

2017 SSC CGL 11 Aug Shift-3

Reasoning

Instructions

For the following questions answer them individually

Question 1

In the following question, select the related word from the given alternatives.

Ampere : Electric current : : Fathom : ?

- A Depth of Water
- B Frequency
- C Sound level
- D Work or energy

Answer: A

Explanation:

Ampere is the SI unit of electric current, similarly fathom is the unit of depth of water.

=> Ans - (A)

Question 2

In the following question, select the related number from the given alternatives.

AKP : 1121256 : : LNO : ?

- A 196125144
- B 144196225
- C 144225196
- D 41521196

Answer: B

Explanation:

Expression = AKP : 1121256 : : LNO : ?

The pattern followed is that the square of the numbers which represents English alphabetical letters is given.

Eg = AKP = $(1, 11, 16)^2 \equiv 1, 121, 256$

Similarly, LNO = $(12, 14, 15)^2 \equiv 144, 196, 225$

=> Ans - (B)

Question 3

In the following question, select the related number pair from the given alternatives.

534 : 2 : : ? : ?

- A 102 : 9
- B 553 : 6
- C 884 : 2

D 999 : 2

Answer: D

Question 4

In the following question, select the odd word from the given alternatives.

A Baseball

B Football

C Hockey

D Snooker

Answer: D

Explanation:

Apart from snooker, all the games mentioned are outdoor sports, hence it is the odd one out.

=> Ans - (D)

Question 5

In the following question, select the odd letters from the given alternatives.

A BOH

B ERK

C HUO

D KXQ

Answer: C

Explanation:

(A) : B (+13 letters) = O (-7 letters) = H

(B) : E (+13 letters) = R (-7 letters) = K

(C) : H (+13 letters) = U (-6 letters) = O

(D) : K (+13 letters) = X (-7 letters) = Q

=> Ans - (C)

Question 6

In the following question, select the odd number from the given alternatives.

A 145

B 463

C 581

D 651

Answer: B

Explanation:

145, 581 and 651 are composite numbers, while 463 is prime.

=> Ans - (B)

Question 7

Arrange the given words in the sequence in which they occur in the dictionary.

1. Clocklipe
2. Cloddier
3. Clodpates
4. Clodpolls
5. Clockwise

A 15234

B 23154

C 24315

D 51234

Answer: A

Explanation:

As per the dictionary,

= Clocklipe -> Clockwise -> Cloddier -> Clodpates -> Clodpolls

≡ 15234

=> Ans - (A)

Question 8

In the following question, which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?

efg _ _ eff _ ghhe _ eff _ gggh _ h

A eghhfe

B ghhhh

C hegefh

D hgefhe

Answer: C

Explanation:

Expression : efg _ _ eff _ ghhe _ eff _ gggh _ h

The pattern followed is that first 'efgh' are written one time, then each of the letters are written twice and then thrice.

=> efg**h** **eeff**gghh **eeeff**gggh**hh**

=> Ans - (C)

Question 9

In the following question, select the missing number from the given series.

5, 13, 40, 104, ?

A 229

B 239

C 259

D 269

Answer: A

Explanation:

Cubes of natural numbers starting from 2 are added.

$$5 + 2^3 = 13$$

$$13 + 3^3 = 40$$

$$40 + 4^3 = 104$$

$$104 + 5^3 = \mathbf{229}$$

=> Ans - (A)

Question 10

The ratio of the present ages of Aman and Ankit is 2 : 1 and the sum of their present ages is 72 years. What will be the Aman's age (in years) after 6 years?

A 30

B 48

C 52

D 54

Answer: D

Explanation:

Let present ages of Aman and Ankit be $2x$ years and x years respectively.

$$\Rightarrow \text{Sum of ages} = 2x + x = 3x = 72$$

$$\Rightarrow x = \frac{72}{3} = 24$$

$$\text{Thus, Aman's age after 6 years} = 2(24) + 6$$

$$= 48 + 6 = 54 \text{ years}$$

=> Ans - (D)

Question 11

There are five girls - R, S, T, P and Q sitting in a row facing north. T is sitting exactly in the middle of the row. Q is sitting to the immediate right and immediate left of P and T respectively. S is not sitting at the extreme end. Who is sitting third to the left of R?

A P

B Q

C S

D T

Answer: B

Explanation:

T is sitting exactly in the middle of the row, => __ T __

Q is sitting to the immediate right and immediate left of P and T respectively, => P Q T __

S is not sitting at the extreme end, => S is sitting to the immediate right of T.

∴ Arrangement : **P Q T S R**

=> Q is sitting third to the left of R.

=> Ans - (B)

Question 12

In the following question, from the given alternative words, select the word which cannot be formed using the letters of the given word.

ERADICATE

A AREA

B CARE

C DICE

D TASTE

Answer: D

Explanation:

The word ERADICATE does not contain any 'S', thus the word 'Taste' cannot be formed.

=> Ans - (D)

Question 13

In a certain coded language, 'hit ka tom' is written as 'tie the shoes', 'ka lo fod' is written as 'shoes of leather' and 'lo tin lot' is written as 'leather and raxin'. How is 'of' written in this code language?

