RRC Group D Previous Year Paper 13 (Held On: 11 Oct 2018 Shift 1)

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

Take this paper as a timed mock test

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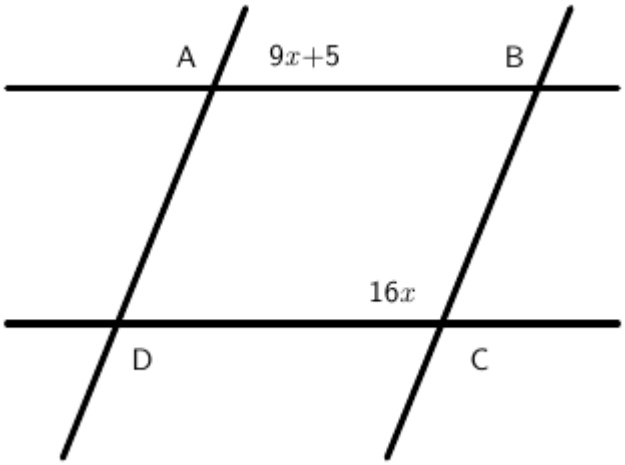
Q1. Panu, Jiban, and Jalil can complete a certain task individually in 30, 20 and 60 days, respectively. Jiban started work on the task and Panu and Jalil agreed to help Jiban every third day. How many days will it take to complete the task?

(a) 13
(b) 12
(c) 14
(d) 15

Q2. If 3 is added to both the numerator and the denominator, the fraction becomes 10/11. When 4 is subtracted from both the numerator and the denominator of the same fraction. it becomes 3/4. What is the value of the fraction?

(a) 3/5
(b) 7/8
(c) 3/4
(d) 6/13

Q3. Find the measure of angle ABC (in degrees) in the parallelogram ABCD as shown in the given figure:



(a) 68
(b) 112
(c) 102
(d) 78

Q4. Which South Indian film stars have formally entered politics recently?

(a) Vijay and Surya
(b) Siddharth and Madhavan
(c) Ajith and Shalini
(d) Rajinikanth and Kamal Haasan

Q5. P 3 R I M J 3 Q % W @ / N $ E 5 X Y 1 # 8

In the above series, the 6^(th) term to the left of the 15^(th) term from the left is:

(a) W
(b) %
(c) 8
(d) #

Q6. If tan θ = a/b such that (asin~θ ~-bcos θ)/(asin θ ~+~bcos θ)~=~[(a²-b²)/(a²+b²)]^k, then k is:

(a) 6
(b) 2
(c) 1
(d) 8

Q7. The HCF of 156, 312 and 195 is:

(a) 39
(b) 3
(c) 78
(d) 13

Q8. The difference between the selling prices of a keyboard when sold at losses of 15% and 25% is Rs. 50. Then, the cost price of the keyboard will be:

(a) Rs. 240
(b) Rs. 330
(c) Rs. 300
(d) Rs. 500

Q9. The 17^(th) Lok Sabha elections are proposed to be held in which year?

(a) 2020
(b) 2019
(c) 2024
(d) 2022

Q10. Who is the managing director and CEO of Axis Bank as of 2018?

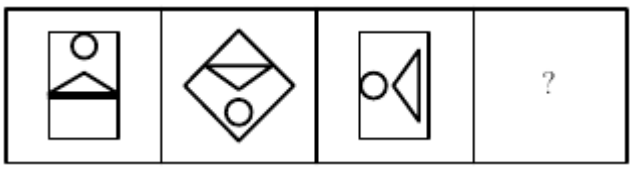
(a) Chanda Kochhar
(b) Arundhati Bhattacharya
(c) Shikha Sharma
(d) Sanjaya Sharma

Q11. If the edge of a cube is halved, then its volume reduces to _____ times its original volume.

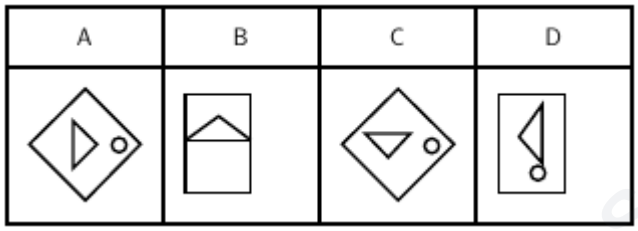
(a) 1/3
(b) 1/4
(c) 1/8
(d) 1/2

Q12. Select the option figure that will complete the series of question figures.

Question Figures



Option figures



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

Q13. Who invented a smart glove called TerraBlue XT - TJay that predicts epileptic seizures?
(a) Rajlakshmi Borthakur
(b) Ankita Deka
(c) Archana SR
(d) Chayanika Baruah

Q14. Read the given statement(s) and conclusions carefully and select which of the conclusions logically follow(s) from the statement(s).
Statements:
I. All snakes are poisonous.
II. All poisonous are reptiles.
Conclusions:
1. All snakes are reptiles.
2. Some reptiles are poisonous.
(a) Neither 1 nor 2 follows.
(b) Conclusion 2 alone follows.
(c) Both 1 and 2 follows.
(d) Conclusion 1 alone follows

Q15. The chemical name of _____ is calcium sulphate hemihydrate.
(a) Baking powder
(b) Gypsum
(c) Baking soda
(d) Plaster of paris

Q16. In a group of 100 students, every student study 8 subjects and every subject is studied by 10 students. The number of subjects is:
(a) Exactly 80
(b) May be 50
(c) At most 30
(d) At least 90

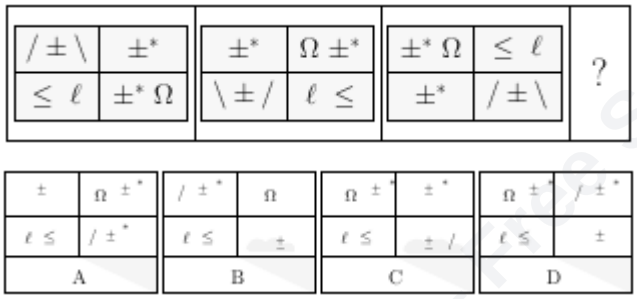
Q17. Pointing to a woman, Raghav said, “Her son is my daughter’s uncle”. How is the woman related to Raghav?
(a) Sister
(b) Mother
(c) Daughter
(d) Grandmother

Q18. In which of the following classifications are the elements arranged in the order of their increasing atomic number?
(a) The Modern Periodic Table
(b) Mendeleev’s Periodic Table
(c) Newland’s Law of Octaves

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(d) Dobereiner's Triads

Q19. Select the option that can replace the question mark(?) in the following series.

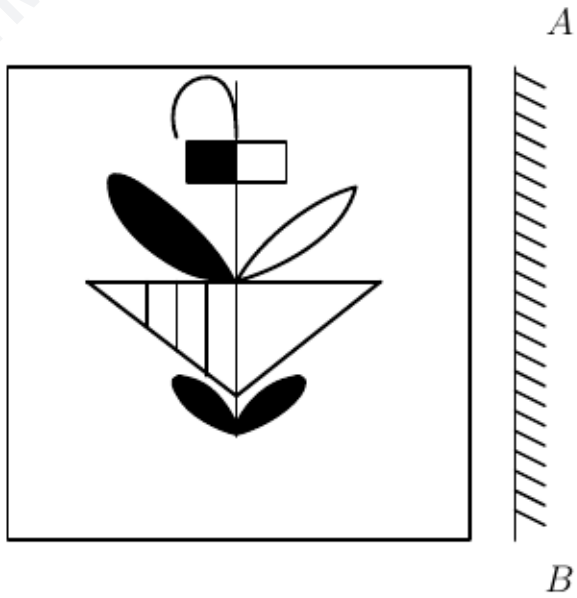


(a) A
(b) B
(c) C
(d) D

Q20. Who has been appointed as the Executive Director of Canara Bank?

(a) Ravi Venkatesan
(b) Murali Ramaswamy
(c) Mahesh Kumar Jain
(d) Debashish Mukherjee

Q21.

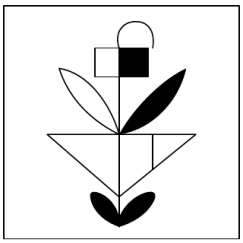


The mirror image of the above figure with respect to the line AB is:

(a)



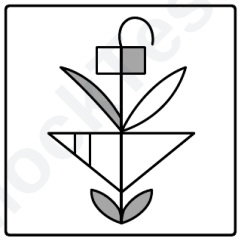
(b)



(c)



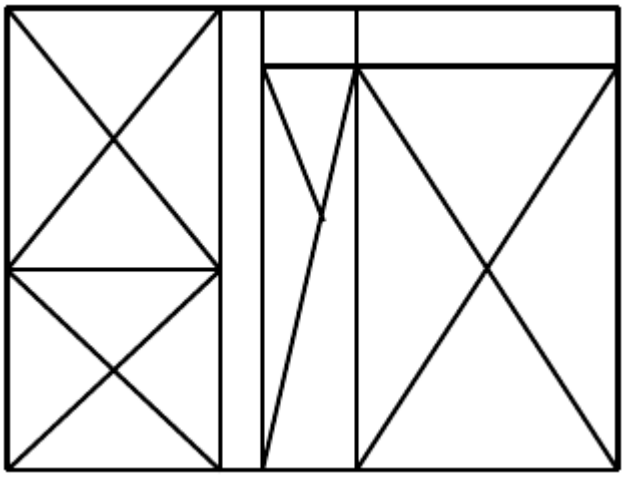
(d)



Q22. You are driving from point A to point B at a speed of 45 km/hr. Your friend is driving from point B to point A at a speed of 53 km/hr. if the distance between the two points in 1029 km and both of you started at the same time, how many hours will be before you pass each other?

(a) 9.5
(b) 10
(c) 11
(d) 10.5

Q23. How many triangles are there in the following figure?



(a) 22
(b) 27
(c) 23
(d) 24

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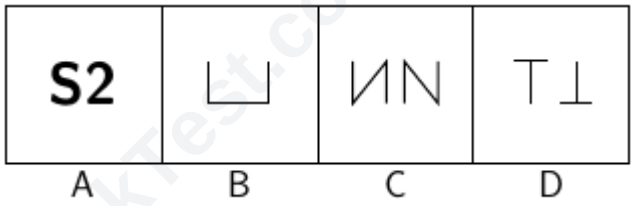
Q24. The age of a mother 10 years ago was thrice the age of her son. 10 years hence, the mother's age will be twice that of her son. The ratio of their present ages is:

(a) 12 : 5
(b) 6 : 1
(c) 7 : 3
(d) 4 : 2

Q25. Sagar Baheti has become the first visually impaired Indian runner to complete the historic Boston Marathon. Where does Sager hail from?

(a) Mumbai
(b) Bengaluru
(c) New Delhi
(d) Chennai

Q26. Find the odd one out.



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

Q27. Which of the following plants is NOT a Thallophyta?

(a) Spirogyra
(b) Ulva
(c) Riccia
(d) Chara

Q28. In a garden 42 trees, 3/7 of them are Neem trees and the rest are Mango trees. Find the number of Mango trees.

