# RRC Group D Previous Year Paper 4 (Held On: 22 Sep 2018 Shift 1)

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

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

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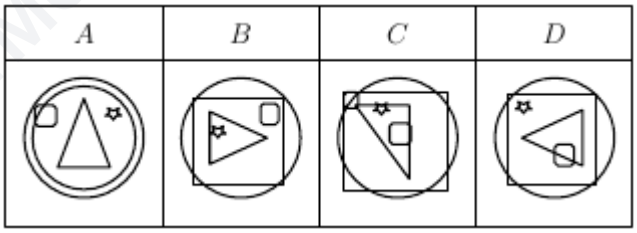
## CBT

**Q1.** Which of the option figures bears the closest resemblance to the question figure?

Question Figure:



Option Figures:




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

**Q2.** Who among the following has been conferred the National Kalidas Samman award in 2018?

**(a)** Anjolie Ela Menon
**(b)** Girish Karnad
**(c)** Mallika Sarabhai
**(d)** Shabana Azmi

**Q3.** The chemical formula of Iron (III) oxide is _____.

**(a)** FeO
**(b)** Fe3O4
**(c)** Fe3O3
**(d)** Fe2O3

**Q4.** Find the odd man out: Si, P, Ge, and As,

**(a)** Si
**(b)** As
**(c)** P
**(d)** Ge

**Q5.** The sum of the first 2007 terms of the sequence 1, 2, 3, 4, 1, 2, 3, 4, _____ is:

**(a)** 5013
**(b)** 5016
**(c)** 5020
**(d)** 5107

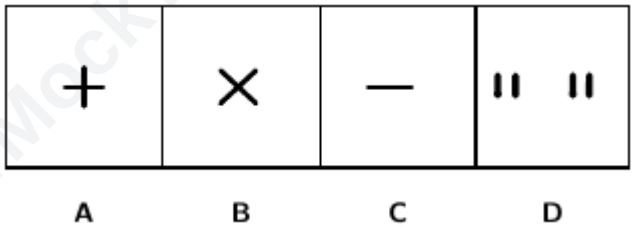
**Q6.** Rs. 1,125 invested for 3 months gave an interest of Rs. 27. What was the simple rate of interest per annum?

**(a)** 12%
**(b)** 9.6%
**(c)** 7.2%
**(d)** 2.4%

**Q7.** Which union ministry has launched a nation-wide training programme for Elected Women Representatives (EWRs) of Panchayats?

**(a)** Ministry of Panchayati Raj
**(b)** Ministry of External Affairs
**(c)** Ministry of Women and Child Development
**(d)** Ministry of Culture

**Q8.** Find the odd one out.




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

**Q9.** Where is 'The Gateway of India' located?

**(a)** Chennai
**(b)** Jaipur
**(c)** New Delhi
**(d)** Mumbai

**Q10.** A mobile when sold at a gain of 6% yields Rs. 870 more than when it is sold at a loss of 6%. What is the cost price of the mobile phone?

**(a)** Rs. 7250
**(b)** Rs. 6265
**(c)** Rs. 6000
**(d)** Rs. 7000

**Q11.** A 1.5 m tall boy observes a pole. The angle of elevation of the top of the pole is 30° from the eyes of the boy. Then he approaches the pole by 7.3 m. Now the angle of elevation is 45°. Find the height of the pole from the ground.
Take $\sqrt{3} = 1.73$

**(a)** 8.5 m
**(b)** 11.5 m
**(c)** 10 m
**(d)** 11 m

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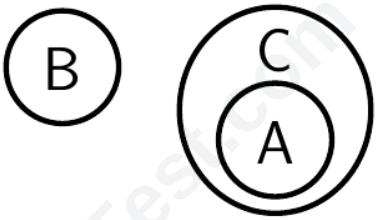
**Q12.** According to Whittaker's classification, organisms belonging to the kingdom _____ do not have a well-defined nucleus.

**(a)** Protista
**(b)** Fungi
**(c)** Monera
**(d)** Plantae

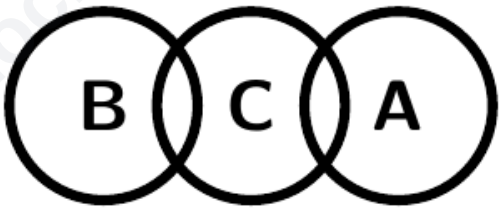
**Q13.** Which of the following correctly represents the relationship between

A. Car
B. Park
C. Satellite

**(a)**



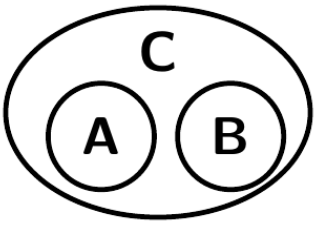

**(b)**




**(c)**




**(d)**




**Q14.** A current of 0.5 A is maintained in a resistor of 10 Ω. The amount of charge flowing through the resistor in one minute is:

**(a)** 30 C
**(b)** 5 C
**(c)** 0.5 C
**(d)** 20 C

**Q15.** The time taken for the tail end of a train to cross a pole is 53 seconds. If the length of the train is 110 m and speed of the train is 36 km/hr, find the initial distance of the pole from the front end of the train.

**(a)** 420 m
**(b)** 530 m

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**(c)** 640 m
**(d)** 1798 m

**Q16.** Find the 13/16 worth of land whose 9/7 worth be Rs. 10116.
**(a)** Rs. 6391.75
**(b)** Rs. 6394.75
**(c)** Rs. 6392.75
**(d)** Rs. 6302.75

**Q17.** Shaan's current age is four years less than 1.6 times that of Uddalak's. 26 years ago, Uddalak's age was one year less than half of Shaan's age. What is Shaan's present age in years?
**(a)** 84
**(b)** 76
**(c)** 68
**(d)** 60

**Q18.** The mega event Global Entrepreneurship Summit (GES-2017) in Hyderabad was co-hosted by NITI Aayog. What is the full form of NITI?
**(a)** National Institute of Teaching India
**(b)** National Institution for Transforming India
**(c)** National India Transforming Information
**(d)** National Institution Towards India

**Q19.** If "LAME" is coded as JYKC, how "MINE" would be written in this code?
**(a)** KGLC
**(b)** KHGC
**(c)** KLGC
**(d)** KJGC

**Q20.** If an electric iron rated 1000W is operated for 3 hours/day, final the total energy consumed in 30 days in Kwh.
**(a)** 90000 Kwh
**(b)** 9000 Kwh
**(c)** 90 Kwh
**(d)** 900 Kwh

**Q21.** $70 \div 5 \times (10 - 8 \div 2) \div 3 = ?$
**(a)** 28
**(b)** 3
**(c)** 1/3
**(d)** 7

**Q22.** Frictional force acts _____.
**(a)** Against the direction of the force
**(b)** At any angle to the direction of the force
**(c)** In the direction of the force
**(d)** Perpendicular to the direction of the force

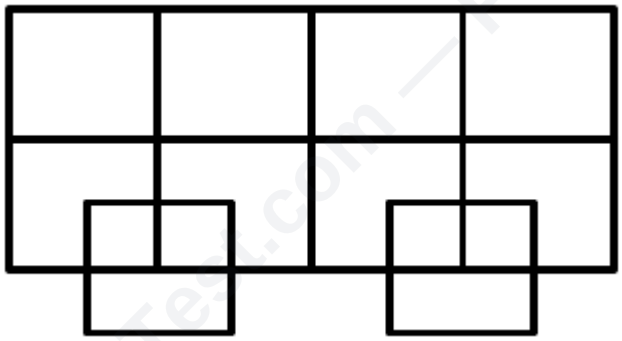
**Q23.** Can you tell which argument is strong?
Statement:
Should government take priority in linking rivers?
Arguments:
I. Yes, in the long run this will entirely eradicate water shortages in remote areas.
II. No, we shouldn't contaminate water and the rivers will naturally take its course.
**(a)** Both I and II are strong
**(b)** Only argument II is strong

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**(c)** Neither I nor II is strong.
**(d)** Only argument I is strong.

**Q24.** The elements with atomic numbers 35, 53 and 85 are _____.
**(a)** noble gases
**(b)** halides
**(c)** alkaline
**(d)** halogens

**Q25.** Find the number of squares in the following figure.



**(a)** 18
**(b)** 16
**(c)** 17
**(d)** 19

**Q26.** Find the odd one out.

| A | B | C | D |
|---|---|---|---|
| W23 | I10 | L12 | Q17 |

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

**Q27.** If the perimeter of a circular plot is equal to the perimeter of a square plot, then the ratio of their respective areas is:
**(a)** 6 : 11
**(b)** 7 : 11
**(c)** 12 : 11
**(d)** 14 : 11

**Q28.** The largest wind energy plant in Kanyakumari generates _____ MW of electricity.
**(a)** 1500
**(b)** 1600
**(c)** 2000
**(d)** 1000

**Q29.** The mass number of an isotope of an element is 298. If its nucleus has 189 neutrons, what is its atomic number?
**(a)** 487.0
**(b)** 189.0
**(c)** 109.0
**(d)** 298.0

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**Q30.** In a ΔABC, points D and E are lying on AB and AC, respectively. DE is also parallel to the base BC. O is the intersection of BE and CD. If AD : DB = 4 : 3 find the ratio of DO to DC.

**(a)** 5 : 7
**(b)** 4 : 11
**(c)** 5 : 12
**(d)** 3 : 7

**Q31.** Three flood gates A, B and C can fill a reservoir in 6 hours. After working at it together for 2 hours, flood gate C is closed. Flood gates A and B can fill the remaining part in 7 hours. The number of hours taken by flood gate C alone to fill the reservoir is:

**(a)** 16
**(b)** 10
**(c)** 14
**(d)** 12

**Q32.** Ace Indian cueist _____ won the 2017 IBSF World Billiards Championship held at Doha.

**(a)** Ashok Shandilya
**(b)** Subhash Agarwal
**(c)** Geet Sethi
**(d)** Pankaj Advani

**Q33.** Who among the following has been appointed the Chef de Mission of the Indian contingent for the Asian Games 2018?

**(a)** Ramkishore Singh
**(b)** Rajeev Mehta
**(c)** Brij Bhushan Sharan Singh
**(d)** Digvijay Singh

**Q34.** Odometer is an instrument used to measure:

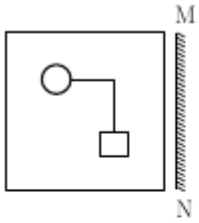
**(a)** Direction
**(b)** Distance
**(c)** Odour
**(d)** Speed

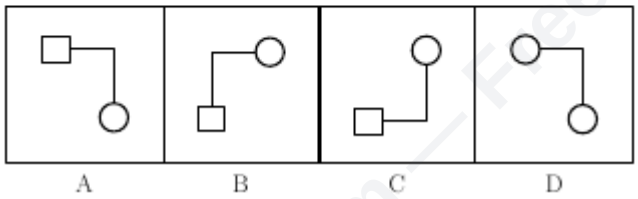
**Q35.** What is the horizontal mirror image of REST?

| | | | |
|---|---|---|---|
| REST | TƎЯ | ꓶƎS | TSƎЯ |
| A | B | C | D |

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

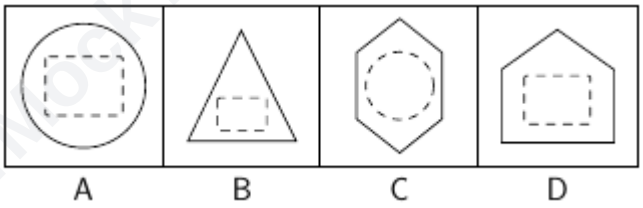
**Q36.** Choose the mirror for the following figure when the mirror is kept at the MN line.




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

**Q37.** Find the odd one out.




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

**Q38.** The hydrochloric acid secreted by the gastric glands facilitates the action of the enzyme _____.

**(a)** Amylase
**(b)** Trypsin
**(c)** Lipase
**(d)** Pepsin

**Q39.** If '+' means '-', '-' means '×', '÷' means '+' and '× 'means '÷', then what is the value of (23 – 4 + 15 × 3 ÷ 10)?