A fod

B ka

C lo or fod

D tin

Answer: A

Explanation:

In the first two statements, common word is 'shoes' coded as = 'ka'

In the last two statements, common word is 'leather' = 'lo'

Thus, remaining word in the 2nd statement is 'of' coded as = **'fod'**

=> Ans - (A)

Question 14

If "-" means "added to", "+" means "divided by", "÷" means "multiplied by", "x" means "subtracted from", then

$$13 + 12 \times 9 \div 3 - 6 = ?$$

A $-117/11$

B $117/11$

C $-237/12$

D $-239/12$

Answer: D

Explanation:

Expression : $13 + 12 \times 9 \div 3 - 6 = ?$

$$\equiv 13 \div 12 - 9 \times 3 + 6$$

$$= \frac{13}{12} - 27 + 6$$

$$= \frac{13}{12} - 21 = \frac{13-252}{12}$$

$$= \frac{-239}{12}$$

=> Ans - (D)

Question 15

If $6 @ 4 @ 7 = 109$ and $2 @ 5 @ 11 = 150$, then what is the value of A in $A @ 8 @ 9 = 289$?

A 5

B 8

C 12

D 17

Answer: C

Explanation:

The pattern followed is that sum of squares of the number is written on the right.

$$\text{Eg} = 6^2 + 4^2 + 7^2 = 36 + 24 + 49 = 109$$

$$\text{and } 2^2 + 5^2 + 11^2 = 4 + 25 + 121 = 150$$

$$\text{Similarly, } A^2 + 8^2 + 9^2 = 289$$

$$\Rightarrow A^2 + 64 + 81 = 289$$

$$\Rightarrow A^2 = 289 - 145 = 144$$

$$\Rightarrow A = \sqrt{144} = 12$$

=> Ans - (C)

Question 16

In the following question. select the number which can be placed at the sign of question mark (?) from the given alternatives.

	20	72	
2	3	6	

	90	110	
3	7	4	

	56	?	
1	7	6	

A 112

B 144

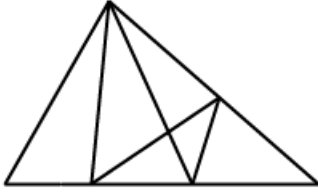
C 156

D 186

Answer: C

Question 17

How many triangles are there in the given figure ?



A 13

B 14

C 15

D 16

Answer: C

Question 18

In the following question below are given some statements followed by some conclusions. Taking the given statements to be true even if they seem to be at variance from commonly known facts, read all the conclusions and then decide which of the given conclusion logically follows the given statements.

Statements:

- I. Some banks are private.
- II. All private are industry.

Conclusions:

- I. Some banks are industry.
- II. All banks are industry.

A Only conclusion (I) follows.

B Only conclusion (II) follows.

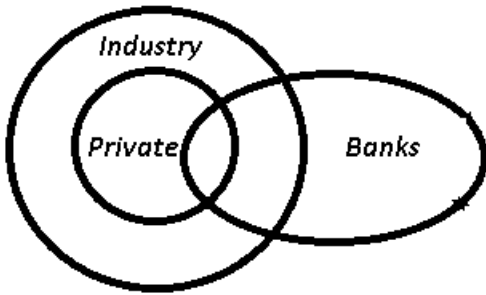
C Neither conclusion (I) nor conclusion (II) follows.

D Both conclusions follow.

Answer: A

Explanation:

The venn diagram for the above statements is :



I. Some banks are industry = true

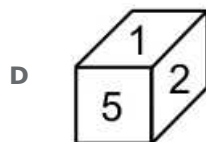
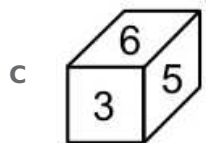
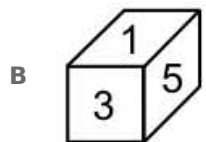
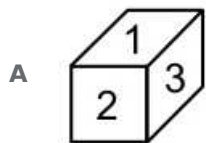
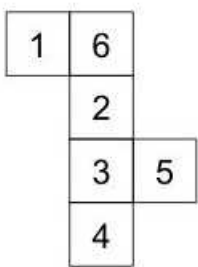
II. All banks are industry = false

Thus, only conclusion (I) follows.

=> Ans - (A)

Question 19

From the given options. which figure can be formed by folding the figure given in the question?



Answer: A

Explanation:

When we fold the above figure, side with number 3 will be the bottom and 6 will be top.

Also, 4 will face 2 and 1 will face 5.

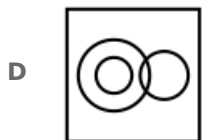
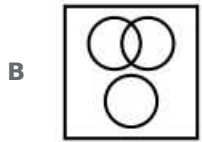
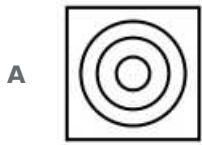
Thus, (1,5) and (3,6) cannot be the adjacent sides of the cube.

=> Ans - (A)

Question 20

Identify the diagram that best represents the relationship among the given classes.

Animal, Leopard, Lion



Answer: C

Explanation:

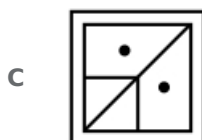
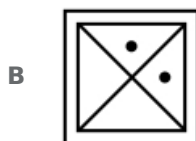
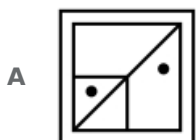
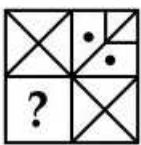
Both leopard and lion are animals but are completely different from each other.

Thus, the third figure best describes above relationship.

=> Ans - (C)

Question 21

Which answer figure will complete the pattern in the question figure



D



Answer: C

Explanation:

When we complete the question figure, we get :



Thus, the third figure matches the figure in blue colour.

