RRC Group D Previous Year Paper 33 (Held On: 3 Oct 2018 Shift 2)

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

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CBT

Q1. The CEAT International Cricketer of the Year Award 2017 was presented to:

(a) Ravindra Jadeja
(b) Chetweshwar Pujara
(c) Irfan Pathan
(d) Ravichandran Ashwin

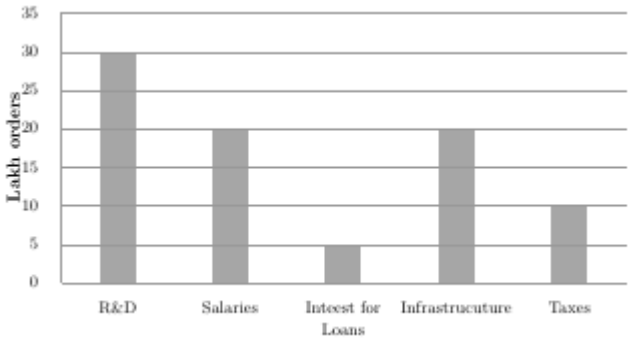
Q2. The Square Root of 7569 is:

(a) 87
(b) 93
(c) 83
(d) 77

Q3. An element has electronic configuration 2,8,6. It belongs to _____.

(a) 6 group and 2 period
(b) 16 group and 3 period
(c) 1 group and 1 period
(d) 2 group and 2 period

Q4. The graph below shows the expenditure of a public sector company ‘ABC’ under different heads for the financial year 2015-16



How much did company ABC spend on infrastructure in 2015-2016?

(a) 20 lakh crores
(b) 30 lakh crores
(c) 25 lakh crores
(d) 5 lakh crores

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Q5. How is Madhuri's brother's only sister's father's father related to her?

(a) Brother
(b) Uncle
(c) Father
(d) Paternal Grandfather

Q6. A 5 Ω resistance wire is doubled on it. Calculate the new resistance of the wire.

(a) 1.25 Ω
(b) 2.25 Ω
(c) 1.5 Ω
(d) 1.00 Ω

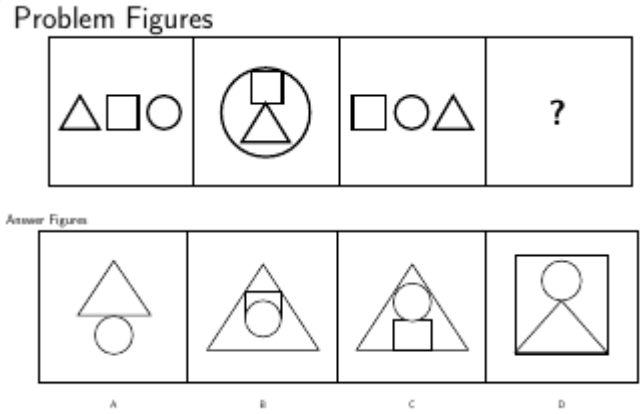
Q7. What is the answer of 1/6 + 1/12 + 1/20 + 1/30 + 1/42 + 1/56?

(a) 11/24
(b) 3/8
(c) 7/16
(d) 13/28

Q8. Choose the option that is NOT true about vascular system

(a) Blood is only white vascular connective tissue
(b) The vascular system forms about 7-8% of the body weight
(c) There is about 6.8 litres of blood in an adult person
(d) Life span of human RBCs is 115-120 days.

Q9. Pick the figure that will complete the given series.



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

Q10. In November 2017, _____ was India's nominee for the fifth and last seat in the International Court of Justice. S/he was re-elected after Britain withdraw its candidate from the election

(a) Dalveer Bhandari
(b) Ronny Abraham
(c) Neeru Chadha
(d) Debasish Bhaduri

Q11. Tooth decay starts when the pH of the mouth is _____.

(a) more than 5.5
(b) less than 5.5
(c) less than 4.5
(d) more than 4.5

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Q12. ISRO's first sun mission, which is going to take off in 2019, is named as:

(a) Surya L1
(b) Ravi L1
(c) Suraj L1
(d) Aditya L1

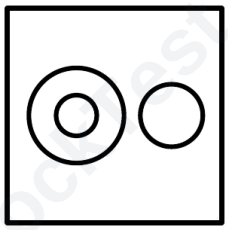
Q13. The ratio of the average ages of three people and the other two in a group of five people is 9 : 7. If the difference of their averages is 12, then find out the average age of all 5 people?

(a) 64.8
(b) 46.8
(c) 49.2
(d) 48.4

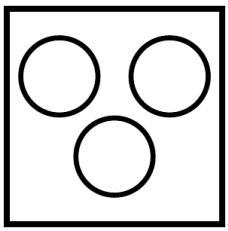
Q14. Choose the best suitable Venn diagram for the following words:

"Bus, Engine, Piston"

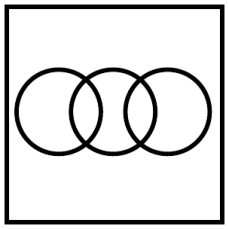
(a)



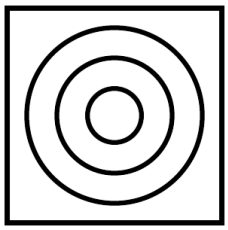
(b)



(c)



(d)



Q15. In the Modern Periodic Table, which period contains 32 elements?

(a) Period 6
(b) Period 3
(c) Period 4
(d) Period 5

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Q16. 6 6 8 5 5 3 7 3 7 2 5 8 8 7 8 1 5 5 3

How many 5 are there in the above sequence that is completely divisible by the number on their left but not divisible by the number on their right?

(a) 2
(b) 3
(c) 0
(d) 1

Q17. Which of the following objects would possess potential energy?

(a) Raised Hammer
(b) Blowing wind
(c) A rolling stone
(d) Moving bullet

Q18. Which of the following regions is the original habitat of the 'Toda Tribe'?

(a) Kumaun Hills
(b) Nilgiri Hills
(c) Khasi Hills
(d) Gharwal Hills

Q19. You are given a question and three statements. Identify which of the statements is/ are necessary sufficient to answer the question:

Question:

In which year was Arti born?

Statements:

I. Aarti is six year older than Pranavi

II. Pranavi's sister was born in 1982

III. Aarti's sister is two years younger than Pranavi's sister, who is eight years younger than Pranavi.

(a) Only II and III are sufficient
(b) Only I and III are sufficient
(c) All I, II and III are necessary
(d) Only I is sufficient

Q20. Which of the following cities is situated on river bank of Sabarmati?

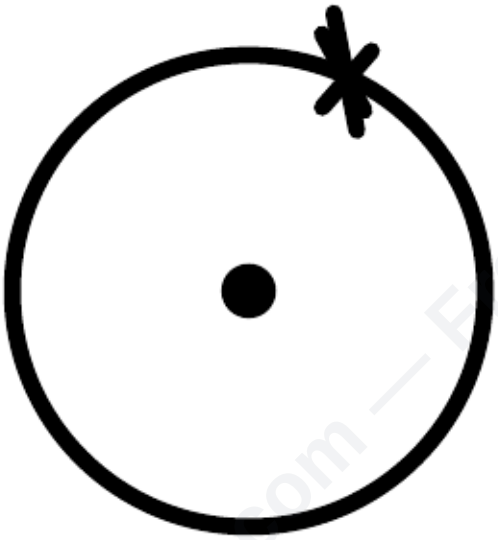
(a) Surat
(b) Bhavnagar
(c) Vadodara
(d) Ahmedabad

Q21. If G is the G.M. of the product of r sets of observations. With geometric means G1, G2, G3, ……., G_r respectively, then find the value of G?

(a) logG1 + logG2 + … logG_r
(b) G1. G2 …… G_r
(c) G1 + G2 + ….. + G_r
(d) logG1. logG2 ….. logG_r

Q22. The given symbol represents _____ element.

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(a) Gold
(b) Hydrogen
(c) Mercury
(d) Carbon

Q23. Name the author of the book 'One Indian Girl'.
(a) Chetan Bhagat
(b) Ashwin Sanghi
(c) Brad Stone
(d) Mark Tully

Q24. The recipients of the Whitley Awards, also called the Green Oscar Awards, are:
(a) S Bhoopaty and Parul Sarkar
(b) P Sanjeevani and Arunima Agarwal
(c) Sanjay Gubbi and Purnima Burman
(d) Manik Rao and Naresh Mehta

Q25. In the Modern Periodic Table, which group has a completely filled valence shell and chemically inactive elements?
(a) 16
(b) 18
(c) 15
(d) 17

Q26. The speed of a boat in still water is 12 km/h. If the boat covers a distance of 38 km upstream in 4 hours, then the speed of the stream (in km/h) is:
(a) 6.5
(b) 3.17
(c) 2.5
(d) 3

Q27. When light travels from a rarer medium to a denser medium, it _____.
(a) speed remains the same
(b) speeds down then up
(c) speeds down
(d) speeds up

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Q28. Which of the following sports is Gurmeet Singh associated with?

(a) Race walk
(b) Kabaddi
(c) Shooting
(d) Wrestling

Q29. Solve the following equation to find x:

$(x - 2)^2 - 36 = 0; x \in N$

(a) 4
(b) -4
(c) -8
(d) 8

Q30. What type of tissue are our bones?

(a) Parenchyma
(b) Permanent tissue
(c) Epidermic
(d) Connective

Q31. There are three groups G_(-1), G2 and G3 in a College with 20, 40 and 60 students respectively. The average marks obtained by groups G1, G2 and G3 are 50%, 60% and 70% respectively. Find the average marks (approx) of the entire college.

(a) 60%
(b) 63%
(c) 62%
(d) 61%

Q32. For which of the following elements, the symbol consists of only one letter?

(a) Calcium
(b) Chlorine
(c) Carbon
(d) Copper

Q33. Chandra Gupta II extended the Gupta Kingdom to Gujarat in _____ AD

(a) 390
(b) 309
(c) 903
(d) 930

Q34. Mahabaleshwar Sail received 2016 Saraswati Samman for _____ Literature.

(a) Marathi
(b) Tulu
(c) Odia
(d) Konkani

Q35. Find the three prime numbers such that product of the first two is 1147 and the product of the last two numbers is 1517?

(a) 21, 47, 61
(b) 31, 37, 61
(c) 21, 37, 41
(d) 31, 37, 41

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Q36. Select the option that is related to the third word on the same basis as the second word is related to the first word.

Instrument : Play ? Bell : ?

(a) Ring
(b) Sound
(c) Shape
(d) Metal

Q37. Read the given statements and conclusions carefully and select which of the conclusions logically follow(s) from the statements.

Statements:

1. All buses are cars.

2. All ships are cars

Conclusions:

I. All cars are ships

II. Some buses are cars

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

Q38. What is the value of one-fourth of G?

If G = (96 ÷ 12) + 14 × (12 + 8) ÷ 2

(a) 38
(b) 36
(c) 148
(d) 37

Q39. An object of mass 12 kg is at a certain height above the ground. If the potential energy of the object is 480 J, find the height at which the object is with respect to the ground. Given, g = 10 ms^(-2).

(a) 5 m
(b) 8 m
(c) 4 m
(d) 6 m

Q40. In the Fibonacci series each number is defined as F_n = F_(n - 1) + F_(n - 2). If the first two numbers in the sequence are 0 and 1 i.e. F0 = 0 and F1 = 1, then find out the 10^(th) number in the sequence?

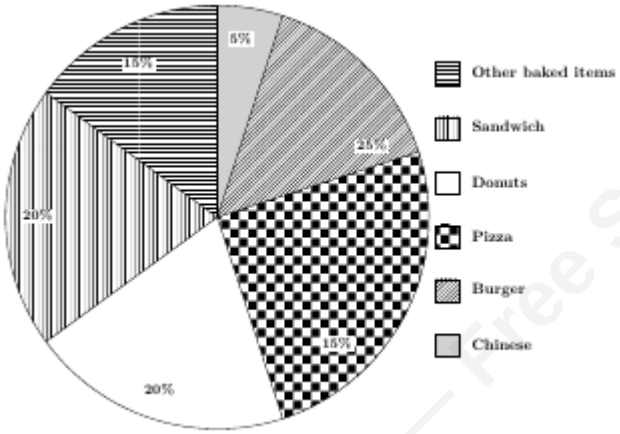
(a) 22
(b) 55
(c) 34
(d) 57

Q41. 1 kWh = ?

