B

Q87. Plants that do NOT have a well-differentiated body design fall in the ____ group.

(a) Gymnosperms
(b) Pteridophyta
(c) Thallophyta
(d) Bryophyta

Q88. You are given a question and two statements. Identify which of the statements is/are necessary/sufficient to answer the question.

Question:

How many daughters does Z have?

Statements:

1. X and Y are only daughters of U.
2. V is brother of X and son of Z.

(a) Either 1 or 2 alone is sufficient
(b) 1 alone is sufficient while 2 alone is not sufficient
(c) 2 alone is sufficient while 1 alone is not sufficient
(d) Both 1 and 2 together are sufficient

Q89. Read the given statements(s) and conclusions carefully and select which of the conclusions logically follow(s) from the statement(s).

Statements:

I. Some tables are wood.

II. Some wood are brown.

Conclusions:

1. Some brown are tables.
2. Some woods are tables.

(a) Conclusion 2 alone follows.
(b) Conclusion 1 alone follows.
(c) Both 1 and 2 follows.
(d) Neither 1 nor 2 follows.

YourMockTest.com — Free Study Material

Q90. The difference between the selling prices of a chair at profits 10% and 14% is Rs. 27. What is the cost price of the chair?

(a) Rs. 586
(b) Rs, 440
(c) Rs. 880
(d) Rs. 675

Q91. A vendor buys pencils at Rs. 25 per dozen and sells them at a rate of 5 pencils for Rs. 12 Find his gain or loss percent?

(a) 15.2% gain
(b) 15% gain
(c) 15.2% loss
(d) 15% loss

Q92. What is the HCF of two prime numbers x and y?

(a) 1
(b) 2
(c) x/y
(d) 0

Q93. Read the given statement(s) and conclusions carefully and select which of the conclusions logically follow(s) from the statement(s)

A job advertisement states: “Suitable candidates with maximum age of 30 years can apply.”

Conclusions:

I. No candidate who is more than 30 years old can apply

II. The company is specific about the age group of candidates.

(a) Both the conclusion follows.
(b) Only conclusion II follows
(c) Only conclusion I follows
(d) No conclusion follows

Q94. An object of mass 15 kg is moving with a uniform velocity of 5 ms^(-1). What is the kinetic energy possessed by the object.

(a) 187.5 ms
(b) 187.5 J
(c) 180.5 J
(d) 17.5 J

Q95. Which of the following numbers is irrational?

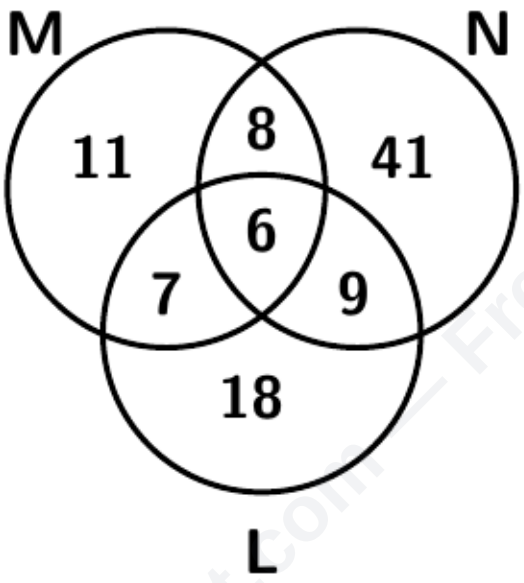
(a) 6√1000000
(b) √1000000
(c) 4√1000000
(d) cbrt1000000

Q96. Calculate the wavelength of a soundwave where frequency is 200 Hz and speed is 400 ms^(-1) in a given medium.

(a) 0.5 m
(b) 0.2 m
(c) 20 m
(d) 2 m

Q97. The below Venn diagram represents the students who play 3 sports M, N and L in a class, total number of students who play both N & L but not M game is:

YourMockTest.com — Free Study Material



(a) 15
(b) 68
(c) 9
(d) 12

Q98. Arjun takes 5 hrs. to swim upstream of 40 km where as he takes only 2 hrs. to swim downstream of 20 km. Find the speed of Arjun in still water.

(a) 15 kmph
(b) 10 kmph
(c) 12 kmph
(d) 9 kmph

Q99. Find the next number in the given series.

3, 6, 12, 24, 48, ?

(a) 96
(b) 405
(c) 95
(d) 100

Q100. If $2x^2 + ax + b$ when divided by $x - 3$ leaves a remainder of 35, and $2x^2 + bx + a$ when divided by $x - 3$ leaves a remainder of 29, then what is the value of a + b?

(a) -23
(b) 7
(c) -7
(d) 23

ANSWER KEY

1	c	2	b	3	a	4	a	5	a	6	b	7	d	8	d	9	a	10	d
11	d	12	a	13	c	14	b	15	a	16	a	17	d	18	b	19	d	20	d
21	b	22	d	23	a	24	b	25	d	26	d	27	b	28	a	29	c	30	c
31	b	32	b	33	c	34	d	35	c	36	a	37	d	38	d	39	d	40	d
41	c	42	d	43	c	44	d	45	c	46	b	47	a	48	c	49	c	50	b
51	a	52	d	53	a	54	c	55	b	56	b	57	b	58	a	59	c	60	c
61	b	62	d	63	d	64	d	65	c	66	d	67	b	68	d	69	d	70	c

YourMockTest.com – Free Study Material

71	d	72	d	73	d	74	c	75	b	76	c	77	a	78	a	79	c	80	c
81	a	82	d	83	b	84	a	85	b	86	b	87	c	88	d	89	a	90	d
91	a	92	a	93	a	94	b	95	c	96	d	97	c	98	d	99	a	100	b

SOLUTIONS

Q1. Answer: (c) four-chambered heart

The correct answer is option 3, i.e., four-chambered heart.

• Birds(aves) have four-chambered heart.

• Chordates have closed circulatory system i.e., heart and blood vessels are found in them, and Heart in is divided into chambers like atriums (auricles) and ventricles.

• Pisces have two-chambered heart, i.e., one auricle and one ventricle.

• Amphibians and Reptile have three-chambered heart, i.e., two auricles and one ventricle.

• Aves and Mammals have four-chambered heart, i.e., two auricles and two ventricles.

• This kind of system prevents mixing of the oxygenated and de-oxygenated blood.

Q2. Answer: (b) doubled

The correct answer is option 2, i.e., doubled.

• If the resistance is halved the current gets doubled.

• Electrical resistance is the obstruction in the flow of current.

• This means that when resistance will be less, the current will be more.

• Also, the formula for the current is, I = V / R, where I = Current, V = Voltage, R = Resistance.

• According to question, Resistance (R) is halved. Now, if the resistance is halved and the voltage remains the same, the new value of current becomes, I′ = 2V/R, I′ = 2(V/R) = 2I. Hence, the current will become double.

Q3. Answer: (a) Supriya Sahu

• The correct answer is Option 1, i.e., Supriya Sahu.

• As of September 2018, Supriya Sahu was the Director-General of Doordarshan.

• Doordarshan is one of the two divisions of the Prasar Bharti.

• It was founded by the Government of India on 15 September 1959 and is one of the largest broadcasting organizations of India in studio and transmitter infrastructure.

• Supriya Sahu is an IAS officer and currently serving as the Principal Secretary-cum-Managing Director of The Tamil Nadu Small Tea Growers' Industrial Cooperative Tea Factories' Federation Limited (INDCOSERVE) in Coonoor.

• A. Surya Prakash is currently serving as the chairperson of Doordarshan.

Q4. Answer: (a) ears

The correct answer is option 1, i.e., ears.

• Pinna is the external part of the ears.

• In mammals, an ear has 3 parts, namely external ear, middle ear, and inner ear.

• The external ear is the outermost part of the ear which is divided into ear pinna and auditory canal.

• The ear pinna is the main part and occurs only in mammals. It is due to this fact mammals are regarded to have true external ears.

• The muscles of ear pinna are vestigial parts of the human body.

• The parts of human eyes include: cornea, sclera, pupil, iris, lens, retina, choroid, etc.

Q5. Answer: (a) 0.00859

Concept Used:

Rules to determine the number of significant figures:

• All non-zero numbers are significant.

• The Zeros between two non-zero digits are significant.

• Leading zeros are not significant.

Calculation:

Considering the given value 0.008594

YourMockTest.com — Free Study Material

Now, Correct to three significant figures can be written as 0.00859

• Significant figures of a number in notation are digits in the number.

• That is absolutely necessary to indicate the quantity of something in an accurate manner.

• This mainly uses to precise a number.

• For example:

Q6. Answer: (b) Cricket

The correct answer is option 2, i.e., Cricket.

• Angha Deshpande is related to Cricket.

• Angha Deshpande was a wicket-keeper and right-handed batswoman.

• She made her ODI debut in the year 2008 and played her last ODI in the year 2013.

• She made her T20 debut in the year 2011 and played her last T20 in the year 2014.

Sport	Famous Indian Women Players
Athletics	P.T. Usha (track and field), Anju Bobby George (long jump), Hima Das (track and field), etc.
Cricket	Mithali Raj, Jhulan Goswami, Harmanpreet Kaur, etc.
Archery	Dola Banerjee, Deepika Kumari, Bombayla Devi Laishram, etc.
Table Tennis	Ankita Das, Manika Batra, etc.

Q7. Answer: (d) • 2.0 ms^(-1)

The correct answer is option 4, i.e., - 2.0 ms-1.

• The recoil velocity is the velocity by which pistol bounces back when a bullet is fired.

• In this case, the momentum of the bullet is equal to the momentum of the pistol.

• Hence, m_bv_b = m_pv_p(where m_b and m_p are the masses of bullet and pistol respectively and v_b and v_p are the velocities of bullet and pistol respectively).

• 3 x v_p = 40 x 10^(-3) x 150

• v_p = 40 x 10-3 x 50

• v_p = 2000 x 10-3

• v_p = 2 m/s

• Here, the velocity of pistol is taken with negative sign because, it is in the opposite direction to that of the velocity of the bullet, i.e., bullet moves forward and pistol moves backwards.

Q8. Answer: (d) A

The figure which can be formed from the given shapes is,

Hence, option 4 is the correct answer.

Q9. Answer: (a) Pratyush

The correct answer is option 1, i.e., Pratyush.