=> Ans - (C)

Question 22

From the given answer select in one in which the question figure is hidden / embedded



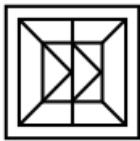
A



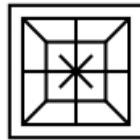
B



C



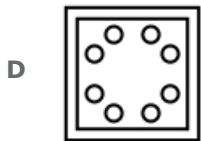
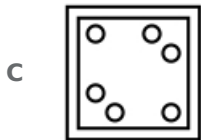
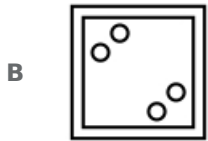
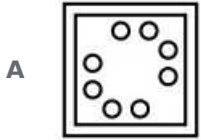
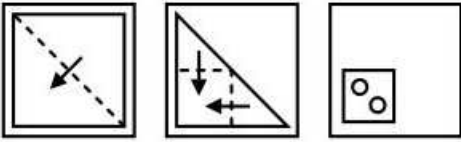
D



Answer: A

Question 23

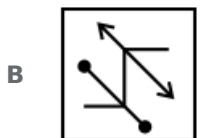
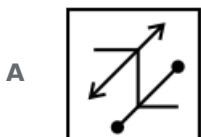
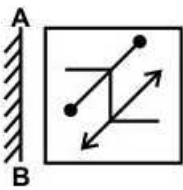
A piece of paper is folded and punched as shown below in the question figures. From the given answer figures, indicate how it will appear when opened.

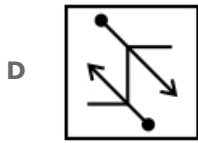
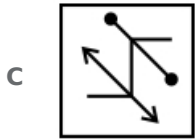


Answer: A

Question 24

If a mirror is placed on the line MN, then which of the answer figures is the right image of the given figure?





Answer: C

Explanation:

A vertical mirror is placed, so the elements at left will appear right and vice-versa. Thus, both the parallel lines currently of which are right diagonals will appear as left diagonals in the mirror image, and thus first option is not possible.

Also, the line with circular ends will remain above the arrow, so the second and last options are eliminated.

=> Ans - (C)

Question 25

A word is represented by only one set of numbers as given in any one of the alternatives. The sets of numbers given in the alternatives are represented by two classes of alphabets as shown in the given two matrices. The columns and rows of Matrix-I are numbered from 0 to 4 and that of Matrix-II are numbered from 5 to 9. A letter from these matrices can be represented first by its row and next by its column, for example, 'F' can be represented by 03, 34, etc., and 'A' can be represented by 31, 43, etc. Similarly, you have to identify the set for the word "RATES".

Matrix - I

	0	1	2	3	4
0	A	G	R	F	E
1	F	E	A	G	R
2	G	R	F	E	A
3	E	A	G	R	F
4	R	F	E	A	G

Matrix - II

	5	6	7	8	9
5	T	P	U	S	O
6	S	O	T	P	U
7	P	U	S	O	T
8	O	T	P	U	S
9	U	S	O	T	P

A 33, 00, 98, 30, 88

B 14, 43, 55, 11, 68

C 21, 24, 86, 42, 56

D 02, 12, 67, 04, 96

Answer: D

Explanation:

(A) : 33, 00, 98, 30, 88 = RATEU

(B) : 14, 43, 55, 11, 68 = RATEP

(C) : 21, 24, 86, 42, 56 = RATEP

(D) : 02, 12, 67, 04, 96 = **RATES**

=> Ans - (D)

Instructions

For the following questions answer them individually

Question 26

In the following question, some part of the sentence may have errors. Find out which part of the sentence has an error and select the appropriate option. If a sentence is free from error, select 'No error'.

Ritika decided to get up early (a)/ to wear a nice dress (b)/ and visit her aunt. (c)/ No Error (d)

- A Ritika decided to get up early
- B to wear a nice dress
- C and visit her aunt
- D No Error

Answer: C

Question 27

In the following question, some part of the sentence may have errors. Find out which part of the sentence has an error and select the appropriate option. If a sentence is free from error, select 'No error'.

The student asked me if (a)/ I knew that Kalidas was the greater (b)/ than any other poet. (c)/ No Error (d)

- A The student asked me if
- B I knew that Kalidas was the greater
- C than any other poet
- D No Error

Answer: B

Question 28

In the following question, the sentence given with blank to be filled in with an appropriate word. Select the correct alternative out of the four and indicate it by selecting the appropriate option.

It is mainly due to Peter's lethargy that the plan fell ____.

- A off
- B through
- C in
- D out

Answer: B

Question 29

In the following question, the sentence given with blank to be filled in with an appropriate word. Select the correct alternative out of the four and indicate it by selecting the appropriate option.

Mother shall return ____ an hour.

- A in
- B after
- C during
- D within

Answer: D

Question 30

In the following question, out of the four alternatives, select the word similar in meaning to the word given.

Surreptitious

- A Hesitation
- B Secret
- C Impious
- D Artless

Answer: B

Question 31

In the following question, out of the four alternatives, select the word similar in meaning to the word given.

Inanition

- A Lethargy
- B Offensive
- C Vacillating
- D Grasping

Answer: A

Question 32

In the following question, out of the four alternatives, select the word opposite in meaning to the word given.

Imbroglia

- A Misery
- B Censure
- C Composure
- D Dilemma

Answer: C

Question 33

In the following question, out of the four alternatives, select the word opposite in meaning to the word given.

Bequest

- A Accord
- B Damage
- C Complex
- D Withdraw

Answer: D

Question 34

In the following question, out of the four alternatives, select the alternative which best expresses the meaning of the idiom/Phrase.