(a) 360000 J
(b) 3600 J
(c) 36000 J
(d) 3600000 J

Q42. The following pie diagram show information the sales of different type of food items by restaurant “XYZ”

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The total revenue made by the restaurant in NOV 2017 was 35 lakhs.

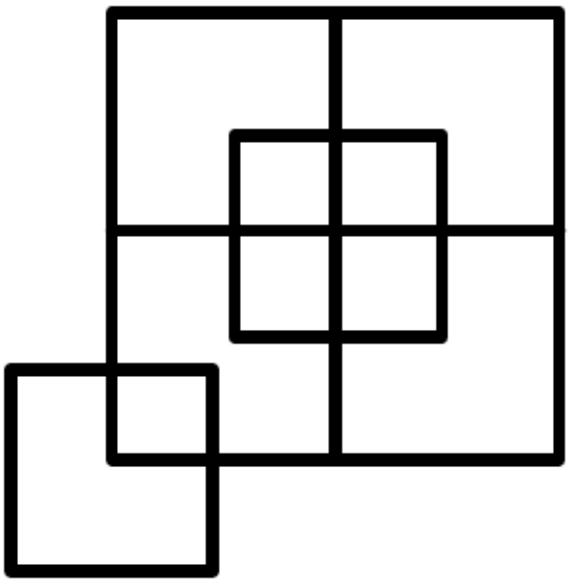
How much revenue was made by the restaurant " XYZ through the sales of Chinese food items?

(a) 1.5 Lakhs
(b) 2 Lakhs
(c) 0.5 Lakhs
(d) 1.75 Lakhs

Q43. The SI unit of 'g' is same as that of acceleration, that is ____.

(a) ms^{1}
(b) ms^(-2)
(c) ms^{2}
(d) ms^(-1)

Q44. Find the number of squares in the given picture.



(a) 8
(b) 6
(c) 10
(d) 12

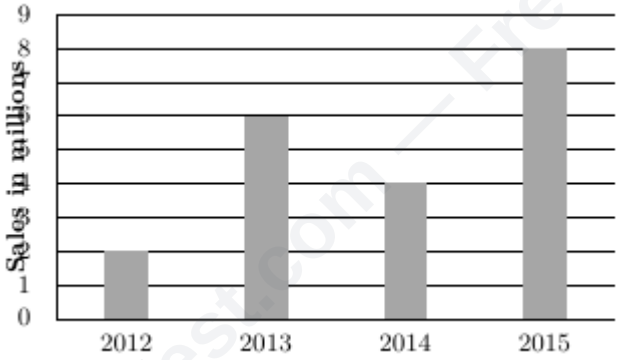
Q45. Who has played the lead role in the movie 'Newton' released in 2017?

(a) Salman Khan
(b) Aamir Khan
(c) Shahrukh Khan
(d) Raj Kumar Rao

Q46. I walk a certain distance and ride back, taking 13/2 hours in total. I could walk both ways in a total of 31/4 hours. How long will it take me to ride both ways?

(a) 6 h 15 min
(b) 5 h 55 min
(c) 4 h 15 min
(d) 5 h 15 min

Q47. The given bar graph shows the sales revenue of steel company 'ABC' for the past four years.



What was the total sales revenue in 2015 (in million $)?

(a) 2
(b) 4
(c) 8
(d) 6

Q48. Kiran swims in a 90 m long pool. He covers 360 m in two minutes by swimming from one end to the other and back along the same straight path. Twice. Find the average velocity of Kiran.

(a) 4 ms^(-1)
(b) 5 ms^(-1)
(c) 3 ms^(-1)
(d) 0 ms^(-1)

Q49. In a code language, BEE is written as YVV. What is the code for ANT?

(a) ZMG
(b) ZMH
(c) ZUG
(d) ZPG

Q50. What does a light year measure?

(a) Velocity
(b) Distance
(c) Energy
(d) Power

Q51. _____ connects bones to other bones..

(a) Ligament
(b) Areolar
(c) Tendon
(d) Cartilage

Q52. A solution contains 31 g of common salt in 320 g of water. Calculate the concentration in terms of mass by mass percentage of the solution.

(a) 9.60%
(b) 8.83%
(c) 9.09%

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(d) 9.80%

Q53. _____ was conceived on the principle of 'one nation, one tax and one market'.

(a) ATM cards
(b) The Goods and Service Tax
(c) Demonetization
(d) Salaries of defence personals

Q54. Which of the following is NOT based on Archimedes' principle?

(a) Lactometers
(b) Hydrometers
(c) Odometers
(d) Submarines

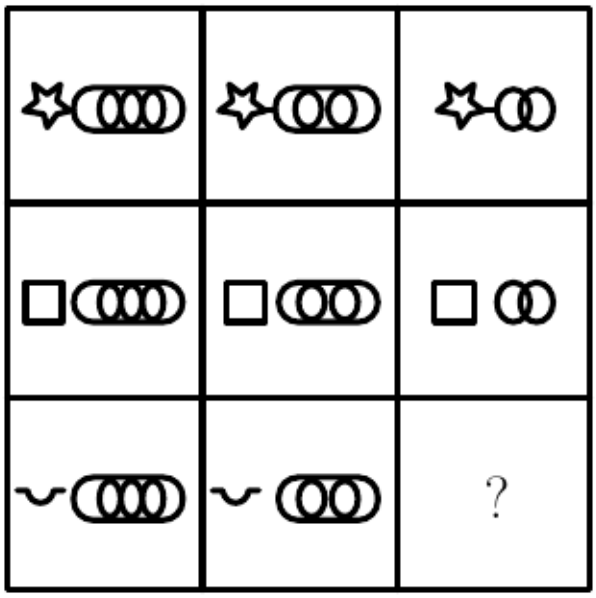
Q55. Part IV of the Indian Constitution deals with _____.

(a) Directive Principles of State Policy
(b) Human Rights
(c) The Union Judiciary
(d) Parliament

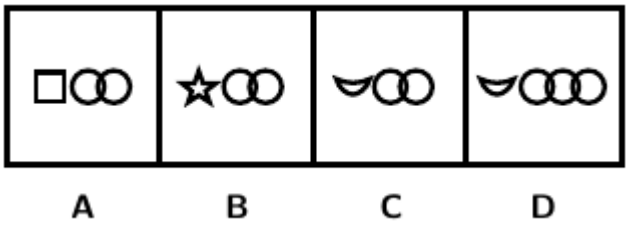
Q56. If $7^2 = 49$; $67^2 = 4489$; then 667^2 = _____

(a) 448844
(b) 444088
(c) 444888
(d) 444889

Q57.



Choose the correct picture that fit the blank place



(a) D
(b) B

(c) A
(d) C

Q58. Read the given statement(s) and conclusions carefully and select which of the conclusions logically follow(s) from the statements(s):

Statement:

"Don't park the vehicle here. Don't you see the no parking sign here?" says Rannu to Sharmu.

Conclusions:

I. Rannu understands the meaning of no parking sign.

II. Sharmu does not follow the road rules.

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

Q59. Who among the following was awarded the Rajiv Gandhi Khel Ratna award for Hockey in 2017?

(a) Sandeep Singh
(b) Birendra Lakra
(c) PR Sreejesh
(d) Sardar Singh

Q60. Which Indian actor has most followers on Twitter?

(a) Amitabh Bachchan
(b) Sushant Singh Rajput
(c) Priyanka Chopra
(d) Shah Rukh Khan

Q61. The value of two angles of a quadrilateral is 65° each. The other two angles are also equal. Find out the value of these angles.

(a) 125°
(b) 115°
(c) 105°
(d) 100°

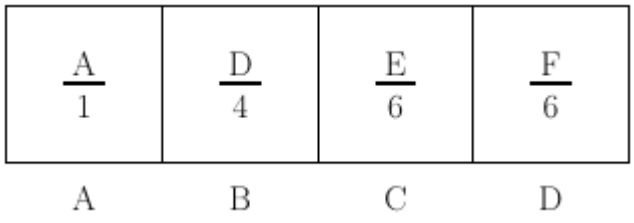
Q62. The sum of ages of 6 Persons A, B, C, D, E and F in a company born at the intervals of 5 years each is 105 years. What is the age of the oldest person?

(a) 25 years
(b) 15 years
(c) 30 years
(d) 20 years

Q63. The time duration that would elapse between 12:37 p.m. of 11th April 2019 and 12:29 p.m. of 12^(th) April 2020 is

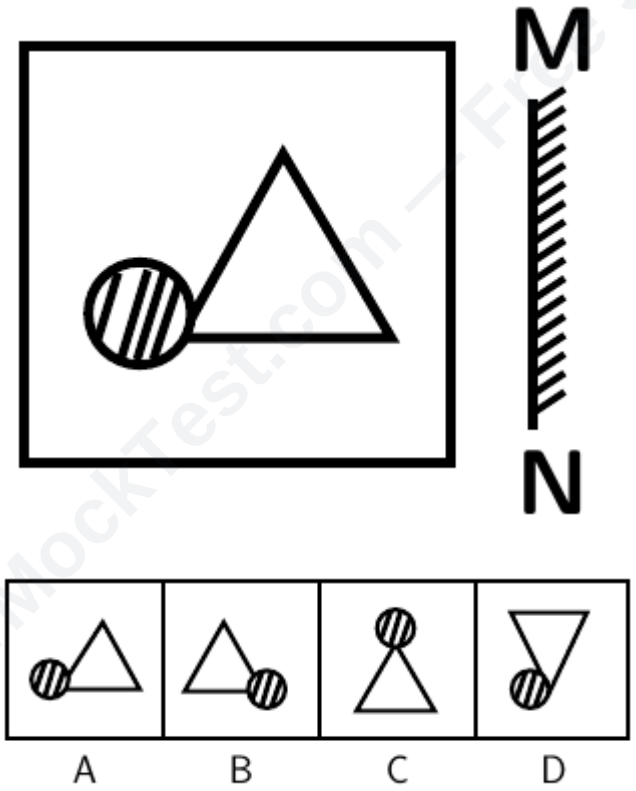
(a) 366 days 23 hours 52 mins
(b) 367 days 8 mins
(c) 365 days 23 hours 52 mins
(d) 366 days 8 mins

Q64. Find the Odd one out:



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

Q65. Find the mirror image of the given figure if the mirror is placed at line MN.



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

Q66. Find the next number in the given series.

8, 14, 23, ?, 50

(a) 35
(b) 34
(c) 38
(d) 40

Q67.



The given symbol represents _____ electrical component.

(a) Rheostat
(b) Electric bulb
(c) Ammeter
(d) Resistor

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Q68. The formula to determine the height of the rocket above the ground at any time during the rocket's flight is given by: h = 119*t - 7t²* where t = the time, in seconds, that has elapsed since the rocket was launched, and h = the height, in meters, of the rocket above the ground at time t.

The value of h was 0 when the rocket hit the ground. How many seconds after the rocket was launched did it hit the ground?

(a) 17
(b) 10
(c) 7
(d) 0

Q69. Which one of the following is highly exothermic?

(a) Dissolving copper sulphate in water
(b) Dissolving bleaching powder in water
(c) Dissolving washing soda in water
(d) Dissolving sulphuric acid in water

Q70. £1475 was invested for 5 years @ 4% simple interest per annum. The interest accrued would be £ ____

(a) 295
(b) 442.5
(c) 590
(d) 147.5

Q71. Who among the following is the current Speaker of the Lok Sabha? (As of 2018)

(a) Ghulam Nabi Azad
(b) Anoop Mishra
(c) PJ Kurien
(d) Sumitra Mahajan

Q72. Daulat Khan sent messengers to Babur in Kabul, offering his allegiance in exchange for assistance against the emperor

(a) Bahlul Lodi
(b) Ibrahim Lodi
(c) Ghazi Khan Lodi
(d) Sikandar Lodi

Q73. Reema bought a car for Rs 75,000 and spent Rs. 10,000 on its repairs. She sold this car to Chiru at a profit of 15% Chiru who sold it to Ritu at a profit of 10%. What did Ritu pay for the car?