(a) 16
(b) 24
(c) 20
(d) 18

Q29. Who is the 16th Honourable Speaker of the Lok Sabha?

(a) Sumitra Mahajan
(b) Manohar Joshi
(c) Meira Kumar
(d) Somnath Chatterjee

Q30. A company's CEO discusses the fund allocation with the CFO. This year the fund for new product development has increased by one third of the fund allocated last year. Last year, Rs. 20,00,000 were allotted for various activities including product development that amounts to 30% of the activities. How much money is the CFO allocating for product development this year?

(a) Rs. 8,00,000
(b) 10,00,000
(c) 12,00,000
(d) 6,00,000

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Q31. One way of dating fossils is only by detecting the ratio of different _____ of the same element in the fossil material.

(a) allotropes
(b) isotopes
(c) isobars
(d) isomers

Q32. The sample space of four coins tossed together is:

(a) 8
(b) 64
(c) 32
(d) 16

Q33. Nandini is sister of Vani. How is Nandini's only sister's father's father related to Vani?

(a) Uncle
(b) Cousin
(c) Father
(d) Paternal Grand father

Q34. An object of mass 13 kg is moving with a uniform velocity of 5 ms^(-1.)What is the kinetic energy possessed by the object?

(a) 187.5 J
(b) 17.5 J
(c) 162.5 J
(d) 162.5 ms

Q35. Given below is 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: Amit can make students understand the complex mathematical problems in a easy way.

Assumptions:

I. Amit likes Mathematics.

II Amit can teach physics well.

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

Q36. Which of the following laws is associated with the heating effect of electric current?

(a) Joule's law
(b) Ohm's law
(c) Faraday's law
(d) Newton's law

Q37. In Modern Periodic Table, there is an anomaly when it comes to the position of _____ because it can be placed either in group 1 or group 17 in the first period.

(a) He
(b) H
(c) Li
(d) Be

Q38. The time period of a vibrating body is 0.04s, then the frequency of the wave is _____.

(a) 25Hz
(b) 20Hz
(c) 250Hz
(d) 200Hz

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Q39. Find the next number in the series.

4, 9, 20, 43, ?

(a) 100
(b) 92
(c) 82
(d) 90

Q40. The natural colour of litmus is _____.

(a) Red
(b) Pink
(c) Green
(d) Purple

Q41. In an electric circuit, Rheostat is often used to change the _____ in the circuit.

(a) temperature
(b) resistance
(c) electric current
(d) potential difference

Q42. Supriya is playing chess with Pallavi. If Supriya is facing North direction, in which direction Pallavi is facing considering the standard chess seating position?

(a) North
(b) West
(c) South
(d) East

Q43. In June 2017, NASA launched the world's lightest satellite which weighs 64 grams and is created by Chennai students. What is called?

(a) Kalam SAT
(b) Cartosat-2C
(c) IRNNS-1G
(d) GSAT_6

Q44. 'Real' is the currency of which country?

(a) South Africa
(b) Brazil
(c) Ghana
(d) Cambodia

Q45. Which of the below allotropes of carbon is in the form of geodesic globe?

(a) Fullerene
(b) Carbon nanotube
(c) Graphite
(d) Diamond

Q46. Medha sells her bag for Rs. 300 and loses Rs. 60. At what price must she sell the article to gain 15%?

(a) Rs 146
(b) Rs 172
(c) Rs 414
(d) Rs 516

Q47. 10 men can finish painting a wall in 8 days. How many more men will be needed of the painting work is to be finished in 4 days?

(a) 8
(b) 5

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(c) 10
(d) 20

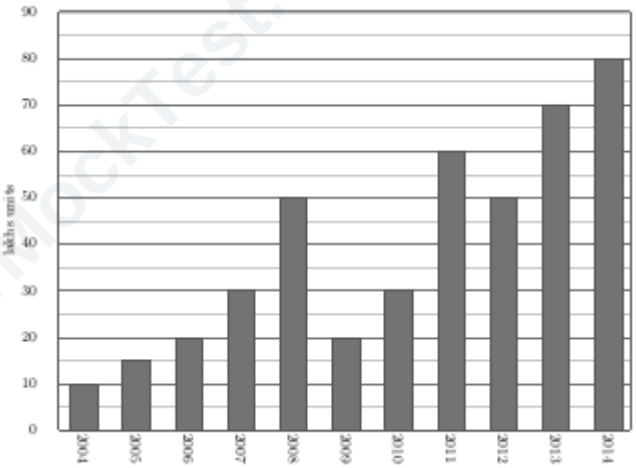
Q48. The atomic mass of Calcium is _____.

(a) 24
(b) 40
(c) 23
(d) 32

Q49. In case of hypermetropia, where is the image formed?

(a) In front of the retina
(b) On the retina
(c) Behind the retina
(d) On the cornea

Q50. The following bar graph shown information on the sales of the personal computers by the company “XYZ” for the last 10 years.



How many units of personal computers were sold by the company XYZ in 2011?

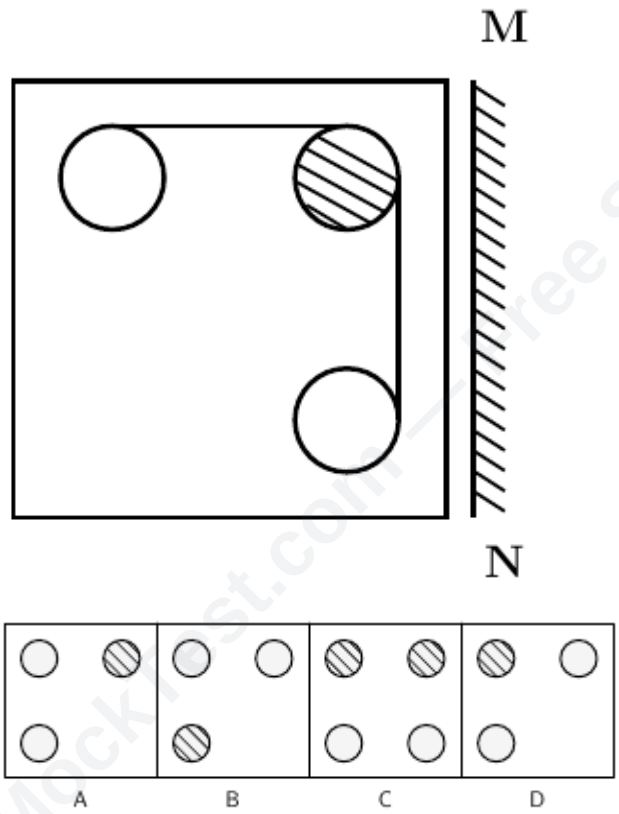
(a) 60
(b) 50
(c) 80
(d) 70

Q51. Aamir Khan was honoured with the Best Actor Award in 2017 at _____.

(a) National Film Award
(b) IIFA Awards
(c) Indian Film Festival
(d) Filmfare Awards

Q52. Choose the mirror image for the following figure.

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

Q53. Samu needs 40% to pass. If he scores 190 marks, but still fails by 10 marks, then what is the maximum number of marks he could have scored?

(a) 400
(b) 500
(c) 450
(d) 550

Q54. Which of the following represents the equation for position-time relation?

(a) $2as = v^2 = u^2$
(b) $S = ut + (1/2)\ at^2$
(c) $v = u - at$
(d) $V = u + at$

Q55. Mahavira is believed to be the last of the _____ Tirthankaras.

(a) 26
(b) 22
(c) 20
(d) 24

Q56. Who invented the periodic table?

(a) Marie Curie
(b) Dmitri Mendeleev
(c) Antoine Lavoisier
(d) Louis Pasteur

Q57. Which of the following energy varies with the height of an object?

(a) Nuclear energy
(b) Kinetic energy
(c) Chemical energy
(d) Potential energy

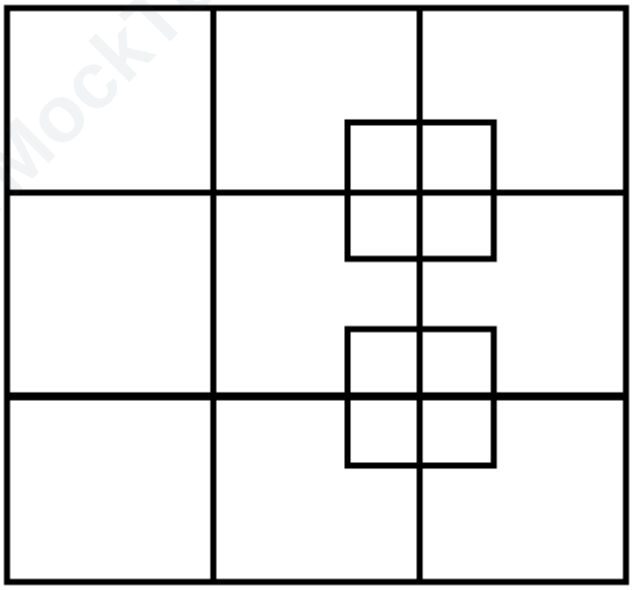
Q58. As of March 2018, how many Indians have won Grand Slam tournaments in tennis?

(a) 6
(b) 7
(c) 5
(d) 4

Q59. In which year did the partition of Bengal take place?

(a) 1910
(b) 1902
(c) 1903
(d) 1905

Q60. Find the number of squares in the following figure.



(a) 24
(b) 20
(c) 22
(d) 26

Q61. Which of the following has low density and low melting point?

(a) Na
(b) Fe
(c) Cu
(d) Au

Q62. The work done is zero if there is no _____.

(a) Power
(b) Momentum
(c) Velocity
(d) Displacement

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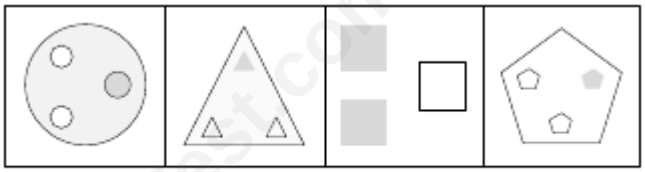
Q63. A sum of Rs 110 is in the form of Rs. 2, Rs. 1, and 50 paise coins in the ration of 1 : 2 : 3 respectively, how many 50 paise coins are there?

(a) 20
(b) 60
(c) 40
(d) 80

Q64. What is the HCF of 16, 72 and 28?

(a) 3
(b) 4
(c) 2
(d) 1

Q65.



The figure that does not belong the group is.

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

Q66. In which state of India ‘Chhapar Mela’ a social festival is organised?

(a) Punjab
(b) Bihar
(c) Odisha
(d) Gujarat

Q67. Two pipes, A and B can fill a tank in X minutes and 6 minutes respectively. If both the pipes are used together, they take 1.5 minutes to fill the tank. Find the value of X.

(a) 1 min
(b) 4 mins
(c) 5 mins
(d) 2 mins

Q68. Which tissue is responsible for transport of water away from the root?

(a) Ground tissue
(b) Cambium
(c) Phloem
(d) Xylem

Q69. What comes next in the given series?

6C, 10F, 14I, 18L?