Adam's ale

- A Gift
- B Food
- C Water
- D Belongings

Answer: C

Question 35

In the following question, out of the four alternatives, select the alternative which best expresses the meaning of the idiom/Phrase.

At one's wits end

- A A man of ability
- B At the last moment
- C To get puzzled
- D Undecided controversy

Answer: C

Question 36

Improve the bracketed part of the sentence.

I had not completed my project so I thought I was (done with) when the manager asked me to hand it in.

- A done for

- B done in
- C done on
- D No improvement

Answer: A

Question 37

Improve the bracketed part of the sentence.

Rohan was upset and so (picked up) his food while his cousins ate heartily.

- A Picked out
- B Picked on
- C Picked at
- D No improvement

Answer: C

Question 38

In the following question, out of the four alternatives, select the alternative which is the best substitute of the phrase.

To give up a throne voluntarily

- A Archer
- B Bigot
- C Abdicate
- D Delegate

Answer: C

Question 39

In the following question, out of the four alternatives, select the alternative which is the best substitute of the phrase.

Words written on the tomb of a person

- A Epigram
- B Epitome
- C Epicure
- D Epitaph

Answer: D

Question 40

In the following question, four words are given out of which one word is incorrectly spelt. Find the incorrectly spelt word.

- A Accurate
- B Business
- C Sedentary
- D Jewellery

Answer: C

Question 41

In the following question, four words are given out of which one word is incorrectly spelt. Find the incorrectly spelt word.

- A Chaufer
- B Committee
- C Veterinary
- D Repentance

Answer: A

Question 42

The question below consists of a set of labelled sentences. Out of the four options given, select the most logical order of the sentences to form a coherent paragraph.

P- They never desert us even when all fair weather friends have deserted us.

Q- Books are never failing friends.

R- They dispel the dark clouds of gloom from our minds and increase our happiness if we are already happy.

S- Through the ages, the scriptures and other great books have provided, immeasurable solace to the wounded and strife torn humanity.

- A QRSP
- B PRSQ
- C RSPQ
- D QPRS

Answer: D

Question 43

The question below consists of a set of labelled sentences. Out of the four options given, select the most logical order of the sentences to form a coherent paragraph.

P- When the robber was near her bed, she stood up suddenly, 'brandishing the knife.

Q- One night the robber did enter her room but Lakshmi did not make any sound.

R- She just kept a tight hold of the knife and pretended to be sound asleep.

S- The robber was taken aback and with a loud cry, he ran out.

- A SQRP

- B** PRQS
- C** QRPS
- D** PSQR

Answer: C

Question 44

In the following question, a sentence has been given in Active/Passive voice. Out of four alternatives suggested, select the one which best expresses the same sentence in Passive/Active voice.

I will write an essay.

- A** An essay will have been written by me.
- B** An essay will be written by me.
- C** An essay has been written by me.
- D** An essay had been written by me.

Answer: B

Question 45

In the following question, a sentence has been given in Direct/Indirect speech. Out of the four alternatives suggested, select the one which best expresses the same sentence in Indirect/Direct speech.

Neha said, "Need I write a letter?"

- A** Neha asked if she have to write a letter.
- B** Neha asked if she had been writing a letter.
- C** Neha asked of writing a letter.
- D** Neha asked if she had to write a letter.

Answer: D

Instructions

In the following passage some of the words have been left out. Read the passage carefully and select the correct answer for the given blank out of the four alternatives.

The quest for a __ (1) __ life engrosses every human being on this earth. Everyman tends to define a happy life in a __ (2) __ individualistic fashion. __ (3) __ have attempted to define a happy life in various terms. Hedonists have a __ (4) __ notion that happiness lies in the __ (5) __ of physical appetites.

Question 46

(1)

- A** simple
- B** sad
- C** happy
- D** real

Answer: C

Question 47

(2)

- A** distinctly
- B** identically
- C** similar
- D** serious

Answer: A

Question 48

(3)

- A** Professors
- B** Thinkers
- C** Researchers
- D** Scientists

Answer: B

Question 49

(4)

- A** complex
- B** distinct
- C** varied
- D** simple

Answer: D

Question 50

(5)

- A** gratification
- B** simplification
- C** purification
- D** identification

Answer: A

General Awareness

Instructions

For the following questions answer them individually

Question 51

Courier service comes under which sector?

- A Primary
- B Secondary
- C Tertiary
- D Both Secondary and Tertiary

Answer: C

Question 52

Which among the following is not a direct tax?

- A Income tax
- B Wealth tax
- C Corporate tax
- D None of these

Answer: D

Question 53

Which of the following is justiciable in nature?

- A Fundamental Duties
- B Directive principles of state policy
- C Fundamental Rights
- D None of these

Answer: C

Question 54

Which of the following Amendments is also known as the 'Mini Constitution' of India?

- A 7th Amendment
- B 42nd Amendment
- C 44th Amendment

D 74th Amendment

Answer: B

Question 55

Match the following.

Column - I

1. Brihadeswara Temple
2. Dilwara Temple
3. Lingraja Temple
4. Hampi Group Monuments

Column - II

- a. Odisha
- b. Tamil Nadu
- c. Karnataka
- d. Rajasthan

A 1 - c, 2 - d, 3 - a, 4 - b

B 1 - a, 2 - c, 3 - d, 4 - b

C 1 - b, 2 - d, 3 - a, 4 - c

D 1 - b, 2 - a, 3 - d, 4 - c

Answer: C

Question 56

In which battle was Siraj ud-Daulah defeated by Lord Clive?