(a) Rs. 1,02,575
(b) Rs. 1,02,252
(c) Rs. 1,07,525
(d) Rs. 1,05,752

Q74. Government of India declared August 15, 2017 to be celebrated as:

(a) Sankalp Dhara
(b) Sambhavana Diwas
(c) Sankalp Parva
(d) Sankalp Diwas

Q75. Pointing to a photograph of a person Ramesh said, "This person is the son of the only child of my mother." Then how is Ramesh related to that person?

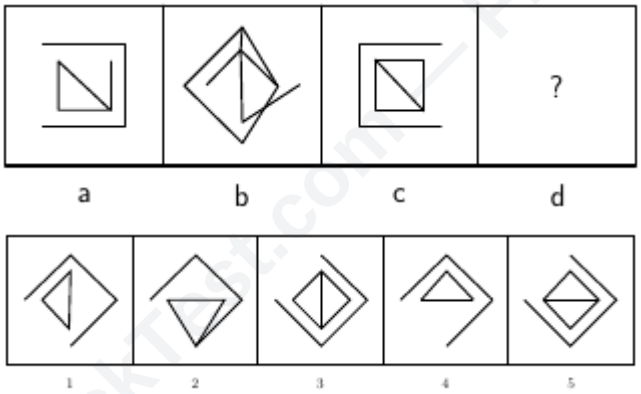
(a) Uncle
(b) Grand Father
(c) Father
(d) Brother

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Q76. A tank has three pipes. The first one fills up the tank in 30 min and the second one can fill it up in 45 min. The third one drains out the tank. With all the pipes open it takes 27 min to fill up the tank. Find out how long it takes the third pipe alone to empty a full tank?

(a) 56 min
(b) 50 min
(c) 52 min
(d) 54 min

Q77. Son and father both identified that Figure a and b are related in a particular way or manner. Establish the same relationship between c and d choosing from five alternatives.



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

Q78. A train leaves from a station and moves at 40 km/hr. After 2 hours, another train leaves from the same station and moves in the same direction at a certain speed.If the second train catches up with the first train in 4 hours, what is the speed of the second train?

(a) 55 km/hr
(b) 50 km/hr
(c) 60 km/hr
(d) 65 km/hr

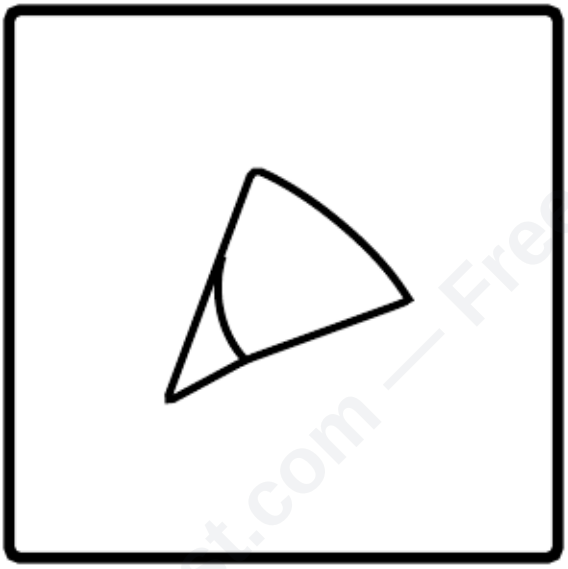
Q79. Which of the following pairs have the same SI units?

(a) Force and pressure
(b) Force and distance
(c) Work and energy
(d) Momentum and force

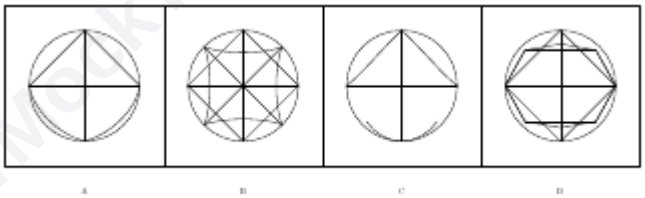
Q80. Which film was given Best Feature Film Award at the 64^(th)National Awards in 2017?

(a) Kaasav
(b) Dangal
(c) Rustom
(d) Sultan

Q81.



The above figure is embedded in one of these four figures. Identify that figure.



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

Q82. Which two alpha-numeric sets will follow in the given series?

N – 14, P – 16, R – 18, T – 20, ?, ?

(a) X – 24, P – 16
(b) L – 12, O – 15
(c) V – 22, Z – 26
(d) V – 22, X – 24

Q83. Sham's marks are 25% more than that of Divya's. By what percent is Divya's marks less than that of Sham's?

(a) 10%
(b) 40%
(c) 20%
(d) 15%

Q84. Which of the following numbers is divisible by 9?

(a) 58556
(b) 56112
(c) 49653
(d) 89445

Q85. A statement is followed by two arguments. Decided which of the arguments is/are strong with respect to the statement.

Statement:

Should taxes on perfume be further increased?

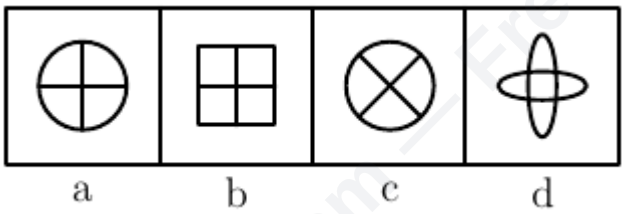
Argument:

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1. Yes, perfume is a luxury item used by rich people only.
2. No, Perfume is used by poor people also.

(a) Neither argument 1 and 2 is strong
(b) Either argument 1 or 2 is strong
(c) Only argument 1 is strong
(d) Only argument 2 is strong

Q86. Find the ODD one:



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

Q87. Consider the given statement(s) and decide which of the given assumption(s) is/are implicit in the statement.

Statement:

Crying children seek more attention from parents.

Assumptions:

I. They are unable to communicate properly.

II. The parents are engrossed in their work and leave the children to play by themselves.

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

Q88. Select the term that relates to the third term in the same way that the second term relates to the first term.

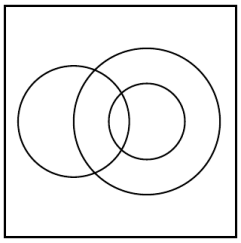
Ammeter : Current ? Ohmmeter : ?

(a) Pressure
(b) Resistance
(c) Speed
(d) Voltage

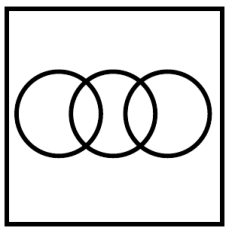
Q89. Which of the following Venn diagrams indicates the best relation between:

English, Chinese, French

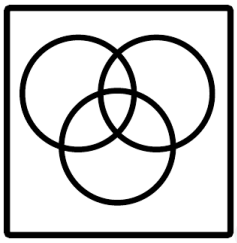
(a)



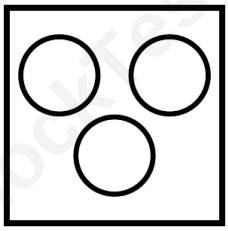
(b)



(c)



(d)



Q90. Find the next letter in the given series.

MD, NE, OF, PG, ?

(a) HV
(b) QK
(c) CE
(d) QH

Q91. During which of the following types of reproduction do the fully matured tiny individuals detach from the parent body and become new independent individuals?

(a) Fission
(b) Regeneration
(c) Budding
(d) Multiple fission

Q92. If Rajan is facing East and then turns 270° clockwise and then 90° anti-clockwise, in which direction is he facing now?

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

Q93. Hydra, starfish, planaria undergo:

(a) sporulation
(b) regeneration
(c) Budding
(d) fragmentation

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Q94. If 25, 35 and p are in continued proportion, then the value of p is _____.

(a) 60
(b) 75
(c) 49
(d) 50

Q95. The LCM of two natural numbers is 432. Which of the following can be their HCF?

(a) 12
(b) 34
(c) 26
(d) 32

Q96. Mr. A starts a business with an investment of Rs. 28,000. Mr. B joins the business after 5 months. After 2 more months Mr. C joins. If the ratio of their profit after one year is 4 : 2 : 3, then find out the investments made by Mr. B and Mr. C in rupees?

(a) Rs. 20,000, Rs. 30,000
(b) Rs. 50,000, Rs. 20,000
(c) Rs. 12,000, Rs. 25,200
(d) Rs. 24000, Rs. 50,400

Q97. The bonds formed by the elements having larger atoms are:

(a) weaker
(b) stronger
(c) very weak
(d) very strong

Q98. Which of the following arguments is strong?

Statement:

Indian professionals working abroad should be called back to India.

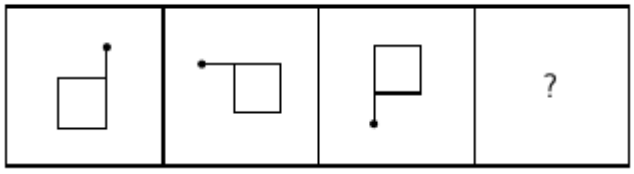
Argument:

1. Yes, one must serve their motherland first and forget about earnings.
2. No, India has enough talented professionals.

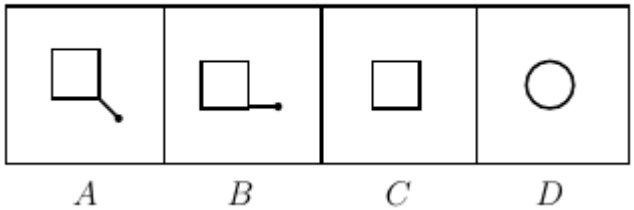
(a) Only argument 2 is strong
(b) Neither 1 nor 2 is strong
(c) Only argument 1 is strong
(d) Both 1 and 2 are strong

Q99. Pick the figure that will complete the given series.

Problem Figures



Answer Figures



(a) C
(b) A

(c) B
(d) D

Q100. Which of the following is/are true/false about the speed of sound in different media at 25^oC?

A. In oxygen gas, the speed of sound is 316 m/s

B. In water (distilled), the speed of sound is 1498 m/s

(a) Only A is true
(b) Only B is true
(c) Neither A nor B is true
(d) Both A and B are true

ANSWER KEY

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

SOLUTIONS

Q1. Answer: (d) Ravichandran Ashwin

The correct answer is option 4 i.e. Ravichandran Ashwin.

• The CEAT Cricket Rating is the first rating system to reward players for the outstanding performance in the cricket on an annual basis from 1995.

• CEAT rating system includes the player's performance in Test Cricket and One Day Internationals format over a period of 12 months from 1 May to 30 April.

• The CEAT Cricket Rating Awards 2019 -

• The Batsman of the year - Virat Kohli

• The Bowler of the Year - Jaspreet Bumrah

• The Test Player of the Year - Cheteshwar Pujara

• | Year | Winners of the CEAT Cricket Rating |

2016-17	**Ravichandran Ashwin**
2018-19	Virat Kohli
2019-20	Rohit Sharma

Q2. Answer: (a) 87

Solution:

Square of 87 = 7569

Square of 93 = 8649

Square of 83 = 6889

Square of 77 = 5929

Hence √7569 = 87

Q3. Answer: (b) 16 group and 3 period

The correct answer is option 2 i.e. 16 group and 3 period

• Sulfur (16S) has a total of 16 electrons (2+8+6=16), and the atomic number of Sulfur is "16".

• Sulfur is placed in the periodic table in place of 16 groups and 3 periods.

• The chemical elements are ordered by the atomic number in the periodic table.

• "Chalcogen" is the Group name of periodic table 16 and classification is "Non-metallic".

Q4. Answer: (a) 20 lakh crores

Given,

The above graph shows the expenditure of a public sector company ‘ABC’ under different heads for the financial year 2015-16.

Calculation:

The company ABC spend on infrastructure in 2015-2016 = 20 lakh crores.