**(a)** 110
**(b)** 95
**(c)** 97
**(d)** 100

**Q40.** If TEEN is written as 205514, then what is the code for ENTER?

**(a)** 51420518
**(b)** 51520618
**(c)** 51420618
**(d)** 51520518

**Q41.** When a bullet is fired from a gun the kinetic energy of the bullet is _____.

**(a)** Less than the gun
**(b)** Is incomparable
**(c)** More than the gun

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**(d)** Equal to the gun

**Q42.** The square root of 13.69 is _____.

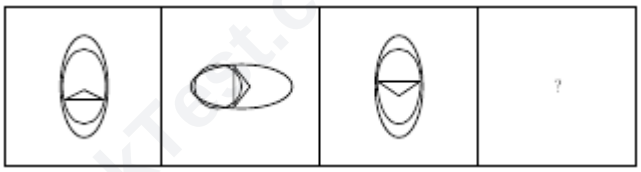
**(a)** 0.37
**(b)** 0.037
**(c)** 3.7
**(d)** 37

**Q43.** Which actor's autobiography is titled 'Khullam Khulla'?

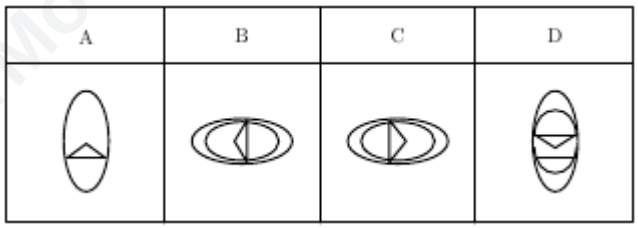
**(a)** Ranbir Kapoor
**(b)** Raj Kapoor
**(c)** Rishi Kapoor
**(d)** Rajiv Kapoor

**Q44.** Select the option that can replace the question mark (?) in the following series.

Question figure:




Option figure:




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

**Q45.** A truck falls off a ledge and drops to the ground in 0.8 secs. How high is the ledge from the ground? ($g = 10\ m/s^2$)

**(a)** 0.32 m
**(b)** 320 m
**(c)** 3.2 m
**(d)** 32 m

**Q46.** The HCF of 54, 66, and 90 is:

**(a)** 6
**(b)** 9
**(c)** 4
**(d)** 3

**Q47.** Given is a statement followed by two arguments numbered I and II. Consider the statement and the arguments and decide which of the arguments is/are strong.

Statement:

Should sports be made compulsory for primary students?

Arguments:

I. Yes, sports are important for physical development.

II. No, sports waste the academic time of students, thus making them weaker in academics.

**(a)** Both argument I and II are strong.

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**(b)** Only argument II is strong.
**(c)** Neither argument I nor II is strong.
**(d)** Only argument I is strong.

**Q48.** Who was the first female CEO of Lloyd's of London?
**(a)** Deanna M. Mulligan
**(b)** Beth E. Mooney
**(c)** Anna Manning
**(d)** Inga Beale

**Q49.** Using the below statements can we verify the conclusions?
Statement:
• All diagrams are figures.
• All figures are three dimensions.
Conclusions:
1. All three dimensions are diagrams
2. All figures are diagrams
**(a)** All the conclusions follow
**(b)** No conclusion follow
**(c)** Only conclusion 1 follows
**(d)** Only conclusion 2 follows

**Q50.** The process where electricity is passed through 10% NaCl is called _____.
**(a)** Hall-Heroult process
**(b)** Chlor-alkali process
**(c)** Bayers Process
**(d)** Chlor-salt process

**Q51.** Name three elements that have a Single electron outermost Shells?
**(a)** Magnesium, Helium, Neon
**(b)** Magnesium, Calcium, Barium
**(c)** Helium, Neon, Argon
**(d)** Lithium, Sodium, Potassium

**Q52.** The Pulichintala Hydroelectric Project is on which river?
**(a)** Penna
**(b)** Krishna
**(c)** Kaveri
**(d)** Godavari

**Q53.** $5.52 – 2.3^2 + 0.8^2 \times 0.12 \div 0.4^4 – 3.14 = ?$
**(a)** -0.07
**(b)** -0.09
**(c)** 0.09
**(d)** 0.07

**Q54.** Solution A has a pH of 6, Solution B has a pH of 8 and Solution C has a pH of 2, Which solution has the most hydrogen ion concentration?
**(a)** B
**(b)** A
**(c)** C
**(d)** None have hydrogen ions

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**Q55.** Find the next number in the following series.

10, 16, 25, 37, ?

**(a)** 42
**(b)** 50
**(c)** 52
**(d)** 45

**Q56.** Who inaugurated Global Entrepreneurship Summit (GES-2017) in Hyderabad jointly with PM Narendra Modi?

**(a)** Ivanka Trump
**(b)** Ivana Trump
**(c)** Melanie Trump
**(d)** Donald Trump

**Q57.** The mean of the observations x, x + 3, x + 5, x + 8, x + 9 is 9. What is the mean of the last three observations?

**(a)** 31/3
**(b)** 32/3
**(c)** 34/3
**(d)** 35/3

**Q58.** Sumana introduces Mahesh and Kumresh as her son's uncle's sons. The boys are Sumana's _____.

**(a)** friends
**(b)** nephews
**(c)** cousins
**(d)** nieces

**Q59.** Which state government will set up the world's first IT campus for differently-abled persons?

**(a)** Haryana
**(b)** Andhra Pradesh
**(c)** Telangana
**(d)** West Bengal

**Q60.** Raghuvir obtained an average of 25 marks in 12 tests. Rumela has been maintaining an average of 23 marks so far, but she has taken only 8 of the tests. How much does Rumela have to score on an average in the remaining 4 tests to match Raghuvir's performance?

**(a)** 26
**(b)** 28
**(c)** 27
**(d)** 29

**Q61.** The oxides of carbon, nitrogen, and Sulphur that are released on burning fossil fuels are

**(a)** Acidic oxides
**(b)** Neutral oxides
**(c)** Amphoteric oxides
**(d)** Basic oxides

**Q62.** Two bones can be connected to each other by another type of connective tissue called the _____.

**(a)** Tendons
**(b)** Cartilage
**(c)** Matrix
**(d)** Ligament

**Q63.** By working 8 hours a day, Ram writes a book in 18 days. How many hours should he work per day to complete his work in 12 days?

**(a)** 9 hours
**(b)** 10 hours

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**(c)** 12 hours
**(d)** 15 hours

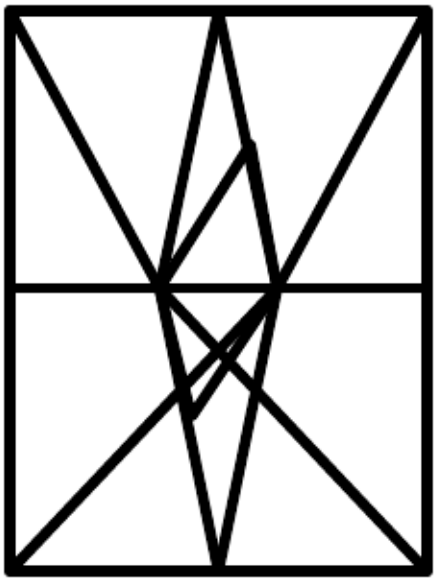
**Q64.** Who among the following was appointed as a whole-time member of market regulator Securities and Exchange Board of India (SEBI) on 7 November 2017?
**(a)** Sanjeev Kaushik
**(b)** UK Sinha
**(c)** Neelam Damodaran
**(d)** V Ramakrishnan

**Q65.** Suresh is facing the south-west direction. He turns 135° clockwise and then turns 45° in the anti-clockwise direction. In which direction he is facing now?
**(a)** North-west
**(b)** South
**(c)** North-East
**(d)** North

**Q66.** Who amongst the following won the Best FIFA Men's Player Award 2017?
**(a)** Lionel Messi
**(b)** Neymar Jr.
**(c)** Cristiano Ronaldo
**(d)** Wayne Rooney

**Q67.** Who was the founder of the Pratihara dynasty?
**(a)** Narasimhadeva I
**(b)** Nagabhata-I
**(c)** Harshvardhan
**(d)** Ramachandra

**Q68.** How many triangles are there in the following figure?



**(a)** 17
**(b)** 14
**(c)** 13
**(d)** 16

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**Q69.** The element with atomic number 57 belongs to:

**(a)** s-block
**(b)** d-block
**(c)** f-block
**(d)** p-block

**Q70.** Aihole Inscription is associated with which of the following rulers?

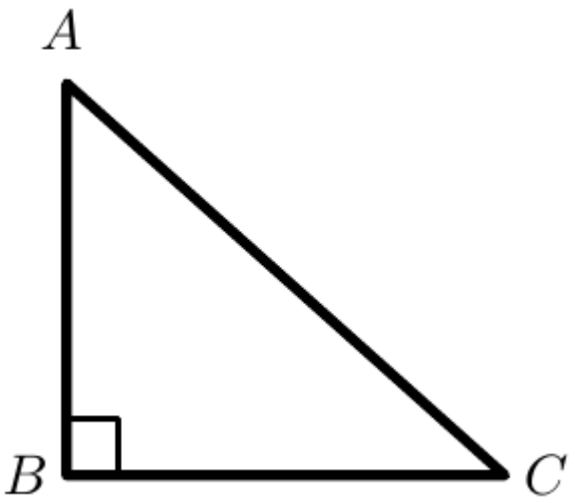
**(a)** Vikramaditya
**(b)** Pulakesin II
**(c)** Akbar
**(d)** Ashoka

**Q71.** There are a red, b yellow and c green tokens in a bag. If a : b ? 13 : 10. b : c ? 6 : 13, then a : b : c is given by:

**(a)** 13 : 6 : 10
**(b)** 13 : 6 : 13
**(c)** 39 : 30 : 65
**(d)** 13 : 60 : 13

**Q72.** Read the given question and decide which of the following information is sufficient to answer the question.

Question:
What is the area of ΔABC?
Information:
1.




2. AB = 12 cm; BC = 12 cm

**(a)** Only 1 is sufficient.
**(b)** Both 1 and 2 are sufficient.
**(c)** Only 2 is sufficient.
**(d)** Either 1 or 2 is sufficient.

**Q73.** The dehydrating agent used in the conversion of ethanol to ethene is _____

**(a)** Heat
**(b)** Concentrated Sulphuric acid
**(c)** Nickel
**(d)** Sunlight

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**Q74.** In which state is the oldest oil field of India?

**(a)** Assam
**(b)** Punjab
**(c)** Maharashtra
**(d)** Gujarat

**Q75.** Find the next term in this series.

14, 42, 126, _____.

**(a)** 370
**(b)** 378
**(c)** 376
**(d)** 375

**Q76.** Saraswathi and Gauri are sisters. How is Gauri's brother related to Saraswathi's father's father?

**(a)** Grand daughter
**(b)** Uncle
**(c)** Grandson
**(d)** Son

**Q77.** What day would it be on 29^(th) March 2020?

**(a)** Friday
**(b)** Monday
**(c)** Sunday
**(d)** Saturday

**Q78.** Who was the second Indian women footballer to win the Arjuna Award?

**(a)** Oinam Bembem Devi
**(b)** Aditi Chauhan
**(c)** Bala Devi
**(d)** Mithali Raj

**Q79.** Given is a statement followed by two assumptions numbered I and II. Consider the statement and the following assumptions and decide which of the assumptions is/are implicit in the statement.

Statement:

"One of the reasons of obesity is binging on junk food", says a mom to her daughter.

Assumptions:

I. Junk food causes obesity.

II. Rita and Gita are mom and daughter.

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

**Q80.** Rakesh and Ranjit can complete a task in 4 and 6 days, respectively when working alone. Ranjit started working on the task, and was joined by Rakesh after 2 days. How many days will they require to complete the remaining work?

**(a)** 1.6
**(b)** 0.8
**(c)** 2
**(d)** 1.2

**Q81.** A ladder of length 13 metres is placed against the wall and the foot of the ladder is 6.5 metres from the wall. What is the angle of elevation of the ladder leaning against a wall?