A Battle of Plassey

B Battle of Buxer

C Battle of Panipat

D Battle of Haldighati

Answer: A

Question 57

Alps mountain range is located in which continent?

A Europe

B North America

C South America

D Africa

Answer: A

Question 58

What is the full form of ITCZ?

- A Inter tropical converter zone
- B Inter tropical convergence zone
- C Inter tropical centre zone
- D None of these

Answer: B

Question 59

Which among the following does not have a cell wall?

- A Euglena
- B Paramecium
- C Gonyaulax
- D Mycoplasma

Answer: D

Question 60

Which among the following is also called as 'power house of the cell'?

- A Plastids
- B Mitochondria
- C Golgi bodies
- D Cell wall

Answer: B

Question 61

What is the role of Pneumatophores?

- A Protect plant from animals
- B Get oxygen for respiration
- C Supports plant in standing upright
- D Helps plant for pollination

Answer: B

Question 62

Which determines the pitch of a sound?

- A Amplitude
- B Frequency

- C Loudness
- D Wavelength

Answer: B

Question 63

Which phenomena shows the particle nature of light?

- A Diffraction
- B Interference
- C Photoelectric effect
- D Polarisation

Answer: C

Question 64

Who is called as 'Father of Modern Computer'?

- A Alexander Fleming
- B Bill Gates
- C Micheal Faraday
- D Charles Babbage

Answer: D

Question 65

What is the common name of CaOCl_2 ?

- A Baking Powder
- B Baking Soda
- C Bleaching Powder
- D Washing Soda

Answer: C

Question 66

What is the common characteristic of the elements of the same group in the periodic table?

- A Electrons in outer most shell
- B Total number of electrons
- C Total number of protons
- D Atomic weight

Answer: A

Question 67

Which disease is caused by Nickel?

- A** Itai Itai
- B** Dermatitis
- C** Learning disability
- D** Asthma

Answer: B

Question 68

When was 'Pregnancy Aid Scheme' launched to help pregnant women financially with Rs. 6000?

- A** 1 December, 2016
- B** 19 December, 2016
- C** 31 December, 2016
- D** 1 January, 2017

Answer: C

Question 69

Who pioneered diagnostic ultrasound?

- A** Alexander Fleming
- B** Ian Donald
- C** A. Laveran
- D** Robert Koch

Answer: B

Question 70

Which of the following pair is CORRECT?

- I. Summer Olympics 2020 - Tokyo**
- II. Summer Olympics 2016 - Rio de Janeiro**
- III. Summer Olympics 2012 - London**

- A** Only I and II
- B** Only I and III
- C** Only II and III

D All are correct

Answer: D

Question 71

Prime Minister of which country attended the recently organised river festival 'Namami Brahmaputra' in India?

A Bhutan

B China

C Nepal

D Bangladesh

Answer: A

Question 72

Who among the following has been awarded the 'Rajiv Gandhi Khel Ratna Award' for the year 2016?

A Jitu Rai

B Sania Mirza

C Rohit Sharma

D Babita Kumari

Answer: A

Question 73

Who is the author of the book 'Akhada: The Authorized Biography of Mahavir Singh Phogat'?

A Rabi Thapa

B Saurabh Duggal

C Salman Rushdie

D Tana French

Answer: B

Question 74

With which Australian University Indian Railways has signed an agreement for Dedicated Freight Corridor?

A Monash University

B Victoria University

C University of Canberra

D University of Sydney

Answer: A

Question 75

Who has won the Australian Open 2019 Women's Singles title?

- A** Angelique Kerber
- B** Naomi Osaka
- C** Serena Williams
- D** Venus Williams

Answer: B

Mathematics

Instructions

For the following questions answer them individually

Question 76

If the square of sum of three positive consecutive natural numbers exceeds the sum of their squares by 292, then what is the largest of the three numbers?

- A** 5
- B** 6
- C** 7
- D** 8

Answer: D

Explanation:

Let the three positive consecutive natural numbers be $(x - 1), (x), (x + 1)$

According to ques,

$$\Rightarrow [(x - 1) + (x) + (x + 1)]^2 - [(x - 1)^2 + (x)^2 + (x + 1)^2] = 292$$

$$\Rightarrow (3x)^2 - [(x^2 - 2x + 1) + (x^2) + (x^2 + 2x + 1)] = 292$$

$$\Rightarrow 9x^2 - 3x^2 - 2 = 292$$

$$\Rightarrow 6x^2 = 292 + 2 = 294$$

$$\Rightarrow x^2 = \frac{294}{6} = 49$$

$$\Rightarrow x = \sqrt{49} = 7$$

\therefore Largest of the three numbers = $7 + 1 = 8$

\Rightarrow Ans - (D)

Question 77

A can do a piece of work in 6 days working 8 hours a day while B can do the same work in 4 days working 10 hours a day. If the work has to be completed in 5 days, so how many hours do they need to work together in a day?