Q5. Answer: (d) Paternal Grandfather

Drawing the family tree,

Madhuri’s brother’s only sister’s father’s father is her paternal grandfather.

Hence, “paternal grandfather” is the correct answer.

Q6. Answer: (a) 1.25 Ω

CONCEPT:

• Resistance (R): The resistance offered to the flow of current is known as the resistance.

• SI unit of resistance is the ohm (Ω).

• Mathematically resistance can be written as

=> R = (ρ l)/A

Where R = resistance, l = length, A = area of cross-section and ρ = resistivity

EXPLANATION:

• That wire is doubled on it means to fold the length of wire. That is its length will get half and the area of the cross-section will get doubled.

Given: R1 = R = 5 Ω

As we know that the resistance of the wire is,

=> R = (ρ l)/A

When the wire is doubled then, then its area will increase automatically. But the volume of the wire will be the same.

Therefore The volume of original wire = volume of new wire

=> A1l1 = A2l2

=> A1l1 = A2 l1/2

=> A2 = 2A1

• The resistance of the wire in 1st case

=> R1 = R = (ρ l1)/A1 ----(1)

• The resistance of the wire in 2nd case

=> R2 = (ρ l2)/A2 = (ρ l1/2)/2A1 = (ρ l1)/4A1 -----(2)

Divide equation 1 and 2, we get

=> R/R2 = ((ρ l1)/A1)/((ρ l1)/4A1) = 4

=> R2 = 5/4 Ω = 1.25 Ω

Q7. Answer: (b) 3/8

Concept:

To find the sum, we need to find the LCM of all the values in denominator. This will make denominator the same of each fraction, then, we can add all the values in the numerator very easily.

LCM = Least common multiple (the least value which is divisible by all the values considered)

Example: 2, 3, 4

LCM = 12 (Least value exactly divisible by 2, 3, and 4)

Important Point: We can also consider any multiple of LCM to ease the fractions as done in the solution. But remember, that multiple value will not be the LCM.

Calculation:

1/6 + 1/12 + 1/20 + 1/30 + 1/42 + 1/56
=> (420 + 210 + 126 + 84 + 60 + 45)/2520
=> 945/2520
Divide numerator and denominator by 315, we get
=> 3/8

Q8. Answer: (a) Blood is only white vascular connective tissue

Option 1 is NOT correct.
• Blood is known as a connective tissue due to it has a matrix.
• The red blood cells called erythrocytes, and white blood cells called leukocytes.
• The vascular system, comprising arteries, capillaries, and veins, and these are supplies oxygen and nutrients to all organs.
• An adult contains blood for approximately 7% (5 to 6 lit) of their total body weight.
• The life span of human RBC and WBC are respectively 115-120 and 3-5 days.

Q9. Answer: (b) C

The pattern followed is,
There are three geometrical figures given in the figures above.
In the first figure three are present straight in a row.
In the second figure square and triangle are immersed inside the circle, which is the last image in the first figure.
In the third figure, three are again straight in a row.
And,
In the fourth figure, circle and square should be immersed in a triangle, which is the last image in the third figure.
The figure which will come next in the series is,
Hence, option 2 is the correct answer.

Q10. Answer: (a) Dalveer Bhandari

The correct answer is option 1 i.e. Dalveer Bhandari.
• Judge Dalveer Bhandari won with an overwhelming majority in the United Nations General Assembly for the International Court of Justice.
• The International Court of Justice (ICJ) has a panel of 15 judges.
• They are elected by the General Assembly and Security Council for the tenure of nine-year.
• The court is situated in the Hague, Netherlands.
• The International Court of Justice was established by the League of Nations in June 1945.

Q11. Answer: (b) less than 5.5

The correct answer is option 2 i.e. less than 5.5.
• When the pH value in the mouth falls below 5.5 then the tooth decay starts.
• It is happened due to the bacteria present in the mouth.
• The Bacteria produce the acid by the degradation of sugar and food particles, which remain in the mouth after eating.
• Acid affects the enamel of teeth and gradually tooth decays.

Q12. Answer: (d) Aditya L1

The correct answer is option 4 i.e. Aditya L1.
• The Aditya L-1 Mission is expected to begin in the year 2020.
• It will closely observe the Sun and study its atmosphere and magnetic field.
• ISRO has classified the Aditya L-1 as a 400 kg-class.
• It will be launched from Polar Satellite Launch Vehicle-XL (PSLV-XL).

Q13. Answer: (c) 49.2

Shortcut Trick
Ratio of average ages = 9 : 7. Difference in ratio units = 9 − 7 = 2 units.
Given difference = 12 years => 2 units = 12 → 1 unit = 6 years.
Average of 3 = 9 × 6 = 54; Average of 2 = 7 × 6 = 42.
Combined Average = [(3 × 54) + (2 × 42)] ÷ 5 = (162 + 84) ÷ 5 = 246 ÷ 5 = 49.2 years.

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Therefore The correct answer is 49.2 years.

Alternate Method

Given: Ratio of averages = 9 : 7, Difference = 12.

Formula Used: Combined Average = (n1a1 + n2a2) ÷ (n1 + n2)

=> Let averages be 9x and 7x.

=> 9x − 7x = 12 => 2x = 12 => x = 6.

=> Average of 3 people (a1) = 9 × 6 = 54.

=> Average of 2 people (a2) = 7 × 6 = 42.

=> Total sum of ages = (3 × 54) + (2 × 42) = 162 + 84 = 246.

=> Average of all 5 people = 246 ÷ 5 = 49.2.

Therefore The correct answer is 49.2 years.

Additional Information

Weighted Average Formula

When groups have different sizes, the combined average is calculated as A_(avg) = (n1A1 + n2A2 + ...) ÷ (n1 + n2 + ...).

Ratio and Average Relation

If the averages are in ratio a : b, the individual values are ax and bx where x is the common multiplier found using the given difference or sum.

Q14. Answer: (d) [figure]

Bus has an engine and piston is inside an engine.

The correct Venn diagram is,

Hence, option 4 is the correct answer.

Q15. Answer: (a) Period 6

The correct answer is option 1 i.e. Period 6

• There are a total of 7 periods in the periodic table.

• The first period contains 2 elements, Hydrogen, and Helium.

• The sixth period of periodic table contains 32 elements.

• It is beginning with cesium and ending with radon.

• Lead (Pb) is currently the last stable element whereas all subsequent elements are radioactive.

• It is tied with Period 7 which also has 32 elements.

Q16. Answer: (a) 2

According to the given series,

6 6 8 5 5 3 7 3 7 2 5 8 8 7 8 1 5 5 3

There are two 5's in the above sequence that are completely divisible by the number on their left but not divisible by the number on their right.

Hence, "option 1" is the correct answer.

Q17. Answer: (a) Raised Hammer

The correct answer is option 1 i.e. Raised Hammer.

• In a resting state, potential energy is present in an object.

• Example - Water-filled in a drum, oil filled in a bottle, Wood, and potential energy is present in a book on a table.

• Raised Hammer has potential energy in it.

• Due to motion in an object is called kinetic energy of that object.

• Example - In flowing water, the arrow released from the bow, the ball was thrown by the children has kinetic energy.

• It is measured using the unit Joule (J).

Q18. Answer: (b) Nilgiri Hills

The correct answer is Nilgiri Hills.

• "Toda" people are a Dravidian tribes group who live in the Nilgiri Mountains of Tamil Nadu.

• Their huts stand on wooden structures and the roofs are semi-cylindrical and springy.

• Toda people do traditional milk business and trade in Baru and bamboo items.

• Kumaon hills situated in Uttarakhand state and it is called the 'Lake District' of India.

• Khasi Hills located in the Meghalaya state.

Q19. Answer: (c) All I, II and III are necessary

According to the given statements,

Statement 1: Arti is six years older than Pranavi.

Statement 2: Pranavi's sister was born in 1982

Statement 3: Arti's sister is two years younger than Pranavi's sister, who is eight years younger than Pranavi

Form statement 3, we can say that Arti's sister was born in 1984 and Pranavi was born in 1974(from statement 2 Pranavi's sister is 8 years younger than Pranavi)

From statement 1, Arti is six years older than Pranavi, so Arti was born in 1968

Hence, all the statements are required.

Q20. Answer: (d) Ahmedabad

The correct answer is option 4 i.e. Ahmedabad.

• The Sabarmati river is the major west-flowing rivers in India.

• It originates in the Aravalli Range of Rajasthan and falls the Gulf of Khambhat of the Arabian Sea.

• Sabarmati is known as one of the most polluted rivers in India.

• | City | River |

Ahmedabad	Sabarmati river
Vadodara	Vishwamitri
Surat	Tapi river

Q21. Answer: (b) G1. G2 …… G_r

Shortcut Trick

The Geometric Mean (G.M.) of the product of corresponding observations in different sets is equal to the product of their individual geometric means.

If sets have G.M.s G1, G2, ..., G_r, then G = G1 × G2 × ... × G_r.

Therefore The correct answer is G1. G2 …… G_r.

Alternate Method

Given: r sets of observations with geometric means G1, G2, ..., G_r.

Formula Used: log G = (1/n) Σ log x_i

=> Let the observations of set 1 be x1, x2, ..., x_n. Then G1 = (x1 × x2 × ... × x_n)^(1/n).

=> Let the observations of set 2 be y1, y2, ..., y_n. Then G2 = (y1 × y2 × ... × y_n)^(1/n).

=> The product set observations are (x1y1...z1), (x2y2...z2), ..., (x_ny_n...z_n).

=> G = [(x1y1...z1) × (x2y2...z2) × ... × (x_ny_n...z_n)]^(1/n)

=> G = [(x1x2...x_n) × (y1y2...y_n) × ... × (z1z2...z_n)]^(1/n)

=> G = (x1x2...x_n)^(1/n) × (y1y2...y_n)^(1/n) × ... × (z1z2...z_n)^(1/n)

=> G = G1 × G2 × ... × G_r

Therefore The correct answer is G1. G2 …… G_r.

Additional Information

Logarithmic Property of G.M.

The logarithm of the geometric mean of a set of observations is the arithmetic mean of their logarithms: log G = (1/n) Σ log x_i.

Combined Geometric Mean

For two groups of sizes n1 and n2 with G.M.s G1 and G2, the combined G.M. (G) is given by: log G = (n1 log G1 + n2 log G2) / (n1 + n2).

Relationship with AM and HM

For any set of positive observations: AM ≥ GM ≥ HM. They are equal only if all observations are identical.

Q22. Answer: (b) Hydrogen

The correct answer is option 2 i.e. Hydrogen.

• Hydrogen is a chemical element and it is contained in the first periods of the periodic table.

• Hydrogen is represented by a symbol "H" and with the atomic number "1".

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• Hydrogen is colorless, odorless, nonmetallic, and tasteless.

• | Element | Symbol | Atomic Number |

Gold	**Au**	**79**
Mercury	Hg	80
Carbon	C	6

Q23. Answer: (a) Chetan Bhagat

The correct answer is option 1 i.e. Chetan Bhagat.

• The author of the book "One Indian Girl" is Chetan Bhagat.

• Chetan Prakash Bhagat is a famous Indian author, Bollywood screenwriter, and inspirational speaker.

• He was written many famous novels like - The Girl in Room 105 (2018), One Indian Girl (2016), Half Girlfriend (2014), etc.

• | Famous Book | Author |

The Heart of India	**Mark Tully**
The Everything Store: Jeff Bezos and the Age of Amazon	Brad Stone.
Keepers of the Kalachakra	Ashwin Sanghi

Q24. Answer: (c) Sanjay Gubbi and Purnima Burman

The correct answer is option 3 i.e. Sanjay Gubbi and Purnima Burman.

• The Whitley Awards is known as Green Oscars – It is a prestigious international award for the contribution to nature conservation.

• Each Award Winner receives a prize worth £40,000 in project funding for one year.

• The two Indian activists won the annual Whitley Awards, for their contribution in the field of animal and bird conservation in India.

• Purnima Barman (Assam) and Sanjay Gubbi (Karnataka) won the prestigious ‘Green Oscars’ Award.

• The Whitley Awards is established in 1994 by Edward Whitley.