**(a)** 105°
**(b)** 30°

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**(c)** 45°
**(d)** 60°

**Q82.** How many leap years are there in a period of 100 years?
**(a)** 23
**(b)** 22
**(c)** 24
**(d)** 25

**Q83.** What is the GDP growth rate for India in 2018-19 projected by IMF?
**(a)** 8.5%
**(b)** 7.3%
**(c)** 9%
**(d)** 6%

**Q84.** Which assumption/s is/are implied from the below statement?
Statement:
The headmistress called for a meeting for all parents and teaching staff to discuss fee structure.
Assumptions:
I. There is a plan to revamp fee structure.
II. To arrive at a common consent.
**(a)** Only II is implicit
**(b)** Only I is implicit
**(c)** Both I and II are implicit
**(d)** Neither I nor II is implicit

**Q85.** In the series below one of the sequences is wrong. Find the wrong option:
100300005, 2000400000, 300040006, 400000600000008
**(a)** 2000400000
**(b)** 400000600000008
**(c)** 100300005
**(d)** 300040006

**Q86.** Who is the first chief commercial officer (CCO) of Bajaj Auto Ltd.?
**(a)** Ramesh Maheshwari
**(b)** Sumeet Narang
**(c)** Rakesh Sharma
**(d)** Eric Vas

**Q87.** If $(x + y) : (x – y) = 5 : 1$ then $(x^2 + y^2) : (x^2 – y^2) = ?$
**(a)** 8 : 17
**(b)** 13 : 5
**(c)** 25 : 9
**(d)** 16 : 1

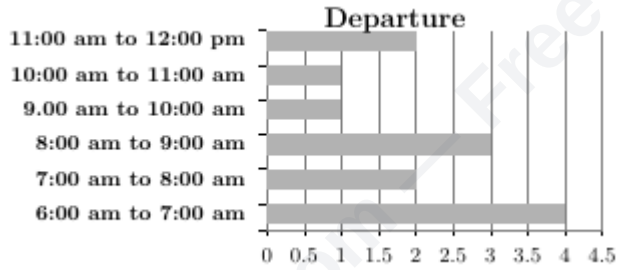
**Q88.** The tissue providing nutrition to the embryo in the uterus is the _____.
**(a)** Fallopian tube
**(b)** Oviduct
**(c)** Placenta
**(d)** Villi

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**Q89.** The cost of same valued 15 tickets is Rs. 9. What will be the cost of 30 tickets?

**(a)** Rs. 19
**(b)** Rs. 15
**(c)** Rs. 18
**(d)** Rs. 16

**Q90.** As per the below chart, during which hour there is the maximum number of departure?




**(a)** 9:00 am to 10:00 am
**(b)** 7:00 am to 8:00 am
**(c)** 6:00 am to 7:00 am
**(d)** 8:00 am to 9:00 am

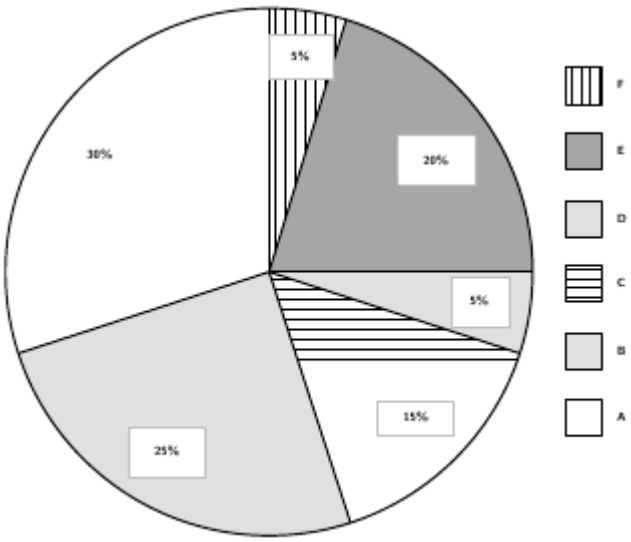
**Q91.** What is the compound interest on Rs. 31250 at 8% per annum for 23/4 years?

**(a)** Rs. 7337
**(b)** Rs. 7387
**(c)** Rs. 7800
**(d)** Rs. 7300

**Q92.** _____ never occurs singly in nature.

**(a)** Momentum
**(b)** Force
**(c)** Velocity
**(d)** Pressure

**Q93.** The given pie chart shows information about Non-Performing Assets (NPA) processed by the various banks of India till December 2017.




If the total NPAs under all the banks are worth Rs. 300 lakh crores, then NPAs worth how much (in Rs. lakh crores) does Bank 'E' contain till December 2017?

**(a)** 20
**(b)** 60

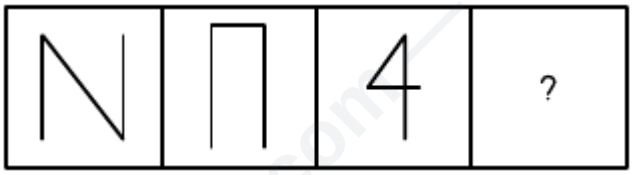
**(c)** 40
**(d)** 80

**Q94.** _____ can reproduce by budding.

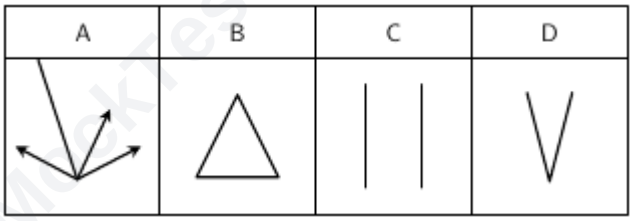
**(a)** Hydra
**(b)** Earthworms
**(c)** Lobsters
**(d)** Starfish

**Q95.** Which of the answer figures will come next in following problem figure series?

Problem figure:




Answer figures:

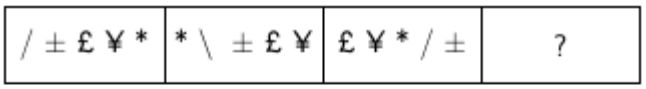


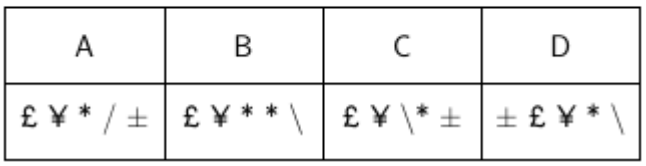

**(a)** A
**(b)** B
**(c)** D
**(d)** C

**Q96.** Who was the Chairman of the Drafting Committee of the Indian Constitution?

**(a)** Jawaharlal Nehru
**(b)** Dr. BR Ambedkar
**(c)** Vallabhai Patel
**(d)** Dr. Rajendra Prasad

**Q97.** Which figure follows next?




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

**Q98.** The size of the image formed by a converging mirror when the object is placed at principal focus is _____.

**(a)** highly magnified
**(b)** diminished
**(c)** of the same size
**(d)** point image

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**Q99.** Read the given statement(s) and conclusions carefully and select which of the conclusions logically follow(s) from the statement(s).

Statement:

• All wool are yarn.

• Some wool are rough.

Conclusions:

1. All rough are wool.

2. Some Yarn are rough.

**(a)** Both conclusions follow.

**(b)** Only conclusion I follows.

**(c)** Neither I nor II follows.

**(d)** Only conclusion II follows.

**Q100.** A galvanometer is used to:

**(a)** detect the direction of light

**(b)** detect the direction of the sound

**(c)** detect the direction of the current

**(d)** detect the direction of magnetic induction

## ANSWER KEY

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

## SOLUTIONS

**Q1. Answer: (d) B**

Here, only in ‘option figure B’ the position of star (inside triangle), small square (beside head vertex) and triangle (isosceles triangle) and square touching the circumference of the circle are oriented as in the question figure and closely resembles it.

Hence, “figure B” is the correct answer.

**Q2. Answer: (a) Anjolie Ela Menon**

• Noted artist Anjolie Ela Menon received the National Kalidas Samman award 2018 for visual arts from the Madhya Pradesh government.

• The award was conferred in recognition of her insightful and sensitive portrayal of the identity and spirit of women through her meaningful paintings in a variety of media.

• Menon is India’s most accomplished artist and is the recipient of the Padma Shri.

• Kalidas Samman was established in the year 1980-81. In this award, Rs. 2,00,000 and a citation is presented in the fields of classical music, classical dance, theatre, and visual art.

• It is a prestigious award presented annually by the government of Madhya Pradesh.

• The award is named after Kalidasa, a writer of ancient history.

Additional Information

• Kalidas Samman award in 2019: Dr Anil Rastogi
• Kalidas Samman award in 2020: Pandit Bhajan Sopori
• Kalidas Samman award in 2021: Pt M Venkateshkumar
• Kalidas Samman award in 2022: Professor Raj Bisaria

**Q3. Answer: (d) Fe2O3**

• The chemical formula of Iron (III) oxide is Fe2O3
• Iron is extracted from iron ore in a huge container called a blast furnace. Iron ores such as haematite contain iron(III) oxide, Fe2O3.
• FeO is also oxide of iron known as Iron(II) oxide or Ferrous oxide. FeO in the mineral form is known as a wustite
• Fe3O4is the chemical formula of Magnetite, Magnetite is a mineral and one of the main iron ores of iron.

**Q4. Answer: (c) P**

• The three elements other than Phosphorus (P) i.e Silicon (Si), Arsenic (As), and Germanium (Ge) are Metalloids while Phosphorus (P) is a non-metal
• A metalloid is a chemical element with properties that are intermediate between those of metals and nonmetals.
• In the modern periodic table, metalloids occur along a diagonal line from boron to polonium.
• Metalloids are least in number, listed in order of increasing atomic number, the metalloids are:
• Boron (B)
• Silicon (Si)
• Germanium (Ge)
• Arsenic (As)
• Antimony (Sb)
• Tellurium (Te)
• polonium (po)

**Q5. Answer: (b) 5016**

Shortcut Trick

The sequence repeats every 4 terms: 1, 2, 3, 4.

Sum of one complete cycle = 1 + 2 + 3 + 4 = 10.

Number of complete cycles in 2007 terms = 2007 ÷ 4 = 501 cycles with 3 terms remaining.

Total Sum = (501 × 10) + (1 + 2 + 3) = 5010 + 6 = 5016.

Therefore The correct answer is 5016.

Alternate Method

Given: Sequence is 1, 2, 3, 4, 1, 2, 3, 4, ...

Formula: Total Sum = (Number of full cycles × Sum per cycle) + Sum of remaining terms

=> Cycle length = 4

=> Sum of 4 terms = 1 + 2 + 3 + 4 = 10

=> Dividing 2007 by 4: Quotient = 501, Remainder = 3

=> Total Sum = (501 × 10) + (First 3 terms of cycle)

=> Total Sum = 5010 + (1 + 2 + 3)

=> Total Sum = 5010 + 6 = 5016

Therefore The correct answer is 5016.

Additional Information

Periodic Sequences

A sequence that repeats its values in regular cycles is called a periodic sequence. The length of the smallest repeating block is the period.

Arithmetic Progression (AP) Sum

For a standard AP, the sum of n terms is S_n = n/2 × [2a + (n−1)d]. However, cyclic sequences are solved by grouping.

Remainder Theorem in Sequences

To find the n^(th) term of a repeating sequence, find n mod cycle_length. If the remainder is 0, it is the last term of the block.

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**Q6. Answer: (b) 9.6%**

Shortcut Trick

Interest for 3 months = Rs. 27

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

Rate % = (Annual Interest ÷ Principal) × 100

Rate % = (108 ÷ 1125) × 100 = 9.6%

Therefore The correct answer is 9.6%.

Alternate Method

Given:

Principal (P) = Rs. 1,125

Interest (I) = Rs. 27

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

Formula Used:

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

Calculations:

=> 27 = (1125 × R × 1/4) ÷ 100

=> 27 × 100 = 1125 × R ÷ 4

=> 2700 × 4 = 1125 × R

=> 10800 = 1125 × R

=> R = 10800 ÷ 1125

=> R = 9.6%

Therefore The correct answer is 9.6%.