- A 4
- B $5\frac{4}{11}$
- C $6\frac{4}{11}$
- D $4\frac{4}{11}$

Answer: D

Explanation:

Working 8 hours a day, A can complete the work in 6 days i.e.

$$= 8 \times 6 = 48 \text{ hours}$$

Working 10 hours a day, B can complete the work in 4 days i.e.

$$= 10 \times 4 = 40 \text{ hours}$$

$$\Rightarrow (A+B)\text{'s 1 hour's work} = \frac{1}{48} + \frac{1}{40}$$

$$= \frac{5+6}{240} = \frac{11}{240}$$

Thus, A and B can complete the work in $\frac{240}{11}$ hours

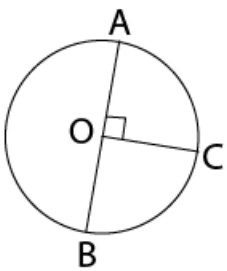
If they work for 5 days, number of hours required to complete the work = $\frac{240}{11 \times 5}$

$$= \frac{48}{11} = 4\frac{4}{11}$$

\Rightarrow Ans - (D)

Question 78

In the given figure. the length of arc BC of the given circle is 44 cm. If O is the centre of circle. then what is the radius (in cm) of the circle?



- A 7
- B 14
- C 28
- D 35

Answer: C

Explanation:

Given : $\widehat{BC} = 44$ cm and $\angle BOC = 90^\circ$

To find : $OB = r = ?$

Solution : Length of arc = $\frac{\theta}{360^\circ} \times 2\pi r$

$$\Rightarrow \frac{90^\circ}{360^\circ} \times 2 \times \frac{22}{7} \times r = 44$$

$$\Rightarrow \frac{11}{7} r = 44$$

$$\Rightarrow r = \frac{44}{11} \times 7$$

$$\Rightarrow r = 4 \times 7 = 28 \text{ cm}$$

\Rightarrow Ans - (C)

Question 79

A shopkeeper allows 25% discount on the marked price of an article and he suffered a loss of 15%. What will be the profit percent if the article is sold at marked price?

A 11.76

B 12.12

C 13.33

D 14.28

Answer: C

Explanation:

Let cost price of article = Rs. $100x$

Loss % = 15%

$$\Rightarrow \text{Selling price} = \frac{85}{100} \times 100x = \text{Rs. } 85x$$

Discount % = 25%

$$\Rightarrow \text{Marked price} = \frac{100}{(100-25)} \times 85x$$

$$= \frac{4}{3} \times 85x = \text{Rs. } 113.33x$$

$$\text{If sold at marked price, } \Rightarrow \text{Profit \%} = \frac{(113.33x - 100x)}{100x} \times 100$$

$$= 13.33\%$$

\Rightarrow Ans - (C)

Question 80

Three boxes of capacity 24 kg, 36 kg and 84 kg are completely filled with three varieties of wheat A, B and C respectively. All the three boxes were emptied and the three types of wheat were thoroughly mixed and the mixture was put back in the three boxes. How many kg of type A wheat would be there in the third box (in kg)?

A 10

B 12

C 14

D 16

Answer: C

Explanation:

Capacity of box containing wheat A = 24 kg , B = 36 kg and C = 84 kg

Ratio of weights of boxes containing wheats A, B and C = 24 : 36 : 84 = 2 : 3 : 7

=> Quantity of type A wheat in third box = $\frac{2}{(2+3+7)} \times 84$

$$= \frac{84}{6} = 14 \text{ kg}$$

=> Ans - (C)

Question 81

A group of boys has an average weight of 36 kg. One boy weighing 42 kg leaves the group and another boy weighing 30 kg joins the group. If the average now becomes 35.7 kg, then how many boys are there in the group?

A 30

B 32

C 40

D 56

Answer: C

Explanation:

Let the number of boys in the group = x

Average weight of boys = 36

=> Total weight of x boys = $36x$ kg

One boy weighing 42 kg leaves and another boy weighing 30 kg joins

=> New weight of the group = $36x - 42 + 30 = (36x - 12)$ kg

$$\therefore \text{New average} = \frac{(36x-12)}{x} = 35.7$$

$$\Rightarrow 36x - 12 = 35.7x$$

$$\Rightarrow 36x - 35.7x = 12$$

$$\Rightarrow 0.3x = 12$$

$$\Rightarrow x = \frac{12}{0.3} = 40$$

=> Ans - (C)

Question 82

A man gains 15% by selling a calculator for a certain price. If he sells it at the triple the price, then what will be the profit percentage?

A 125

B 175

C 225

D 245

Answer: D

Explanation:

Let cost price = Rs. $100x$

Profit % = 15%

$$\Rightarrow \text{Selling price} = \frac{115}{100} \times 100x = \text{Rs. } 115x$$

If selling price is tripled, \Rightarrow new selling price = $3 \times 115x = \text{Rs. } 345x$

$$\therefore \text{Profit \%} = \frac{(345x - 100x)}{100x} \times 100$$

$$= \frac{245x}{x} = 245\%$$

\Rightarrow Ans - (D)

Question 83

In an election between two candidates, the winning candidate has got 70% of the votes polled and has won by 15400 votes. What is the number of votes polled for losing candidate?

A 38500

B 11550

C 26950

D 13550

Answer: B

Explanation:

Let the total votes polled in the election = $100x$

$$\text{Votes polled for winning candidate} = \frac{70}{100} \times 100x = 70x$$

$$\Rightarrow \text{Votes polled for losing candidate} = 100x - 70x = 30x$$

According to ques, $\Rightarrow 70x - 30x = 15400$

$$\Rightarrow x = \frac{15400}{40} = 385$$

$$\therefore \text{Number of votes polled for losing candidate} = 30 \times 385 = 11550$$

\Rightarrow Ans - (B)

Question 84

A boat goes 4 km upstream and 4 km downstream in 1 hour. The same boat goes 5 km downstream and 3 km upstream in 55 minutes. What is the speed (in km/hr) of boat in still water?