(a) 22G
(b) 22O
(c) 20T
(d) 22L

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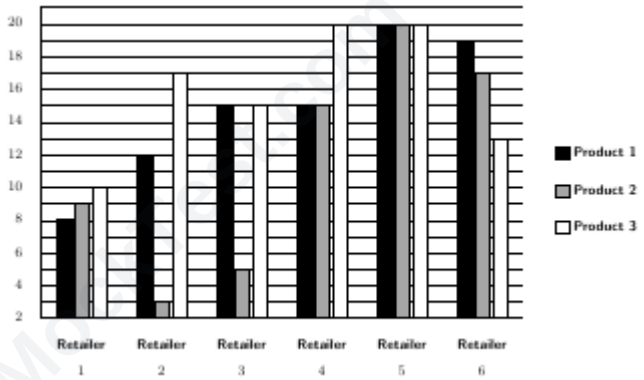
Q70. _____ is least reactive element belonging to group 17.

(a) Bromine
(b) Iodine
(c) chlorine
(d) Fluorine

Q71. A car falls of a ledge and drops to the ground in 0.7 s. (let g = 10 ms²). What is its speed on striking the ground?

(a) 6 ms^(-1)
(b) 8 ms^(-1)
(c) 4 ms^(-1)
(d) 7 ms^(-1)

Q72. Based on the following graph, which retailer offers all the three products for less than Rs. 10 each?



Note: The X axis indicates prices in rupees and Y-axis represents the retailer.

(a) Retailer 4
(b) Retailer 2
(c) Retailer 3
(d) Retailer 1

Q73. Consider the given statements to be true even if they seem to be at variance with the commonly known facts and decide which of the given conclusions logically follows from the statements.

Statements:

1. Some Penguins are Peacocks.
2. All the Peacocks are Snakes.

Conclusions:

1. Some penguins are snakes.
2. No peacock is a penguin.

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

Q74. If A is the sister of C and C is the wife of D. How D is related to A?

(a) Sister
(b) Brother-in-law
(c) Brother
(d) Sister-in-law

Q75. The difference between a fraction and its reciprocal is 9/11. If the cubes of both the fraction and its reciprocal are considered, then what will be the difference between them?

(a) 3996/1331
(b) -1331/2538
(c) 729/1331

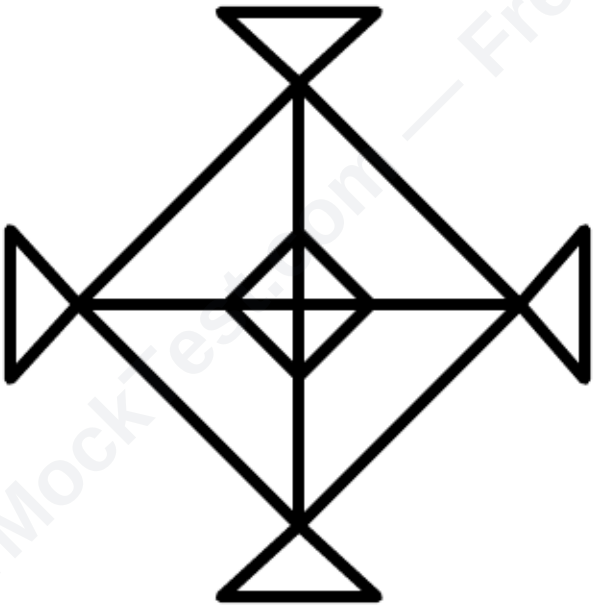
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(d) -2538/1331

Q76. Transfer of Pollengrains from anther to the stigma of a flower is called _____.

(a) Pollination
(b) Regeneration
(c) Transpiration
(d) Sexual reproduction

Q77. Count the number of triangles in the figure.



(a) 28
(b) 24
(c) 26
(d) 20

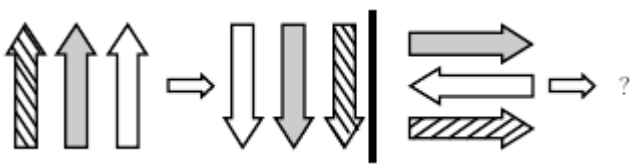
Q78. Where is GIFT city of India being planned by the government?

(a) Ahmedabad
(b) Mysore
(c) Hyderabad
(d) Jaipur

Q79. On which day is “World Hindi Day’ (WHD) observed every year to mark the first anniversary of World Hindi Conference (WHC), which was held in 1975?

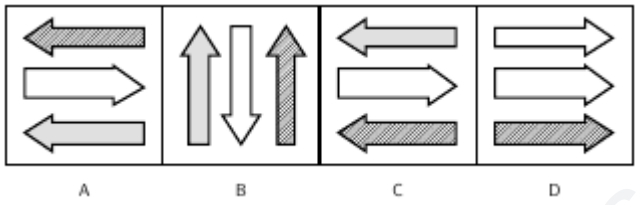
(a) 5^(th) September
(b) 14^(th) October
(c) 10^(th) January
(d) 26^(th) January

Q80.



Which of the below picture correctly fits the above blank space(?)?

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

Q81. The Black soil is also known as _____ soil.

(a) Bhangar
(b) Humus
(c) Crystalline
(d) Regur

Q82. If the number x3339 is divisible by 11, what is the face value of x?

(a) 2
(b) 4
(c) 5
(d) 3

Q83. Which of the following statements is/are true?

A. Rigidity: According to the type of matter, shape differs, depending upon location of particles. Eg, solids have definite shape while liquids acquire the shape of their container and gases, as such. don't have any shape.

B. Compressibility: It is the property of matter to allow a decrease in volume under high pressure and gases show this property.

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

Q84. The number of odd days in a Non leap year is _____.

(a) 1
(b) 2
(c) 4
(d) 3

Q85. Which one of the following is NOT linked to the cerebrum ?

(a) It is a part of forebrain
(b) It has two parts called cerebral hemispheres.
(c) It forms the front, superior and lateral side of the brain
(d) It is the largest part constituting 60% of the brain.

Q86. Read the given statement(s) and conclusions carefully and select which of the conclusions logically follow(s) from the8 statement(s).

Statement:

Sound is produced when something vibrates. The vibrating body causes the medium around it to vibrate.

Conclusions:

I. By medium, they mean only Air

II. Sound is produced by vibration

(a) Only conclusion I follows
(b) Both the conclusions follow

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(c) Only conclusion II follows
(d) No conclusion follows

Q87. 1200 soldiers in a fort had enough food for 28 days. After 4 days, some soldiers left the fort. Thus, food lasted for 32 days, how many soldiers left the fort?
(a) 280
(b) 300
(c) 320
(d) 290

Q88. Read the given statement(s) and conclusions carefully and select which of the conclusions logically follow(s) from the statement(s).

Statement: Our office is located in sixth floor. If a building has more than two floors, then it will have a lift.

Conclusions:

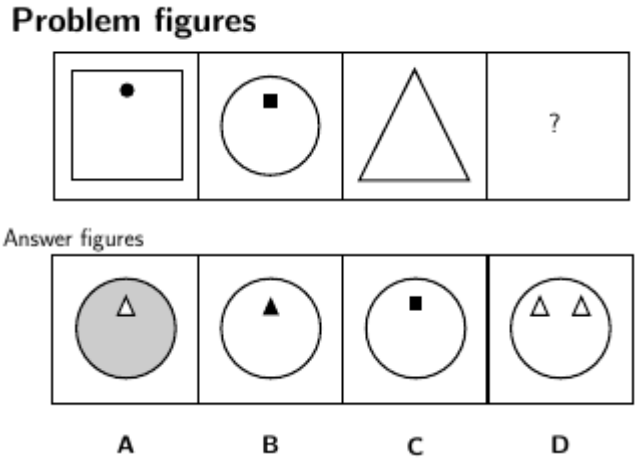
I. Right from first floor to the last each floor can be reached by a lift.

II. Fifth floor do not have a lift.

(a) Only conclusion I follows
(b) Neither I nor II follows
(c) Only conclusion II follows
(d) Both I and II follow

Q89. For creating how many safe cities, has the Union Ministry of Women and Child Development approved projects worth Rs 2,919 crore under Nirbhaya Fund?
(a) 8
(b) 12
(c) 5
(d) 15

Q90. Find the next figure for the given series:



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

Q91. 551 ÷ 29 = 19, then 5.51 ÷ 0.0019 = ?
(a) 2.9
(b) 290
(c) 2900
(d) 0.29

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Q92. 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: “Mandarin oriental hotel has yet another new fan, Amitabh Bachchan,” reads hotel advertisement.

Assumptions:

I. Mandarin Oriental is an expensive hotel.

II. Mandarin Oriental is owned by Amitabh Bachchan.

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

Q93. What is the value of X, if 7580 – X = 3440?

(a) 4150
(b) 5140
(c) 4130
(d) 4140

Q94. Select the institution that does not belong to the group.

(a) NIT Warangal
(b) IIM Ahmedabad
(c) State Bank of India (SBI)
(d) IIT Mumbai

Q95. Which of the following sport is Yuzvendra Chahal related to?

(a) Tennis
(b) Cricket
(c) Shooting
(d) Hockey

Q96. What is the scientific term for the speed of an object moving in definite direction?

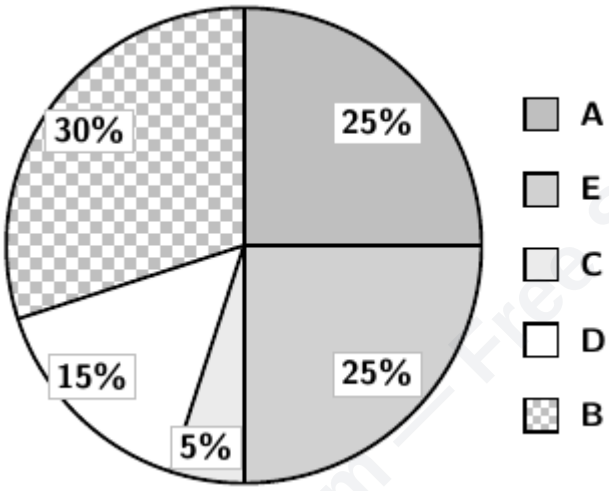
(a) Time
(b) Acceleration
(c) Velocity
(d) Motion

Q97. The zeros of the cubic polynomial $2x^3 – x^2 – 2x + 1$ are a, b and c respectively. Find ab + bc + ca.

(a) 2
(b) 0
(c) • 1
(d) -1

Q98. The following pie diagram shows information about tyres manufacturing data from various companies in India during 2017. If the total tyres produced in India during 2017 was 1,80,000 units, how many units of tyres were produced by company ‘D’?