Q25. Answer: (b) 18

The correct answer is option 2 i.e. 18.

• The noble gases (Group 18) are found on the right side of the periodic table.

• The noble gas-filled its valence shells and do not participate in any chemical reactions.

• Total 7 noble gases found in group 18 like Helium (He), (Neon) Ne, Argon (Ar), Krypton (Kr), etc.

• Neon (Ne) is most useful for its use of lighting and signs.

• Helium (He) is the second most abundant element in the cosmos.

Q26. Answer: (c) 2.5

Shortcut Trick

Upstream Speed (u) = Distance ÷ Time = 38 ÷ 4 = 9.5 km/h.

Speed of Stream (y) = Speed in Still Water (x) − Upstream Speed (u).

y = 12 − 9.5 = 2.5 km/h.

Therefore The correct answer is 2.5 km/h.

Alternate Method

Given:

Speed of boat in still water (x) = 12 km/h

Upstream distance = 38 km

Time taken = 4 hours

Formula Used:

Upstream Speed (u) = Speed in still water (x) − Speed of stream (y)

Speed = Distance ÷ Time

Calculations:

=> Upstream Speed = 38 ÷ 4

=> Upstream Speed = 9.5 km/h

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=> 9.5 = 12 − Speed of stream (y)

=> y = 12 − 9.5

=> y = 2.5 km/h

Therefore The correct answer is 2.5 km/h.

Additional Information

Downstream Speed

When the boat moves with the flow of the stream, Downstream Speed (v) = x + y.

Speed in Still Water

Calculated as the average of Downstream and Upstream speeds: x = (v + u) ÷ 2.

Speed of Stream

Calculated as half the difference between Downstream and Upstream speeds: y = (v − u) ÷ 2.

Q27. Answer: (c) speeds down

The correct answer is option 3 i.e. speeds down.

• When the light rays travel from rarer medium to denser medium then they bend towards normal.

• In this case angle of refraction is smaller than the angle of incidence.

• When the light rays travel from denser medium to rarer medium then they bend away from the normal.

• In this case, the angle of refraction is greater than the angle of incidence.

Q28. Answer: (a) Race walk

The correct answer is option 1 i.e Race walk.

• Gurmeet Singh won a gold medal 20 km race walk in a time of 1:20:29 in the Asian Games event 2016.

• His career turned around when he started to take training at Sports Authority of India, Bangalore center.

• Gurmeet Singh belongs to Uttarakhand, India.

Q29. Answer: (d) 8

Shortcut Trick

Given: $(x − 2)^2 − 36 = 0$

=> $(x − 2)^2 = 36$

Take square root on both sides: $x − 2 = ±6$

Case 1: $x − 2 = 6 \rightarrow x = 8$

Case 2: $x − 2 = −6 \rightarrow x = −4$

Since x in N (Natural Number), discard negative value.

Therefore The correct answer is 8.

Alternate Method

Given: $(x − 2)^2 − 36 = 0$ where x in N

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

=> $(x − 2)^2 − 6^2 = 0$

=> $[(x − 2) − 6][(x − 2) + 6] = 0$

=> $(x − 8)(x + 4) = 0$

=> $x − 8 = 0$ or $x + 4 = 0$

=> $x = 8$ or $x = −4$

=> Condition: x must belong to the set of natural numbers {1, 2, 3, ...}.

=> x = 8 is a natural number, while $x = −4$ is an integer but not a natural number.

Therefore The correct answer is 8.

Additional Information

Natural Numbers (N)

Natural numbers are the set of positive integers starting from 1 {1, 2, 3, 4, ...}. They do not include zero, negative numbers, or fractions.

Difference of Squares Identity

The identity $a^2 − b^2 = (a − b)(a + b)$ is a fundamental algebraic tool used to factorize quadratic expressions.

Quadratic Roots Property

A quadratic equation of the form $ax^2 + bx + c = 0$ will have at most two real roots. Always check if the roots satisfy the domain

constraints (like x in N or x in Z) given in the question.

Q30. Answer: (d) Connective

The correct answer is option 4 i.e. Connective.

• Bone tissue is a type of connective tissue.

• Bone tissue is made of different types of bone cells.

• Three types of cells in bone - Osteoblasts, Osteocytes, and Osteoclasts.

• Osteoblasts are responsible for making bone for growth and remodelling.

• There are 3 types of bone tissue

• Compact tissue - It is a hard (Outer part of bones).

• Cancellous tissue - It is sponge-like tissue (inside bones).

• Subchondral tissue - Cartilage

Q31. Answer: (b) 63%

Shortcut Trick

Ratio of students in G1 : G2 : G3 = 20 : 40 : 60 = 1 : 2 : 3

Weighted Average = [(Ratio1 × Avg1) + (Ratio2 × Avg2) + (Ratio3 × Avg3)] ÷ Total Ratio

Weighted Average = [(1 × 50) + (2 × 60) + (3 × 70)] ÷ (1 + 2 + 3)

Weighted Average = (50 + 120 + 210) ÷ 6 = 380 ÷ 6 ≈ 63.33%

Therefore The correct answer is 63%.

Alternate Method

Given:

Students in G1 = 20, Average = 50%

Students in G2 = 40, Average = 60%

Students in G3 = 60, Average = 70%

Formula Used:

Combined Average = (n1a1 + n2a2 + n3a3) ÷ (n1 + n2 + n3)

Calculations:

=> Total marks of G1 = 20 × 50 = 1000

=> Total marks of G2 = 40 × 60 = 2400

=> Total marks of G3 = 60 × 70 = 4200

=> Sum of marks of all students = 1000 + 2400 + 4200 = 7600

=> Total number of students = 20 + 40 + 60 = 120

=> Average marks of college = 7600 ÷ 120

=> Average marks = 760 ÷ 12 = 190 ÷ 3

=> Average marks = 63.333...

Therefore The correct answer is 63%.

Additional Information

Weighted Average Formula

The weighted average is calculated as $\sum(w_i \times x_i) \div \sum w_i$, where w represents weights (quantity) and x represents values (average).

Combined Average for Two Groups

If two groups have sizes n1, n2 and averages a1, a2, the combined average is (n1a1 + n2a2) ÷ (n1 + n2).

Deviation Method

Assume a base average (e.g., 60%) and calculate the net deviation. New Average = Assumed Average + (Net Deviation ÷ Total Students).

Q32. Answer: (c) Carbon

The correct answer is option 3 i.e. Carbon.

• The Carbon element consists of only one letter is "C" and its atomic number is 6.

• Carbon is related to group 14 of the periodic table.

• Carbon is the fourth most abundant element in the whole universe.

• It is the second most abundant element in human bodies, the first is Oxygen.

• Diamond and graphite are the two major allotropes the Carbon.
• Carbon is known as the "king of the elements".

Element	Symbol
Chlorine	Cl
Calcium	Ca
Copper	Cu

Q33. Answer: (a) 390

The correct answer is option 1 i.e. 390 AD.
• The scholars at his court were the astronomer Varahamihira and the Sanskrit poet and dramatist Kalidasa.
• Chandragupta II is known as Vikramaditya, a powerful emperor (380-415 AD) of northern India.
• He was the son of Samudra Gupta who established a vast empire.
• Chandragupta II subjugated (From 388 to 409 AD) Gujarat, the north of Bombay, Saurashtra, in western India, and Malwa.
• The famous astronomer Varahamihira and the Sanskrit poet and dramatist Kalidasa were lived in the court of Chandragupta II.

Q34. Answer: (d) Konkani

The correct answer is option 4 i.e. Konkani Literature.
Saraswati Samman is an annual award given Indian citizens for their outstanding literary work written.
• It was given in any 22 Indian languages mentioned in Schedule VIII.
• It was established in 1991 by the K. K. Birla Foundation.
• The first inaugural award was given to Harivanshrai 'Bachchan' for his four-volume autobiography.
• The famous Konkani writer Mahabaleshwar Sail was awarded on 31 August 2016 for his novel 'Hawthan'.

Year	Winner	Literature
2017	Sitanshu Yashaschandra	Vakhar (Gujarati)
2018	K Siva Reddy	Pakkaki Ottigilite (Telugu)
2019	Vasdev Mohi	Chequebook (Sindhi)

Q35. Answer: (d) 31, 37, 41

Shortcut Trick
Let the three prime numbers be A, B, and C.
Given: A × B = 1147 and B × C = 1517.
The common factor B is the HCF of 1147 and 1517.
HCF(1147, 1517) = 37. Thus, B = 37.
A = 1147 ÷ 37 = 31 and C = 1517 ÷ 37 = 41.
Therefore The correct answer is 31, 37, 41.
Alternate Method
Given: Product of first two numbers = 1147; Product of last two numbers = 1517.
=> Let the numbers be A, B, and C.
=> A × B = 1147
=> B × C = 1517
=> (A × B) ÷ (B × C) = 1147 ÷ 1517
=> A / C = 1147 / 1517
=> Divide both by their HCF (37): 1147 = 31 × 37 and 1517 = 37 × 41
=> A = 31, B = 37, C = 41
Therefore The correct answer is 31, 37, 41.
Additional Information
Prime Numbers
A prime number is a natural number greater than 1 that has no positive divisors other than 1 and itself.
HCF of Products

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If two products share a common prime factor, that factor must be the Highest Common Factor (HCF) of the two product values.

Co-prime Numbers

Two numbers are co-prime if their only common factor is 1. All distinct prime numbers are co-prime to each other.

Q36. Answer: (a) Ring

Instrument is an object that is played to produce musical sounds.

Similarly,

Bell is a hollow metal object that sounds a clear musical note when stuck and make a ringing sound.

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

Hence, "ring" is the correct answer.

Q37. Answer: (d) Only II follows

Drawing the Venn diagram,

Conclusion 1: All cars are ships → False (This is possible but not definite)

Conclusion 2: Some buses are cars → True (This is definitely true)

Hence, "only conclusion 2" follows.

Important Points

Some is a subset of all.

If it is given that, 'All A are B' then the conclusion 'Some A are B' will always follow.

Q38. Answer: (d) 37

Given:

G = (96 ÷ 12) + 14 × (12 + 8) ÷ 2

Concept:

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.

Calculation:

G = (96 ÷ 12) + 14 × (12 + 8) ÷ 2

=> G = 8 + 14 × 20 ÷ 2

=> G = 8 + 14 × 10

=> G = 8 + 140

=> G = 148

Therefore One fourth of G = 1/4 × 148 = 37

Q39. Answer: (c) 4 m

The correct answer is option 3 i.e. 4 m.

• Mass of the object = 12 kg

• Potential energy = 480 J

• Potential energy is given by

• Potential energy (P) = m × g × h

• 480 = 12 × 10 × h

• h = 4 m

• The object is at a height of 4 m from the ground.

Q40. Answer: (c) 34

Shortcut Trick

In a Fibonacci series starting with 0 and 1, list the terms by summing the previous two.

Sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ...

The 10^(th) number (counting from F0 as the 1^(st) term) is 34.

Therefore The correct answer is 34.

Alternate Method

Given: F0 = 0, F1 = 1 and the recurrence relation F_n = F_(n−1) + F_(n−2).
0
+1
→
1
+1
→
1
+2
→
2
+3
→
3
+5
→
5
+8
→
8
+13
→
13
+21
→
21
+34
→
34
=> 1^(st) term (F0) = 0
=> 2^(nd) term (F1) = 1
=> 3^(rd) term (F2) = 0 + 1 = 1
=> 4^(th) term (F3) = 1 + 1 = 2
=> 5^(th) term (F4) = 1 + 2 = 3
=> 6^(th) term (F5) = 2 + 3 = 5
=> 7^(th) term (F6) = 3 + 5 = 8
=> 8^(th) term (F7) = 5 + 8 = 13
=> 9^(th) term (F8) = 8 + 13 = 21
=> 10^(th) term (F9) = 13 + 21 = 34
Therefore The correct answer is 34.
Additional Information
Fibonacci Sequence Properties
Each term is the sum of the preceding two terms. The ratio of consecutive terms approaches the Golden Ratio (φ ≈ 1.618).
Binet's Formula
The n^(th) Fibonacci number can be found using $F_n = [\varphi^n - (-\varphi)^{(-n)}] / \sqrt{5}$, where $\varphi = (1 + \sqrt{5}) / 2$.