• Pratyush is India's fastest and first multi-petaflops (PF) supercomputer unveiled at the Pune-based Indian Institute of Tropical Meteorology (IITM).

• The meaning of the word 'Pratyush' is 'rising sun' and the maximum speed of the supercomputer is 4.0 PetaFlops.

• It was inaugurated on 8 January 2018 by the Union Minister of Science and Technology, Dr. Harsh Vardhan.

• Pratyush is used for weather forecasting and climate monitoring.

• After Japan, the USA, and the UK, India has become the fourth country in the world to have a High-Performance Computing (HPC) facility meant for climate and weather research.

• The team of engineers that built Pratyush was led by Suryachandra A Rao at the IITM, Pune.

• Mihir is another supercomputer unveiled at the National Center for Medium Range Weather Forecast (NCMRWF), Noida. The maximum speed of this supercomputer is 2.8 PetaFlops. Together they provide a combined output of 6.8 PetaFlops.

• The purpose of the Mihir supercomputer is the same as that of Pratyush.

Q10. Answer: (d) Both I and II are implicit.

According to the given information,

Assumption I: This is implicit, because there are other oils available in the market.

YourMockTest.com — Free Study Material

Assumption II: This is also implicit, because health is definitely a priority for every individual and their family.

Hence, “both I and II” are implicit.

Q11. Answer: (d) 23

Shortcut Trick

If $x + 1/x = k$, then $x^2 + 1/x^2 = k^2 - 2$.

Given: tan f + cot f = 5 (Note: cot f = 1/tan f).

Let tan f = x, then $x + 1/x = 5$.

Value = $5^2 - 2 = 25 - 2 = 23$.

Therefore The correct answer is 23.

Alternate Method

Given: tan f + cot f = 5

Formula Used: $(a + b)^2 = a^2 + b^2 + 2ab$

=> $(\tan f + \cot f)^2 = 5^2$

=> $\tan^2 f + \cot^2 f + 2 \times \tan f \times \cot f = 25$

=> $\tan^2 f + \cot^2 f + 2 \times \tan f \times (1/\tan f) = 25$

=> $\tan^2 f + \cot^2 f + 2 = 25$

=> $\tan^2 f + \cot^2 f = 25 - 2$

=> $\tan^2 f + \cot^2 f = 23$

Therefore The correct answer is 23.

Additional Information

Reciprocal Identities

In trigonometry, tan f × cot f = 1 because cot f is the reciprocal of tan f.

Algebraic Power Rule

If $x + 1/x = a$, then $x^4 + 1/x^4 = (a^2 - 2)^2 - 2$.

Pythagorean Identities

Related identities include $1 + \tan^2 f = \sec^2 f$ and $1 + \cot^2 f = \text{cosec}^2 f$.

Q12. Answer: (a) Fullerenes

The correct answer is option 1, i.e., Fullerenes.

• In Fullerenes, carbon atoms are arranged in the shape of a football.

• Fullerenes are one of the allotropes of carbon.

• In fullerenes, carbon atoms are bonded by single and double bonds so as to form a closed or partially closed mesh, with fused rings of five to seven atoms.

• The most famous member of the Fullerenes is Buckminster Fullerenes. The molecule has 60 carbon atoms.

• It is named after Buckminster Fuller, because the structure of the molecule is similar to geodesic spheres made by this American architect, and is also known as 'Buckyball' as its shape is similar to that of 'soccer balls'.

• The accidental synthesis in the year 1985 led to the discovery of fullerenes.

• Methane (CH4) is a hydrocarbon belonging to the family of alkanes and is the first member of the alkane family.

• Benzene is an aromatic hydrocarbon with the formula C6H6.

• Ethane (C2H6) is the second member of the alkane family after Methane.

Q13. Answer: (c) Kalidas

The correct answer is option 3, i.e., Kalidas.

• 'Raghuvansham' is compiled by Kalidas.

• 'Raghuvansham' known as 'Raghuvamsa' is a Sanskrit epic poem compiled by Kalidas.

• The poem speaks in 19 sargas, about the Raghu dynasty, which included Raghu, Dasaratha, Rama, etc.

• Kalidas is assumed to be a 5th-century poet and writer. His famous works include Abhijanasakuntalam, Meghaduta, etc.

• Surdas was a 16th-century blind poet whose works were dedicated to the devotion towards Lord Krishna. He used to write in Braj Basha and 'Sur Sagar' is his most famous composition.

• Kabirdas was a 15th-century saint and poet, whose writings were influential in the Bhakti movement. He also wrote in Braj and his works were concerned with devotion, mysticism, and discipline. 'Kabir ke dohe' is still very popular.

• Tulsidas a devotee of Lord Rama was a saint and a renowned poet. He is best known for 'Ramcharitmanas'.

YourMockTest.com — Free Study Material

Q14. Answer: (b) 273 K

The correct answer is option 2, i.e., 273 K.

Key Points

• The melting point of ice is 273 K.

• Water can exist in all three forms, i.e., solid, liquid, and gas.

• Solid in the form of ice, liquid in the form of water, and gas in the form of water vapours.

• The melting point is the temperature at which a substance changes its state from solid into liquid.

• For ice, the temperature in degree Celcius is 0 and in kelvin, it is 273.

• Kelvin is the SI unit of temperature and 0ºC = 273 K

• The formula for converting ºC into K is: K = 273 + temperature in ºC

• The temperature at which a liquid transforms into gas is termed as its boiling point.

• For water, the boiling point is 100ºC, i.e., 373 K.

Q15. Answer: (a) 250

The correct answer is 250.

Key Points

• The maximum permissible strength of the Rajya Sabha is 250.

• As per Article 80 of the Indian Constitution, the maximum permissible strength of the Upper House of the Parliament, i.e., Rajya Sabha is 250.

• Out of the total 250, 238 are representatives from the States and Union Territories and 12 are nominated by the President.

• Currently, the maximum strength for Rajya Sabha is 245, of which 233 are elected by the legislatures of the states and union territories and the remaining 12 are nominated by the President.

• The Vice-President of India is the ex-officio Chairman of the Rajya Sabha, i.e., whosoever holds the office of Vice-President will automatically become the Chairman of the Rajya Sabha.

Q16. Answer: (a) Both 1 and 2 follows

According to the given statement,

Course of action 1: This follows, because the footpath is filled with beggars.

Course of action 2: This also follows, because the social status of the beggars should be increased.

Hence, “both 1 and 2” follow.

Q17. Answer: (d) 0.017

Given

49 × 17 = 833

Calculation

0.0833 ÷ 4.9

= 833/10000 ÷ 49/10

= (833/10000) × (10/49)

= (49 × 17)/(1000 × 49)

= 17/1000

= 0.017

Q18. Answer: (b) Tasman Sea

The correct answer is option 2, i.e., Tasman Sea.

• Tasman Sea separates Australia from New Zealand.

• The Tasman Sea is a section of the Southwestern Pacific Ocean and it is 2800 km long and 2000 km wide.

• Between the southeast coast of Australia and Tasmania to the west and New Zealand to the east.

• The sea was first navigated by Dutch explorer Abel Janszoon Tasman, hence the name the Tasman Sea.

Q19. Answer: (d) 150 (1 + √3) m

Shortcut Trick

In Δ formed by depression angle 30°, the ratio of Height : Base is 1 : √3. Since Height = 150 m, then Base = 150√3 m.

In Δ formed by elevation angle 45°, the ratio of Height : Base is 1 : 1.

Since the Base is the same (150√3 m), the additional height is also 150√3 m.

Total Height of Building B = 150 + 150√3 = 150(1 + √3) m.

Therefore The correct answer is 150 (1 + √3) m.

Alternate Method

Given: Height of Building A = 150 m. Angle of elevation = 45°. Angle of depression = 30°.

Formula Used: tan(θ) = Perpendicular ÷ Base

=> In bottom triangle: tan(30°) = 150 ÷ Distance between buildings

=> 1/√3 = 150 ÷ Distance

=> Distance = 150√3 m

=> In top triangle: tan(45°) = Extra height of B ÷ 150√3

=> 1 = Extra height ÷ 150√3

=> Extra height = 150√3 m

=> Total Height of Building B = 150 + 150√3

Therefore The correct answer is 150 (1 + √3) m.

Additional Information

Angle of Elevation and Depression

The angle of elevation is measured upwards from the horizontal, while the angle of depression is measured downwards from the horizontal.

Trigonometric Ratios for Standard Angles

tan(30°) = 1/√3, tan(45°) = 1, and tan(60°) = √3. These are essential for solving Height and Distance problems.

Q20. Answer: (d) 90 degrees

The correct answer is option 4, i.e., 90 degrees.

• If the work done is zero, then the angle between the force and displacement is 900.

• Work is a scalar quantity, i.e., it only has magnitude and no direction.

• Work done is a scalar product of force and displacement, i.e., W = F.s or W = F s cosθ

• The value of cos 90° is 0, and as we know when anything is multiplied with 0 the product is 0.

• It is due to this, we say that the work done when the angle between force and displacement is 90º.

Q21. Answer: (b) 16.8

Shortcut Trick

Use the direct formula for distance when speed and time differences are given.

Distance = [Product of Speeds ÷ Difference of Speeds] × [Difference in Time]

Difference in time = (1 minute early) − (−3 minutes late) = 4 minutes = 4/60 hours.

Distance = [(42 × 36) ÷ (42 − 36)] × [4/60]

Distance = [1512 ÷ 6] × [1/15] = 252 ÷ 15 = 16.8 km.

Therefore The correct answer is 16.8 km.

Alternate Method

Given:

Speed1 (S1) = 42 km/h, Time1 = T − 1 min

Speed2 (S2) = 36 km/h, Time2 = T + 3 min

Formula Used:

Distance = S1 × T1 = S2 × T2

Calculations:

=> Let Distance be D.

=> Difference in time = 1 − (−3) = 4 minutes = 4/60 hour.

=> (D/36) − (D/42) = 4/60

=> [(7D − 6D) / 252] = 1/15

=> D / 252 = 1/15

=> D = 252 ÷ 15

=> D = 16.8 km

Therefore The correct answer is 16.8 km.

Additional Information

Ratio Method for Distance

When distance is constant, speed is inversely proportional to time. Speed ratio 42:36 (7:6) implies time ratio 6:7. Difference 1 unit = 4 mins.