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(a) 18000
(b) 36000
(c) 9000
(d) 27000

Q99. Rs. 1,080 invested for 3 months gave an interest of Rs. 27. The simple rate of interest per annum was:

(a) 25%
(b) 5%
(c) 7.5%
(d) 10%

Q100. The force of gravitation between two bodies in the universe does NOT depend on:

(a) the distance between them
(b) the sum of their masses
(c) the gravitational constant
(d) the product of their masses

ANSWER KEY

1	d	2	b	3	a	4	d	5	b	6	c	7	a	8	d	9	b	10	c
11	c	12	d	13	a	14	c	15	d	16	a	17	b	18	a	19	c	20	d
21	c	22	d	23	b	24	c	25	b	26	c	27	c	28	b	29	a	30	a
31	b	32	d	33	d	34	c	35	d	36	a	37	b	38	a	39	d	40	d
41	b	42	c	43	a	44	b	45	a	46	c	47	c	48	b	49	c	50	a
51	d	52	c	53	b	54	b	55	d	56	b	57	d	58	d	59	d	60	a
61	a	62	d	63	b	64	b	65	c	66	a	67	d	68	d	69	b	70	b
71	d	72	d	73	d	74	b	75	a	76	a	77	d	78	a	79	c	80	b
81	d	82	c	83	b	84	a	85	d	86	c	87	b	88	a	89	a	90	c
91	c	92	c	93	d	94	c	95	b	96	c	97	d	98	d	99	d	100	b

SOLUTIONS

Q1. Answer: (d) 15

Shortcut Trick

Let Total Work be 60 units (LCM of 30, 20, 60).

Efficiencies: Panu = 2, Jiban = 3, Jalil = 1.

Work in 3 days: Jiban (Day 1) + Jiban (Day 2) + All three (Day 3) = 3 + 3 + (2+3+1) = 12 units.

To finish 60 units: (60 ÷ 12) × 3 days = 15 days.

Therefore The correct answer is 15 days.

Alternate Method

Given: Individual days for Panu = 30, Jiban = 20, Jalil = 60.

Person	Days	Total Work	Efficiency
Panu	30	60	2
Jiban	20	3	
Jalil	60	1	

Calculations:

=> Work done on Day 1 (Jiban) = 3 units

=> Work done on Day 2 (Jiban) = 3 units

=> Work done on Day 3 (Jiban + Panu + Jalil) = 3 + 2 + 1 = 6 units

=> Total work done in a 3-day cycle = 3 + 3 + 6 = 12 units

=> Number of cycles required = 60 ÷ 12 = 5 cycles

=> Total days = 5 × 3 = 15 days

Therefore The correct answer is 15 days.

Additional Information

Total Work Concept

Total work is always considered as the Least Common Multiple (LCM) of the individual days to avoid fractions during calculation.

Efficiency Relationship

Efficiency is inversely proportional to the time taken. Efficiency = Total Work ÷ Time.

Alternate Day Work

In problems involving assistance or alternate days, calculate the work done in one complete cycle and then multiply to reach the target work.

Q2. Answer: (b) 7/8

Let the numerator be x and denominator be y, then fraction be x/y

According condition first

(x + 3)/(y + 3) = 10/11

11 × (x + 3) = 10 × (y + 3)

11x + 33 = 10y + 30

11x – 10y = 30 – 33

11x – 10y = (-3) ---(1)

According condition second

(x – 4)/(y – 4) = 3/4

4 × (x – 4) = 3 × (y – 4)

4x – 16 = 3y – 12

4x – 3y = 16 – 12

4x – 3y = 4 ---(2)

Multiply by 11 in equation (2) and multiply by 4 in equation (1)

y = 8

Put the value of y = 8 in equation (1)

x = 7

Required fraction = 7/8

We also can solve this question using options

Q3. Answer: (a) 68

Shortcut Trick

In a parallelogram, opposite angles are always equal in measure.

From the given figure, angle ADC and angle ABC are opposite angles.

=> angle ABC = angle ADC
=> angle ABC = 68°
Therefore The correct answer is 68°.
Alternate Method
Given:ABCD is a parallelogram where angle ADC = 68°.
Formula Used: In a parallelogram, the sum of consecutive (adjacent) angles is 180°.
Calculations:
=> In parallelogram ABCD, AD || BC and AB || CD.
=> angle ADC + angle DAB = 180° (Consecutive interior angles)
=> 68° + angle DAB = 180°
=> angle DAB = 180° − 68° = 112°
=> Similarly, angle DAB + angle ABC = 180° (Consecutive interior angles)
=> 112° + angle ABC = 180°
=> angle ABC = 180° − 112° = 68°
Therefore The correct answer is 68°.
Additional Information

Q4. Answer: (d) Rajinikanth and Kamal Haasan

• Rajinikanth and Kamal Haasan, stars from South Indian, have formally entered politics recently.
• Rajnikanth entered politics in the year 2017 and may also contest the Tamil Nadu Legislative Assembly elections in 2021.
• Kamal Haasan, in 2018, launched his political party Makkal Needhi Maiam.

Q5. Answer: (b) %

Given series:
Left Side P 3 R I M J 3 Q % W @ / N $ E 5 X Y 1 # 8 Right Side
The 15^(th) term to the left side: E
and the 6^(th) term from the left of E is %.
Hence, '%' is the correct answer.

Q6. Answer: (c) 1

Shortcut Trick
Divide the numerator and denominator of the expression by cos θ.
The expression becomes (a tan θ − b) / (a tan θ + b).
Substitute tan θ = a/b into the expression: (a × a/b − b) / (a × a/b + b).
Simplifying gives $(a^2 - b^2) / (a^2 + b^2)$, which is $[(a^2 - b^2) / (a^2 + b^2)]^1$.
By comparison with the given RHS $[(a^2 - b^2) / (a^2 + b^2)]^k$, we find k = 1.
Therefore The correct answer is 1.
Alternate Method
Given: tan θ = a/b
Formula Used: tan θ = Perpendicular / Base; sin θ = Perpendicular / Hypotenuse; cos θ = Base / Hypotenuse
=> Let Perpendicular (P) = a and Base (B) = b.
=> Hypotenuse (H) = $\sqrt{(a^2 + b^2)}$.
=> sin θ = a / $\sqrt{(a^2 + b^2)}$ and cos θ = b / $\sqrt{(a^2 + b^2)}$.
=> LHS = (a × [a / $\sqrt{(a^2 + b^2)}$] − b × [b / $\sqrt{(a^2 + b^2)}$]) / (a × [a / $\sqrt{(a^2 + b^2)}$] + b × [b / $\sqrt{(a^2 + b^2)}$]).
=> LHS = [$(a^2 - b^2)$ / $\sqrt{(a^2 + b^2)}$] / [$(a^2 + b^2)$ / $\sqrt{(a^2 + b^2)}$].
=> LHS = $(a^2 - b^2) / (a^2 + b^2)$.
=> Given $(a^2 - b^2) / (a^2 + b^2) = [(a^2 - b^2) / (a^2 + b^2)]^k$.
=> $[(a^2 - b^2) / (a^2 + b^2)]^1 = [(a^2 - b^2) / (a^2 + b^2)]^k$.
=> k = 1.
Therefore The correct answer is 1.
Additional Information
Trigonometric Ratio Identity
The tangent of an angle θ is the ratio of the sine to the cosine: tan θ = sin θ / cos θ.

Pythagorean Identity

For any angle θ, $\sin^2 \theta + \cos^2 \theta = 1$. This is derived from the Pythagoras Theorem: $a^2 + b^2 = c^2$.

Component and Dividendo Rule

If p/q = r/s, then (p − q)/(p + q) = (r − s)/(r + s). This property is often used to simplify trigonometric fractions.

Q7. Answer: (a) 39

Shortcut Trick

Identify the smallest difference between any two numbers: 195 − 156 = 39.

Check if 39 divides all numbers: 156/39 = 4, 312/39 = 8, 195/39 = 5.

Since 39 divides all given numbers, it is the Highest Common Factor.

Therefore The correct answer is 39.

Alternate Method

Given: Numbers are 156, 312, and 195.

Formula Used: Prime Factorization Method for HCF.

=> Prime factors of 156 = $2 \times 2 \times 3 \times 13 = 2^2 \times 3^1 \times 13^1$

=> Prime factors of 312 = $2 \times 2 \times 2 \times 3 \times 13 = 2^3 \times 3^1 \times 13^1$

=> Prime factors of 195 = $3 \times 5 \times 13 = 3^1 \times 5^1 \times 13^1$

=> Common factors = $3^1 \times 13^1$

=> HCF = 3 × 13 = 39

Therefore The correct answer is 39.

Additional Information

HCF (Highest Common Factor)

The greatest number that divides two or more numbers without leaving a remainder. Also known as GCD (Greatest Common Divisor).

Relationship between HCF and LCM

For two numbers A and B: HCF(A, B) × LCM(A, B) = A × B.

Difference Method for HCF

The HCF of a set of numbers is always a factor of the difference between any two numbers in that set.

Q8. Answer: (d) Rs. 500

Shortcut Trick

Difference in loss percentages = 25% − 15% = 10%.

This 10% difference in Selling Price is given as Rs. 50.

10% of Cost Price (CP) = Rs. 50.

100% of Cost Price (CP) = 50 × 10 = Rs. 500.

Therefore The correct answer is Rs. 500.

Alternate Method

Let the Cost Price (CP) of the keyboard be x.

Selling Price at 15% loss (SP1) = 85% of x = 0.85x.

Selling Price at 25% loss (SP2) = 75% of x = 0.75x.

Difference between SPs = 0.85x − 0.75x = 50.

=> 0.10x = 50

=> x = 50 ÷ 0.10

=> x = 500

Therefore The correct answer is Rs. 500.

Additional Information

Profit and Loss Percentage

Profit % = (Profit/CP) × 100 and Loss % = (Loss/CP) × 100. Both are always calculated on the Cost Price unless stated otherwise.

Selling Price Calculation

SP = CP × (100 − Loss%)/100 or SP = CP × (100 + Profit%)/100.

Successive Discounts

If two successive discounts a% and b% are given, the single equivalent discount is (a + b − ab/100)%.

Q9. Answer: (b) 2019

- The 17th Lok Sabha elections were held in 2019.
- Elections were held between 11 April-19 - May 2019.
- BJP-led government was formed after the elections.
- Narendra Modi was re-elected as the Prime Minister.
- Om Birla was elected the Lok Sabha speaker.

Q10. Answer: (c) Shikha Sharma

- Shikha Sharma was the managing director and CEO of Axis Bank as of 2018.
- The current managing director and CEO of Axis Bank is Amitabh Chaudhry.
- Chanda Kochhar is the former MD and CEO of ICICI bank.
- Arundhati Bhattacharya is the former chairman of SBI.
- Sanjaya Sharma is the founder of Tata Interactive Systems.

Q11. Answer: (c) 1/8

Shortcut Trick

The volume of a cube is proportional to the cube of its side (V prop. to a^3).

If the edge (side) is halved, the ratio of the original side to the new side is 2 : 1.

The ratio of their volumes will be $(2)^3 : (1)^3 \Rightarrow 8 : 1$.

This means the new volume is 1/8 of the original volume.

Therefore The correct answer is 1/8.

Alternate Method

Given:

Original edge of the cube = a

New edge of the cube = a/2

Formula Used:

Volume of a cube = $(\text{Edge})^3$

Calculations:

$\Rightarrow$ Original Volume (V1) = a^3

$\Rightarrow$ New Volume (V2) = $(a/2)^3$

$\Rightarrow V2 = a^3 / (2 \times 2 \times 2)$

$\Rightarrow V2 = a^3 / 8$

$\Rightarrow V2 = (1/8) \times V1$

Therefore The correct answer is 1/8.