Additional Information

Simple Interest vs Compound Interest

Simple Interest is calculated only on the principal amount, while Compound Interest is calculated on the principal and the accumulated interest of previous periods.

Time Conversion

In interest formulas, Time (T) must always be in years. Convert months to years by dividing by 12, and days to years by dividing by 365.

Amount Formula

The total amount (A) at the end of the period is the sum of Principal and Interest: A = P + SI = P(1 + RT/100).

**Q7. Answer: (c) Ministry of Women and Child Development**

• The Ministry of Women and Child Development in collaboration with the Ministry of Panchayati Raj launched a nation-wide training program for Elected Women Representatives (EWRs) of Panchayats.

• The training program will empower the EWRs of panchayats by magnifying their ability, capacity, and skills in governance and administration of villages.

• This program will also help the women in the daily functioning of Panchayats and will also provide knowledge about the various laws and rights for women in the Indian constitution.

**Q8. Answer: (b) D**

Here, every symbol except ‘symbol D’ is a mathematical operation symbol, where as figure D is a double quotation mark.

Hence, “D” is the correct answer.

**Q9. Answer: (d) Mumbai**

• The Gateway of India is located in Mumbai, Maharashtra

• Gateway of India was built by the British government. It was designed by George Wittet. He was a Scottish Architect and was asked to design a Gateway in order to commemorate the visit of King George V and Queen Mary, prior to the Delhi Durbar, in December 1911

**Q10. Answer: (a) Rs. 7250**

Shortcut Trick

Difference in Profit% and Loss% = 6% − (−6%) = 12%.

Given that this 12% difference is equal to Rs. 870.

Using the unitary method: 12% → 870.

Therefore, 100% (Cost Price) = (870 ÷ 12) × 100.

Cost Price = 72.5 × 100 = Rs. 7250.

Therefore The correct answer is Rs. 7250.

Alternate Method

Given → Gain = 6%, Loss = 6%, Difference in Selling Prices = Rs. 870.

Formulas → SP = CP × (100 + Gain%) ÷ 100 | SP = CP × (100 − Loss%) ÷ 100.

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

=> Selling Price at 6% gain (SP1) = 1.06x.

=> Selling Price at 6% loss (SP2) = 0.94x.

=> Difference: SP1 − SP2 = 1.06x − 0.94x = 0.12x.

=> 0.12x = 870 => x = 870 ÷ 0.12 = 7250.

Therefore The correct answer is Rs. 7250.

Additional Information

Relationship between Gain and Loss

When an item is sold at a gain and then at a loss, the numerical difference between the two selling prices represents the sum of the gain and loss percentages of the Cost Price.

Cost Price as Base

Unless stated otherwise, Profit% and Loss% are always calculated on the Cost Price. CP is always considered 100% in percentage-based calculations.

**Q11. Answer: (b) 11.5 m**

Shortcut Trick

Distance moved (d) = h' × (cot θ1 − cot θ2), where h' is height above eye level.

7.3 = h' × (cot 30° − cot 45°) => 7.3 = h' × (√3 − 1).

h' = 7.3 ÷ (1.73 − 1) = 7.3 ÷ 0.73 = 10 m.

Total Height of pole = h' + height of boy = 10 + 1.5 = 11.5 m.

Therefore The correct answer is 11.5 m.

Alternate Method

Given: Height of boy = 1.5 m, Distance moved = 7.3 m, Angles = 30° and 45°.

Let h' be the height of the pole above the boy's eye level.

In triangle with 45°: tan 45° = h' / base2 => 1 = h' / base2 => base2 = h'.

In triangle with 30°: tan 30° = h' / (base2 + 7.3).

=> 1/√3 = h' / (h' + 7.3)

=> h' + 7.3 = h'√3

=> 7.3 = h'(√3 − 1)

=> 7.3 = h'(1.73 − 1) => 7.3 = h' × 0.73

=> h' = 10 m.

=> Total height of pole = h' + 1.5 = 10 + 1.5 = 11.5 m.

Therefore The correct answer is 11.5 m.

Additional Information

Angle of Elevation

The angle formed by the line of sight with the horizontal when looking upwards at an object.

Height and Distance Relation

For two angles of elevation α and β (where β > α), the distance moved d is given by d = h(cot α − cot β).

Standard Trigonometric Values

tan 30° = 1/√3, tan 45° = 1, tan 60° = √3. Note: √3 ≈ 1.732 and √2 ≈ 1.414.

**Q12. Answer: (c) Monera**

• Monera are single-celled organisms with no true nuclear membrane.

• It is a kingdom that contained unicellular organisms with a prokaryotic cell organization having no nuclear membrane and vacuoles but having a rigid cell wall, reproducing through binary fission. Example: bacteria.

• R.H. Whittaker was the first to propose the five-kingdom classification of the world's flora and fauna into the Animalia, Plantae,

Fungi, Protista, and Monera in 1969.

**Q13. Answer: (c) [figure]**

As we know that there is no relation between car, park and satellite.So the best possible venn diagram is as follows,

Hence, “figure 3” is the correct answer.

**Q14. Answer: (a) 30 C**

Resistance given here is Irrelevant

As Current, I = 0.5 A

time, t = 1 minute = 1 × 60 = 60 seconds

let the total charge flown = Q

→ We know that Q = I × t

Where Q = charge in Coulombs

I = Current flowing in Ampere

t = time duration in seconds

→ So now Q = 0.5 × 60

Q = 30 A sec or Coulombs

**Q15. Answer: (a) 420 m**

Shortcut Trick

Convert speed to m/s: 36 × (5/18) = 10 m/s.

Total distance covered in 53 seconds = 10 × 53 = 530 m.

Initial distance = Total distance − Train length = 530 − 110 = 420 m.

Therefore The correct answer is 420 m.

Alternate Method

Given:

Length of train (L) = 110 m

Speed of train (S) = 36 km/hr

Time taken (T) = 53 seconds

Formula Used:

Distance = Speed × Time

Total Distance = Length of train + Initial distance of pole from front end

Calculations:

=> Speed in m/s = 36 × (5/18) = 10 m/s

=> Total distance = Speed × Time = 10 × 53 = 530 m

=> Initial distance + 110 = 530

=> Initial distance = 530 − 110

=> Initial distance = 420 m

Therefore The correct answer is 420 m.

Additional Information

Unit Conversion

To convert km/hr to m/s, multiply by 5/18. To convert m/s to km/hr, multiply by 18/5.

Train crossing a Stationary Object

When a train crosses a pole or point object, the distance covered equals the length of the train.

Train crossing a Platform

When a train crosses a platform or bridge, the total distance covered is the sum of the length of the train and the length of the platform.

**Q16. Answer: (c) Rs. 6392.75**

Shortcut Trick

Direct calculation: Target Value = Given Value × (Inverted Given Fraction) × (Target Fraction)

Required value = 10116 × (7 ÷ 9) × (13 ÷ 16)

=> 1124 × 7 × 13 ÷ 16 = 7868 × 13 ÷ 16

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=> 491.75 × 13 = 6392.75
Therefore The correct answer is Rs. 6392.75.
Alternate Method
Given:
Value of 9/7 portion of land = Rs. 10116
Formula Used:
Total Worth (X) = Value ÷ Fraction
Required Worth = Total Worth × Required Fraction
Calculations:
=> Let the total worth of land be X.
=> (9 ÷ 7) × X = 10116
=> X = (10116 × 7) ÷ 9
=> X = 1124 × 7 = 7868
=> The total worth of the land is Rs. 7868.
=> Now, find 13/16 worth of the land:
=> Required value = (13 ÷ 16) × 7868
=> Required value = 13 × 491.75
=> Required value = 6392.75
Therefore The correct answer is Rs. 6392.75.
Additional Information
Reciprocal (Multiplicative Inverse)
To find the total value when a fraction of it is known, multiply the given value by the reciprocal of that fraction.
Unitary Method for Fractions
If portion A = Value V, then portion B = (V ÷ A) × B. This is the fastest way to solve proportionality problems.
Fraction Conversion
An improper fraction (like 9/7) represents a value greater than 1, while a proper fraction (like 13/16) represents a value less than 1.

**Q17. Answer: (b) 76**

Shortcut Trick
Let Uddalak's present age be u and Shaan's be s.
Condition 1: s = 1.6u − 4 => s + 4 = 1.6u.
Condition 2: 26 years ago, (u − 26) = 0.5(s − 26) − 1.
Testing options for s: If s = 76, then 76 + 4 = 1.6u => 80 = 1.6u => u = 50.
Check Condition 2: (50 − 26) = 24; 0.5(76 − 26) − 1 = 0.5(50) − 1 = 25 − 1 = 24. Matches!
Therefore The correct answer is 76 years.
Alternate Method
Given:
Current age of Shaan = s, Current age of Uddalak = u.
Equations:
=> s = 1.6u − 4 --- (Eq. 1)
=> u − 26 = (s − 26) ÷ 2 − 1 --- (Eq. 2)
Calculations:
=> From Eq. 2: 2(u − 26) = s − 26 − 2
=> 2u − 52 = s − 28
=> s = 2u − 24
=> Equating both values of s: 1.6u − 4 = 2u − 24
=> 2u − 1.6u = 24 − 4
=> 0.4u = 20
=> u = 20 ÷ 0.4 = 50
=> Substitute u = 50 in Eq. 1: s = 1.6 × 50 − 4
=> s = 80 − 4 = 76
Therefore The correct answer is 76 years.

Additional Information

Linear Equations in Ages

Age problems often involve translating verbal statements into linear equations. If 'x' is current age, age 'n' years ago is (x − n) and age 'n' years hence is (x + n).

Ratio of Ages

The difference between the ages of two people remains constant throughout their lives, even if the ratio of their ages changes over time.

**Q18. Answer: (b) National Institution for Transforming India**

• National Institution for Transforming India (NITI Aayog), is a Government of India policy think-tank established by the BJP government to replace the Planning Commission.

• Shri Arvind Panagariya was first Vice-Chairman of Niti Aayog

• The Chairman of NITI Ayog is the Prime Minister of India. He has the first right to preside over its meetings. Vice-Chairman presides over the NITI Ayog in PM's absence.

• Parameswaran Iyer is the current CEO of Niti Ayog

• Dr. Suman K Bery : Vice Chairperson of NITI Aayog.

**Q19. Answer: (a) KGLC**

The pattern followed here is as follows,

Similarly,

Hence, "KGLC" is the correct answer.

**Q20. Answer: (c) 90 Kwh**

Given data

=> Rated value of the electric lamp (P) = 1000 watts

=> Amount of time the iron is being used = 3 × 30 = 90 hours

=> t = 90 h

We know that, Power(P) = E/t

Where 'P' is power in watts and 'E' is energy consumed in watt-hours and 't' is time.

Substituting the values in the above equation, we get

1000 = E/90

E = 90000 Watt-Hours

E = 90 kWh or units. (1 Kilo Watt Hour = 1 unit)

Hence, the energy consumed by the lamp in 30 days (E) = 90 kWh

**Q21. Answer: (a) 28**

Using BODMAS rule,

=> 70 ÷ 5 × (10 – 8 ÷ 2) ÷ 3

=> 14 × (10 – 4) ÷ 3

Therefore 14 × 2 = 28

**Q22. Answer: (a) Against the direction of the force**

• The force of friction always acts in a direction opposite to that in which the body tends to move, means against the direction of the force.

• Till the limiting value is reached, the magnitude of friction is exactly equal to the force which tends to move the body.

• The magnitude of the limiting friction bears a constant ratio to the normal reaction between the two surfaces.

• The force of friction depends upon the roughness/smoothness of the surfaces.

• The force of friction is independent of the area of contact between the two surfaces.

**Q23. Answer: (d) Only argument I is strong.**

• The statement is talking about linking the rivers. The argument I claims that linking the rivers will lead to complete "eradication of water shortage in remote areas". Taking steps that can eradicate water shortage, in the long run, is necessary and a must. Therefore, this can be considered a strong reason to prioritize linking rivers. Hence, argument I is strong.

• Argument II is talking about "river contamination" which is not mentioned in the statement at all.