Relative Speed

In the same direction, relative speed is the difference (S1 − S2). In opposite directions, it is the sum (S1 + S2).

Average Speed

For the same distance covered at different speeds x and y, Average Speed = (2 × x × y) ÷ (x + y).

Q22. Answer: (d) Only (2) follows

Drawing the Venn diagram,

Conclusion 1: Some parrots are NOT wolves. → False (This is definitely false)

Conclusion 2: Some wolves are parrots → True (This is definitely true)

Hence, “only conclusion 2” follows.

Q23. Answer: (a) 10

Shortcut Trick

Efficiency ratio of Expert (E) to Trainee (T): 15E = 25T => 3E = 5T.

Work required: 8E + 15T. Since 15T = 9E, Work = 8E + 9E = 17E.

New team: 11E + xT must equal 17E => xT = 6E.

Since 3E = 5T, then 6E = 10T.

Therefore The correct answer is 10 trainees.

Alternate Method

Given: 15 experts = 25 trainees (in terms of work done).

Formula Used: Total Work = Efficiency × Time

=> 15 Expert (E) = 25 Trainee (T)

=> 1 E = 25/15 T = 5/3 T

=> Case 1 Total Work = (8E + 15T) × Time

=> Case 2 Total Work = (11E + xT) × Time

=> 8E + 15T = 11E + xT

=> 15T − xT = 11E − 8E

=> (15 − x)T = 3E

=> Substitute 3E = 5T:

=> (15 − x)T = 5T

=> 15 − x = 5

=> x = 10

Therefore The correct answer is 10 trainees.

Additional Information

Efficiency Equivalence

When M1 men can do as much work as M2 women, the efficiency ratio is E1/E2 = M2/M1.

Total Work Formula

Total Work = (Number of People × Individual Efficiency) × Time. For the same duration, work is directly proportional to total efficiency.

Q24. Answer: (b) A and B both are true

The correct answer is option 2, i.e. A and B are both true.

• Rigidity: It is the property of matter to maintain its shape even if external force works on it and solids show this property.

• The property exhibited by the solids by virtue of which they maintain their shape is termed as Rigidity.

• This is so because in solids the particles are closely packed with very little or no space between the particles and also the force of attraction between the particles is very high.

• Fluidity: It is the property of a substance to easily flow and allow a change in its shape under external forces and this property is exhibited both by liquids and gasses.

• Fluidity in simple terms can be defined as the ability to flow.

• The ability of liquids and gases to take the shape of the container in which they are kept is because of their fluidity.

YourMockTest.com — Free Study Material

Q25. Answer: (d) CaCO3

The correct answer is option 4, i.e., CaCO3.

• While whitewashing, Ca(OH)2 reacts slowly with CO2 in the air to form a thin layer of CaCO3 on the walls.

• Ca(OH)2 is Calcium hydroxide, CO2 is Carbon dioxide, and CaCO3 is Calcium carbonate.

• Calcium carbonate is formed 2-3 days after whitewashing, and thus we get a shiny finish on the wall.

• Following reaction takes place in the given case:

• Ca(OH)2 + CO2 → CaCO3 + H2O

• The common name of Calcium hydroxide is 'slaked lime' and the saturated solution of Calcium hydroxide is known as 'limewater'.

• Calcium carbonate is commonly known as 'limestone'.

• CaO is Calcium oxide.

• CaSO4 is Calcium sulphate.

• CaCl2 is Calcium chloride.

Q26. Answer: (d) Jwala Gutta

The correct answer is option 4, i.e., Jwala Gutta.

• Jwala Gutta was included in the Badminton Association of India's coach panel in 2017.

• The Badminton Association of India (BAI) has formed a new panel of 19 coaches which include former players like Jwala Gutta, Arvind Bhat, Chetan Anand, etc. Pullela Gopichand will still remain the Chief National Coach.

• Jwala Gutta is a renowned badminton player. She represented India in both mixed doubles and women's doubles at the international stage. She won the bronze medal in the 2011 World Championship.

• Other than Jwala Gutta, the other 3 women players included in the panel are Madhumita Bisht, Pradnya Gadre, and Oli Deka.

• Saina Nehwal is a former world no. 1 badminton player and has been honored with Rajiv Gandhi Khel Ratna Award and Arjuna Award.

• PV Sindhu is also a very famous badminton player and has won silver in the 2016 Summer Olympics and has been felicitated with awards like Rajiv Gandhi Khel Ratna Award, Padma Shri, and Padma Vibhushan.

Q27. Answer: (b) Li Keqiang

The correct answer is option 2, i.e., Li Keqiang.

• Li Keqiang is the current Prime Minister of China.

• Li Keqiang, the incumbent Premier of the People's Republic of China, assumed his office on 15 March 2013.

• Li Keqiang is not only the head of the government but also one of the leading figures behind China's Financial and Economic Affairs, National Security, Foreign Affairs, etc.

• Xi Jinping is the President of the People's Republic of China.

• Hu Jintao was the President of the People's Republic of China before Xi Jinping.

• Wang Qishan is the Vice-President of the People's Republic of China.

Q28. Answer: (a) [figure]

Flowers, fruits and leaves are different elements that we get from plants and they are represented separately.

The correct Venn diagram is,

Hence, option 1 is the correct answer.

Q29. Answer: (c) ± 6

Shortcut Trick

Condition for equal roots in x2 + kx + 9 = 0 is b2 = 4ac.

k2 = 4 × 1 × 9

k2 = 36

k = ± √36 = ± 6

Therefore The correct answer is ± 6.

Alternate Method

Given:

Quadratic Equation: x2 + kx + 9 = 0

Formula Used:

A quadratic equation ax2 + bx + c = 0 has equal roots if its Discriminant (D) is zero.

=> D = b2 − 4ac = 0

Calculations:

=> Comparing the given equation with ax2 + bx + c = 0, we get:

=> a = 1, b = k, c = 9

=> Substitute values in the condition D = 0:

=> k2 − 4 × 1 × 9 = 0

=> k2 − 36 = 0

=> k2 = 36

=> k = ± √36

=> k = ± 6

Therefore The correct answer is ± 6.

Additional Information

Nature of Roots

For a quadratic equation, if D > 0, the roots are real and distinct; if D = 0, the roots are real and equal; if D < 0, the roots are imaginary.

Discriminant Formula

The discriminant (D) of the quadratic equation ax2 + bx + c = 0 is calculated using the formula D = b2 − 4ac.

Perfect Square Condition

A quadratic expression ax2 + bx + c is a perfect square if and only if its discriminant is zero (b2 − 4ac = 0).

Roots of Quadratic Equation

The roots are found using the quadratic formula: x = (−b ± √D) / 2a.

Q30. Answer: (c) Diamond

The correct answer is option 3, i.e., diamond.

• In diamond, each carbon atom is bonded to four other carbon atoms forming a rigid three-dimensional structure.

• Diamond is an allotrope of carbon, in which atoms are arranged in a crystal structure called diamond cubic.

• Diamond is the hardest and has the highest thermal conductivity of any natural material. These properties make it very useful for industrial purposes.

• Graphite is also an allotrope of carbon in which atoms are arranged in the hexagonal arrangement. Graphite is the most stable form of carbon under the STP (standard temperature and pressure). It is used in pencils and electrodes.

• Ethane (C2H6) is a hydrocarbon and second member of the alkane family after methane.

• Methane (CH4) is the first member of the alkane family having only one carbon atom.

Q31. Answer: (b) Dronacharya Award

The correct answer is option 2, i.e., Dronacharya Award.

• Dronacharya Award is bestowed upon coaches for producing medal winners at prestigious international sport events.

• Dronacharya Award is officially known as Dronacharya Award for Outstanding Coaches in Sports and Games.

• The award has been named after "Guru Dronacharya" who was the teacher of Kauravas and Pandavas in the Mahabharata and is given for producing medal winners at prestigious international sport events.

• The award is presented annually by the Ministry of Youth Affairs and Sports and was first presented in the year 1985.

• A bronze statue of Dronacharya, a certificate, ceremonial dress, and a cash prize of Rs. 5 lakhs is given to the awardee.

• The most recent recipients of the award in the year 2019 are: Mohinder Singh Dhillon, Rambir Singh Khokar, U. Vimal Kumar, Sandip Gupta, Sanjay Bhardwaj, and Merzban Patel.

• Arjuna Award is also presented by the Ministry of Youth Affairs and Sports to the players for their outstanding achievements in sports.

• Rajiv Gandhi Khel Ratna Award is the highest honour given to a sportsperson in India. It is also presented by the Ministry of Youth Affairs and Sports.

• Dhyan Chand Award is officially known as the Dhyan Chand Award for Lifetime Achievement in Sports and Games, is the award given for the contribution to the sport during the active career and also after the retirement.

Q32. Answer: (b) Rs. 8000

Shortcut Trick

For 2 years, the difference between CI and SI is given by: P × (r/100)².

Given Rate (r) = 15% and Difference = Rs. 180.

180 = P × (15/100) × (15/100)

180 = P × (3/20) × (3/20) => 180 = P × (9/400)

P = (180 × 400) ÷ 9 = 20 × 400 = 8000.

Therefore The correct answer is Rs. 8000.

Alternate Method

Given:

Time (n) = 2 years

Rate of Interest (r) = 15% per annum

Difference (CI − SI) = Rs. 180

Formula Used:

Difference for 2 years = P × $(r/100)^2$

Calculations:

=> Let the Principal be P.

=> Simple Interest for 2 years = (P × 15 × 2) ÷ 100 = 0.30P

=> Compound Interest for 2 years = P × $[(1 + 15/100)^2 − 1]$

=> CI = P × $[(1.15)^2 − 1]$ = P × [1.3225 − 1] = 0.3225P

=> Difference = CI − SI = 0.3225P − 0.30P = 0.0225P

=> 0.0225P = 180

=> P = 180 ÷ 0.0225

=> P = (180 × 10000) ÷ 225

=> P = 1800000 ÷ 225 = 8000

Therefore The correct answer is Rs. 8000.

Additional Information

Difference for 3 Years

For a period of 3 years, the difference between CI and SI is calculated as: D = $P(r/100)^2 × (3 + r/100)$.

Effective Interest Rate (CI)

For 2 years at rate r%, the effective compound interest rate is r + r + (r × r / 100)%.