Q41. Answer: (d) 3600000 J

The correct answer is option 4 i.e. 3600000 J
• When a 1000 watt electrical appliance is used for an hour then, 1 Kwh is electrical energy consumed.
• The unit of energy is the watt and 1 Watt = 1 Joule /second.
• (One kilowatt-hour is equal to the energy of 1,000 joules)
• One kilowatt-hour = 1000 × 3600 = 3600000 J or 3.6 Megajoules

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• Work is done in terms of joules and this is per second.

Q42. Answer: (d) 1.75 Lakhs

Given,

The total revenue made by the restaurant in NOV 2017 was 35 lakhs.

Revenue made by the restaurant “XYZ” through the sales of Chinese food items is = 5%

Calculation:

Revenue made by the sales of Chinese food items = 5% of 35

=> 35 × 5/100

=> 1.75 lakhs

Q43. Answer: (b) ms^(-2)

The correct answer is option 2 i.e. ms-2.

Key Points

• Earth pulls an object towards its center. The acceleration generated due to this force is called gravity acceleration (g).

• In SI units this acceleration is measured in meters per second squared (m/s^2).

• The acceleration due to the gravity of the earth is referred to as 'g'.

• The approximate value of the acceleration due to the gravity of the earth is 9.8 m/s2.

• The weight of an object on the Earth's surface is the downwards force on that object.

• It was explained by Newton's second law of motion or F = ma.

Q44. Answer: (d) 12

The number of squares in the given figure is,

Hence, “12” is the correct answer.

Q45. Answer: (d) Raj Kumar Rao

The correct answer is option 4 i.e. Raj Kumar Rao.

• In the Newton movie, Raj Kumar Rao plays the lead role was a satire on India's election process.

• Rajkummar Rao is known as Rajkumar Yadav, an Indian actor.

• He established a career in Hindi cinema and is the recipient of several awards, as a National Film Award and three Filmfare Awards, etc.

• Newton was awarded the National Film Award for the Best Feature Film in Hindi.

• Pankaj Tripathi won a special mention at 65th National Film Awards in 2018.

Q46. Answer: (d) 5 h 15 min

Shortcut Trick

In such problems, the time difference between walking and riding is constant.

Time for (Walk + Ride) = 13/2 = 6.5 hours.

Time for (Walk + Walk) = 31/4 = 7.75 hours.

Time for (Ride + Ride) = 2 × (Walk + Ride) − (Walk + Walk) = 2 × 6.5 − 7.75 = 13 − 7.75 = 5.25 hours.

5.25 hours = 5 hours + 0.25 × 60 min = 5 h 15 min.

Therefore The correct answer is 5 h 15 min.

Alternate Method

Given:

Time for Walk (W) + Ride (R) = 13/2 hours = 6.5 hours

Time for Walk (W) + Walk (W) = 31/4 hours = 7.75 hours

Calculations:

=> 2W = 7.75 hours

=> W = 7.75 ÷ 2 = 3.875 hours

=> W + R = 6.5 hours

=> 3.875 + R = 6.5

=> R = 6.5 − 3.875 = 2.625 hours

=> Time for Ride both ways = 2R = 2 × 2.625 = 5.25 hours

=> 5.25 hours = 5 hours + (0.25 × 60) min = 5 hours 15 minutes

Therefore The correct answer is 5 h 15 min.

Additional Information

Two-way Travel Logic

In constant distance problems, (T_(Walk) + T_(Ride)) is always the average of (T_(Both Walk)) and (T_(Both Ride)).

Unit Conversion

To convert decimal hours to minutes, multiply the decimal part by 60. Example: 0.25 hours = 0.25 × 60 = 15 minutes.

Q47. Answer: (c) 8

Given,

The given bar graph shows the sales revenue of steel company ‘ABC’ for the past four years

To Find:

The total sales revenue in 2015 (in million $)

Calculation:

The total sales revenue in 2015 is = 8 million $

Q48. Answer: (d) 0 ms^(-1)

Given,

Kiran cover 360 m distance in = 2 min

Concept:

Average speed = Total distance/total time

Average velocity = Displacement/Time taken

Where, Displacement = distance between the starting and finishing point

Calculation:

Because Kiran swims from one end to the other and returned to the same starting point.

=> Displacement = 90 – 90 + 90 – 90 = 0 m

1 min = 60 sec

Therefore Average velocity of Kiran = 0/120 = 0 ms^(-1)

Q49. Answer: (a) ZMG

The pattern followed is,

Similarly,

Hence, “ZMG” is the correct answer.

Q50. Answer: (b) Distance

The correct answer is option 2 i.e. Distance.

• A light-year unit uses for the measuring of the long distance.

• A light-year is a distance which "light can cover in one year".

• The Light moves at a velocity of about 300,000 kilometers per second.

• Thus, Light can travel about 10 trillion km.

• The light-year unit used to denotes astronomical distances and measures about 9.46 trillion kilometers (9.46 × 1012 km).

Q51. Answer: (a) Ligament

The correct answer is Ligament.

Key Points

• Ligament - It connects bones to other bones.

• Areolar - It holds organs in place and attaches epithelial tissue to other tissues.

• Tendon - It connects muscle to bone and is capable of withstanding tension.

• Cartilage - It is rubber-like padding that covers and protects the ends of long bones at the joints.

Q52. Answer: (b) 8.83%

Shortcut Trick

Mass of solution = 31 + 320 = 351 g

Concentration % = (31 ÷ 351) × 100

Since 31 × 11 ≈ 341 and 31 × 12 ≈ 372, the answer must be between 8% and 9.5%.

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Calculating 3100 ÷ 351 ≈ 8.83%

Therefore The correct answer is 8.83%.

Alternate Method

Given:

Mass of solute (common salt) = 31 g

Mass of solvent (water) = 320 g

Formula Used:

Mass percentage = [Mass of solute ÷ (Mass of solute + Mass of solvent)] × 100

Calculations:

=> Total Mass of Solution = 31 g + 320 g = 351 g

=> Mass percentage = (31 ÷ 351) × 100

=> Mass percentage = 3100 ÷ 351

=> Mass percentage = 8.8319...

=> Mass percentage ≈ 8.83%

Therefore The correct answer is 8.83%.

Additional Information

Mass by Volume Percentage

It is the mass of solute dissolved in 100 mL of solution. Formula: (Mass of solute ÷ Volume of solution) × 100.

Volume by Volume Percentage

Used for liquid-in-liquid solutions. Formula: (Volume of solute ÷ Total volume of solution) × 100.

Solubility

The maximum amount of solute that can be dissolved in a specific amount of solvent at a specific temperature.

Q53. Answer: (b) The Goods and Service Tax

The correct answer is option 2 i.e. The Goods and Service Tax.

• The GST was purposed as a “One Market, One Nation, One Tax” reform.

• The Goods and Services Tax (GST), was the biggest tax reform since Independence in India.

• Conceived on the principle of 'one nation, one tax, one market', the tax that includes 17 central and state levies*.*

• The tax came into effect from 1 July 2017 through the of the 101st Amendment by the Indian government.

• The GST Council approved four main tax slabs - 5%, 12%, 18 %, and 28%.

Q54. Answer: (c) Odometers

The correct answer is option 3 i.e. Odometers.

• Archimedes principle explains that the buoyant force applied by the fluid is equal to the weight of the displaced fluid.

• Submarine - It also works on the ‘law of flotation’ and ‘the principle of Archimedes’.

• Hydrometer - From this, the specific density of the liquids is extracted and their purity is tested.

• Lactometer - It is an Instrument used for finding the purity of a milk sample.

• Odometer - It is an instrument for measuring the distance by a wheeled vehicle. It doesn't depend on the Archimedes principle.

Q55. Answer: (a) Directive Principles of State Policy

The correct answer is Directive Principles of State Policy.

• Part IV (Article 36-51) of the Indian Constitution is related to Directive Principles of our State Policy.

• It is not enforceable by any court but these are fundamental in the governance of the country.

• It is the duty of the government to apply these principles in law-making.

• These principles have been taken from the Constitution of Ireland.

Q56. Answer: (d) 444889

Given,

$7^2 = 49$

$67^2 = 449$

Concept:

We can see the pattern

=> $7^2 = 49$: 7 Has 1 digit, then frequency of 4 from the starting is 1 and unit digit is 9.

=> 67^2 = 4489: 67 Has 2 digit, then the frequency of 4 from the starting is 2 and 6 comes in 1 time, then 8 comes in 1 time and the unit digit is 9.

Calculation:

=> 667^2 = Has 3 digit, then the frequency of 4 from the starting is 3 and 6 comes 2 times, then 8 will come 2 times and the unit digit is 9.

Therefore 667^2 = 444889

Q57. Answer: (d) C

The pattern followed is,

In row one, there is a star symbol given in each column and the number of circles keeps on decreasing form four to two.

And,

In row two, there is a square symbol given in each column and the number of circles keeps on decreasing form four to two.

Similarly,

In row three, there is an arc symbol given in each column and the number of circles keeps on decreasing form four to two.

The figure which will fit the blank is,

Hence, option 4 is the correct answer.

Q58. Answer: (b) Both I and II follow

According to the given information,

Conclusion 1: This follows, because Rannu asked Sharmu about the parking sign, which tells us that he knows the meaning of no parking sign.

Conclusion 2: This also follows, because Rannu asked Sharmu not to park the vehicle where there is no parking sign, which tells us that Sharmu does not follow the road rules.

Hence, “both conclusions 1 and 2” follow.

Q59. Answer: (d) Sardar Singh

The correct answer is option 4 i.e. Sardar Singh.

• Sardar Singh was awarded the Rajiv Gandhi Khel Ratna award for Hockey in 2017.

• The Rajiv Gandhi Khel Ratna award in Sports is the highest sporting honor of India.

• It is awarded by the Ministry of Youth Affairs and Sports.

• The first recipient of the award was Viswanathan Anand, who was the country's first chess Grandmaster.

• Deepa Malik and Bajrang Punia are awarded the Rajiv Gandhi Khel Ratna award for Athletics and Wrestling respectively in 2019.

Q60. Answer: (d) Shah Rukh Khan

The correct answer is option 4 i.e. Shah Rukh Khan.

• Shah Rukh Khan became the most-followed Indian celebrity on twitter site with 39 million followers.

• Shah Rukh Khan overtook emperor Amitabh Bachchan in reference to followers on Twitter.

• Priyanka Chopra was the first Bollywood celebrity to visit the Twitter headquarters in New York.

• Amitabh Bachchan is one of the most active Bollywood personalities on Twitter.

Mistake Points

• Answer is according to year 2018, currently Mr Amitabh Bachchan has maximum foolowes on Twitter as an Indian Actor.

Q61. Answer: (b) 115°

Shortcut Trick

Sum of all four interior angles of a quadrilateral is always 360°.

Sum of the two given angles = 65° + 65° = 130°.

Sum of the remaining two equal angles = 360° − 130° = 230°.

Value of each of the other two angles = 230° ÷ 2 = 115°.

Therefore The correct answer is 115°.

Alternate Method

Given:

Two angles of the quadrilateral = 65° each.

The other two angles are equal. Let each of them be x.

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Formula Used:

Sum of interior angles of a quadrilateral = 360°.

Calculations:

=> 65° + 65° + x + x = 360°

=> 130° + 2x = 360°

=> 2x = 360° − 130°

=> 2x = 230°

=> x = 230° ÷ 2

=> x = 115°

Therefore The correct answer is 115°.

Q62. Answer: (c) 30 years

Shortcut Trick

Average age of 6 Persons = 105 ÷ 6 = 17.5 years.

For an even number of terms in Arithmetic Progression, the average is the mean of the two middle terms (3^(rd) and 4^(th)).

Middle gap = 5 years => 4^(th) person's age = 17.5 + (5 ÷ 2) = 20 years.

Age of the oldest person (6^(th)) = 20 + 5 + 5 = 30 years.

Therefore The correct answer is 30 years.