Additional Information

Total Surface Area (TSA) of a Cube

The total area of the six square faces is given by $6 \times (\text{side})^2$. If the side is halved, TSA reduces to 1/4 of the original.

Diagonal of a Cube

The longest internal diagonal connecting two opposite corners is side $\times \sqrt{3}$.

Volume Scaling Law

If every dimension of a 3D shape is multiplied by a factor k, the volume is multiplied by k^3.

Lateral Surface Area (LSA)

The area of the four side faces (excluding top and bottom) is $4 \times (\text{side})^2$.

Q12. Answer: (d) A

In each quadrant there are two small shapes i.e. triangle and circle which are facing each other.

Only in figure A, given condition follows.

Hence, figure A is the correct answer.

Q13. Answer: (a) Rajlakshmi Borthakur

- Rajlakshmi Borthakur invented a smart glove called TerraBlue XT - TJay that predicts epileptic seizures.
- It uses AI to predict epilepsy attacks and allows remote monitoring of patients.
- She has also won the Innovate for Digital India challenge in 2016 for this device.

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• She is the founder and CEO of TerraBlue XT- company that manufactures this device.

Q14. Answer: (c) Both 1 and 2 follows.

From the

The least possible Venn diagram for the given statements is as follows,

Conclusions:

1. All snakes are reptiles → True, as all snakes are poisonous and all poisonous are reptiles, all snakes will definitely be the reptiles.

2. Some reptiles are poisonous → True, as all poisonous are reptiles, some reptiles will definitely be the poisonous.

Hence, both conclusion 1 and 2 follows.

Q15. Answer: (d) Plaster of paris

• The chemical name of plaster of paris is calcium sulphate hemihydrate.

• Sodium hydrogen carbonate is the chemical name for baking powder and baking soda.

• Calcium sulphate dyhydrite is the chemical name for gypsum.

Q16. Answer: (a) Exactly 80

Shortcut Trick

Calculate total enrollment slots by multiplying the number of students by the subjects per student.

Total slots = 100 × 8 = 800.

Divide the total slots by the number of students per subject to find the number of subjects.

Number of subjects = 800 ÷ 10 = 80.

Therefore The correct answer is 80.

Alternate Method

Given:

Total Students (S) = 100

Subjects per Student (n) = 8

Students per Subject (k) = 10

Formula Used:

In any mapping where every element of set A is linked to 'n' elements of set B, and every element of set B is linked to 'k' elements of set A:

Total links = (Number of elements in A) × n = (Number of elements in B) × k

Calculations:

Let the total number of subjects be N.

=> Total study instances = 100 × 8

=> Total study instances = 800

=> Also, Total study instances = N × 10

=> 10 × N = 800

=> N = 800 ÷ 10

=> N = 80

Therefore The correct answer is 80.

Additional Information

Double Counting Principle

This method involves counting the size of a set in two different ways to establish a mathematical identity, often used in combinatorics.

Bipartite Graphs

The relationship between students and subjects can be modeled as a bipartite graph where edges exist only between the student set and the subject set.

Handshake Lemma

In graph theory, the sum of the degrees of all vertices is equal to twice the number of edges: $\Sigma \deg(v) = 2 \times E$.

Q17. Answer: (b) Mother

We can draw a family tree diagram from the given information as follows,

Clearly, the woman is the mother of Raghav.

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Hence, “Mother” is the correct answer.

Q18. Answer: (a) The Modern Periodic Table

The correct answer is The Modern Periodic Table

• In the Modern Periodic Table, the elements are arranged in the order of their increasing atomic number.

• In Mendeleev’s Periodic Table, the elements are arranged in the order of their atomic masses.

• In Newland’s Law of Octaves, the elements are arranged in the order of their increasing atomic masses and every 8th element has similar properties.

• Dobereiner’s Triads have elements with similar properties.

Q19. Answer: (c) C

Every element which is inside in the rectangle is shifting to next quadrant in a clockwise manner in succeeding image.

Hence, “figure C” is the correct answer.

Q20. Answer: (d) Debashish Mukherjee

• Debashish Mukherjee was appointed as the Executive Director of Canara Bank in February 2018.

• R A Sankara Narayanan is the current Executive Director of Canara Bank.

• Mahesh Kumar Jain is the Deputy Governor of the RBI.

Q21. Answer: (c) [figure]

The mirror image of line AB is as follow,

Hence, “figure 3” is the correct answer.

Q22. Answer: (d) 10.5

Shortcut Trick

When two objects move towards each other, their relative speed is the sum of their individual speeds.

Relative Speed = 45 + 53 = 98 km/hr.

Time = Total Distance ÷ Relative Speed = 1029 ÷ 98.

Time = 10.5 hours.

Therefore The correct answer is 10.5 hours.

Alternate Method

Given:

Speed of car from A (S1) = 45 km/hr

Speed of car from B (S2) = 53 km/hr

Total Distance (D) = 1029 km

Formula Used:

Time = Distance ÷ (S1 + S2)

Calculations:

=> Relative Speed = S1 + S2

=> Relative Speed = 45 + 53 = 98 km/hr

=> Meeting Time = 1029 ÷ 98

=> Meeting Time = 10.5 hours

Therefore The correct answer is 10.5 hours.

Additional Information

Relative Speed (Opposite Direction)

When two bodies move towards each other or in opposite directions, the relative speed is the sum of their speeds (u + v).

Relative Speed (Same Direction)

When two bodies move in the same direction, the relative speed is the difference of their speeds (u − v).

Time of Meeting

Time taken to meet = Initial distance between objects ÷ Relative speed.

Q23. Answer: (b) 27

Hence, there are 27 triangles in the given figure.

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Q24. Answer: (c) 7 : 3

let age of her son 10 years ago was be x

So, age of mother 10 years ago = 3x

According to the question

(3x + 20)/(x + 20) = 2/1

3x + 20 = 2x + 40

3x - 2x = 40 - 20

x = 20

Age of her son 10 years ago was x = 20 years

Present age of her son = 20 + 10 = 30

Age of mother 10 years ago was = 3x = 3 × 20 = 60 years

Present age of mother = 60 + 10 = 70 years

Ratio of ages of mother to her son = 70 : 30 = 7 : 3

Hence, 7 : 3 is the correct answer.

Q25. Answer: (b) Bengaluru

- Sagar Baheti became the first visually impaired Indian runner to complete the historic Boston Marathon in 2017.
- He hails from Bengaluru.
- He completed a distance of 42.16 km in just 4 hours.
- Boston Marathon is the hardest and the world's oldest marathon.

Q26. Answer: (c) D

In all figures except figure D, alphabets S, L, and N are shown with their mirror images.

Only in figure D, alphabet T is shown with its water image.

Hence, figure D is odd one out.

Q27. Answer: (c) Riccia

- Riccia is not a Thallophyta.
- It is a Bryophyta (not a Thallophyta).
- The Bryophyta are those plants which do not have rudimentary root-like organs and vascular tissues.
- Spirogyra, Ulva, and Chara are Thallophyta.
- The Thallophyta are those plants which do not have any roots, stems, or leaves.

Q28. Answer: (b) 24

Number of trees in the garden = 42

Number of Neem trees in the garden = 42 × 3/7 = 18

Number of Mango trees in the garden = 42 – 18 = 24

Q29. Answer: (a) Sumitra Mahajan

- Sumitra Mahajan was the Honourable (16th) Speaker of the Lok Sabha.
- Om Birla is the incumbent Honourable (17th) Speaker of the Lok Sabha.
- Manohar Joshi is the former CM of Maharashtra.
- Meira Kumar was the 15th Lok Sabha Speaker.
- Somnath Chatterjee was the 14th Lok Sabha Speaker.

Q30. Answer: (a) Rs. 8,00,000

Shortcut Trick

Last year fund for product development = 30% of Rs. 20,00,000 = Rs. 6,00,000.

Increase = 1/3 of last year fund = 1/3 × Rs. 6,00,000 = Rs. 2,00,000.

Current year fund = 6,00,000 + 2,00,000 = Rs. 8,00,000.

Therefore The correct answer is Rs. 8,00,000.

Alternate Method

Given:

Total fund last year = Rs. 20,00,000

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Product development share last year = 30%
Increase in fund this year = 1/3 of last year's allocation
Calculations:
=> Fund for product development (Last Year) = 30% × 20,00,000
=> Fund (Last Year) = (30/100) × 20,00,000 = Rs. 6,00,000
=> Amount of increase = (1/3) × 6,00,000 = Rs. 2,00,000
=> Total fund for product development (This Year) = 6,00,000 + 2,00,000
=> Total fund (This Year) = Rs. 8,00,000
Therefore The correct answer is Rs. 8,00,000.
Additional Information
Percentage Increase
To find the new value after an increase of x%, use: New Value = Original Value × (1 + x/100).
Fraction to Percentage
An increase by one third is equivalent to a percentage increase of approximately 33.33%.
Budget Allocation
In financial management, individual department funds are calculated as a percentage of the Total Gross Budget.

Q31. Answer: (b) isotopes

• One way of dating fossils is only by detecting the ratio of different isotopes of the same element in the fossil material.
• This is known as Absolute dating.
• There are 2 main types of determining a fossil's age- absolute dating and relative dating.
• Relative dating determines a fossil's age by comparing it with the similar fossils and rocks of similar age.

Q32. Answer: (d) 16

Shortcut Trick
For tossing n coins, the total number of outcomes in the sample space is 2^n.
Here, the number of coins (n) = 4.
Total outcomes = 2^4 = 2 × 2 × 2 × 2 = 16.
Therefore The correct answer is 16.
Alternate Method
Given: Number of coins tossed together = 4.
Formula Used: Total outcomes = (Outcomes per coin)^(Number of coins)
=> Each coin has 2 possible outcomes (Head or Tail).
=> For 4 coins, the Sample Space (S) size is calculated by multiplying the outcomes of each coin.
=> n(S) = 2 × 2 × 2 × 2
=> n(S) = 16
Therefore The correct answer is 16.
Additional Information
Sample Space Definition
The sample space is the set of all possible outcomes of a random experiment. For n coins, it contains 2^n elements.
Dice Outcomes
If n dice are rolled, the total number of outcomes in the sample space is 6^n.
Probability Formula
The probability of an event P(E) = (Number of favorable outcomes) ÷ (Total number of outcomes in Sample Space).

Q33. Answer: (d) Paternal Grand father

We can draw a family tree diagram from the given information as follows,
Hence, “Paternal Grandfather” is the correct answer.

Q34. Answer: (c) 162.5 J

Concept:
Concept:
• The kinetic energy of an object is defined as the energy that it possesses due to its motion

• And can be expressed as K.E = 1/2 mv²

Mass of particle = m

The velocity of particle = v

Kinetic energy = K.E

Calculation:

Given,

Mass of object = 13 Kg

Speed of object = 5 m/s

Now from the above explanation, we can see that,

K.E = 1/2 mv²

=> Kinetic energy possessed by the object = 1/2 × 13 × (5)²

=> 1/2 × 13 × 25 = 162.5 J

Q35. Answer: (d) Only assumption I is implicit

Since Amit can make students understand the difficult mathematical problems in a simpler way, he might as well understand them very well himself. Therefore, it is safe to assume that he likes Mathematics.