Successive Percentage Change

The difference between CI and SI for 2 years is always equal to the interest calculated on the first year's interest: (r% of r)% of Principal.

Q33. Answer: (c) In vitro fertilisation

The correct answer is option 3, i.e., In vitro fertilization.

• In some females, due to some problem, fertilization cannot take place. In such cases, freshly released egg and sperms are kept together for few hours for fertilization to occur outside the body. This is called: In vitro fertilization.

• The word "in vitro" means "in glass", the artificial fertilization that takes place outside the body in a glass test-tube is known as In vitro fertilization.

• In this process, the ovulation cycle of the woman is administered and the egg is taken from the body of the female and it is fertilized with the sperm of the male in the artificial environment.

• Regeneration is an asexual mode of reproduction in which a part of the body detaches from the parent to become an independent individual. This generally takes place in lower animals like hydra, sponges, earthworms, starfish, etc.

• Vegetative reproduction is also an asexual mode of reproduction in which a plant is grown from a specialized tissue of the parent plant body.

• Fertilization is a process of fusion of male and female gametes.

Q34. Answer: (d) altitude

The correct answer is option 4, i.e., altitude.

• The value of 'g' decreases with altitude.

• 'g' is the acceleration due to gravity.

• The acceleration due to gravity is the acceleration gained by an object due to the force of gravitation. The SI unit for the same is m/s^2.

• Its standard value is 9.8 m/s^2 on the surface of the earth at the sea level.

• The formula of 'g' is: g = GM / R^(2)(where G is 'gravitational constant', M is the mass of the earth, and R is the radius of the earth)

• The other formula for 'g' is: g = 4/3 πρRG

• The value of 'g' depends on the following:
• altitude above the surface of Earth
• shape of the Earth
• depth below the surface of Earth
• rotational motion of the Earth
• The value of 'g' decreases with altitude because g_h = g (1 + h/R)^(-2) [where g_h is the acceleration due to gravity at height h]. This formula suggests that 'g' decreases with altitude.

Q35. Answer: (c) 50

Shortcut Trick
Direct identity: Difference of squares = (Sum of numbers) × (Difference of numbers)
Sum of numbers = (Difference of squares) ÷ (Difference of numbers)
Sum = 100 ÷ 2
Sum = 50
Therefore The correct answer is 50.
Alternate Method
Given:
Let the two numbers be x and y.
Difference between numbers (x − y) = 2
Difference of squares ($x^2 - y^2$) = 100
Formula Used:
Algebraic Identity: $a^2 - b^2 = (a + b)(a - b)$
Calculations:
=> $x^2 - y^2 = 100$
=> $(x + y)(x - y) = 100$
=> $(x + y) \times 2 = 100$
=> $x + y = 100 \div 2$
=> $x + y = 50$
Therefore The correct answer is 50.
Additional Information
Square of Sum Identity
The expansion of the square of the sum of two numbers is given by: $(a + b)^2 = a^2 + b^2 + 2ab$.
Square of Difference Identity
The expansion of the square of the difference of two numbers is given by: $(a - b)^2 = a^2 + b^2 - 2ab$.
Relation between Squares
A useful combined identity is: $(a + b)^2 - (a - b)^2 = 4ab$.

Q36. Answer: (a) There is increase in CO2 concentration over the years.

From the given graph we can say that,
In 1995 concentration of CO2= 360
In 2000 concentration of CO2= 370
In 2005 concentration of CO2 = 380
In 2010 concentration of CO2= 385
In 2015 concentration of CO2= 400
Every year concentration of CO2 is increasing.
Therefore we can say that option (i) is the right answer

Q37. Answer: (d) 27, 36

Shortcut Trick
Initial Ratio = 3 : 4 (Difference = 1 unit)
Final Ratio = 10 : 13 (Difference = 3 units)
To equate the differences, multiply initial ratio by 3 → 9 : 12
Change in each part = 10 − 9 = 1 unit → 1 unit = 3

Original numbers → 9 × 3 = 27 and 12 × 3 = 36

Therefore The correct answer is 27, 36.

Alternate Method

Let the original numbers be 3x and 4x.

As per the condition, 3 is added to each number:

=> (3x + 3) / (4x + 3) = 10 / 13

=> 13 × (3x + 3) = 10 × (4x + 3)

=> 39x + 39 = 40x + 30

=> 40x − 39x = 39 − 30

=> x = 9

=> First Number = 3 × 9 = 27

=> Second Number = 4 × 9 = 36

Therefore The correct answer is 27, 36.

Additional Information

Ratio and Proportion

A ratio compares two quantities by division. If a : b = c : d, then the product of extremes equals the product of means (ad = bc).

Cross Multiplication Method

For ratio problems involving additions or subtractions, the cross-product of the ratios can quickly determine the value of one unit.

Q38. Answer: (d) 55/23 hours

Shortcut Trick

Net efficiency = 1/6 + 1/8 − 1/10

LCM of 6, 8, 10 = 120

Net efficiency = (20 + 15 − 12) / 120 = 23 / 120

Time taken = 120 / 23 = 5(5/23) hours

Therefore The correct answer is 5(5/23) hr.

Alternate Method

Given: Inlet A fills in 6 hr, Inlet B fills in 8 hr, Outlet C empties in 10 hr.

Formula Used: Total Work = LCM of individual times; Efficiency = Total Work ÷ Time

Pipe	Time (hr)	Total Work (L)	Efficiency (L/hr)
Pipe A (+)	6	120	20
Pipe B (+)	8	15	
Pipe C (−)	10	−12	

=> Total Efficiency when all opened = 20 + 15 − 12

=> Total Efficiency = 23 L/hr

=> Total Time = Total Work ÷ Total Efficiency

=> Total Time = 120 ÷ 23 = 5(5/23) hours

Therefore The correct answer is 5(5/23) hr.

Additional Information

Inlet and Outlet Logic

An inlet pipe does positive work (filling), while an outlet pipe does negative work (emptying) relative to the tank capacity.

Combined Efficiency

If pipe A fills in x hours and pipe B empties in y hours, net work in 1 hour = (1/x) − (1/y). If the result is positive, the tank fills; if negative, it empties.

Pipes and Cisterns vs Time and Work

The concepts are identical to Time and Work, where the tank capacity is the total work and the filling/emptying rates are the efficiencies.

Q39. Answer: (d) Voltmeter

The correct answer is Voltmeter.

Key Points

YourMockTest.com — Free Study Material

• A voltmeter is an instrument used to measure the potential difference.
• A voltmeter is used between two points in an electric circuit to measure the potential difference between those two points.
• Voltmeter was invented in 1819 by Hans Oersted.
• The symbol for the voltmeter is shown below:
• Additional Information
• The ammeter is the instrument used for measuring current in the electrical circuit.
• The galvanometer is the instrument that detects current in the electrical circuit.

Q40. Answer: (d) Lead

The correct answer is option 4, i.e., lead.
• Lead is not a compound.
• Lead is an element and the symbol for lead is Pb.
• The atomic number of lead is 82 and belongs to group 14 of the periodic table and thus is a post transitional metal.
• Lead is a heavy metal that is soft and malleable, has low melting point, and is amphoteric in nature i.e., can react with both acids and bases.
• Compound is formed by the combination of two or more elements.
• Hydrogen sulfide (H2S) is a gas that smells like rotten eggs.
• Chalk is a form of calcium carbonate i.e. CaCO3.
• Sulphur dioxide (SO2) is a toxic gas.

Q41. Answer: (c) C

Here except E, the mirror image of M, W, and T will be same as they appear originally.
Hence, option C is the odd one out.

Q42. Answer: (d) 1.5 ms^(-2)

The solution is in Hindi. Read it online.

Q43. Answer: (c) ½ meter

Shortcut Trick
Let the side of the carpet be x m.
Cost Equation: $15x^2 + 6.50(100 - x^2) = 1338.50$
$8.50x^2 + 650 = 1338.50 \Rightarrow 8.50x^2 = 688.50 \Rightarrow x^2 = 81 \Rightarrow x = 9$ m.
Width of border = (Room side − Carpet side) ÷ 2 = (10 − 9) ÷ 2 = 0.5 m.
Therefore The correct answer is 1/2 m.
Alternate Method
Given: Side of square room = 10 m, Total area = 100 m².
Formula Used: Area = Side²; Total Cost = (Area1 × Rate1) + (Area2 × Rate2).
=> Let the side of the square carpet be x meters.
=> Area of carpet = x^2 and Area of oil cloth = $100 - x^2$.
=> Total Cost = $(x^2 \times 15) + [(100 - x^2) \times 6.50] = 1338.50$
=> $15x^2 + 650 - 6.50x^2 = 1338.50$
=> $8.50x^2 = 1338.50 - 650 = 688.50$
=> $x^2 = 688.50 \div 8.50 = 81$
=> $x = \sqrt{81} = 9$ m.
=> Width of oil cloth border (w) = (10 − 9) ÷ 2 = 0.5 m.
Therefore The correct answer is 1/2 m.
Additional Information
Border Area Calculation
For a square/rectangular path inside a boundary, the inner side = Outer side − 2 × Width.
Area of Path
Area of square path = $(\text{Outer Side})^2 - (\text{Inner Side})^2$ or $4w(S - w)$ where S is outer side and w is width.
Costing Problems
Always ensure units for area (m²) and rate (per m²) are consistent before performing addition.

Q44. Answer: (d) [figure]

The pattern followed is,

In the third figure there is a single diagram and in the fourth figure the same diagram is represented twice and they are joined.

Similarly,

In the second figure, there are two triangles joined.

And,

In the first figure, there should be a single triangle.

Hence, option 4 is the correct answer.

Q45. Answer: (c) Cot

Blankets, Sheets and Pillows are generally used for covering the Cot.

Whereas,

Cot is a small bed.

Hence, “cot” does not belong to the group.

Q46. Answer: (b) 9

Shortcut Trick

Remaining work in terms of man-days = 18 workers × (12 − 4) days = 144 units.

New number of workers = 18 − 2 = 16 workers.

Days required = Remaining Work ÷ Current Workers = 144 ÷ 16 = 9 days.

Therefore The correct answer is 9 days.

Alternate Method

Given: Initial workers (M1) = 18, Initial days (D1) = 12, Days worked = 4, Workers left = 2.

Formula Used: Total Work = M × D; Remaining Work = M1 × (D1 − days lapsed) = M2 × D2

=> Total work = 18 × 12 = 216 units.