• Hence, only argument I is strong.

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**Q24. Answer: (d) halogens**

• The Halogens are the elements belonging to Group 17 in the periodic table.

| Element Name | Symbol | Atomic Number |
|---|---|---|
| Fluorine | F | 9 |
| Chlorine | Cl | 17 |
| Bromine | Br | 35 |
| Iodine | I | 53 |
| Astatine | At | 85 |

**Q25. Answer: (c) 17**

We count the squares as follows,

Hence, there are “17” squares in the given figure.

**Q26. Answer: (b) B**

Here, every letter is written with its positional value as per the English alphabetical order, except I10. Since, ‘10’ is positional value for ‘J’.

Hence, “I10” is the correct answer.

**Q27. Answer: (d) 14 : 11**

Shortcut Trick

When Perimeters are equal: Ratio of Area of Circle : Area of Square = 14 : 11.

Perimeter of Circle ($2\pi r$) = Perimeter of Square ($4a$).

Ratio = $\pi r^2 : a^2 = \pi r^2 : (\pi r/2)^2 = \pi : \pi^2/4 = 4 : \pi$.

Substituting $\pi = 22/7 \rightarrow 4 : (22/7) = 28 : 22 = 14 : 11$.

Therefore The correct answer is 14 : 11.

Alternate Method

Given: Perimeter of Circle = Perimeter of Square

Formula Used: Area of Circle = $\pi r^2$ | Area of Square = $a^2$

=> $2\pi r = 4a$

=> $a = \pi r / 2$

=> Ratio of Areas = Area of Circle / Area of Square

=> Ratio = $\pi r^2 / (\pi r / 2)^2$

=> Ratio = $\pi r^2 / (\pi^2 r^2 / 4)$

=> Ratio = $4 / \pi = 4 / (22 / 7)$

=> Ratio = $(4 \times 7) / 22 = 28 / 22 = 14 / 11$

Therefore The correct answer is 14 : 11.

Additional Information

Constant Perimeter Comparison

For a given fixed perimeter, a circle encloses the maximum area compared to any polygon or square.

Area and Side Relation

If Area of Circle = Area of Square, then the ratio of their perimeters is $\sqrt{\pi} : 2$.

Standard Ratios

Ratio of circumference to diameter is always $\pi \approx 22/7$ or 3.14.

**Q28. Answer: (a) 1500**

• This windfarm situated in the Kanyakumari district of Tamil Nadu has a capacity of generating 1500 megawatt of power.

• The state’s wind turbines have a total installed capacity of 7.9 gigawatt which makes it a world leader in renewable energy.

**Q29. Answer: (c) 109.0**

• The Mass number is always equal to the sum of the number of protons and the number of neutrons. The mass number determines the Atomic mass of an atom, Mass Number is denoted by A

• The Atomic number of an element is the number of protons present in the nucleus of an atom, Atomic Number is denoted by Z.

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Atomic Number = Number of Protons

Mass Number = Number of Protons + Number of Neutrons

• Here, Mass Number = 298

Number of Protons + Number of Neutrons = 298

Number of Protons = 298 - 189 = 109

Hence, Atomic Number = 109 [As, Atomic Number = Number of Protons]

• Isotopes are defined as elements with the same number of protons but a different number of neutrons present in their nucleus. As the electrons remain the same, so their chemical properties don't change however due to change in neutron number their atomic mass is changed which results in different physical properties like melting, colour, etc.

**Q30. Answer: (b) 4 : 11**

Shortcut Trick

In ΔABC, since DE || BC, DE/BC = AD/AB = 4/(4+3) = 4/7.

Since DE || BC, ΔODE ~ ΔOCB (by AA similarity).

The ratio of corresponding sides DO/OC = DE/BC = 4/7.

Total length DC = DO + OC = 4 + 7 = 11 units.

The required ratio DO : DC = 4 : 11.

Therefore The correct answer is 4 : 11.

Alternate Method

Given: AD : DB = 4 : 3, DE || BC, and O is the intersection of BE and CD.

Formula Used: Basic Proportionality Theorem (BPT) and Triangle Similarity (AA).

=> AD/AB = AD/(AD + DB) = 4/(4 + 3) = 4/7.

=> In ΔADE and ΔABC, DE || BC => ΔADE ~ ΔABC.

=> DE/BC = AD/AB = 4/7.

=> In ΔODE and ΔOCB, angle ODE = angle OCB and angle OED = angle OBC (alternate interior angles).

=> ΔODE ~ ΔOCB => DO/OC = DE/BC = 4/7.

=> DC = DO + OC.

=> DO/DC = DO/(DO + OC) = 4/(4 + 7) = 4/11.

Therefore The correct answer is 4 : 11.

Additional Information

Basic Proportionality Theorem (BPT)

If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio: AD/DB = AE/EC.

Similarity of Triangles

Two triangles are similar if their corresponding angles are equal (AA similarity) and their corresponding sides are in the same ratio.

Ratio of Corresponding Parts

In similar triangles, the ratio of any two corresponding segments (like medians, altitudes, or segments of intersecting lines) is equal to the ratio of the corresponding sides.

**Q31. Answer: (c) 14**

Shortcut Trick

Total work = 6 units (since A+B+C take 6 hours).

Work done in 2 hours = 2 units; Remaining work = 4 units.

Efficiency of (A+B) = 4 units ÷ 7 hours = 4/7.

Efficiency of C = Total efficiency − (A+B) efficiency = 1 − 4/7 = 3/7.

Time for C = Total Work ÷ Efficiency = 6 ÷ (3/7) = 14 hours.

Therefore The correct answer is 14 hours.

Alternate Method

| Person | Days/Hours | Total Work | Efficiency |
|---|---|---|---|
| A + B + C | 6 | 42 | 7 |
| A + B | 10.5 | 4 | |

Given: A+B+C fill in 6 hours. After 2 hours, C is closed. A+B fill remaining in 7 hours.

Calculations:

=> Work done by (A+B+C) in 2 hours = 2/6 = 1/3 of the reservoir.

=> Remaining work = 1 − 1/3 = 2/3 of the reservoir.

=> (A+B) fill 2/3 part in 7 hours.

=> (A+B) fill 1 full part in 7 × (3/2) = 10.5 hours.

=> Let Total Work = LCM(6, 10.5) = 42 units.

=> Efficiency of (A+B+C) = 42 ÷ 6 = 7 units/hour.

=> Efficiency of (A+B) = 42 ÷ 10.5 = 4 units/hour.

=> Efficiency of C = Efficiency of (A+B+C) − Efficiency of (A+B) = 7 − 4 = 3 units/hour.

=> Time taken by C alone = Total Work ÷ Efficiency of C = 42 ÷ 3 = 14 hours.

Therefore The correct answer is 14 hours.

Additional Information

Time and Work Relation

Total Work = Efficiency × Time. Efficiency is inversely proportional to time taken when work is constant.

Pipes and Cisterns

The same logic applies where filling pipes have positive efficiency and outlet pipes (leaks) have negative efficiency.

Combined Efficiency

If multiple gates work together, their individual efficiencies are added: E_(total) = E1 + E2 + ... + E_n.

**Q32. Answer: (d) Pankaj Advani**

• Indian cueist Pankaj Advani won his 17^(th) world title at the IBSF World Billiards Championship 2017 in Doha, Qatar.

• Pankaj beat Mike Russell of England by 6-2 (and won his 17^(th) world title at the IBSF World Billiards Championship 2017.

• He is the winner of the maximum number of world titles in any sport by an Indian

**Q33. Answer: (c) Brij Bhushan Sharan Singh**

• Brij Bhushan Sharan Singh was appointed the Chef de Mission of the Indian contingent for the Asian Games 2018.

• He is the president of Wrestling Federation of India (WFI).

• The 2018 Asian Games took place from August 18 to September 2 in 2018 and were held in cities of Jakarta and Palembang in Indonesia.

• Javelin throwing star Neeraj Chopra was India’s flag bearer in the opening ceremony of the Asian Games 2018.

• By winning 69 Medals in the Asian Games 2018 which includes 15 Gold, 24 Silver, and 30 Bronze Medals India ranked 8^(th) in the medal tally of the Asian Games 2018.

**Q34. Answer: (b) Distance**

• An Odometer is an instrument that indicates distance traveled by a vehicle, such as a motorcycle and motor vehicle automobile

• The device may be electronic, mechanical, or a combination of both

• It is also called as a trip meter in case of short trips of every ride

• The distance mentioned in the odometer generally is in km

**Q35. Answer: (d) C**

The horizontal mirror image of REST is as shown in the below figure:

Hence, “option figure C” is the correct answer.

**Q36. Answer: (b) B**

The mirror image of the given figure is as shown in the following figure,

Hence, “option figure B” is the correct answer.

**Q37. Answer: (b) C**

Here, in every figure, a dotted rectangular figure is enclosed except in option figure C which enclosed a circular figure.

Hence, “option C” is the correct answer.

**Q38. Answer: (d) Pepsin**

• The hydrochloric acid secreted by the gastric glands facilitates the action pepsin.

• Pepsin is an enzyme found in the gastric juice that digests proteins.

• Pepsin was found by German physiologist Theodor Schwann.

• Pepsin affects only partial degradation of proteins into smaller units called peptides which are absorbed by the intestines or broken down further by the pancreatic enzymes.

**Q39. Answer: (c) 97**

| Symbol | • | • | × | ÷ |
|---|---|---|---|---|
| Meaning | • | × | ÷ | • |

Given expression: 23 – 4 + 15 × 3 ÷ 10

After changing the symbols:23 × 4 - 15 ÷ 3 + 10

= 23 × 4 - 5 + 10

= 92 – 5 + 10

= 97

Hence, “97” is the correct answer.

**Q40. Answer: (a) 51420518**

The pattern followed here is as follows,

The letters are coded as per their alphabetical values:

Similarly,

Hence, “51420518” is the correct answer.

**Q41. Answer: (c) More than the gun**

• According to Conservation Of Linear Momentum momentum, the linear momentum of bullet and gun is the same in magnitude but opposite in direction.

• The relation between Kinetic energy and linear momentum is given by -

K.E = $p^2/2$ m

→ now momentum remains the same as said above

Therefore, K.E prop. to 1/2 m

K.E is inversely proportional to the mass of the body

• Therefore body having less mass will have greater kinetic energy and vice versa

• Here, in this case, the bullet is lighter than the gun, therefore, the kinetic energy of the bullet is more than that of the gun.

**Q42. Answer: (c) 3.7**

Given:

We need to find √13.69

Calculations:

Let x be the square root of 13.69

=> $x^2$ = 13.69

=> $x^2$ = 1369/ 100

=> $x^2$ = 37 × 37/ (10 × 10)

=> x = 37/ 10

=> x = 3.7

Shortcut Trick

√13.69 = √(1369/100) = √1369 / √100 = 37 /10 = 3.7

**Q43. Answer: (c) Rishi Kapoor**

• Rishi Kapoor is the author of the book & ldquo; Khullam Khulla: Rishi Kapoor Uncensored.

• It was published in the year 2017.

• The book is about his father’s affairs, his own temptations, crushes on Bollywood actresses, and his own quirks that wife Neetu has to put up with, or why his relationship with son Ranbir is not quite how it should be!

**Q44. Answer: (d) B**

The pattern followed here is that the next image is rotating 90° in a clockwise direction.

Similarly,

Hence, “option figure B” is the correct answer.

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**Q45. Answer: (c) 3.2 m**

Using the second law of motion to compute the height of the ledge

$s = ut + ½ gt^2$

s = height of the ledge

u = Initial velocity

t = time

g = acceleration due to gravity,

→ $s = 0 + ½ \times 10 \times (0.8)^2$ [Intial velocity will be zero]

s = 3.2 m

→ Therefore, the ledge is 3.2 m high from the ground.

**Q46. Answer: (a) 6**

Shortcut Trick

Identify the smallest difference between any two given numbers: 66 − 54 = 12.

The HCF must be a factor of this difference (12).

Factors of 12 are 12, 6, 4, 3, 2, 1.