A 6.5

B 7.75

C 9

D 10.5

Answer: C

Explanation:

Let speed of boat in still water = x km/hr and speed of current = y km/hr

The boat goes 4 km upstream and 4 km downstream in 1 hour

Using, time = distance/speed

$$\Rightarrow \frac{4}{x+y} + \frac{4}{x-y} = 1$$

Similarly, $\frac{5}{x+y} + \frac{3}{x-y} = \frac{55}{60}$

Let $\frac{1}{x+y} = w$ and $\frac{1}{x-y} = z$

$$\Rightarrow 4w + 4z = 1 \text{ and } 5w + 3z = \frac{55}{60}$$

Solving above equations, we get : $w = \frac{1}{12}$ and $z = \frac{1}{6}$

$$\Rightarrow x + y = 12 \text{ -----(i)}$$

$$\text{and } x - y = 6 \text{ -----(ii)}$$

Adding equations (i) and (ii), $\Rightarrow 2x = 12 + 6 = 18$

$$\Rightarrow x = \frac{18}{2} = 9 \text{ km/hr}$$

\Rightarrow Ans - (C)

Question 85

Simple Interest received by a person in 10 years on a principal of Rs 9500 is 130% of the principal. What is the rate of interest (in %) per annum?

A 12

B 13

C 15

D 19

Answer: B

Explanation:

Let the principal amount = Rs. $100x$

$$\Rightarrow \text{Simple interest} = \frac{130}{100} \times 100x = \text{Rs. } 130x$$

Let rate of interest = $r\%$ and time period = 10 years

$$\Rightarrow S.I. = \frac{P \times r \times t}{100}$$

$$\Rightarrow \frac{100x \times r \times 10}{100} = 130x$$

$$\Rightarrow 10r = 130$$

$$\Rightarrow r = \frac{130}{10} = 13\%$$

\Rightarrow Ans - (B)

Question 86

For what value of k, the expression $x^6 - 18x^3 + k$ will be a perfect square?

A - 9

B - 81

C + 9

D + 81

Answer: D

Explanation:

Expression : $x^6 - 18x^3 + k$

Let $x^3 = y$

$= y^2 - 18y + k$

$= y^2 - 2(y)(9) + k$

For above expression to be a perfect square, $k = (9)^2 = 81$

$= y^2 - 2(y)(9) + 81$

$= (y - 9)^2$

$= (x^3 - 9)^2$, which is a perfect square

=> Ans - (D)

Question 87

If $\frac{\sqrt{5+x} + \sqrt{5-x}}{\sqrt{5+x} - \sqrt{5-x}} = 3$, then what is the value of x?

A 5/2

B 25/3

C 4

D 3

Answer: D

Explanation:

Expression : $\frac{\sqrt{5+x} + \sqrt{5-x}}{\sqrt{5+x} - \sqrt{5-x}} = 3$

Rationalizing the denominator,

$\Rightarrow \frac{\sqrt{5+x} + \sqrt{5-x}}{\sqrt{5+x} - \sqrt{5-x}} \times \frac{\sqrt{5+x} + \sqrt{5-x}}{\sqrt{5+x} + \sqrt{5-x}} = 3$

$\Rightarrow \frac{[(\sqrt{5+x}) + (\sqrt{5-x})]^2}{(\sqrt{5+x})^2 - (\sqrt{5-x})^2} = 3$

$\Rightarrow \frac{(5+x) + (5-x) + 2(\sqrt{5+x})(\sqrt{5-x})}{(5+x) - (5-x)} = 3$

$\Rightarrow \frac{10 + 2\sqrt{25-x^2}}{2x} = 3$

$\Rightarrow 5 + \sqrt{25-x^2} = 3x$

$\Rightarrow 3x - 5 = \sqrt{25-x^2}$

Squaring both sides, we get :

$\Rightarrow (3x - 5)^2 = (\sqrt{25-x^2})^2$

$\Rightarrow 9x^2 + 25 - 30x = 25 - x^2$

$\Rightarrow 10x^2 - 30x = 0$

$\Rightarrow 10x(x - 3) = 0$

$\Rightarrow x = 0, 3$ [But x can't be zero because the denominator can't be zero]

=> Ans - (D)

Question 88

If $(x + y + z) = 12$, $xy + yz + zx = 44$ and $xyz = 48$, then what is the value of $x^3 + y^3 + z^3$?

A 104

- B 144
- C 196
- D 288

Answer: D

Explanation:

Given : $xy + yz + zx = 44$ and $xyz = 48$ -----(i)

and $x + y + z = 12$ -----(ii)

Squaring both sides, we get :

$$\Rightarrow (x + y + z)^2 = (12)^2$$

$$\Rightarrow (x^2 + y^2 + z^2) + 2(xy + yz + zx) = 144$$

$$\Rightarrow (x^2 + y^2 + z^2) + 2(44) = 144$$

$$\Rightarrow x^2 + y^2 + z^2 = 144 - 88 = 56$$
 -----(iii)

We know that, $x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - xy - yz - zx)$

Substituting values from equations (i),(ii) and (iii),

$$\Rightarrow x^3 + y^3 + z^3 - 3(48) = (12)(56 - 44)$$

$$\Rightarrow x^3 + y^3 + z^3 - 144 = 144$$

$$\Rightarrow x^3 + y^3 + z^3 = 144 + 144 = 288$$

\Rightarrow Ans - (D)

Question 89

If $x = \frac{4\sqrt{ab}}{\sqrt{a}+\sqrt{b}}$, then what is the value of $\frac{x+2\sqrt{a}}{x-2\sqrt{a}} + \frac{x+2\sqrt{b}}{x-2\sqrt{b}}$ (When $a \neq b$) ?