=> Work completed in 4 days = 18 × 4 = 72 units.

=> Remaining work = 216 − 72 = 144 units.

=> New strength of workers = 18 − 2 = 16 people.

=> Time taken by 16 people = 144 ÷ 16 = 9 days.

Therefore The correct answer is 9 days.

Additional Information

Chain Rule Formula

For work problems involving variations in men, days, and hours: (M1 × D1 × H1) / W1 = (M2 × D2 × H2) / W2.

Man-Days Concept

Total work is often expressed as the product of the number of men and the number of days they work (M × D), assuming constant efficiency.

Efficiency Relation

The number of people is inversely proportional to the time taken to complete a fixed amount of work.

Q47. Answer: (a) Melting of ice

The correct answer is option 1, i.e., Melting of ice.

• The melting of ice is a physical change.

• The change that does not lead to changes in the chemical composition of a substance is termed as physical change.

• Physical changes lead to changes in the physical properties and are generally reversible in nature.

• Examples of physical changes are: melting of ice, transition into gas, textural changes, changes in size, shape, color, etc.

Additional Information

• In the case of the melting of ice, only a phase transition takes place, the chemical composition of ice does not change.

• Chemical changes lead to the transformation in the chemical composition of the substance. Either a new substance is synthesized or a substance is decomposed.

• The setting of milk into curd, the ripening of fruits, and fermentation of grapes all are examples of chemical changes since the chemical properties of each are changed.

YourMockTest.com — Free Study Material

Q48. Answer: (c) wrinkled seed

The correct is option 3, i.e., wrinkled seed.

• The wrinkled seed character is recessive in garden pea plants.

• Gregor John Mendel, known as 'father of genetics', chose garden pea (Pisum sativum) for his experiments.

• Mendel coined terms 'dominant' and 'recessive' in terms of the characters studied by him.

• A dominant trait is one that expresses itself in the presence of other contrasting trait and dominates it. eg: tallness.

• A recessive trait is one that is not expressed when present along with the contrasting trait in the hybrid. eg: dwarfness.

Character	Dominant	Recessive
Color of seed	Yellow	Green
Color of unripened pods	Green	Yellow
Difference in form of ripe seeds	Round	Wrinkled

Q49. Answer: (c) [figure]

The mirror image for the given figure is,

Hence, option 3 is the correct answer.

Q50. Answer: (b) Hydrogen

The correct answer is Hydrogen.

Key Points

• Hydrogen is the only non-metal placed with alkali metals.

• Hydrogen and alkali metals are placed in group 1 of the periodic table.

• This is so because Hydrogen and alkali metals both have only one electron in their valence shell.

• Alkali metals include Lithium (^{3}Li), Sodium (^{11}Na), Potassium (^(19)K), Rubidium (^(37)Rb), Caesium (^(55)Cs), and Francium (^(87)Fr).

• Alkali metals along with Alkaline Earth metals form the s-block elements since the last electron enters the s-orbital.

• Alkali metals are highly reactive, shiny, and soft metals. They readily lose their valence electron to become cations with a +1 charge.

• These react with acids to form salt and hydrogen gas. For eg:

• 2Na + 2HCl → 2NaCl + H2

Q51. Answer: (a) 152

Shortcut Trick

For any n-sided polygon, the number of diagonals is given by the formula:

Number of diagonals = [n × (n − 3)] ÷ 2

Here, n = 19 (for a 19-gon).

Number of diagonals = [19 × (19 − 3)] ÷ 2

Number of diagonals = [19 × 16] ÷ 2 = 19 × 8 = 152

Therefore The correct answer is 152.

Alternate Method

Given:

Number of vertices (n) = 19

Formula Used:

Number of diagonals = ^{n}C2 − n

Calculations:

=> Total number of lines that can be drawn using 19 vertices = ^(19)C2

Q52. Answer: (d) Sania Mirza

The correct answer is option 4, i.e., Sania Mirza.

Key Points

• The author of the book "Ace against Odds" is Sania Mirza.

• The book is an autobiography, i.e., Sania Mirza has written about her own life.

• The book was released by Indian actor Shahrukh Khan in July 2016.

• Sania Mirza is a renowned Indian Tennis player. She is a former world number 1 and has won 6 Grand Slams. She took retirement from singles in the year 2013.

• Rohan Bopanna is also a professional tennis player from India and has won the 2017 French Open mixed double title with Gabriela Dabrowski.

• Leander Paes is a world-renowned Indian tennis player, with the greatest number of doubles win in the Davis Cup.

• Yuki Bhambri is an Indian tennis player and represents India in Davis Cup and is a former junior number 1.

Q53. Answer: (a) MU

The pattern followed here is,

Hence, “MU” is the correct answer.

Q54. Answer: (c) 10

Shortcut Trick

Total pearls can be taken as LCM of denominators (8, 4, 5) = 40 units.

Floor = 5 units, Chair = 10 units, Sofa = 16 units → Total distributed = 31 units.

Remaining on strand = 40 − 31 = 9 units.

Given 9 units = 18 pearls => 1 unit = 2 pearls.

Pearls on floor = 5 units = 5 × 2 = 10.

Therefore The correct answer is 10.

Alternate Method

Given:

Let total pearls be x.

Floor = x/8, Chair = x/4, Sofa = 2x/5, Strand = 18.

Calculations:

=> x = x/8 + x/4 + 2x/5 + 18

=> x − (x/8 + x/4 + 2x/5) = 18

=> x − [(5x + 10x + 16x) / 40] = 18

=> x − 31x/40 = 18

=> 9x/40 = 18

=> x = (18 × 40) / 9 = 80

=> Pearls on floor = 80 / 8 = 10

Therefore The correct answer is 10.

Additional Information

Fractional Summation

To find the remaining part, subtract the sum of all given fractions from 1: Remaining = 1 − (Σ Fractions).

LCM Method for Fractions

When dealing with multiple fractions, assuming the total as the LCM of denominators avoids complex decimal calculations.

Base Change in Percentage

Fractions can be converted to percentages (1/8 = 12.5%, 1/4 = 25%, 2/5 = 40%) to solve using the 100% base method.

Q55. Answer: (b) 490 sq cm

Shortcut Trick

Side of cube (a) = $\sqrt[3]{343}$ = 7 cm.

When two cubes are joined, total surface area = 2 × ($6a^2$) − 2 × (common face area).

TSA = $12a^2 - 2a^2 = 10a^2$.

TSA = $10 \times 7^2 = 10 \times 49$ = 490 sq cm.

Therefore The correct answer is 490 sq cm.

Alternate Method

Given: Volume of each cube = 343 cm^3.

Formula Used: Volume of cube = a^3; TSA of cuboid = 2(lb + bh + hl).

=> Side of cube (a) = $\sqrt[3]{343}$ = 7 cm.

=> For the resulting cuboid:

=> Length (l) = 7 + 7 = 14 cm.

=> Breadth (b) = 7 cm.

=> Height (h) = 7 cm.

=> TSA = 2(14×7 + 7×7 + 7×14)

=> TSA = 2(98 + 49 + 98) = 2(245) = 490 sq cm.

Therefore The correct answer is 490 sq cm.

Additional Information

Cube Properties

Lateral Surface Area = $4a^2$ and diagonal of a cube = $a\sqrt{3}$.

Cuboid Diagonal

Length of the longest rod that can be placed in a cuboid = $\sqrt{(l^2 + b^2 + h^2)}$.

Volume of Cuboid

The amount of space inside the cuboid is calculated as V = l × b × h.

Q56. Answer: (b) Ministry of Agriculture & Farmers, Welfare

The correct answer is option 2, i.e., Ministry of Agriculture & Farmers, Welfare.

• Ministry of Agriculture & Farmers, Welfare has launched 'Mission Fingerling' in March 2017 to achieve the Blue Revolution.

• Mission Fingerling is a programme that aims to enable holistic development and management of the fisheries sector.

• The expected expenditure for the programme is Rs. 52000 lakhs.

• The target set for the programme is to raise the fisheries production from 10.79 mmt (2014-2015) to 15 mmt by 2020-21.

• 20 states have been identified by the government based on their potential to boost the Fish Fingerling production and Fish Seed Infrastructure in the country.

• Fingerling rearing ponds and hatcheries would be developed and the programme will converge in the production of 20 lakh tonnes fish annually, which will benefit approx. 4 million families.

• Blue Revolution aims to boost the fisheries sector in the country.

Q57. Answer: (b) Council

A group of players is called a team.

Similarly,

A group of ministers represent a Council.

“Council” relates to the third term in the same way that the second term relates to the first term.

Hence, “council” is the correct answer.

Q58. Answer: (a) Only argument 1 is strong

According to the given information,

Argument 1: This is strong, since alcohol is bad for health, government should not promote it.

Argument 2: This is not strong, because there are other forms also for revenue generation.

Hence, “only argument 1” is strong.

Q59. Answer: (c) Chief Justice Indira Banerjee

The correct answer is option 3, i.e., Chief Justice Indira Banerjee.

• Chief Justice Indira Banerjee became the Chief Justice of the Madras High court in March 2017.

• She assumed the office as the Chief Justice of the Madras High court on 5th April 2017 and remained at the post till 6th Aug 2018.

• Presently she is serving as a Judge of Supreme Court.

• She is the 8th female judge and the 3rd female judge of the Supreme Court in the Indian history.

• Justice Ashok Kumar Ganguly is a former Indian jurist. He retired as a Supreme court judge in 2012. He held the positions of Chief Justice of Madras High Court and Orissa High Court.

• Justice Sanjay Kaul is a Supreme Court judge and has earlier served as Chief Justice of Madras High Court and Punjab and Haryana High Court.

• Justice Rajesh Kumar Agrawal is currently serving as the President of the National Consumer Disputes Redressal Commission (NCDRC) and has earlier served as judge of the Supreme Court.

Q60. Answer: (c) Gauri Lankesh

The correct answer is option 3, i.e., Gauri Lankesh.

• Gauri Lankesh was awarded the prestigious Reach All Women in WAR (RAW in WAR) Anna Politkovskaya Award on 7th

October 2017.

• Anna Politkovskaya Award is given to honour women who are human rights defender from a conflict zone, who stand up for the victims of conflict.

• Anna Politkovskaya, a Russian journalist, lived her life bravely and stood for truth in the face of grave danger. She was murdered on 7th October 2006.