Checking the largest factor: 12 does not divide 54. Next largest factor 6 divides 54, 66, and 90.

Therefore The correct answer is 6.

Alternate Method

Given: Numbers are 54, 66, and 90.

Formula Used: Prime Factorization Method for finding Highest Common Factor (HCF).

=> Prime factors of 54 = 2 × 3 × 3 × 3

=> Prime factors of 66 = 2 × 3 × 11

=> Prime factors of 90 = 2 × 3 × 3 × 5

=> Common Factors = 2 × 3

=> HCF = 6

Therefore The correct answer is 6.

Additional Information

HCF (Highest Common Factor)

Also known as GCD (Greatest Common Divisor), it is the largest positive integer that divides each of the integers without a remainder.

LCM (Least Common Multiple)

The smallest positive integer that is divisible by each of the given numbers. Relationship: Product of two numbers = HCF × LCM.

Co-prime Numbers

Two numbers are said to be co-prime if their HCF is exactly 1.

**Q47. Answer: (d) Only argument I is strong.**

The argument I holds strong as it stated about the importance of playing sports for “physical development”.

Argument II is talking about the time that is spent in playing sports, which can be managed well in a way that sports and academics go hand in hand. Thus, argument II is not that strong as it does not give us any direct disadvantage of playing sports. Hence, “Only argument I is strong”.

**Q48. Answer: (d) Inga Beale**

- Inga Beale was the first female CEO of Lloyd’s of London
- Lloyd's of London is an insurance and reinsurance market located in London, United Kingdom.

**Q49. Answer: (b) No conclusion follow**

The minimum possible Venn diagram of the given statements,

Conclusions:

I. All three dimensions are diagrams → False (its possible but not definite)

II. All figures are diagrams → False (its possible but not definite)

Hence, “No conclusion follows”.

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**Q50. Answer: (b) Chlor-alkali process**

• When the electricity is passed through the aqueous solution of 10% NaCl (brine) then it decomposes to form sodium hydroxide, a basic compound. This process is called chlor - alkali process.

2Nacl_((aq)) + 2H2o → 2NaOH_((aq)) + cl_(2 (g))+ H_(2(g))

• The three products in this reaction come are -

Sodium hydroxide (NaOH)

Chlorine (Cl2)

Hydrogen(H2)

**Q51. Answer: (d) Lithium, Sodium, Potassium**

Explanation:

• Lithium, Sodium, and Potassium have a Single-electron outermost Shells

• All the elements belonging to the 1^(st) group of the periodic table have one electron in their outermost shell.

• The 1^(st) group elements include hydrogen, lithium, sodium, potassium, Rubidium, caesium and francium.

**Q52. Answer: (b) Krishna**

• The Pulichintala Hydroelectric project is located on River Krishna in Andhra Pradesh.

• It is named after eminent engineer and former Union Minister, Late K L Rao, the Pulichintala dam built across the Krishna River between areas in Nalgonda on one side and Guntur on the other side, is the third major irrigation project, after Srisailam and Nagarjuna Sagar.

**Q53. Answer: (c) 0.09**

Using BODMAS rule:

=> $5.52 – 2.3^2 + 0.8^2 \times 0.12 \div 0.4^4 – 3.14$

=> $5.52 – 5.29 + 0.64 \times 0.12 \div 0.0256 – 3.14$

=> $0.23 + 0.64 \times 4.6875 – 3.14$

Therefore $0.23 + 3 – 3.14 = 0.09$

**Q54. Answer: (c) C**

• The pH level is a measure of the number of Hydrogen ions in a solution.

• The lower the solution or compound on the pH scale, the higher will be the concentration of hydrogen ions.

• Therefore the solution having a pH of 2 i.e Solution C will have the highest concentration of hydrogen ions.

• The pH scale ranges from 0 to 14.

• A pH value of 7 is considered neutral, example - water and pH value > 7 is Basic >pH value < 7 is Acidic

**Q55. Answer: (c) 52**

Shortcut Trick

Identify the difference between consecutive terms.

Differences are: 6, 9, 12... which are multiples of 3.

Next difference = 15.

Next term = 37 + 15 = 52.

Therefore The correct answer is 52.

Alternate Method

Given Series: 10, 16, 25, 37, ?

10

+6

→

16

+9

→

25

+12

→

37

+15

→

52

The pattern follows an arithmetic progression in the first layer of differences.

=> 16 − 10 = 6

=> 25 − 16 = 9

=> 37 − 25 = 12

=> Following the pattern (+3 in each difference), the next difference is 15.

=> Next number = 37 + 15 = 52.

Therefore The correct answer is 52.

Additional Information

Arithmetic Series

A series where the difference between consecutive terms remains constant or follows a specific linear pattern.

Double Difference Series

In some complex series, the difference of the differences (second layer) is constant. Here, the second layer difference is constant at 3.

Common Patterns

Always check for prime numbers, square/cube addition, or geometric ratios if simple differences do not work.

**Q56. Answer: (a) Ivanka Trump**

• Ivanka Trump the daughter of Donald Trump (President of USA) inaugurated Global Entrepreneurship Summit (GES-2017) in Hyderabad jointly with PM Narendra Modi

• India and US co-hosted the Global Entrepreneurship Summit at Hyderabad from November 28 this year.

• The three-day summit to bring together entrepreneurs from the two countries was hosted by India and the US.

**Q57. Answer: (c) 34/3**

Shortcut Trick

Total sum of 5 observations = 5 × 9 = 45.

Sum of variable components (5x) = 45 − (0 + 3 + 5 + 8 + 9) = 20.

So, x = 20 ÷ 5 = 4.

Last three observations are (4+5), (4+8), and (4+9) = 9, 12, 13.

Mean of last three = (9 + 12 + 13) ÷ 3 = 34/3.

Therefore The correct answer is 34/3.

Alternate Method

Given: Observations are x, x+3, x+5, x+8, x+9 and their Mean is 9.

Formula Used: Mean = (Sum of all observations) ÷ (Total number of observations)

=> Mean = [x + (x + 3) + (x + 5) + (x + 8) + (x + 9)] ÷ 5 = 9

=> 5x + 25 = 9 × 5

=> 5x + 25 = 45

=> 5x = 45 − 25

=> 5x = 20

=> x = 4

=> Last three observations: (x + 5), (x + 8), (x + 9)

=> Values: (4 + 5), (4 + 8), (4 + 9) = 9, 12, 13

=> Mean of last three = (9 + 12 + 13) ÷ 3

=> Mean = 34/3

Therefore The correct answer is 34/3.

Additional Information

Arithmetic Mean Properties

If each observation is increased by a constant k, the new mean also increases by k. If each is multiplied by k, the mean is multiplied by k.

Mean of AP Series

For a set of numbers in Arithmetic Progression, the mean is always the middle term (if the number of terms is odd) or the average

of the two middle terms (if even).

Sum of Deviations

The algebraic sum of deviations of a set of observations from their Arithmetic Mean is always zero: Σ(x_i − Mean) = 0.

**Q58. Answer: (b) nephews**

From the given information we can draw two possible family tree diagrams as follows,

Or

From both the diagrams it is clear that “Mahesh and Kumresh” both are Sumana’s nephews.

Hence, “nephews” is the correct answer.

**Q59. Answer: (c) Telangana**

• The Telangana government announced that it will set up an information technology campus for persons with disabilities, claiming this will be the world's first such facility.

• The government entered into an agreement with Vindhya E-Infomedia Private Limited to set up the IT campus, which will focus on creating employment opportunities for persons with disabilities.

• Currently, K. Chandrashekar Rao is the CM and E. S. L. Narasimhan is the governor of Telangana.

**Q60. Answer: (d) 29**

Shortcut Trick

Target Average to match performance = 25 marks.

Rumela’s current deficit per test = 25 − 23 = 2 marks.

Total deficit for 8 tests = 8 × 2 = 16 marks.

Extra marks needed per remaining test = 16 ÷ 4 = 4 marks.

Required average = Target Average + Extra needed = 25 + 4 = 29 marks.

Therefore The correct answer is 29 marks.

Alternate Method

Given: Raghuvir average (12 tests) = 25, Rumela average (8 tests) = 23, Remaining tests = 4.

Formula Used: Total Marks = Average × Number of Tests; Required Average = (Total Required − Current Total) ÷ Remaining Tests

=> Total marks scored by Raghuvir = 12 × 25 = 300 marks.

=> Total marks scored by Rumela so far = 8 × 23 = 184 marks.

=> Remaining marks needed by Rumela = 300 − 184 = 116 marks.

=> Average marks required in 4 tests = 116 ÷ 4 = 29 marks.

Therefore The correct answer is 29 marks.

Additional Information

Average Definition

The average (Arithmetic Mean) is the ratio of the sum of all observations to the total number of observations. Formula: Average = ∑x ÷ n.

Weighted Average

When two groups with averages A1 and A2 and sizes n1 and n2 are combined, the weighted average is (n1A1 + n2A2) ÷ (n1 + n2).

Net Deviation Concept

In any data set, the sum of deviations of all observations from the mean is always zero. This is useful for finding missing values quickly.

**Q61. Answer: (a) Acidic oxides**

• Metals form basic oxide while Non-metals can form acidic oxides in general.

• Generally, Metals can have 1 to 3 electrons in their outermost shell and Non-metals have 4 to 8 electrons in the outermost shell.

• Therefore, carbon, nitrogen, and Sulphur being non-metals will form Acidic oxides.

**Q62. Answer: (d) Ligament**

• Ligament is the connective tissue which connects bone to bone.

• Tendon connects muscle to bone and fasciae connects muscle to muscle.

• Cartilage Smoothen bone surface at joints.

**Q63. Answer: (c) 12 hours**

Shortcut Trick

Apply the M1D1H1 = M2D2H2 rule for constant work.

Here, the person (Ram) is the same, so D1 × H1 = D2 × H2.

18 × 8 = 12 × H2

H2 = (18 × 8) ÷ 12 = 144 ÷ 12 = 12 hours.

Therefore The correct answer is 12 hr.

Alternate Method

Given:

Initial hours (H1) = 8 hours/day

Initial days (D1) = 18 days

Target days (D2) = 12 days

Formula Used:

Total Work = Days × Hours per day (since efficiency is constant)

Calculations:

=> Total Work = 18 × 8 = 144 man-hours

=> Let the required hours per day be x.

=> 12 × x = 144

=> x = 144 ÷ 12

=> x = 12 hours

Therefore The correct answer is 12 hr.

Additional Information

Chain Rule Formula

The general formula is (M1D1H1E1) / W1 = (M2D2H2E2) / W2, where M is men, D is days, H is hours, E is efficiency, and W is work.

Inverse Proportion

When work is constant, the number of days is inversely proportional to the hours worked per day (D prop. to 1/H).

**Q64. Answer: (a) Sanjeev Kaushik**

• Sanjeev Kaushik was appointed as whole-time member of SEBI for a period of three years or till the age of 65 years, whichever is earlier.

• Kaushik replaces S Raman, who retired from the post of a whole-time member in September 2017.

• Prior to this appointment, he was Chairman and Managing Director of India Infrastructure Finance Company Ltd (IIFCL).

• The Securities and Exchange Board of India (SEBI) is the regulator for the securities market in India

• About SEBI: As of May 2022

• Chairman- Madhabi Puri Buch

• Founded- 1992

• Headquarters - Mumbai Maharashtra

**Q65. Answer: (a) North-west**

Following figure shows the information given,

Clearly, Suresh is facing North-west direction.

Hence, “North-West” is the correct answer.

**Q66. Answer: (c) Cristiano Ronaldo**

• Cristiano Ronaldo has caught up with Lionel Messi to become a five-time winner of FIFA’s best player award.

• The Real Madrid forward was crowned player of the year at the FIFA Best ceremony at the London Palladium theatre.

• Lieke Martens, who scored in the final win over Denmark, won the player’s award and Sarina Wiegman collected the coaching accolade.

• Ronaldo is a Portuguese professional footballer who plays for Saudi Arabian club Al Nassr and the Portugal national team. He is a forward and serves as captain for Portugal.

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**Q67. Answer: (b) Nagabhata-I**

The correct answer is Nagabhata-I.