Hence, assumption I is implicit.

The statement suggests nothing about Amit's teaching ability in Physics, therefore, assumption II is not implicit.

Hence, only assumption I is implicit.

Q36. Answer: (a) Joule's law

The Correct Answer is Option 1 i.e Joule's Law

• Joule's law is associated with the heating effect of electric current.

• It is a way to find the amount of heat produced by electric current.

• H=I²Rt is the relation used to calculate heat generated.

Additional Information

• Ohm's law-

• The potential difference or voltage between 2 points is directly proportional to the electricity or current passing through the resistance.

• V=IR is the relation derived from Ohm's Law.

• Faraday's law of electromagnetic induction predicts how a magnetic field will interact with an electric circuit in order to produce an EMF, electromotive force.

• Newton's laws of motion describe the relationship between an object and the forces acting upon it.

Q37. Answer: (b) H

• In Modern Periodic Table, there is an anomaly when it comes to the position of H because it can be placed either in group 1 or group 17 in the first period.

• Hydrogen combines with halogens so it can be placed in group 1 of the alkali metals.

• It also exists as a diatomic molecule and forms ionic compounds with metals so it can be placed in the halogen group (17) also.

The modern periodic table is as follows;

Q38. Answer: (a) 25Hz

CONCEPT:

• Wave: It can be defined as the transport of energy without the transport of matter.

• The properties of waves are:

• Wavelength (λ): The distance between two crests or troughs of a wave is known as wavelength. One wavelength equals the distance between two consecutive crests.

• Frequency (f): The number of oscillations or the number of waves passes a given point in one sec. Its SI unit is Hertz.

• Time period (T): The time taken by the wave to complete one cycle.

• The relation between velocity, wavelength and frequency and time period of a wave is

=> f = 1/T = v/λ

[where f = frequency, T = time period, v = velocity of wave, λ = wavelenght]

CALCULATION:

Given that,

time period of a wave, t = 0.04 seconds,

Its frequency = 1/ t

f = 1/0.04 = 25 Hz

Q39. Answer: (d) 90

The pattern followed here is,

Hence, “90” is the correct answer.

Alternate Method

4 × 2 +1 = 9

9 × 2 + 2 = 20

20 × 2 + 3 = 43

43 × 2 + 4 = 90

Q40. Answer: (d) Purple

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

• The natural colour of litmus is purple.

• Litmus paper is used as one of the chemical indicators.

• It is used to determine whether a solution is acidic or basic.

• If the blue litmus paper is put in an acidic solution, it turns red.

Q41. Answer: (b) resistance

CONCEPT:

• Rheostat: The variable resistor is a type of resistor whose electrical resistance value can be adjusted as per our demand. This type of resistor is called a rheostat.

• This is not temperature sensitive.

Explanation:

• In an electric circuit, Rheostat is often used to change the resistance in the circuit.

• A rheostat is a variable resistor that controls the flow of electric current by decreasing or increasing the resistance manually.

• The flow of electric current in a circuit can be controlled if we place a rheostat in the circuit.

• It finds its usage in the applications where a high current or voltage is required.

Additional Information

The below fig shows representation the structure of rheostats

Q42. Answer: (c) South

In chess, the players always sit in front of each other.

If Supriya is facing North, then Pallavi is definitely facing at South.

From the following figure.

Hence, South is the correct answer.

Q43. Answer: (a) Kalam SAT

• In June 2017, NASA launched the world’s lightest satellite Kalam SAT, which weighs 64 grams and iscreated by Chennai students.

• It has been developed by Rifath Sharook and his team.

• It has been named after Dr APJ Abdul Kalam.

• It is so small that it can be held in one palm.

Q44. Answer: (b) Brazil

Country	Currency
South Africa	Rand
Brazil	Real
Ghana	Cedi
Cambodia	Riel

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Q45. Answer: (a) Fullerene

- Fullerenes are those allotropes of carbon which are in the form of geodesic globe.
- The other allotropes of carbon include diamond, graphite, carbon nanotube, etc.
- Allotropy is a property possessed by a few chemical elements to exist in allotropes or more than 2 different forms.

Q46. Answer: (c) Rs 414

Shortcut Trick

Determine Cost Price by adding Loss to Selling Price: 300 + 60 = 360.

Apply the multiplier method for 15% Gain: 360 × 1.15.

Calculate: 360 × 115 ÷ 100 = 36 × 11.5 = 414.

Therefore The correct answer is Rs 414.

Alternate Method

Given: Selling Price (SP1) = Rs. 300, Loss = Rs. 60, Target Gain% = 15%.

Formulas: CP = SP + Loss | New SP = CP × (100 + Gain%) ÷ 100

=> Cost Price (CP) = 300 + 60 = Rs. 360.

=> Required Selling Price (SP2) = 360 × (100 + 15) ÷ 100.

=> SP2 = 360 × 115 ÷ 100 = 360 × 1.15 = 414.

Therefore The correct answer is Rs 414.

Additional Information

Cost Price and Loss Relationship

When an article is sold at a loss, the Cost Price is always greater than the Selling Price. CP = SP + Loss.

Gain Percentage

Gain% is always calculated on the Cost Price unless stated otherwise. SP = CP × (1 + Gain ÷ 100).

Q47. Answer: (c) 10

Shortcut Trick

Using the Man-Days concept: M1D1 = M2D2

Given: 10 × 8 = M2 × 4

=> M2 = 20 men

Extra men needed = 20 − 10 = 10 men

Therefore The correct answer is 10 men.

Alternate Method

Person	Days	Total Work	Efficiency
10 Men	8	80 units	10 units/day

Given: Initial Men (M1) = 10, Initial Days (D1) = 8, Target Days (D2) = 4

Formula Used: Total Work = Men × Days

=> Total Work = 10 × 8 = 80 units

=> Total Men required for 4 days = Total Work ÷ D2

=> New Men (M2) = 80 ÷ 4 = 20 men

=> Additional Men = M2 − M1

=> Additional Men = 20 − 10 = 10 men

Therefore The correct answer is 10 men.

Additional Information

Chain Rule Formula

For work problems involving multiple variables, use (M1D1H1)/W1 = (M2D2H2)/W2, where H is hours and W is work.

Inverse Proportion

The number of men is inversely proportional to the time taken. If time is halved (8 to 4), the number of men must be doubled (10 to 20).

Q48. Answer: (b) 40

- The mass of an atom or a molecule is referred to as the atomic mass.

Element	Atomic Mass
Calcium	40
Magnesium	24
Sodium	22.98
Sulphur	32

Q49. Answer: (c) Behind the retina

The correct answer is option 3 i.e., Behind the retina.

Hypermetropia:

• Hypermetropia is the term used to define longsightedness.

• In this, the image of a nearby object is formed behind the retina.

• This means that light is focused too far back in the eye, causing things that are close up to appear blurred.

• A convex lens is used to solve the problem of longsightedness or Hypermetropia.

• A convex lens is also known as a converging lens. A converging lens is a lens that converges rays of light that are travelling parallel to its principal axis.

Name of disease	lense used
Myopia	Concave lens
Hypermetropia	Convex lens
Astigmatism	Cylindrical lens

Q50. Answer: (a) 60

Number of units of personal computers sold by the company XYZ in 2011 is = 60 unit

Q51. Answer: (d) Filmfare Awards

• Aamir Khan was honoured with the Best Actor Award in 2017 at Filmfare Awards.

• He was awarded for his film Dangal for his role as Mahavir Singh Phogat.

• Alia Bhatt was awarded Best Actress for her film Udta Punjab.

• Best Film was won by film Dangal.

• Nitesh Tiwari won Best Director for the film Dangal.

Q52. Answer: (c) D

The mirror image is as follows,

Hence figure D is the correct figure.

Q53. Answer: (b) 500

Shortcut Trick

Passing Marks = Scored Marks + Failing Margin

Passing Marks = 190 + 10 = 200 marks

Since 40% = 200 marks, then 1% = 200 ÷ 40 = 5 marks

Maximum Marks (100%) = 5 × 100 = 500 marks

Therefore The correct answer is 500 marks.

Alternate Method

Given:

Pass percentage = 40%

Marks scored = 190

Failing marks = 10

Calculations:

=> Passing Marks = 190 + 10 = 200

=> According to the question, 40% of Maximum Marks = 200

=> Let Maximum Marks be M.

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=> (40 ÷ 100) × M = 200

=> M = (200 × 100) ÷ 40

=> M = 5 × 100

=> M = 500

Therefore The correct answer is 500 marks.

Additional Information

Percentage to Value Conversion

To find the total value when a percentage part is known: Total = (Given Value ÷ Percentage) × 100.

Passing Condition

In exam problems, Passing Marks = Scored Marks + Failing Marks OR Scored Marks − Excess Marks.

Maximum Marks Definition

Maximum marks always represent the 100% base value of the examination score.

Q54. Answer: (b) S = ut + (1/2) at²

CONCEPT:

• Equation of motion: The mathematical equations used to find the final velocity, displacements, time, etc of a moving object without considering force acting on it are called equations of motion.

• These equations are only valid when the acceleration of the body is constant and they move on a straight line.

There are three equations of motion:

V = u + at

V2 = u2 + 2 a S

S = ut + (1/2) at²

Where, V = final velocity, u = initial velocity, s = distance travelled by the body under motion, a = acceleration of body under motion, and t = time taken by the body under motion.

EXPLANATION:

From the above explanation, we can see that

• S = ut + 1/2 at² represents the equation for position-time relation.

• Hence option 2 is correct among all

Q55. Answer: (d) 24

• Mahavira is believed to be the last of the 24 Tirthankaras.

• His place of Nirvan is Pava Puri.

• Tirthankaras were the spiritual teachers and saviours of the Jain Dharma.

• The first Tirthankara was Rishabhdev and his place of Nirvan was Ashtapad.

Q56. Answer: (b) Dmitri Mendeleev

• Dmitri Mendeleev invented the periodic table in the year 1869.

• He arranged the chemical elements by their atomic masses.

Scientist	Invention/Discovery
Marie Curie	Radium
Dmitri Mendeleev	Periodic Table
Antoine Lavoisier	Chemical reactivity of oxygen
Louis Pasteur	Pasteurization

Q57. Answer: (d) Potential energy

• Potential energy varies with the height of an object.

• Potential energy is that which is stored within an object because of its state, arrangement, or position.

• The energy present in the nucleus of an atom is known as nuclear energy.

• The energy that an object possesses because of its motion is known as kinetic energy.

• The energy which is stored in the bonds of chemical compounds is known as chemical energy.

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Q58. Answer: (d) 4

- As of March 2018, 4 Indians have won Grand Slam tournaments in tennis.
- These 4 Indians are Leander Paes, Mahesh Bhupathi, Sania Mirza, and Rohan Bopanna.
- Mahesh Bhupathi was the first Indian to win the Grand Slam tournament.

Q59. Answer: (d) 1905

- The partition of Bengal took place in the year 1905.
- It was carried out by Lord Curzon, the British Viceroy of India.
- Large Muslim and Hindu areas were separated from each other in October 1905.
- The partition was announced in July 1905, while it took place in October 1905.