• To mark her death anniversary this award is presented annually.

• The RAW in WAR was founded by Mariana Katzarova, a friend and a human rights colleague of Politkovskaya, in the year 2006.

• Natalia Estemirova was the first recipient of the award.

• Gauri Lankesh was an Indian journalist-turned-activist from Bangalore who was murdered on 5 September 2017. She was given the Anna Politkovskaya Award for campaigning for women's rights and opposing caste-based discrimination.

• Kusum Nair was also a journalist who used to give her views on the agricultural policies.

• Sucheta Dalal is a business journalist who was awarded the Padma Shri in the year 2006.

• Malini Parthasarathy is the co-chairperson of The Hindu Group's Publishing Company, THG Publishing Private Limited.

Q61. Answer: (b) United States

The correct answer is option 2, i.e., the United States.

• The Yellowstone National Park is situated in the United States.

• The National Park is situated in the western part of the US and was established on March 1, 1872.

• It is the first National Park of the US and is known for its rich flora and fauna.

• The Yellowstone National Park is a UNESCO World Heritage Site.

Country	Famous National Park
United Kingdom	Peak District National Park, Lake District National Park, etc.
United States	Yellowstone National Park, Grand Canyon National Park, Rocky Mountain National Park, etc.
France	Vanoise National Park, Port-Cros National Park, etc.
South Africa	Addo Elephant National Park, Agulhas National Park, etc.

Q62. Answer: (d) 22000 Hz

The correct answer is option 4, i.e., 22000 Hz.

• A frequency of 22000n Hz is not audible to human beings.

• The frequency range of sound that a normal human adult can detect is from 20 Hz to 20000 Hz.

• The human infants can hear frequencies slightly higher than 20 kHz.

• Most small mammals have the capability of hearing higher frequencies but are however insensitive to lower frequencies.

• For eg. : In some species of bats, the frequency range of sound is 20 kHz to 200kHz.

• The frequencies above the audible range for humans, i.e., above 20 kHz, are termed as ultrasonic.

• The frequencies below the audible range for humans, i.e., below 20 Hz, are termed as infrasonic.

• Ultrasonic and infrasonic frequencies of sound are inaudible to humans.

• 22000 Hz comes under ultrasonic range, hence it is inaudible to human beings.

Q63. Answer: (d) Mass of the falling object 'm'

The correct answer is option 4, i.e., Mass of the falling object 'm'.

• The value of acceleration due to gravity does not depend upon: Mass of the falling object 'm'.

• The acceleration that is gained by an object due to the force of gravitation, is known as acceleration due to gravity (g).

• The formula of calculating acceleration due to gravity is: $g = GM / r^2$ [where 'G' is gravitational constant, 'M' is the mass of the earth, and 'r' is the radius of the earth.

• The above formula suggests that acceleration due to gravity depends on Mass of the earth 'M', Constant of gravitation 'G', and Radius of the earth 'R'. Since all these are constant, therefore the value of 'g' is on the surface of the earth at the sea level is constant, i.e., 9.8 m/s^2.

• The formula does not contain the mass of the object, it means that acceleration due to gravity works equally on every object irrespective of its mass.

Q64. Answer: (d) 101

Given:

21 + [5 of {15 + (18 – 17)}]

Follow BODMAS rule to solve this question, as per the order given below:

Step-1: Parts of an equation enclosed in 'Brackets' must be solved first, and in the bracket,

Step-2: Any mathematical 'Of' or 'Exponent' must be solved next,

Step-3: Next, the parts of the equation that contain 'Division' and 'Multiplication' are calculated,

Step-4: Last but not least, the parts of the equation that contain 'Addition' and 'Subtraction' should be calculated.

Now

21 + [5 of {15 + (18 – 17)}]

=> 21 + [5 of {15 + 1}]

=> 21 + [5 of 16]

=> 21 + 80

=> 101

Q65. Answer: (c) 40

The number of triangles in the given figure are,

Hence, “40“ is the correct answer.

Q66. Answer: (d) Rs. 30,000

Given:

Earning of 2012 = 2,50,000

Earning of 2013 = 3,00,000

Earning of 2014 = 3,00,000

Earning of 2015 = 2,50,000

Earning of 2016 = 4,00,000

Calculation:

Varied cost of 2012 = 10% of 2,50,000 = 25000

Varied cost of 2013 = 10% of 3,00,000 = 30000

Varied cost of 2014 = 10% of 3,00,000 = 30000

Varied cost of 2015 = 10% of 2,50,000 = 25000

Varied cost of 2016 = 10% of 4,00,000 = 40000

Total varied cost of all five years = (25000 + 30000 + 30000 + 25000 + 40000) = 1,50,000

Therefore Average varied cost of five years = 150000/5 = 30000

Q67. Answer: (b) Chennai

The correct answer is option 2, i.e., Chennai.

• Chennai was recently included in the United Nations Educational, Scientific, and Cultural Organization's (UNESCO's) Creative Cities Network for contribution to Music.

• Chennai is the capital city of the Indian state of Tamil Nadu.

• Chennai is one amongst the 64 cities chosen from the 44 nations of the world.

• The number tally has now gone up to 180 cities of the 72 nations.

• Chennai is the third Indian city to get the designation of UNESCO's Creative Cities. The other cities are:

• Varanasi (City of Music)

• Jaipur (City of Crafts and Folk Arts)

• Mumbai has been designated a Creative city of film.

• Hyderabad a Creative city of gastronomy

• UNESCO's Creative Cities Network launched in the year 2004 includes cities in the below mentioned seven creative fields:

• Crafts and Folk Art

• Design

• Film

• Gastronomy

• Literature

• Media Arts
• Music

Q68. Answer: (d) 0.713

Given
31 × 23 = 713
Calculation
3100 × 0.00023
= 3100 × 23/100000
= (31 × 23)/1000
= 713/1000
= 0.713.

Q69. Answer: (d) D

The pattern followed is,
In all the given figures, except in figure D the bigger and smaller version of same figure is shown.
Whereas,
In figure D, both figures are different.
Hence, option 4 is the odd one.

Q70. Answer: (c) Vishnu Sharma

The correct answer is Vishnu Sharma.
Key Points
• Vishnu Sharma is the author of 'Panchatantra'.
• Panchatantra refers to the ancient Indian collection of interrelated animal fables and was originally written in the Sanskrit language.
• It was written around 200 BCE and is one of the oldest surviving texts.
• Panchatantra was translated into other languages like Persian, Syrian, and Arabic languages.
• Vishnu Sharma was an Indian scholar.
Additional Information
• Kalidas was a Sanskrit writer whose famous works include Abhijnanasakuntalam, Meghaduta, Raghuvamsa, etc.
• Valmiki was one of the most celebrated writers and his most famous works include Ramayana.
• Sri Harsha was a Sanskrit poet and philosopher of the 12th century and his famous works include Naishadha Charita, etc.

Q71. Answer: (d) four, eight

The correct answer is four, eight.
Important Points
• The foundation of Buddhism is the four noble truths and the eight-fold path.
• The four Noble Truths are:
• The Truth of Suffering (Dukkha)
• The Truth of the Cause of Suffering (Samudhya)
• The Truth of the Cessation of Suffering (Nirodha)
• The Truth of the Path Cessation of Suffering (Magga)
• The eight-fold path is Ashtangika Marga -
• Right View or Right Understanding
• Right Thoughts
• Right Speech
• Right Conduct
• Right Livelihood
• Right Effort
• Right Mindfulness
• Right Meditation or Right Contemplation
Additional Information

YourMockTest.com — Free Study Material

• Mahayana Buddhism:

• After the death of Buddha, a group evolved who believed that compassion for all humanity was an important part of the path, and that teaching is fully available to all.

• Those who followed the newly expanded ideals called themselves Mahayana meaning the big raft.

• In Mahayana Buddhism, all practicing Buddhists are apprentice Bodhisattvas.

• In Mahayana countries, images of the Buddha are set up in the temples and homes as an object of worship.

• Hinayana Buddhism:

• From about 100 years after the death of the Buddha, there had been a movement towards embracing the style of Buddhism.

• The early monks concentrated on personal enlightenment, seeking spiritual answers for themselves, and teaching others the way of enlightenment.

• But the information was severely limited to the lay community as it was assumed only monks could achieve Buddhahood.

• This section came to be known as Hinayana or also known as Theravada.

• Theravada means the way of elders.

• Milindapanha:

• The Milindapanha, or "Milinda's Questions," is an important early Buddhist text that usually is not included in the Pali Canon.

• Even so, the Milindapanha is cherished because it addresses many of Buddhism's most difficult doctrines with wit and clarity.

• The Milindapanha presents a dialogue between King Menander I (Milinda in Pali) and an enlightened Buddhist monk named Nagasena.

• Menander- I was an Indo-Greek king thought to have ruled from about 160 to 130 BCE.

• He was a king of Bactria, an ancient kingdom that took in what is now Turkmenistan, Afghanistan, Uzbekistan, and Tajikistan, plus a small part of Pakistan.

Q72. Answer: (d) 8/3 hours

Shortcut TrickLet Total Capacity be the LCM of 2, 8, and 4 = 8 units.Efficiency of Tap A = 8 ÷ 2 = +4 units/hrEfficiency of Tap B = 8 ÷ 8 = +1 units/hrEfficiency of Tap C (Emptying) = 8 ÷ 4 = −2 units/hrCombined Efficiency = 4 + 1 − 2 = 3 units/hrTime taken = Total Capacity ÷ Combined Efficiency = 8 ÷ 3 hours.Therefore The correct answer is 8/3 hr.Alternate MethodGiven: Filling time for Tap A = 2 hours, Tap B = 8 hours. Emptying time for Tap C = 4 hours.Formula Used: Net Work Done per hour = (1/A + 1/B − 1/C)PersonDaysTotal Work(LCM of 2, 8, 4)EfficiencyTap A (Fill)2 hr8 ÷ 2 = 4Tap B (Fill)8 hr88 ÷ 8 = 1Tap C (Empty)4 hr8 ÷ 4 = −2=> Total Efficiency of (A + B + C) = 4 + 1 − 2=> Total Efficiency = 3 units/hr=> Time required to fill the tank = Total Work ÷ Total Efficiency=> Time = 8/3 hoursTherefore The correct answer is 8/3 hr.Additional InformationPipes and Cisterns LogicAn inlet pipe is considered positive work (+), while an outlet pipe (leak) is considered negative work (−).Net Efficiency RuleIf a tank is filled in 'x' hours and emptied in 'y' hours, the net part filled in 1 hour is (1/x − 1/y) if x < y.