Key Points

• Nagabhatta I was the founder of the Gurjara-Pratiharas Dynasty.

• The Pratiharas Dynasty(8th-11th Century A.D):

• The Pratiharas were also renamed as Gurjara.

• Between the 8th and 11th century A.D, they ruled over northern and western India.

• Pratiharas: A fortification- Against the hostility of the Muslims from the days of Junaid of Sind, the Pratiharas stood as a fortification of India's defense to Mahmud of Ghazni.

Additional Information

• Basic Information about other Kings given in Option:

• Narasimhadeva I: Narasingha Deva I was a powerful monarch and warrior of the Eastern Ganga Dynasty or suryabansha of early medieval Odisha who reigned from 1238 to 1264.

• Harshvardhan: He was an Indian emperor who ruled majorly in North India from 606 to 647 CE. He was a member of the Vardhana dynasty.

• Ramachandra: He was a ruler of the Sauna (Yadava) dynasty of Deccan region in India. He established his capital in Devagiri which is presently located in Maharashtra.

**Q68. Answer: (d) 16**

We can count the triangles as follows,

Hence, there are "16" triangles.

**Q69. Answer: (b) d-block**

• The element with atomic number 57 belongs to d-block.

• Lanthanum having atomic number 57 is a member of d-block elements as the last valence electron enters the d orbital.

• La belongs to the 5d series.

• The d-block elements are called transition metals and have valence electrons in d-orbital that's why such metals named as d-block elements.

• The d-block elements are found in groups 3, 4, 5, 6, 7, 8, 9, 10, 11, and 12 of the periodic table

• Valence shell electronic configuration of d-block element is (n- 1)d1-10 ns1-2.

• There are three series of transition elements which are known as 3d series, 4d series, 5d series.

• 3d series start from Scandium (Sc) to Zinc (Zn), 4d series start from Yttrium (Y) to Cadmium (Cd) and 5d series start from Lanthanum(La) to Mercury (Hg), excluding Cerium (Ce) to Lutetium (Lu).

Mistake Points

The f group started from element 58, before that it comes in 'd group'

**Q70. Answer: (b) Pulakesin II**

The correct answer is Pulakesin II.

Important Points

• Aihole inscription was written by Ravikirti who was a poet during the reign of Pulakeshi II.

• Aihole is situated in Karnataka and is widely recognized as the Cradle of Indian Architecture.

• It served as the capital of Chalukyas.

• This inscription gives information about the conquests of Pulakesin, especially how he defeated Harshavardhana.

Additional Information

• Pulakeshin II, the King of the Chalukya dynasty defeated Harshavardhana when he seeks to enlarge his Empire into the southern peninsula of India.

• Chalukya king Pulakesin II had defeated Harshavardhan on the banks of River Narmada in 618 AD.

**Q71. Answer: (c) 39 : 30 : 65**

Shortcut Trick

To find the combined ratio a : b : c, make the common term b equal in both ratios.

Multiply a : b (13 : 10) by 3 and b : c (6 : 13) by 5 to get b = 30.

New ratios: a : b = 39 : 30 and b : c = 30 : 65.

Therefore The correct answer is 39 : 30 : 65.

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Alternate Method
Given:
Ratio of red (a) to yellow (b) => a : b = 13 : 10
Ratio of yellow (b) to green (c) => b : c = 6 : 13
Calculations:
=> To combine, find LCM of common term b (10 and 6) = 30
=> a : b = (13 × 3) : (10 × 3) = 39 : 30
=> b : c = (6 × 5) : (13 × 5) = 30 : 65
=> a : b : c = 39 : 30 : 65
Therefore The correct answer is 39 : 30 : 65.
Additional Information
Compound Ratio
For two ratios a : b and c : d, the compound ratio is (a × c) : (b × d).
Balancing Ratios
To combine multiple ratios, identify the connecting variable and use the LCM method to make its value identical in all parts.
Inverse Ratio
The inverse ratio of a : b is 1/a : 1/b, which simplifies to b : a.

**Q72. Answer: (b) Both 1 and 2 are sufficient.**

Shortcut Trick
To find the Area of a Triangle, we need at least two sides and the included angle (θ) using the formula: Area = 1/2 × a × b × sin(θ).
From Statement 1: We have AB = 12 cm and BC = 12 cm (two sides).
From Statement 2: We have angle ABC = 90° (the included angle).
Combining both: Area = 1/2 × 12 × 12 × sin(90°) = 72 cm². Therefore, both pieces of information are essential.
Therefore The correct answer is Both 1 and 2 are sufficient.
Alternate Method
Given Information:
Statement 1: AB = 12 cm and BC = 12 cm.
Statement 2: angle ABC = 90°.
Step-by-step Analysis:
=> If we take only Statement 1, ΔABC is isosceles, but without an angle, multiple triangles can be formed with different areas.
=> If we take only Statement 2, ΔABC is right-angled, but without side lengths, the size and area are undefined.
=> Combining both: Base (BC) = 12 cm and Height (AB) = 12 cm since angle B = 90°.
=> Area of ΔABC = 1/2 × Base × Height
=> Area = 1/2 × 12 × 12
=> Area = 6 × 12 = 72 cm².
=> Thus, the information in both statements 1 and 2 together is sufficient to answer the question.
Therefore The correct answer is Both 1 and 2 are sufficient.
Additional Information
Area of a Right-angled Triangle
The area is calculated as 1/2 × base × height, where the base and height are the two sides forming the 90° angle.
General Triangle Area (Sine Rule)
For any triangle with sides a, b and included angle C, the area is given by 1/2 × a × b × sin(C).
Isosceles Right-angled Triangle
If two legs of a right triangle are equal (a = b), the area is 1/2 × a² and the hypotenuse is a√2.
2

**Q73. Answer: (b) Concentrated Sulphuric acid**

• When ethanol is heated with Concentrated Sulphuric acid ethene is obtained, it is known as a dehydration reaction.
• A dehydration reaction is a conversion in which water is lost from the reacting molecule or ion. Dehydration reactions are common methods, the reverse of a hydration reaction.
• A dehydrating agent is a chemical compound used to drive a dehydration reaction and to absorb moisture from its surroundings.

**Q74. Answer: (a) Assam**

• Digboi is known as the Oil City of Assam where the first oil well in Asia was drilled.

• The first refinery was started here as early as 1901 by Assam Oil Company Ltd.

• Digboi has the oldest oil well in operation.

• The Indian Oil Corporation Ltd (IOC) took over the refinery and marketing management of Assam Oil Company Ltd. with effect from 1981 and created a separate division.

**Q75. Answer: (b) 378**

Shortcut Trick

Each term in the number series is obtained by multiplying the previous term by 3.

Pattern: 14 × 3 = 42, 42 × 3 = 126.

Next term => 126 × 3 = 378.

Therefore The correct answer is 378.

Alternate Method

Given Series: 14, 42, 126, ?

14

×3

→

42

×3

→

126

×3

→

378

This is a Geometric Progression (GP) where the common ratio is 3.

=> 1^(st) term = 14

=> 2^(nd) term = 14 × 3 = 42

=> 3^(rd) term = 42 × 3 = 126

=> 4^(th) term = 126 × 3 = 378

Therefore The correct answer is 378.

Additional Information

Multiplication Series

In this pattern, each term is multiplied by a constant number or a changing number to get the next term.

Geometric Progression (GP)

A sequence where each term after the first is found by multiplying the previous one by a fixed, non-zero number called the common ratio.

Difference Pattern

Always check the difference between terms; if the difference increases rapidly, it usually indicates a multiplication or exponential pattern.

**Q76. Answer: (c) Grandson**

The best possible family tree diagram from given information as follows,

Clearly, Saraswathi's father's father will be grandfather of Saraswathi, Gauri and Gauri's brother. Since, all of them i.e., Saraswathi, Gauri and Gauri's brother are siblings.

Hence, Gauri's brother is "grandson" of Saraswathi's father's father.

**Q77. Answer: (c) Sunday**

As 2000 is divisible by 400 the number of odd days is 0.

Number of leap years till 2019 = 4 (2004, 2008, 2012 and 2016)

Number of ordinary years till 2019 = 15

Number of odd days till 2020 = 15 + (4 × 2) = 23 odd days

Number of odd days in January 2020 = 3

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Number of odd days in February 2020 (2020 is the leap year) = 1

Total number of odd days till 29^(th) March 2020 = 23 + 3 + 1 + 29 = 56 odd days = 0 odd days

So, the day on 29^(th) March 2020 is Sunday.

**Q78. Answer: (a) Oinam Bembem Devi**

• Oinam Bembem Devi, flag bearer of Indian women's football over the past 2 decades has been named as the winner of Arjuna Award.

• Bembem becomes the 2^(nd) Indian woman footballer to win the award, the first being Shanti Mullick in 1983.

• Bembem, nicknamed 'Durga of Indian Football, made her international debut in 1995, bowed out on a high after winning SAF Games Gold Medal in Shillong in 2015.

**Q79. Answer: (b) Only assumption I is implicit.**

Assumption I is implicit - Because From the statement we know that "the reasons of obesity is binging on junk food," which is very clear and therefore, we can assume that "junk food causes obesity".

Assumption II is not implicit - Because the statement gives no information about Rita and Gita, so the assumption that "Rita and Gita are mom and daughter" cannot be implied.

Hence, "only assumption I is implicit".

**Q80. Answer: (a) 1.6**

Shortcut Trick

Total Work (LCM of 4 and 6) = 12 units.

Efficiencies: Rakesh = 3 units/day, Ranjit = 2 units/day.

Work done by Ranjit in first 2 days = 2 × 2 = 4 units.

Remaining work = 12 − 4 = 8 units.

Time taken for remaining work = 8 ÷ (3 + 2) = 8/5 = 1.6 days.

Therefore The correct answer is 1.6 days.

Alternate Method

Given: Time taken by Rakesh = 4 days, Time taken by Ranjit = 6 days.

Formula Used: Efficiency = Total Work ÷ Time Taken; Time = Work ÷ Efficiency

| Person | Days | Total Work | Efficiency |
|---|---|---|---|
| Rakesh | 4 | 12 | 3 |
| Ranjit | 6 | 2 | |

=> Ranjit works alone for 2 days.

=> Work completed by Ranjit = 2 × 2 = 4 units.

=> Remaining Work = 12 − 4 = 8 units.

=> Combined efficiency of Rakesh and Ranjit = 3 + 2 = 5 units/day.

=> Time for remaining work = 8 ÷ 5 = 1.6 days.

Therefore The correct answer is 1.6 days.

Additional Information

Combined Efficiency

When multiple people work together, their daily efficiencies are added. Combined Time = Total Work ÷ (Efficiency1 + Efficiency2 + ...).

Work and Wages

Wages are distributed in the ratio of the work done by each individual, which is proportional to (Efficiency × Time).

Fraction Method

If a person does a job in X days, their 1-day work is 1/X. Remaining work = 1 − (Work done).

**Q81. Answer: (d) 60°**

Shortcut Trick

Length of ladder (Hypotenuse) = 13 m

Distance from wall (Base) = 6.5 m

Ratio of Base to Hypotenuse = 6.5 ÷ 13 = 1/2

Since cos θ = 1/2, then θ = 60°.

Therefore The correct answer is 60°.

Alternate Method

Given:

Length of the ladder (AC) = 13 m

Distance of the foot of the ladder from the wall (BC) = 6.5 m

Formula Used:

In a right-angled triangle, cos θ = Base / Hypotenuse

Calculations:

=> cos θ = BC / AC

=> cos θ = 6.5 / 13

=> cos θ = 1 / 2

=> θ = cos^(−1)(1/2)

=> θ = 60°

Therefore The correct answer is 60°.

Additional Information

Trigonometric Ratios

Common values for cos θ: cos 0° = 1, cos 30° = √3/2, cos 45° = 1/√2, cos 60° = 1/2, cos 90° = 0.

Angle of Elevation

The angle of elevation is the angle formed by the line of sight with the horizontal when looking upwards.

Pythagoras Theorem

In any right triangle: Hypotenuse² = Base² + Perpendicular².