Q60. Answer: (a) 24

Hence, there are 24 squares in the figure.

Q61. Answer: (a) Na

- Sodium (Na) has low density and low melting point.
- This is the reason it is stored in either kerosene or mineral oil.
- It is found in the first group of the periodic table.
- It is the 6th most abundant element on the Earth.
- It is never found in pure form and is highly reactive.

Q62. Answer: (d) Displacement

The correct answer is Displacement.

Key Points

- The work done is zero if there is no displacement.
- Displacement is the change in the position of an object, measuring from its starting and final position.
- Power is defined as the rate at which energy is transferred or work is done.
- Velocity is a vector quantity that gives the rate of the direction of motion.

Q63. Answer: (b) 60

Shortcut Trick

Value ratio of coins = (1 × 2) : (2 × 1) : (3 × 0.5) = 2 : 2 : 1.5

Total units = 2 + 2 + 1.5 = 5.5 units

5.5 units = Rs. 110 => 1 unit = Rs. 20

Value of 50 paise coins = 1.5 × 20 = Rs. 30

Number of 50 paise coins = 30 ÷ 0.5 = 60

Therefore The correct answer is 60 coins.

Alternate Method

Given: Total amount = Rs. 110. Ratio of coins (Rs. 2 : Rs. 1 : 50p) = 1 : 2 : 3.

Formula Used: Total Value = ∑(Number of coins × Face value of coin)

=> Let the number of coins be 1x, 2x, and 3x respectively.

=> Total Value = (1x × 2) + (2x × 1) + (3x × 0.5) = 110

=> 2x + 2x + 1.5x = 110

=> 5.5x = 110

=> x = 110 ÷ 5.5 = 20

=> Number of 50 paise coins = 3x = 3 × 20 = 60

Therefore The correct answer is 60 coins.

Additional Information

Coin Value Conversion

Always convert all denominations into a single unit (either all in Rupees or all in Paise) before solving. 50 paise = Rs. 0.5 or Rs. 1/2.

Ratio of Value vs Ratio of Number

Ratio of Number × Face Value = Ratio of Total Value. Conversely, Ratio of Value ÷ Face Value = Ratio of Number of coins.

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Q64. Answer: (b) 4

Shortcut Trick

HCF must be a factor of the smallest difference between any two numbers.

Differences: 28 − 16 = 12, 72 − 28 = 44, 72 − 16 = 56.

Factors of the smallest difference (12) are: 1, 2, 3, 4, 6, 12.

The highest factor among these that divides 16, 72, and 28 is 4.

Therefore The correct answer is 4.

Alternate Method

Given numbers: 16, 72, 28

Formula Used: Prime Factorization Method

=> 16 = 2 × 2 × 2 × 2 = 2^4

=> 72 = 2 × 2 × 2 × 3 × 3 = $2^3 \times 3^2$

=> 28 = 2 × 2 × 7 = $2^2 \times 7$

=> HCF = Product of common prime factors with the lowest power

=> HCF = $2^2 = 4$

Therefore The correct answer is 4.

Additional Information

Highest Common Factor (HCF)

HCF is the greatest number that divides two or more numbers without leaving any remainder.

Least Common Multiple (LCM)

LCM is the smallest number that is exactly divisible by each of the given numbers.

HCF and LCM Relation

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

Q65. Answer: (c) C

Here in all figures, except figure C, only 1 portion is shaded, and 2 portions are unshaded, whereas in figure C, 2 portions are shaded, and 1 portion is unshaded.

Hence, figure C is odd one out.

Q66. Answer: (a) Punjab

- ‘Chhapar Mela’, a social festival is organised in the state of Punjab.
- It is celebrated in the town of Chhapar, Ludhiana, Punjab.
- It is held every year in the month of September.
- It is held in the memory of Gugga Pir.

Q67. Answer: (d) 2 mins

Shortcut Trick

Use the direct formula for combined work: Combined Time = (A × B) ÷ (A + B)

Let Time taken by A = X and Time taken by B = 6.

Combined time = 1.5 minutes.

=> 1.5 = (X × 6) ÷ (X + 6)

=> 1.5X + 9 = 6X => 4.5X = 9 => X = 2 minutes.

Therefore The correct answer is 2 min.

Alternate Method

Given: Time for Pipe A = X min, Time for Pipe B = 6 min, Combined Time = 1.5 min.

Person	Days	Total Work	Efficiency
Pipe A	X	6	6/X
Pipe B	6	1	

Calculations:

=> Combined Efficiency = Total Work ÷ Combined Time

=> Efficiency_A + Efficiency_B = 6 ÷ 1.5

=> (6/X) + 1 = 4
=> 6/X = 4 − 1
=> 6/X = 3
=> X = 6 ÷ 3
=> X = 2 minutes
Therefore The correct answer is 2 min.
Additional Information
Pipes and Cisterns Efficiency
Efficiency is inversely proportional to the time taken to fill a tank. Net work done = Sum of efficiencies of individual pipes.
Inlet and Outlet Pipes
Inlet pipe efficiency is taken as positive (+), while outlet (leakage) pipe efficiency is taken as negative (−).
Combined Work Formula
For two pipes filling a tank, the total time T is given by 1/T = 1/t1 + 1/t2.

Q68. Answer: (d) Xylem

- Xylem tissue is responsible for the transport of materials away from the root.
- Ground tissue provides support to the plant and synthesizes organic compounds.
- Cambium tissues are responsible for secondary growth of roots and stems.
- Phloem tissues transport food made by the leaves to rest of the parts of the plant.

Q69. Answer: (b) 22O

The pattern followed here is,
Hence, “22O” is the correct answer.

Q70. Answer: (b) Iodine

- Iodine is the least reactive element belonging to group 17.
- The 5 non-metallic, toxic elements that form group 17 of the periodic table are iodine, chlorine, fluorine, bromine, and astatine.
- These are known as halogens.
- Fluorine is the most reactive element belonging to group 17.

Q71. Answer: (d) 7 ms^(-1)

Concept:
The motion of particles can be predicted using Kinematic equations and they are given as
1. $S=ut+1/2at^2$
2. $v=u+at$
3. $v^2=u^2+2aS$
Here,
Displacement of particle = S
Initial velocity = u
Final velocity = v
Acceleration of particle = a
Time period at any instant= t
Calculation:
Given
=> Initial velocity (u) = 0
=> Time (t) = 0.7 s
=> g =10 ms2
=> Final velocity (v) = u + gt
=> v = 0 + 10*0.7
=> v = 7ms^(-1)

Q72. Answer: (d) Retailer 1

Only Retailer 1 offers all three products less than Rs. 10

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Q73. Answer: (d) Only 1 follows.

The least one possible figure Venn diagram for the given statements is as follows,

Conclusions:

1. Some penguins are snakes → True, as Some Penguins are Peacocks and all the Peacocks are Snakes, some penguins will definitely be the snakes.

2. No peacock is a penguin → False, as some Penguins are Peacocks, some peacock will definitely be the Penguins.

Hence, only conclusion 1 follows.

Q74. Answer: (b) Brother-in-law

We can draw a family tree diagram from the given information as follows,

Clearly, D is brother-in-law of A.

Hence, “Brother-in-law” is the correct answer.

Q75. Answer: (a) 3996/1331

Shortcut Trick

If the difference between a fraction and its reciprocal is k (where $k = x - 1/x$), then the difference of their cubes ($x^3 - 1/x^3$) is given by the shortcut formula: $k^3 + 3k$.

Given: $k = 9/11$

Difference of cubes = $(9/11)^3 + 3 \times (9/11)$

Difference of cubes = $729/1331 + 27/11 = (729 + 3267) / 1331 = 3996/1331$

Therefore The correct answer is 3996/1331.

Alternate Method

Given:

Difference between fraction (x) and its reciprocal (1/x) = 9/11

Formula Used:

The algebraic identity for the cube of a binomial: $(a - b)^3 = a^3 - b^3 - 3ab(a - b)$

Calculations:

=> Let the fraction be x. Then its reciprocal is 1/x.

=> $x - 1/x = 9/11$

=> To find the difference of their cubes, calculate $x^3 - 1/x^3$.

=> $x^3 - 1/x^3 = (x - 1/x)^3 + 3 \times x \times (1/x) \times (x - 1/x)$

=> $x^3 - 1/x^3 = (9/11)^3 + 3 \times (9/11)$

=> $x^3 - 1/x^3 = 729/1331 + 27/11$

=> Taking LCM of 1331 and 11, which is 1331:

=> $x^3 - 1/x^3 = (729 + 27 \times 121) / 1331$

=> $x^3 - 1/x^3 = (729 + 3267) / 1331$

=> $x^3 - 1/x^3 = 3996/1331$

Therefore The correct answer is 3996/1331.

Additional Information

Sum of Cubes Identity

If the sum is given as $x + 1/x = k$, then the sum of their cubes is $x^3 + 1/x^3 = k^3 - 3k$.

Relation between Sum and Difference

The relationship between the sum and difference of a reciprocal pair is $(x + 1/x)^2 - (x - 1/x)^2 = 4$.

Reciprocal Property

For any non-zero number x, the product of the number and its reciprocal (1/x) is always 1.

Q76. Answer: (a) Pollination

- Transfer of Pollengrains from anther to the stigma of a flower is called pollination.
- Regeneration is the process through which organisms restore or replace their lost body parts.
- Transpiration is the process through which plants release water in the form of water vapours or moisture.
- Sexual reproduction is the process through which a new organism is formed from 2 organisms of different sexes.

Q77. Answer: (d) 20

Hence, there are 20 triangles in the figure.

Q78. Answer: (a) Ahmedabad

- GIFT city of India is being planned in Ahmedabad, Gujarat.
- It stands for Gujarat International Finance Tec-City.
- It is India's first international financial services centre and also first operational smart city.
- It will have features such as underground utility tunnel, district cooling system, etc.

Q79. Answer: (c) 10^(th) January

- “World Hindi Day’ (WHD) is observed every year on 10 January.
- It mark the first anniversary of World Hindi Conference (WHC), which was held in 1975.
- Then Prime Minister Indira Gandhi inaugurated the first WHC.
- National Hindi Diwas is celebrated on 14 September every year.

Q80. Answer: (b) A

The logic followed here is:

Figure rotates in 180°in clockwise direction.

Similarly,

Hence, "Figure A" is the correct answer.

Q81. Answer: (d) Regur

Correct Answer Regur

Key Points:

- The Black soil is also known as regur soil.
- It covers a major part of Deccan plateau including the states of Andhra Pradesh, Gujarat, Madhya Pradesh, Maharashtra, and Tamil Nadu.
- It is also known as black cotton soil.
- These are impermeable, deep, and, clayey and are rich in alumina, magnesia, iron, and lime.
- Some of the crops grown on it include cotton, jowar, wheat, and linseed, etc.

Q82. Answer: (c) 5

Shortcut Trick

For a number to be divisible by 11, the difference between the sum of digits at odd positions and the sum of digits at even positions must be 0 or a multiple of 11.

Sum at odd positions (from right): 9 + 3 + x = 12 + x

Sum at even positions (from right): 3 + 3 = 6

Difference: (12 + x) − 6 = 6 + x

For divisibility by 11, 6 + x = 11 => x = 5.