Q73. Answer: (d) North – west

Drawing the diagram according to the given information,

When playing carrom, one faces opposite the other.

If Prakash is facing South – east, then Sunder will face North – west.

Hence, “north – west” is the correct answer.

Q74. Answer: (c) A raised hammer

The correct answer is option 3, i.e., A raised hammer.

• A raised hammer does NOT possess kinetic energy.

• The word "kinesis" means "motion", hence the kinetic energy is possessed by an object in motion.

• A rolling stone, a falling coconut, and a speeding car all are in some kind of motion and hence all these possess Kinetic energy.

• Kinetic energy is calculated using the formula: K.E. = ½ mv² [where 'm' is the mass of the object and 'v' is the velocity of the object]

• A raised hammer is in the stationary position and hence possess the Potential Energy.

• A raised hammer possesses Gravitational Potential Energy by virtue of its height.

• The formula of Gravitational Potential Energy is: U_g = mgh [where 'm' is the mass of the object, 'g' is the acceleration due to gravity and 'h' is the height above the ground]

Q75. Answer: (b) H - 225

The pattern followed here is,

Hence, “H - 225” is the correct answer.

Q76. Answer: (c) 89 - 103

The correct answer is option 3, i.e., 89-103.

• Atomic numbers of Actinoides are from 89-103.

• Actinides start from Actinium and go till the Lawrencium, i.e., there are 15 elements.

• Actinium (atomic no. 89) is often included in group 3, and the f-block actinides start from Thorium (atomic no. 90) thus reducing the elements to 14.

• The term Actinide means "actinium-like" and the elements included are: Ac, Th, Pa, U, Np, Pu, Am, Cm, Bk, Cf, Es, Fm, Md, No, and Lr.

• Actinides have variable valency, very large atomic and ionic radii, and exhibit an unusually large range of physical properties.

• All actinides are radioactive in nature, Uranium, and Thorium being the naturally occurring radioactive elements.

• 58-71 atomic numbers belong to the first series of the f-block i.e., the lanthanides.

• Lanthanides start from Lanthanum and the last lanthanide is Lutetium.

• But, similar to Actinium, Lanthanum (atomic no. 57) is not included in the f-block and belongs to the group 3.

• Hence, the f-block lanthanides are from atomic number 58-71.

• The Lanthanide series include: Ce, Pr, Nd, Pm, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu.

Q77. Answer: (a) Rs. 2959.50

Shortcut Trick

Total bulbs needed = 300 for 4 colors => 75 bulbs per color.

Bulbs to buy: Red = 43, Green = 49, Yellow = 66, Blue = 75.

Discounts: Red/Green (0%), Yellow (20% as $50 \le 66 < 70$), Blue (30% as $75 \ge 70$).

Total Cost = $(43 + 49) \times 15 + 66 \times 15 \times 0.80 + 75 \times 15 \times 0.70$.

Total Cost = 1380 + 792 + 787.50 = Rs. 2959.50.

Therefore The correct answer is Rs. 2959.50.

Alternate Method

Given: Total bulbs = 300, Colors = 4, Price/bulb = Rs. 15.

Formulas: Required Bulbs = (Total ÷ 4) − Existing | Discounted SP = Price × (100 − D)% ÷ 100

=> Required per color = 300 ÷ 4 = 75 bulbs.

=> Red bulbs to buy = 75 − 32 = 43 (Cost = 43 × 15 = 645).

=> Green bulbs to buy = 75 − 26 = 49 (Cost = 49 × 15 = 735).

=> Yellow bulbs to buy = 75 − 9 = 66. Since $66 \ge 50$, Price = 15 × 0.80 = 12 (Cost = 66 × 12 = 792).

=> Blue bulbs to buy = 75 − 0 = 75. Since $75 \ge 70$, Price = 15 × 0.70 = 10.5 (Cost = 75 × 10.5 = 787.5).

=> Total Spend = 645 + 735 + 792 + 787.50 = 2959.50.

Therefore The correct answer is Rs. 2959.50.

Additional Information

Quantity-Based Discounting

Discounts are often applied based on slabs. In this problem, purchasing 50-69 bulbs yields one rate, while 70+ bulbs yields a higher discount rate.

Fixed vs Variable Costing

Calculating requirements first (Target − Inventory) is essential before applying the pricing logic based on the purchase volume per item.

Q78. Answer: (a) 7500

Given:

Satin% = 5%

Total production of fabric (of all type) = 1,50,000

Calculation:

=> 5% of 1,50,000

=> (5/100) × 150000

=> 5 × 1500

=> 7500

Therefore Fabric produced in the year 2015 = 7500 tons

Q79. Answer: (c) Cool

Embroidery is the activity of beautifully decorating a piece of cloth with stitches sewn into it.

Similarly,

Moonlight is the pale, cool light of the moon at night.

Beautiful is the word used for Embroidery and Cool is the word used for Moonlight.

'Cool' is related to the third word on the same basis as the second word is related to the first word.

Hence, "cool" is the correct answer.

Q80. Answer: (c) Pune

The correct answer is option 3, i.e., Pune.

• Pune was ranked first in the 2018 Ease of Living Index prepared by the Ministry of Housing and Urban Affairs.

• The 2018 Ease of Living Index was released by the then Minister for Housing and Urban Affairs, Hardeep Singh Puri.

• Pune got the top spot out of the total 111 cities taken into consideration for the index.

• Navi Mumbai was successful in achieving the second spot.

• The national capital Delhi got the 65th position.

• Chennai was ranked 14th in the index.

• The last position was given to Rampur, a city in Uttar Pradesh.

• The Ease of Living Index aims to capture the state of the livability of the cities against the national and international benchmarks and it also encourages cities to move towards an 'outcome-based' approach to urban planning and management.

• The four parameters taken into consideration are:

• institutional factors (governance)

• social factors (education, health, etc.)

• economic factors (economy, employment)

• physical factors (pollution, water supply, etc.)

Q81. Answer: (a) D

The pattern followed here is,

The circles in the figure inside keeps on increasing by one.

And,

The circles outside the figure keeps on decreasing by one.

The first figure should have one circle inside it.

The complete pattern is,

Hence, option 1 is the correct answer.

Q82. Answer: (d) Rs. 50,000 crore

The correct answer is option 4, i.e., Rs. 50,000 crore.

• The Government of India has launched the Pradhan Mantri Krishi Sinchai Yojana (PMKSY) with an investment of Rs. 50,000 crore aiming at the development of irrigation sources for providing a permanent solution form drought.

• The scheme has been formulated keeping in view the visions "Har Khet Ko Pani" and "More Crop Per Drop".

• The scheme was launched on 1 July 2015, and it is an amalgamation of schemes like Accelerated Irrigation Benefit Irrigation (AIBP), Integrated Watershed Management Programme (IWMP), and On-Farm Water Management (OFWM).

• Rs 50,000 crores have been approved for the Pradhan Mantri Krishi Sinchai Yojana for a duration of 5 years.

• The major objectives of the scheme include:

• Confluence of investment in irrigation at the field level.

• Improvement in the efficiency of water usage so as to reduce the wastage of water

• Expansion in the cultivable land under irrigation (Har Khet Ko Pani)

• Intensifying the initiatives of being precise in irrigation and other water-saving technologies (more crop per drop)

Q83. Answer: (b) A

The pattern followed here is,

The figure is rotated anti clock – wise direction by one place.

The figure which will come next in the pattern is,

Hence, option 2 is the correct answer.

Q84. Answer: (a) Good Governance Day

The correct answer is option 1, i.e., Good Governance Day.

• The Union Ministry of Personnel, Public Grievances and Pensions launched the electronic - Human Resource Management System (e - HRMS) on the occasion of Good Governance Day on 25th December.

• The e-HRMS is an online platform and has been launched to take forward the goal of 'minimum government, maximum governance'.

• 25 applications of the 5 modules of the system were simultaneously launched.

• The e-HRMS will help central government employees in applying for leaves and in accessing their service-related information.

• The system will enable people to obtain all management-related inputs and reports through its dashboard.

• The launch of e-HRMS is in the line of fully automating the human resource management system with the target to bring all government employees on the employee portal.

• The Good Governance Day in India was established in the year 2014 on the birth anniversary of former PM Late Atal Bihari Vajpayee to honour him for his contributions.

• As per the government orders, the Good Governance day observed annually on 25th December will be a working day for the employees.

Q85. Answer: (b) D

The pattern followed is,

All the figures except, figure D are formed with the help of lines.

Whereas,

Figure D is a circle.

Hence, option 2 is the odd one.

Q86. Answer: (b) D

The pattern followed here is,

All the figures, except figure A are joined with the other figure.

Whereas,

In figure D, the figures given are represented separately, and are not joined.

Hence, option 2 is the odd one.

Q87. Answer: (c) Thallophyta

The correct answer is Option 3, i.e Thallophyta.

• Plants are divided into five groups: Thallophytes, Bryophytes, Pteridophytes, Gymnosperms and Angiosperms.

• Thallophyta do not have a well-differentiated body design and are the simplest of plants.

• Bryophyta are often called amphibians of the plant kingdom.

• Gymnosperms are flowerless plants that produce cones and seeds. The term gymnosperm literally means "naked seed," as gymnosperm seeds are not encased within an ovary.

• Pteridophytes include horsetails and ferns. Pteridophytes are used for medicinal purposes and as soil-binders

• Plantae and Animalia are further divided into subdivisions on the basis of increasing complexity of body organisation.

Q88. Answer: (d) Both 1 and 2 together are sufficient

From statement 1:

From statement 2:

Combining both the statements,

We get the relationship by combining both statements.

Hence, “both 1 and 2 together” are sufficient.

Q89. Answer: (a) Conclusion 2 alone follows.

The least possible Venn diagram is as follows,

Conclusion 1: Some brown are tables → False (This is definitely false)

Conclusion 2: Some woods are tables → True (This is definitely true)

Hence, “conclusion 2 alone” follow.

Q90. Answer: (d) Rs. 675

Shortcut Trick

Profit difference in percentage = 14% − 10% = 4%.