Alternate Method

Given:

Total persons = 6

Age interval = 5 years

Sum of ages = 105 years

Let the age of the youngest person be x.

The ages of the 6 persons are x, (x + 5), (x + 10), (x + 15), (x + 20), and (x + 25).

=> x + (x + 5) + (x + 10) + (x + 15) + (x + 20) + (x + 25) = 105

=> 6x + (5 + 10 + 15 + 20 + 25) = 105

=> 6x + 75 = 105

=> 6x = 105 − 75

=> 6x = 30

=> x = 5 years

=> Age of the oldest person = x + 25 = 5 + 25 = 30 years.

Therefore The correct answer is 30 years.

Additional Information

Arithmetic Progression (AP) Sum

The sum of an AP is $S_n = (n/2) \times [2a + (n - 1)d]$, where 'a' is the first term and 'd' is the common difference.

Average Property of AP

The average of any AP is equal to the average of the first and last terms: Average = (First Term + Last Term) ÷ 2.

Middle Term Calculation

For an odd number of terms (n), the average is exactly the middle term. For an even number (n), it is the average of the two central terms.

Q63. Answer: (a) 366 days 23 hours 52 mins

Given:

Day	11 April 2019	12 April 2020
Time	12:37 pm	12:29 pm

Concept:

Firstly we have to calculate the number of days and then the time followed by it.

For Calculate Number of Days, we have to find the exact days i.e., from 11 April 2019 to 12 April 2020 (as Time period for 12^(th) April 2020 is less than 24 hours)

Number of Days in normal year = 365 days

Number of days in leap year = 366 days (and the extra day falls on February)

Calculation:

Number of Days = 11 April 2019 to 11 April 2020 = 366 days (As 2020 is a leap year)

Time = 11^(th) April 2020 (12:37 pm) to 12^(th) April 2020 (12:29 pm)

The difference in Time = 23 hours 52 minutes

Therefore Required Answer = 366 days 23 hours 52 minutes

While calculating the number of Days, we use 365 days instead of 366 days (as they considered the year is not completed).

While calculating the time duration, Many of the candidates subtracted bigger value to smaller i.e, 37 minutes - 29 minutes (which is incorrect). We have to find the time difference from 37 minutes to 60 minutes first (i.e, 23 minutes) and then added these 23 minutes in 29 minutes of the next hour. (22 + 29 = 52 minutes).

Q64. Answer: (b) C

The pattern followed is,

The place value of A is 1

The place value of D is 4

The place value of E is 5

The place value of F is 6

In the given pattern, the place values of A, D and F are correct.

Whereas,

The place value of E is given as 6, instead of 5.

Hence, option 2 is the odd one.

Q65. Answer: (b) B

The mirror image of the given figure if the mirror is placed at line MN is,

Hence, option 2 is the correct answer.

Q66. Answer: (a) 35

The pattern followed is,

Hence, “35” is the correct answer.

Q67. Answer: (a) Rheostat

The correct answer is option 1 i.e. Rheostat.

• The rheostat is an electrical device consist of magnum wire with the cylinder and three-terminal.

• It is used for the three purpose -

• The Resistance varies

• Current controlling device

• Voltage divider

• The ammeter is an instrument used for measuring electric current in amperes.

• The resistor is an electrical component that is used to reduces the electric current.

Q68. Answer: (a) 17

The correct answer is option 1, i.e. 17.

Given,

The formula for the height of the rocket above the ground at any time during the rocket's flight: $h = 119t - 7t^2$

where, t = time in seconds

h = height in meters

Now, it is given that value of h, is 0 when the rocket hit the ground so,

$0 = 119t - 7t^2$

$0 = 7t(t - 17)$

The values of t are 0 and 17.

So, the rocket hit the ground after 17 seconds of its launch.

Q69. Answer: (d) Dissolving sulphuric acid in water

The correct answer is option 4 i.e. Dissolving sulphuric acid in water.

• Sulfuric acid (H_2SO_4) is a strong mineral acid and soluble in water at all concentrations.

• The Sulphuric acid reaction with water is highly exothermic.
• If water is mixed to concentrated sulphuric acid, it acts to boil and spits.
• Sulphuric acid was discovered by alchemist Jabir ibn Hayyan in 8th century.
• Sulphuric acid has a very high affinity for the water.

Q70. Answer: (a) 295

Shortcut Trick
Total Simple Interest percentage = Rate × Time
=> 4% × 5 years = 20%
Interest Accrued = 20% of £1475
=> (1/5) × 1475 = 295
Therefore The correct answer is £295.
Alternate Method
Given:
Principal (P) = £1475
Rate (R) = 4% per annum
Time (T) = 5 years
Formula Used:
Simple Interest (SI) = (P × R × T) ÷ 100
Calculations:
=> SI = (1475 × 4 × 5) ÷ 100
=> SI = (1475 × 20) ÷ 100
=> SI = 1475 ÷ 5
=> SI = 295
Therefore The correct answer is £295.
Additional Information
Total Amount
The total sum of money payable at the end of the period is called the Amount. Formula: A = Principal + Simple Interest.
Simple Interest Characteristics
In Simple Interest, the interest is always calculated only on the original Principal amount for every year of the loan duration.
SI vs CI for Year 1
For the first year (if interest is compounded annually), the Simple Interest and Compound Interest on the same principal and rate are always equal.

Q71. Answer: (d) Sumitra Mahajan

The correct answer is option 4 i.e. Sumitra Mahajan.
• The Speaker of the Lok Sabha is the presiding officer of the lower house (Loksabha) of the Parliament of India.
• Sumitra Mahajan was the Speaker of 16th Loksabha from 2014 to 2019.
• Ganesh Vasudev Mavalankar was the first Speaker of 1st Loksabha (15 May 1952).
Important Points
• Om Birla is the current Speaker of 18th Lok Sabha.

Q72. Answer: (b) Ibrahim Lodi

The correct answer is option 2 i.e. Ibrahim Lodi
• Daulat Khan Lodi was the governor of Lahore in the reign of Ibrahim Lodi.
• Ibrahim Lodi was the last king of the Lodi dynasty.
• Ibrahim was defeated by Babur in 1526 at the Battle of Panipat.
• Daulat Khan sent his son, Ghazi Khan Lodi, to Delhi to know more about the state's situation in the government.
• Then, Ghazi Khan told his father about Ibrahim Lodi's planning that Ibrahim was planning to remove his governorship.
• In response, Daulat Khan showed his loyalty by sending messengers to Babur in Kabul.
• In exchange for assistance against Ibrahim Lodi, Babur agreed.

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Q73. Answer: (c) Rs. 1,07,525

Shortcut Trick

Effective Cost Price (CP) of Reema = 75,000 + 10,000 = 85,000.

Successive multipliers: 15% profit = 115/100 and 10% profit = 110/100.

Final Price (Ritu) = 85,000 × (115/100) × (110/100).

Final Price = 850 × 1.15 × 110 = 85 × 115 × 11 = 1,07,525.

Therefore The correct answer is Rs. 1,07,525.

Alternate Method

Given → Initial Cost = Rs. 75,000, Repair Cost = Rs. 10,000, Profit1 = 15%, Profit2 = 10%.

Formulas: Total CP = Purchase Price + Overhead | SP = CP × (100 + P%)/100.

=> Total Cost Price for Reema = 75,000 + 10,000 = Rs. 85,000.

=> Selling Price for Reema (Chiru's CP) = 85,000 × (115/100) = Rs. 97,750.

=> Selling Price for Chiru (Ritu's CP) = 97,750 × (110/100) = Rs. 1,07,525.

Therefore The correct answer is Rs. 1,07,525.

Additional Information

Overhead Expenses

Any extra money spent on repairs, transport, or labor after buying an item is added to the Original Cost Price to get the Effective Cost Price.

Successive Percentage Change

When a price is increased multiple times, the net change is calculated using the formula: Result = Initial × (1 + r1/100) × (1 + r2/100).

Q74. Answer: (c) Sankalp Parva

The correct answer is option 3 i.e. Sankalp Parva.

• The Central Government had decided to celebrate August 15, 2017, Independence Day as "Sankalp Parv".

• The government appealed to the people to dedicate themselves to social causes and share their ideas to make a New India.

• August 15, 2017, was celebrated as the 'Sankalp Parva'.

• In August 2022, India will complete 75 years as an independent nation.

Q75. Answer: (c) Father

According to the given information,

Hence, Ramesh is the father of that person.

Q76. Answer: (d) 54 min

Shortcut Trick

Let the efficiency of filling pipes be positive and draining pipe be negative.

Combined efficiency (1/30 + 1/45 − 1/C) = 1/27

Total work (LCM of 30, 45, 27) = 270 units.

Efficiencies: Pipe A = 9, Pipe B = 6, Combined (A+B+C) = 10.

Efficiency of Pipe C = (9 + 6) − 10 = 5 units.

Time for Pipe C = 270 ÷ 5 = 54 min.

Therefore The correct answer is 54 min.

Alternate Method

Given:

Time taken by Pipe A = 30 min

Time taken by Pipe B = 45 min

Time taken by (A + B + C) = 27 min (where C is the outlet pipe)

Pipe	Time (min)	Total Capacity (LCM)	Efficiency
Pipe A	30	270 units	9
Pipe B	45	6	
A + B + C	27	10	

Calculations:

=> Efficiency of Pipe A = 270 ÷ 30 = 9 units/min

=> Efficiency of Pipe B = 270 ÷ 45 = 6 units/min

=> Combined efficiency of (A + B + C) = 270 ÷ 27 = 10 units/min

=> Efficiency of Pipe C = (Efficiency of A + B + C) − (Efficiency of A + Efficiency of B)

=> Efficiency of Pipe C = 10 − (9 + 6) = 10 − 15 = −5 units/min

=> (The negative sign indicates it is an outlet/drain pipe)

=> Time taken by Pipe C alone to empty the tank = Total Capacity ÷ Efficiency of C

=> Time = 270 ÷ 5 = 54 min

Therefore The correct answer is 54 min.

Additional Information

Inlet and Outlet Pipes

Inlet pipes fill the tank (positive work) while outlet pipes empty the tank (negative work). Net work per unit time is the algebraic sum of their efficiencies.

LCM Method for Capacity

To simplify calculations, assume the total capacity of the tank as the Least Common Multiple (LCM) of the individual times given in the problem.

Efficiency Formula

Efficiency = Total Work ÷ Time Taken. Total time taken to complete a task = Total Work ÷ Combined Efficiency.

Q77. Answer: (a) 1

According to the given figures,

Figure which is outside rotates 135^? clockwise direction and figure which is inside rotates

135^? anti clockwise direction

The figure which will come next in the pattern is,

Hence, option 1 is the correct answer.

Q78. Answer: (c) 60 km/hr

Shortcut Trick

Relative Speed concept: The first train travels for 2 hours before the second starts.

Initial gap = 40 km/hr × 2 hr = 80 km.

Relative speed required to cover 80 km in 4 hours = 80 ÷ 4 = 20 km/hr.

Speed of second train = Speed of first train + Relative speed = 40 + 20 = 60 km/hr.

Therefore The correct answer is 60 km/hr.

Alternate Method

Given: Speed of 1^(st) train = 40 km/hr, Time headstart = 2 hours, Time taken to catch up = 4 hours.

Formula: Distance = Speed × Time

=> Total time traveled by Train 1 = 2 + 4 = 6 hours.

=> Distance covered by Train 1 = 40 × 6 = 240 km.

=> Total time traveled by Train 2 = 4 hours.

=> Since they meet at the same point, Distance by Train 2 = 240 km.

=> Speed of Train 2 = Distance ÷ Time = 240 ÷ 4.

=> Speed of Train 2 = 60 km/hr.

Therefore The correct answer is 60 km/hr.

Additional Information

Relative Speed (Same Direction)

When two objects move in the same direction, the relative speed is the difference between their speeds: V_(rel) = V1 − V2.

Meeting Time Formula

Time to catch up = (Initial Distance Gap) ÷ (Relative Speed). Here, 4 = (40 × 2) ÷ (V − 40).

Average Speed

If a body covers two equal distances at speeds x and y, the Average Speed = 2xy ÷ (x + y).