**Q82. Answer: (c) 24**

Leap year comes after a period of 4 years.

In a period of 100 years the number of leap years = 100/4 = 25 – 1 = 24

Hence, the correct answer is 24 years.

Century leap year are those which are completely divisible by 400.

for ex: 100, 200 are not leap years while 400, 800, 1200 are leap years.

so if you consider another set of 100 whose 100th year is leap then the answer is 25 but we have to considered 24 as answer because when period of year is not mentioned then the safe is 24.

**Q83. Answer: (b) 7.3%**

• According to the International Monetary Fund (IMF), India's growth is projected to pick up (from 7.1% in 2018) to 7.3% in 2019 and 7.5% in 2020

• The International Monetary Fund (IMF) has projected that global growth will be 3.3% in 2019, down from 3.6% in 2018 and 4% in 2017.

• This lower projection is due to lower global expansion in the second half of 2018 caused because of factors like U.S.-China trade tensions.

**Q84. Answer: (c) Both I and II are implicit**

From the given statement we know that a meeting has been called to discuss the fee structure, and unless there is any change in the fee structure that needs to be discussed, there is no point in a holding a meeting. Hence, assumption I follows.

The idea of any meeting is to discuss the issue and arrive at a decision that is favorable to all, hence assumption II follows.

**Q85. Answer: (d) 300040006**

Shortcut Trick

Each term in the series follows a specific structural pattern based on its position n.

The pattern is: The number starts with n, followed by (n+1) zeros, then (n+1), followed by (n+2) zeros, and ends with (n+2).

For n = 3: 3 + (0000) + 4 + (00000) + 5 → 300004000005.

The given term 300040006 does not match this position-based symmetry.

Therefore The correct answer is 300040006.

Alternate Method

100300005

Pattern

→

2000400000

Pattern

→

300040006

Pattern

→

400000600000008

Let us analyze the structural logic for each term T_n:

=> T1: (1) + 00 + (3) + 0000 + (5) → 100300005 (Valid)

=> T2: (2) + 000 + (4) + 00000 + (6) → Note: If the last digit is 0, the term is 2000400000 (Valid)

=> T3: (3) + 0000 + (5) + 000000 + (7) → Expected: 3000050000007

=> The term 300040006 breaks the incremental digit and zero-gap pattern established in the previous sequences.

=> T4: (4) + 00000 + (6) + 0000000 + (8) → 400000600000008 (Valid)

Therefore The correct answer is 300040006.

Additional Information

Visual/Structural Series

In these series, the pattern depends on the visual placement of digits and the count of zeros between them rather than arithmetic operations.

Wrong Number Identification

To find the wrong term, compare the number of digits and the internal ratios of segments within each term to find the outlier.

Zero-Padding Rules

Many banking exams use nested patterns where the number of zeros increases by a fixed amount k in each successive term.

**Q86. Answer: (c) Rakesh Sharma**

• Bajaj Auto Ltd. appointed Rakesh Sharma as its first chief commercial officer (CCO) to complement the offices of the ED and the CTO on 23 July 2018

• Bajaj Auto Ltd. is a global two-wheeler and three-wheeler manufacturing company based i India.

• It is a manufacturer of motorcycles, scooters and auto rickshaws. Bajaj Auto is a part of the Bajaj Group. It was founded by Jamnalal Bajaj in Rajasthan in the 1940s.

**Q87. Answer: (b) 13 : 5**

Shortcut Trick

Using the Componendo and Dividendo property for the ratio $(x + y) / (x - y) = 5 / 1$:

$x / y = (5 + 1) / (5 - 1) = 6 / 4 = 3 / 2$

Directly substitute $x = 3$ and $y = 2$ into $(x^2 + y^2) : (x^2 - y^2)$:

$(3^2 + 2^2) : (3^2 - 2^2) = (9 + 4) : (9 - 4) = 13 : 5$

Therefore The correct answer is 13 : 5.

Alternate Method

Given: $(x + y) : (x - y) = 5 : 1$

Formula Used: Basic Ratio and Proportion substitution.

=> $(x + y) / (x - y) = 5 / 1$

=> $x + y = 5x - 5y$

=> $5y + y = 5x - x$

=> $6y = 4x$

=> $x / y = 6 / 4 = 3 / 2$

=> Let $x = 3k$ and $y = 2k$

=> $x^2 = 9k^2$ and $y^2 = 4k^2$

=> $(x^2 + y^2) : (x^2 - y^2) = (9k^2 + 4k^2) : (9k^2 - 4k^2)$

=> $(x^2 + y^2) : (x^2 - y^2) = 13k^2 : 5k^2 = 13 : 5$

Therefore The correct answer is 13 : 5.

Additional Information

Componendo and Dividendo Rule

If a / b = c / d, then (a + b) / (a − b) = (c + d) / (c − d). This is used to simplify linear equations in ratios.

Duplicate Ratio

The duplicate ratio of a : b is $a^2 : b^2$. Similarly, the triplicate ratio is $a^3 : b^3$.

Proportion Property

For any four quantities a, b, c, d in proportion (a : b :: c : d), the product of extremes equals the product of means (ad = bc).

**Q88. Answer: (c) Placenta**

• Through the Placenta, the embryo gets nutrition in the uterus from the mother's blood.
• The placenta provides oxygen and nutrients to the baby and removes carbon dioxide and other waste products.
• The placenta connects the growing baby's umbilical cord to the mother by attaching itself to the inner wall of the womb.
• Towards the end of pregnancy, the placenta transfers antibodies from mothers to the fetus.
• HCG(Human chorionic gonadotropin) is also secreted by Placenta

**Q89. Answer: (c) Rs. 18**

Shortcut Trick

In direct proportion, if the quantity doubles, the cost also doubles.

Number of tickets increases from 15 to 30 (a factor of 2).

Therefore, Cost = 9 × 2 = Rs. 18.

Therefore The correct answer is Rs. 18.

Alternate Method

Given:

Cost of 15 tickets = Rs. 9

To find: Cost of 30 tickets

Formula Used:

Unitary Method: Cost of 1 unit = Total Cost ÷ Number of units

Calculations:

=> Cost of 1 ticket = 9 ÷ 15

=> Cost of 1 ticket = Rs. 0.6

=> Cost of 30 tickets = 30 × Cost of 1 ticket

=> Cost of 30 tickets = 30 × 0.6

=> Cost of 30 tickets = Rs. 18

Therefore The correct answer is Rs. 18.

Additional Information

Direct Proportion

Two quantities are in direct proportion if an increase in one leads to a proportional increase in the other. Formula: x1/y1 = x2/y2.

Unitary Method

This method involves finding the value of a single unit first and then multiplying that value by the desired number of units to find the total value.

Inverse Proportion

In inverse proportion, as one quantity increases, the other decreases such that their product remains constant. Formula: x1 × y1 = x2 × y2.

**Q90. Answer: (c) 6:00 am to 7:00 am**

As per given data, the maximum number of departures happened during 6:00 am to 7:00 am

**Q91. Answer: (b) Rs. 7387**

Shortcut Trick

Rate for first 2 years = 8% each; Rate for remaining 3/4 year = 8% × 3/4 = 6%.

Effective Multiplier = 1.08 × 1.08 × 1.06 = 1.1664 × 1.06 = 1.236384.

Compound Interest = Principal × (Multiplier − 1) = 31250 × 0.236384.

CI = Rs. 7387.

Therefore The correct answer is Rs. 7387.

Alternate Method

Given:

Principal (P) = Rs. 31250

Rate (R) = 8% per annum

Time (T) = 2 3/4 years = 2 years and 9 months

Formula Used:

Amount = $P \times (1 + R/100)^n \times [1 + (R \times \text{fraction})/100]$

Compound Interest (CI) = Amount − Principal

Calculations:

=> Amount = $31250 \times (1 + 8/100) \times (1 + 8/100) \times (1 + (8 \times 3/4)/100)$

=> Amount = $31250 \times (108/100) \times (108/100) \times (106/100)$

=> Amount = $31250 \times (27/25) \times (27/25) \times (53/50)$

=> Amount = $(31250 \div 31250) \times 27 \times 27 \times 53$

=> Amount = $1 \times 729 \times 53 = 38637$

=> CI = 38637 − 31250 = 7387

Therefore The correct answer is Rs. 7387.

Additional Information

Compound Interest for Fractional Years

When time is in fractions like a b/c years, Amount = P(1 + R/100)^a × [1 + (R × b/c)/100].

Effective Rate of Interest

For two successive rates x% and y%, the effective rate is [x + y + (xy/100)]%.

CI and SI Difference

The difference between CI and SI for 2 years is given by $P(R/100)^2$.

**Q92. Answer: (b) Force**

• According to Newton, Force is the mutual interaction between two bodies; hence it never occurs singly in nature.

• This is the basis of Newton's third law i.e., "For every action, there is always an equal and opposite reaction".

• This states that forces always occur in pairs i.e., if A exerts a force on B then B will exert an equal and opposite force on A.

→ Additional Information:

• Momentum is defined as the product of mass and velocity of the body and is the measure of the amount of motion contained in a body, Unit of momentum is (kg?m/s).

• Velocity is defined as the displacement of the object in a unit time interval, unit of velocity is m/s.

• The pressure is defined as the force applied perpendicularly per unit area (pressure=force/area), SI unit of pressure is 'Pascal' and its formula sign is Pa.

**Q93. Answer: (b) 60**

NPAs of Bank 'E' till December 2017 = 20% of 300 lakh crores = 60 lakh crores

**Q94. Answer: (a) Hydra**

• Hydra can reproduce by regeneration and budding.

• In budding, initially buds appear as a small bulge. They further grow, and within 2-4 days they become fully-formed hydra. Then it detaches from the parent body.

• In regeneration, regrowth of damaged or lost part takes place.

• Hydra reproduces sexually and asexually both. Asexual reproduction takes place either by budding or by fission.

• Hy dra belongs to Phylum Coelenterata.

**Q95. Answer: (b) B**

The pattern followed here is:

1.

• 3 minimum straight lines

2.

• 3 minimum straight lines

3.

• 3 minimum straight lines

4.

• 3 minimum straight lines

Hence, “option figure B” is the correct answer.

**Q96. Answer: (b) Dr. BR Ambedkar**

• On August 29, 1947, the Drafting Committee of the Indian constitution was set up and Dr. Bhimrao Ramji Ambedkar was appointed its chairman.

• The Drafting Committee was set up for preparing a draft for the new constitution.

• While deliberating upon the draft Constitution, the Assembly moved, discussed and disposed of as many as 2,473 amendments out of a total of 7,635 tabled.

• B.R. Ambedkar was also the first Law Minister of India.

**Q97. Answer: (c) D**

The pattern followed here is as follows,

similarly,

Note: as per pattern followed in the series, we see the elements in the 1^(st) step shift by +1, then in the 2^(nd) step by +2. There is a possibility that in the 3^(rd) step it will be shifted by +3 but as per the given options we seen option D is most suitable were elements are shifted by again +1. In all the other option the 1^(st) elements is not shifted only thus they are eliminated.

Hence, “option figure D” is the correct answer.

**Q98. Answer: (a) highly magnified**

• When the object is placed at the principal focus in case of converging or concave mirror then the parallel ray of light pass through the principal focus F giving us the reflected ray.

• And the second ray of light passes through the center of curvature C and is reflected along the same path forming another reflected ray. In this case, both the reflected rays will become parallel to each other so these rays cannot intersect each other and the image will be formed at infinity.

• The image formed in this case will be highly magnified, real and inverted.

**Q99. Answer: (d) Only conclusion II follows.**

The least possible Venn diagram of the given statements is as follows:

Conclusions:

I. All rough are wool → False (it is possible but not definite)

II. Some Yarn are rough → True.

Hence, “only conclusion II follows”.

**Q100. Answer: (c) detect the direction of the current**

• The galvanometer is an instrument for measuring value and direction of a small electrical current or a function of the current by deflection of a moving coil.

• The deflection is a mechanical rotation derived from forces resulting from the current.

• An ammeter is also used for measuring the magnitude of the current.

• Galvanometer was invented by Johann Schweigger in 1820.

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