Therefore The correct answer is 5.

Alternate Method

Given: Number = x3339, Divisor = 11.

Divisibility Rule of 11: Sum of digits at odd places − Sum of digits at even places = 0, 11, 22, ...

=> Sum of digits at odd positions = x + 3 + 9 = x + 12

=> Sum of digits at even positions = 3 + 3 = 6

=> Difference = (x + 12) − 6 = x + 6

=> For x + 6 to be divisible by 11, it must be 11 (since x is a single digit 0-9)

=> x + 6 = 11

=> x = 11 − 6 = 5

Therefore The correct answer is 5.

Additional Information

Face Value and Place Value

The face value of a digit is the digit itself, regardless of its position. The place value depends on its position (e.g., in x3339, place value of x is x × 10,000).

Divisibility Rule of 3 and 9

A number is divisible by 3 or 9 if the sum of its digits is divisible by 3 or 9 respectively.

Divisibility Rule of 11 (Alternate)

Subtract the last digit from the rest of the number. If the result is divisible by 11, the original number is also divisible by 11.

Q83. Answer: (b) A and B are both true

The correct answer is A and B are both true.

Key Points

• Rigidity is defined as the state in which the particles of a substance are fixed in their positions.

• It is also the property of solids of being rigid and stiff towards stress.

• Compressibility is the property of matter to allow a decrease in volume under high pressure and gases show this property.

Q84. Answer: (a) 1

1 Non-leap year = 365 days = 52 weeks + 1 day

(as 365 = 7 × 52 + 1)

This extra day is called an odd day.

Hence, the number of odd days in a non-leap year is 1.

Note:

No. of days in a leap year = 366.

No. of odd days in a leap year = 2 (as the remainder of 366 upon division by 7 is 2)

Q85. Answer: (d) It is the largest part constituting 60% of the brain.

The correct answer is It is the largest part constituting 60% of the brain.

• The cerebrum is a part of the forebrain.

• It has two parts called cerebral hemispheres.

• It forms the front, superior, and lateral sides of the brain.

• The cerebrum in the human brain is the center for intelligence, memory, and emotions.

• It is the largest part constituting 80% of the brain. It coordinates voluntary muscle movements and helps in maintaining posture and balance.

Additional Information

Parts of brain	Its Functions
Cerebrum	• It is the main thinking part of the brain. It is the site of our faculties such as learning, reasoning, intelligence, and memory, etc. - All our thoughts, sensations, actions, and movements are controlled by the cerebrum.
Midbrain	• It controls reflex movements of the head, neck, and trunk in response to visual and auditory stimuli. - It also controls the reflex movements of the eye muscles, changes in pupil and shape of the eye lens.
Pons	• It consists of fiber tracts that interconnect different regions of the brain. - It also takes part in regulatory respiration.
Cerebellum	• It helps in maintaining the posture and balance of the body. - It also enables us to make precise and accurate movements. - It coordinates smooth body movements such as walking, dancing and riding a bicycle, etc.

Q86. Answer: (c) Only conclusion II follows

We cannot be specific about the medium mentioned in the given statements. Therefore, conclusion I does not follow.

The first part of the statement means that vibration produces sound. Therefore, conclusion II follows.

Hence, only conclusion II follows.

Q87. Answer: (b) 300

Shortcut Trick

Remaining food for 1200 soldiers was for 28 − 4 = 24 days.

Let M2 be the remaining soldiers. Using M1×D1 = M2×D2

1200 × 24 = M2 × 32

M2 = (1200 × 24) ÷ 32 = 900 soldiers.

Soldiers who left = 1200 − 900 = 300.

Therefore The correct answer is 300 soldiers.

Alternate Method

Given:

Initial soldiers (M1) = 1200

Total days food would last = 28 days

Days passed = 4 days

Remaining days for original strength = 28 − 4 = 24 days

New duration (D2) = 32 days

Formula:

Total Work (Food) = Men × Days

Calculations:

=> Remaining Food = 1200 × 24

=> Let remaining soldiers be x

=> x × 32 = 1200 × 24

=> x = (1200 × 24) ÷ 32

=> x = 1200 × (3/4)

=> x = 300 × 3 = 900

=> Soldiers left = Initial soldiers − Remaining soldiers

=> Soldiers left = 1200 − 900 = 300

Therefore The correct answer is 300 soldiers.

Additional Information

Chain Rule

The relation between men, days, and work is given by (M1×D1×H1)/W1 = (M2×D2×H2)/W2.

Inverse Proportion

For a constant amount of work (or food), the number of men is inversely proportional to the number of days (M prop. to 1/D).

Work & Wages

Wages are distributed in the ratio of the work done by individuals, which is usually (Efficiency × Time).

Q88. Answer: (a) Only conclusion I follows

The statement says that a building with more than two floors (ground floor and first floor) will have a lift.

Thus, the building in question which has at least 6 floors has a lift.

Therefore, it can be concluded that, except for the ground floor, every floor can be reached by a lift.

Hence conclusion I follows.

Also, it can be understood that either conclusion I or conclusion II follows.

As conclusion I is true, conclusion II has to be false.

Hence, only conclusion I follows.

Q89. Answer: (a) 8

• For creating 8 safe cities, the Union Ministry of Women and Child Development has approved projects worth Rs 2,919 crore under Nirbhaya Fund.

• The cities are Lucknow, Hyderabad, Kolkata, Bengaluru. Delhi, Chennai, Mumbai, and Ahmedabad.

• Some of the measures taken under the project include use of latest technology, helpdesk services, enhanced safety at public places, etc.

Q90. Answer: (c) B

In the given question, first figure (square) and second figure(circle) are related to each other.

In the first figure, a small circle is inside the square and in the second figure a small square inside the circle.

Similarly,

In the third figure, a small circle is inside the triangle. Now the fourth figure should consist of a small shaded triangle within the

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circle.

Hence, figure B is the correct answer.

Q91. Answer: (c) 2900

If 551 ÷ 29 = 19, then

55 ÷ 19 = 29

55/19 = 29

$5.51/(0.0019 \times 10^2) = 29$

5.51/(0.0019) = 2900

Q92. Answer: (c) Neither I nor II is implicit

The advertisement does not suggest anything about its affordability. Moreover, any person taking an interest in the hotel need not mean that it is due to its expensiveness. Therefore, assumption I is not implicit.

A person taking a liking to a hotel does not suggest that he owns it. Therefore, assumption II is not implicit.

Hence, neither I nor II is implicit.

Q93. Answer: (d) 4140

7580 – X = 3440

X = 4140

Q94. Answer: (c) State Bank of India (SBI)

NIT Warangal, IIM Ahmedabad and IIT Mumbai are related to Educational institution while State Band of India is a Bank.

Hence State Bank of India does not belong the group.

Q95. Answer: (b) Cricket

• Yuzvendra Chahal is related to cricket.

• He plays for Royal Challengers Bangalore in the IPL.

Sports	Famous players
Tennis	Mahesh Bhupathi
Cricket	Yuzvendra Chahal
Shooting	Jitu Rai
Hockey	Manpreet Singh

Q96. Answer: (c) Velocity

Concept:

• Velocity of a particle is defined as the rate of change of its displacement

And it is expressed as

v = dx/dt or (Δ x)/(Δ t)

• Similarly, acceleration of a particle is defined as the rate of change of its velocity

And it is expressed as

a = dv/dt or (Δ v)/(Δ t)

In terms of displacement a = fracd²xdt²

• Where x is the displacement of a particle, v is its velocity and a is its acceleration at some time interval Δt

Explanation:

From the above explanation, we can see that,

• Velocity is the scientific term for the speed of an object moving in a definite direction.

• Acceleration is defined as the rate of change of velocity with respect to time.

• The change in the position of an object with time is known as motion.

Q97. Answer: (d) -1

Shortcut Trick

For a cubic polynomial $Ax^3 + Bx^2 + Cx + D$, the sum of the products of zeros taken two at a time (ab + bc + ca) is always C/A.

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From the given expression $2x^3 - x^2 - 2x + 1$, we identify A = 2 and C = −2.

Result = −2 ÷ 2 = −1.

Therefore The correct answer is −1.

Alternate Method

Given: Cubic polynomial $P(x) = 2x^3 - x^2 - 2x + 1$ with zeros a, b, and c.

Formula Used: Vieta's formulas for cubic equations.

=> Compare P(x) with the standard form $Ax^3 + Bx^2 + Cx + D$.

=> Coefficients are: A = 2, B = −1, C = −2, D = 1.

=> Sum of zeros (a + b + c) = −B/A = −(−1)/2 = 1/2.

=> Sum of product of zeros taken two at a time (ab + bc + ca) = C/A.

=> ab + bc + ca = −2 / 2.

=> ab + bc + ca = −1.

Therefore The correct answer is −1.

Additional Information

Sum of Zeros

For a cubic polynomial, the sum of zeros (a + b + c) is given by −B/A, which is the negative ratio of the coefficient of x^2 to the coefficient of x^3.

Product of Zeros

The product of the zeros (abc) is given by −D/A, which is the negative ratio of the constant term to the coefficient of x^3.

General Relation

In any polynomial of degree n, the sum of roots taken 'k' at a time is (−1)^k × (Coefficient of x^(n−k) ÷ Coefficient of x^n).

Q98. Answer: (d) 27000

The total tyres produced in India during 2017 was = 1,80,000 units,

Tyres produced by company ‘D’ in 2017 = 15% of 1,80,000 = 1,80,000 × (15/100) = 27,000

Q99. Answer: (d) 10%

Shortcut Trick

Interest for 3 months = Rs. 27.

Interest for 12 months (1 year) = 27 × 4 = Rs. 108.

Rate of Interest (R) = (Interest for 1 year ÷ Principal) × 100.

Rate (R) = (108 ÷ 1080) × 100 = 10%.

Therefore The correct answer is 10%.

Alternate Method

Given:

Principal (P) = Rs. 1,080

Interest (SI) = Rs. 27

Time (T) = 3 months = 3/12 year = 1/4 year = 0.25 year

Formula Used:

Simple Interest (SI) = (P × R × T) ÷ 100

=> 27 = (1080 × R × 0.25) ÷ 100

=> 27 × 100 = 1080 × 0.25 × R

=> 2700 = 270 × R

=> R = 2700 ÷ 270

=> R = 10%

Therefore The correct answer is 10%.

Additional Information

Simple Interest (SI) Formula

SI is calculated on the original Principal for the entire period: SI = (P × R × T) ÷ 100, where T is always in years.

Amount (A)

The total money paid back after the time period: Amount = Principal + Simple Interest.

Time Conversion

To convert months to years, divide by 12. To convert days to years, divide by 365 (standard year).

Effective Rate

For Simple Interest, the interest remains constant every year if the rate and principal are unchanged.

Q100. Answer: (b) the sum of their masses

- The force of gravitation between two bodies in the universe does not depend on the sum of their masses.
- It depends on distance, gravitational constant, and the product of their masses.
- The strength of the gravitational force depends on distance and mass.
- Gravitational force is that which attracts any 2 objects with mass.

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