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Q79. Answer: (c) Work and energy

The correct answer is option 4 i.e. Work and energy.

• The standard unit of energy and work is the joule (J).

• The SI unit of pressure is the "Pascal".

• The SI unit of force is the "Newton".

• The SI unit of momentum is "Kilogram meters per second".

Q80. Answer: (a) Kaasav

The correct answer is option 1 i.e. Kaasav

• The National Film Awards is the most famous film award ceremony in India.

• It was established by the Ministry of Information and Broadcasting in India in 1954.

• "Kaasav" is an Indian (Marathi-language) film released on 6 October 2017.

• It was directed by filmmaker duo Sumitra Bhave–Sunil Sukthankar.

Year	Film (Winner)	Language
2016	Kaasav	Marathi
2017	Village Rockstars	Assamese
2018	Hellaro	Gujarati

Q81. Answer: (d) B

The above figure is embedded in,

Hence, option 4 is the correct answer.

Q82. Answer: (d) V – 22, X – 24

The pattern followed is,

Hence, “V – 22, X – 24” is the correct answer.

Q83. Answer: (c) 20%

Shortcut Trick

Apply the percentage reduction formula: [r / (100 + r)] × 100

Here, r = 25%

Reduction % = [25 / (100 + 25)] × 100

Reduction % = [25 / 125] × 100 = 1/5 × 100 = 20%

Therefore The correct answer is 20%.

Alternate Method

Given: Sham's marks are 25% more than Divya's marks.

Let Divya's marks = 100 units

=> Sham's marks = 100 + 25% of 100 = 125 units

=> Difference = 125 − 100 = 25 units

=> Required Percentage = (Difference / Sham's marks) × 100

=> Percentage = (25 / 125) × 100

=> Percentage = 1/5 × 100 = 20%

Therefore The correct answer is 20%.

Additional Information

Percentage Change Comparison

If A is R% more than B, then B is [R / (100 + R)] × 100 % less than A.

Percentage Decrease Comparison

If A is R% less than B, then B is [R / (100 − R)] × 100 % more than A.

Fraction Equivalents

25% increase is a multiplier of 5/4. To reverse it, we use a decrease of 1/5, which is 20%.

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Q84. Answer: (c) 49653

Shortcut Trick

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

Option (1): 5+8+5+5+6 = 29 (No)

Option (2): 5+6+1+1+2 = 15 (No)

Option (3): 4+9+6+5+3 = 27 (Yes, 27 is divisible by 9)

Option (4): 8+9+4+4+5 = 30 (No)

Therefore The correct answer is 49653.

Alternate Method

Given: Four numbers to check for divisibility by 9.

Rule Used: Divisibility rule of 9 → Sum of digits must be a multiple of 9.

=> For 58556: 5+8+5+5+6 = 29; 29 ÷ 9 leaves remainder 2.

=> For 56112: 5+6+1+1+2 = 15; 15 ÷ 9 leaves remainder 6.

=> For 49653: 4+9+6+5+3 = 27; 27 ÷ 9 = 3 (Remainder 0).

=> For 89445: 8+9+4+4+5 = 30; 30 ÷ 9 leaves remainder 3.

Therefore The correct answer is 49653.

Additional Information

Divisibility Rule of 3

Similar to 9, a number is divisible by 3 if the sum of its digits is divisible by 3.

Divisibility Rule of 6

A number is divisible by 6 if it is divisible by both 2 (even number) and 3 (sum of digits rule).

Digit Sum Concept

The digit sum is also known as the digital root, which is the remainder when a number is divided by 9 (if the sum is 9, the remainder is 0).

Q85. Answer: (a) Neither argument 1 and 2 is strong

According to the given information,

Argument 1: This is not strong, because it is not given in the statement that perfume is only used by rich people.

Argument 2: This is not strong, because it is not given in the statement that perfume is used by poor people also.

Hence, “neither argument 1 nor argument 2” is strong.

Q86. Answer: (b) d

The pattern followed is,

The figures A, B and C are geometrical figures with different symbols placed inside them.

Whereas,

In figure D, one figure is placed on the outer layer of the other.

Hence, figure D is the odd one.

Q87. Answer: (c) Both I and II are implicit

According to the given information,

Assumption 1: This is implicit, as when a children cry means they wanted to say something which they are unable to say.

Assumption 2: This is also implicit, because parents leave them to play by themselves and when they cry parent need to see them.

Hence, “both 1 and 2” are implicit.

Q88. Answer: (b) Resistance

Ammeter is a measuring instrument used to measure current in a circuit.

Similarly,

Ohmmeter is an electrical instrument that measures electrical resistance (the opposition offered by a substance to the flow of electric current).

‘Ohmmeter’ relates to the third term in the same way that the second term relates to the first term.

Measurements	Instrument to measure
Pressure	Pressure gauge

Resistance	Ohmmeter
Speed	Speedometer
Voltage	Voltmeter

Hence, “ohmmeter” is the correct answer.

Q89. Answer: (d) [figure]

English, Chinese and French are different languages.

The correct Venn diagram is,

Hence, option 4 is the correct answer.

Q90. Answer: (d) QH

The pattern followed is,

Hence, “QH” is the correct answer.

Q91. Answer: (c) Budding

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

• Budding is a type of asexual reproduction and related to both multicellular and unicellular organisms.

• Budding - In this process, a new organism develops from bud due to cell division in one particular area.

• These buds develop into tiny individuals and, when fully mature, detach from the parent body and become new individuals.

• Budding is found in Bacteria, yeast, corals, flatworms, and jellyfish.

• Fission in bacteria is the process where a cell splits into two daughter cells.

• Regeneration is the natural process of replacing or restoring damaged or missing cells, tissues, organs, and even entire body parts to full function in plants and animals.

• Multiple fission is the process of asexual reproduction in which instead of 2 daughter cells, many daughter cells are produced from the parent cell. In this, the nucleus undergoes repeated division to produce a large number of nuclei.

Q92. Answer: (c) West

Drawing the diagram according to the given information,

He is facing west now.

Hence, “west” is the correct answer.

Q93. Answer: (b) regeneration

The correct answer is regeneration.

Key Points

• Regeneration - In this process, an animal gets the ability to recover its lost part.

• Regeneration occurs in organisms like hydra, flatworms, tapeworms. They have highly adaptive regenerative capabilities.

• This asexual reproduction is found in hydra, starfish, and planaria.

• Fragmentation - In this process, the breaking up parent animal into small parts, each can grow a new complete individual.

Mistake Points

• Since the question asks about all three, the answer would be regeneration.

• The source for the same can be found here.

• The terms regeneration and fragmentation are sometimes used alternatively, but are actually different processes.

• Also, Hydra has 2 methods of reproduction, Regeneration and Budding

Q94. Answer: (c) 49

Shortcut Trick

For continued proportion a, b, c → $b^2 = a \times c$

Here, a = 25, b = 35, and c = p

$p = b^2 \div a = (35 \times 35) \div 25$

$p = 1225 \div 25 = 49$

Therefore The correct answer is 49.

Alternate Method

Given: Numbers 25, 35, and p are in continued proportion.

Formula Used: If x, y, z are in continued proportion, then x/y = y/z.

=> 25/35 = 35/p

=> 25 × p = 35 × 35

=> 25p = 1225

=> p = 1225 ÷ 25

=> p = 49

Therefore The correct answer is 49.

Additional Information

Mean Proportional

In a continued proportion a : b :: b : c, the term b is called the mean proportional and b = √(ac).

Third Proportional

The term c in the continued proportion a : b :: b : c is known as the third proportional to a and b.

Fourth Proportional

If four numbers a, b, c, d are in proportion (a : b :: c : d), then d is the fourth proportional where d = (b × c) ÷ a.

Q95. Answer: (a) 12

Shortcut Trick

The HCF of two numbers must always be a factor of their LCM.

Check which option divides 432 exactly without leaving a remainder:

432 ÷ 12 = 36 (Perfectly divisible)

432 ÷ 34 ≈ 12.7 | 432 ÷ 26 ≈ 16.6 | 432 ÷ 32 = 13.5

Therefore The correct answer is 12.

Alternate Method

Given: LCM of two natural numbers = 432

Formula Used: LCM = HCF × (product of remaining co-prime factors)

=> Let the numbers be Hx and Hy, where H is the HCF and x, y are co-prime.

=> LCM = H × x × y

=> 432 = H × (xy)

=> This implies that H must be a divisor of 432.

=> Testing Option 1: 432/12 = 36 (Possible)

=> Testing Option 2: 432/34 = 12.70 (Not Possible)

=> Testing Option 3: 432/26 = 16.61 (Not Possible)

=> Testing Option 4: 432/32 = 13.5 (Not Possible)

Therefore The correct answer is 12.

Additional Information

Product Rule

The product of two numbers is always equal to the product of their HCF and LCM. (First Number × Second Number = HCF × LCM)

HCF of Fractions

HCF of fractions = HCF of Numerators ÷ LCM of Denominators.

Co-prime Numbers

If two numbers are co-prime, their HCF is always 1 and their LCM is the product of the two numbers.

Q96. Answer: (d) Rs. 24000, Rs. 50,400

Shortcut Trick

Investment ratio = (Profit ratio ÷ Time ratio).

Time periods: A = 12 months, B = 7 months, C = 5 months.

Investment ratios: A : B : C = (4÷12) : (2÷7) : (3÷5) = (1÷3) : (2÷7) : (3÷5).

Multiplying by LCM(3, 7, 5) = 105: 35 : 30 : 63.

Given 35 units = Rs. 28,000 => 1 unit = Rs. 800.

B = 30 × 800 = Rs. 24,000; C = 63 × 800 = Rs. 50,400.

Therefore The correct answer is Rs. 24,000, Rs. 50,400.

Alternate Method

Given → Investment of A (I_A) = Rs. 28,000, Profit ratio = 4 : 2 : 3.

Formulas: Profit = Investment × Time | Investment = Profit ÷ Time

=> Time for A = 12 months; Time for B = 12 − 5 = 7 months.

=> Time for C = 7 − 2 = 5 months.

=> Ratio of Profit (A:B) = (I_A × 12) : (I_B × 7) = 4 : 2.

=> (28000 × 12) ÷ (I_B × 7) = 2 => I_B = (28000 × 12) ÷ 14 = Rs. 24,000.

=> Ratio of Profit (A:C) = (I_A × 12) : (I_C × 5) = 4 : 3.

=> (28000 × 12) ÷ (I_C × 5) = 4 ÷ 3 => I_C = (28000 × 12 × 3) ÷ (4 × 5) = Rs. 50,400.

Therefore The correct answer is Rs. 24,000, Rs. 50,400.

Additional Information

Partnership Basics

Profit is distributed based on the product of Capital and Time. Formula: P1 : P2 = (C1 × T1) : (C2 × T2).

Effective Capital

When partners join at different times, we calculate Effective Capital for the total period (usually one year or as specified).

Q97. Answer: (c) very weak

The correct answer is option 3 i.e. Very Weak.

• Bonds formed by elements having larger atoms are weaker.

• Due to the small carbon atoms, there is a strong bond between them.

• This enables the nucleus to strongly hold shared pairs of electrons.

• The triple bonds are stronger than double bonds between the same two atoms.

• The double bonds are stronger than single bonds between the same two atoms.

Q98. Answer: (b) Neither 1 nor 2 is strong

According to the given information,

Argument 1: This is not strong, because nothing about earnings is mentioned in the statement.

Argument 2: This not strong, because it is only mentioned about Indians working abroad.

Hence, “neither 1 nor 2” is strong.

Q99. Answer: (c) B

Figure is moving by one place in anti-clockwise direction.

The figure which will come next in the series is,

Hence, option 3 is the correct answer.

Q100. Answer: (d) Both A and B are true

The correct answer is option 4 i.e. Both A and B are true.

• The speed of sound - It is the distance covered per unit time by the sound wave.

• The speed of sound varies in different mediums.

• | State | Substance | Speed (m/s) |

Solid	**Iron**	**5950**
Liquid	Distilled Water	1498
Gas	Oxygen	316

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