The value of this 4% difference is given as Rs. 27.

Ratio-unitary method: 4% => 27.

Therefore, 100% (Cost Price) = (27 ÷ 4) × 100.

CP = 27 × 25 = 675.

Therefore The correct answer is Rs. 675.

Alternate Method

Given: Profit1 = 10%, Profit2 = 14%, Difference in Selling Price = Rs. 27.

Formulas: SP = CP × (100 + Profit%) ÷ 100 | Difference in SP = SP2 − SP1.

=> Let the Cost Price (CP) be x.

=> SP1 = x × (110 ÷ 100) = 1.10x.

=> SP2 = x × (114 ÷ 100) = 1.14x.

=> Difference = 1.14x − 1.10x = 0.04x.

=> 0.04x = 27.

=> x = 27 ÷ 0.04 = 675.

Therefore The correct answer is Rs. 675.

Additional Information

Cost Price & Selling Price Relationship

When an article is sold at a profit, SP = CP + Profit. If two different profit percentages are given for the same CP, the difference in SP is directly proportional to the difference in profit percentages.

Profit and Loss Basics

Profit % is always calculated on the Cost Price unless stated otherwise. Formula: Profit% = (Profit ÷ CP) × 100.

Q91. Answer: (a) 15.2% gain

Shortcut Trick

Make the quantity of pencils equal for both buying and selling.

L.C.M. of 12 and 5 is 60.

CP of 60 pencils = (25 ÷ 12) × 60 = 125.

SP of 60 pencils = (12 ÷ 5) × 60 = 144.

Profit% = (SP − CP) ÷ CP × 100 = (144 − 125) ÷ 125 × 100 = 19 ÷ 125 × 100 = 15.2%.

Therefore The correct answer is 15.2% gain.

Alternate Method

Given: CP = 25 per dozen (12 pencils); SP = 12 for 5 pencils.

Formulas: Profit = SP − CP | Profit% = (Profit ÷ CP) × 100.

=> Cost Price (CP) of 1 pencil = 25 ÷ 12 = Rs. 2.0833

=> Selling Price (SP) of 1 pencil = 12 ÷ 5 = Rs. 2.4

=> Profit = SP − CP = 2.4 − 2.0833 = 0.3167

=> Profit% = (0.3167 ÷ 2.0833) × 100

=> Profit% = 15.2%

Therefore The correct answer is 15.2% gain.

Additional Information

Profit and Loss Calculation

To calculate Gain% or Loss%, always compare the CP and SP of the same number of items.

Unitary Method

Find the price of a single unit by dividing the total price by the total quantity before comparing.

Q92. Answer: (a) 1

Shortcut Trick

Prime numbers have only two factors: 1 and the number itself.

By definition, any two distinct prime numbers are co-prime.

YourMockTest.com — Free Study Material

The Highest Common Factor (HCF) of any set of co-prime numbers is always 1.

Therefore The correct answer is 1.

Alternate Method

Given: x and y are two prime numbers.

=> Factors of x = 1 × x

=> Factors of y = 1 × y

=> Common Factor between x and y is only 1.

=> HCF (Highest Common Factor) = 1

Therefore The correct answer is 1.

Additional Information

Co-prime Numbers

Numbers whose HCF is 1 are called co-prime or relatively prime numbers.

LCM of Prime Numbers

The Least Common Multiple (LCM) of two prime numbers x and y is their product: x × y.

Property of HCF and LCM

For any two numbers a and b, HCF(a, b) × LCM(a, b) = a × b.

Q93. Answer: (a) Both the conclusion follows.

According to the given information,

Conclusion I: This follows because it is mentioned in the statement that candidates with a maximum age of 30 years can apply. So, anyone who is more than 30 years old will be ineligible for applying.

Conclusion II: Maximum age of 30 years means that eligible candidates should belong to the age group of "below 30 years". Thus, the second conclusion is valid.

Hence, “both conclusions” follow.

Q94. Answer: (b) 187.5 J

The correct answer is option 2, i.e., 187.5 J.

• The Kinetic Energy possessed by the object is 187.5 J.

• The energy possessed by the moving object is termed as its Kinetic Energy.

• The Kinetic Energy (K.E.) can be calculated by the following formula:

• K.E. = ½ mv^2 [where m is the mass of the object and v is the velocity of the object]

• K.E. = ½ × 15 × 5 × 5

• K.E. = 187.5 J

Q95. Answer: (c) 4√1000000

Shortcut Trick

Identify that 1,000,000 = 10^6.

A root $\sqrt[n]{x^m}$ is rational only if the exponent m is divisible by the root index n.

Check divisibility of the exponent 6 by the root indices: 6 is divisible by 6, 2, and 3.

6 is not divisible by 4 (6 ÷ 4 = 1.5), so the fourth root is irrational.

Therefore The correct answer is ^4√1000000.

Alternate Method

Given: Four options involving the n-th roots of 1,000,000.

Method: Simplify each expression to determine if it is a rational number (an integer or fraction) or an irrational number (contains a non-perfect surd).

=> Let x = 1,000,000 = 10^6

=> Option (1): ^6√10^6 = 10^(6/6) = 10^1 = 10 (Rational)

=> Option (2): √10^6 = 10^(6/2) = 10^3 = 1000 (Rational)

=> Option (4): $\sqrt[3]{}$10^6 = 10^(6/3) = 10^2 = 100 (Rational)

=> Option (3): ^4√10^6 = 10^(6/4) = 10^(3/2) = √10^3 = √1000 = 10√10

=> Since √10 is a non-terminating, non-recurring decimal, 10√10 is irrational.

Therefore The correct answer is ^4√1000000.

Additional Information

Irrational Numbers

A number is irrational if it cannot be written as p/q, where p and q are integers and q ≠ 0. Examples include √2, √3, and π.

Roots of Perfect Powers

The n-th root of a number a is rational if a is a perfect n-th power. If not, the result is an irrational surd.

Rational Number Properties

All integers, terminating decimals, and repeating decimals are classified as rational numbers.

Q96. Answer: (d) 2 m

The correct answer is option 4, i.e., 2 m.

• The wavelength of the soundwave is 2 m.

• The wavelength of a wave is the distance between two corresponding crests or two corresponding troughs and is denoted by symbol λ.

• The frequency of a wave is defined as the number of waves passing through a fixed point in the unit time period. It is denoted by symbol ν and f.

• It can be calculated by using the formula mentioned below:

• λ = v / f [where λ is the wavelength, v is velocity of the soundwave, and f is the frequency]

• λ = 400 / 200

• λ = 2 m

Q97. Answer: (c) 9

According to the given Venn diagram,

The shaded part represents number of students who play both N & L but not game M i.e., 9.

Hence, “9” is the correct answer.

Q98. Answer: (d) 9 kmph

Shortcut Trick

Upstream speed (u) = 40 ÷ 5 = 8 kmph

Downstream speed (v) = 20 ÷ 2 = 10 kmph

Speed in still water = (v + u) ÷ 2 = (10 + 8) ÷ 2 = 9 kmph

Therefore The correct answer is 9 kmph.

Alternate Method

Given:

Upstream distance = 40 km, Upstream time = 5 hrs

Downstream distance = 20 km, Downstream time = 2 hrs

Formula Used:

Speed = Distance ÷ Time

Speed in still water (x) = (Downstream speed + Upstream speed) ÷ 2

Calculations:

=> Upstream Speed (u) = 40 ÷ 5 = 8 kmph

=> Downstream Speed (v) = 20 ÷ 2 = 10 kmph

=> Speed of Arjun in still water = (10 + 8) ÷ 2

=> 18 ÷ 2 = 9 kmph

Therefore The correct answer is 9 kmph.

Additional Information

Speed of Stream

The speed of the current or stream (y) is calculated as (Downstream Speed − Upstream Speed) ÷ 2.

Relative Speed in Water

Downstream Speed = Speed in Still Water + Speed of Stream; Upstream Speed = Speed in Still Water − Speed of Stream.

Q99. Answer: (a) 96

The pattern followed here is,

3 × 2 = 6;

6 × 2 = 12;

12 × 2 = 24;
24 × 2 = 48;
48 × 2 = 96
Hence, “96” is the correct answer.

Q100. Answer: (b) 7

Shortcut Trick
According to the Remainder Theorem, for a polynomial f(x), the remainder when divided by (x − 3) is f(3).
Equation 1: $2(3)^2 + 3a + b = 35 \Rightarrow 18 + 3a + b = 35 \Rightarrow 3a + b = 17$
Equation 2: $2(3)^2 + 3b + a = 29 \Rightarrow 18 + 3b + a = 29 \Rightarrow a + 3b = 11$
Adding both equations: $(3a + b) + (a + 3b) = 17 + 11 \Rightarrow 4a + 4b = 28$
Divide by 4: $a + b = 7$
Therefore The correct answer is 7.
Alternate Method
Given:
$f(x) = 2x^2 + ax + b$, divisor = x − 3, remainder = 35
$g(x) = 2x^2 + bx + a$, divisor = x − 3, remainder = 29
Formula Used:
Remainder Theorem: If a polynomial P(x) is divided by (x − c), the remainder is P(c).
Calculations:
$\Rightarrow f(3) = 2(3)^2 + a(3) + b = 35$
$\Rightarrow 18 + 3a + b = 35$
$\Rightarrow 3a + b = 17$ ----(i)
$\Rightarrow g(3) = 2(3)^2 + b(3) + a = 29$
$\Rightarrow 18 + 3b + a = 29$
$\Rightarrow a + 3b = 11$ ----(ii)
=> Adding (i) and (ii):
$\Rightarrow (3a + a) + (b + 3b) = 17 + 11$
$\Rightarrow 4a + 4b = 28$
$\Rightarrow 4(a + b) = 28$
$\Rightarrow a + b = 28 \div 4 = 7$
Therefore The correct answer is 7.
Additional Information
Remainder Theorem
It states that when a polynomial f(x) is divided by (ax − b), the remainder is f(b/a).
Factor Theorem
A special case of the remainder theorem where if f(c) = 0, then (x − c) is a factor of the polynomial f(x).
Quadratic Roots
For $ax^2 + bx + c = 0$, sum of roots is −b/a and product of roots is c/a.

More previous year papers and mock tests: **www.yourmocktest.com/pyq**

YourMockTest.com — Free Study Material