- A 0
- B 2
- C 4
- D $\frac{(\sqrt{a}+\sqrt{b})}{(\sqrt{a}-\sqrt{b})}$

Answer: B

Question 90

In a triangle PQR, $\angle Q = 90^\circ$. If PQ = 12 cm and QR = 5 cm, then what is the radius (in cm) of the circumcircle of the triangle?

- A 5
- B 6
- C 6.5
- D $6\sqrt{2}$

Answer: C

Explanation:

Given : $\angle Q = 90^\circ$, $PQ = 12$ cm and $QR = 5$ cm

To find : Circumradius = ?

Solution : In right angled $\triangle PQR$

$$\Rightarrow (PR)^2 = (PQ)^2 + (QR)^2$$

$$\Rightarrow (PR)^2 = (12)^2 + (5)^2$$

$$\Rightarrow (PR)^2 = 144 + 25 = 169$$

$$\Rightarrow PR = \sqrt{169} = 13 \text{ cm}$$

In a right angled triangle, the circumcentre lies at the mid point of hypotenuse.

$$\Rightarrow \text{Circumradius} = \frac{PR}{2} = \frac{13}{2} = 6.5 \text{ cm}$$

\Rightarrow Ans - (C)

Question 91

If a chord of a circle subtends an angle of 30° at the circumference of the circle, then what is the ratio of the radius of the circle and the length of the chord respectively?

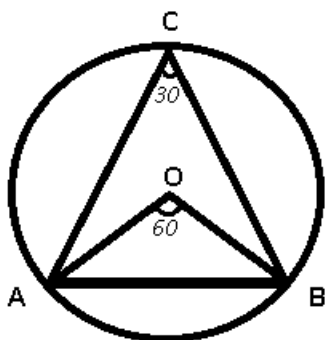
A 1 : 1

B 2 : 1

C 3 : 1

D $\sqrt{2} : 1$

Answer: A

Explanation:

Given : $\angle ACB = 30^\circ$

To find : $OA : AB = ?$

Solution : Angle subtended by an arc at the centre is double the angle subtended by it at any point on the circle.

$$\Rightarrow \angle AOB = 2 \times \angle ACB$$

$$\Rightarrow \angle AOB = 2 \times 30^\circ = 60^\circ$$

In $\triangle AOB$, $OA = OB =$ radii of circle

$$\Rightarrow \angle OAB = \angle OBA = 60^\circ$$

Thus, $\triangle OAB$ is an equilateral triangle and $OA = OB = AB$

$$\Rightarrow OA : AB = 1 : 1$$

\Rightarrow Ans - (A)

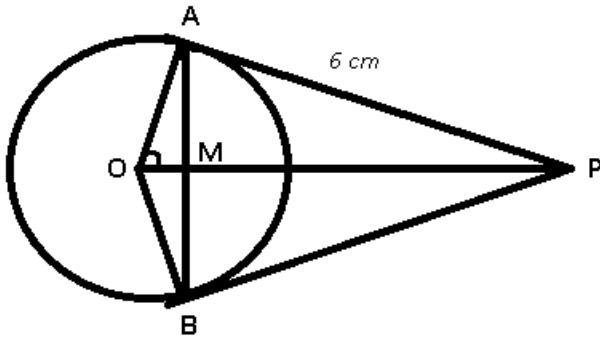
Question 92

The tangents drawn at points A and B of a circle with centre O, meet at P. If $\angle AOB = 120^\circ$ and $AP = 6$ cm, then what is the area of triangle (in cm^2 : APB)?

- A $6\sqrt{3}$
- B $8\sqrt{3}$
- C 9
- D $9\sqrt{3}$

Answer: D

Explanation:



Given : $\angle AOB = 120^\circ$ and $AP = 6$ cm and $\angle OAP = 90^\circ$

To find : $\text{ar}(\triangle APB) = ?$

Solution : $\angle AOP = \frac{1}{2}\angle AOB = \frac{120}{2} = 60^\circ$

In $\triangle AOP$,

$$\Rightarrow \tan(\angle AOP) = \frac{AP}{OA}$$

$$\Rightarrow \tan(60^\circ) = \frac{6}{OA}$$

$$\Rightarrow \sqrt{3} = \frac{6}{OA}$$

$$\Rightarrow OA = \frac{6}{\sqrt{3}} = 2\sqrt{3} \text{ cm}$$

Thus, area of $\triangle AOP = \frac{1}{2} \times (OA) \times (AP)$

$$\frac{1}{2} \times (2\sqrt{3}) \times (6) = 6\sqrt{3} \text{ cm}^2 \text{ -----(i)}$$

Now, in $\triangle AOM$

$$\Rightarrow \sin(\angle AOM) = \frac{AM}{OA}$$

$$\Rightarrow \sin(60^\circ) = \frac{AM}{2\sqrt{3}}$$

$$\Rightarrow \frac{\sqrt{3}}{2} = \frac{AM}{2\sqrt{3}}$$

$$\Rightarrow AM = 3 \text{ cm}$$

Similarly, $OM = \sqrt{3} \text{ cm}$

Thus, area of $\triangle AOM = \frac{1}{2} \times (OM) \times (AM)$

$$\frac{1}{2} \times (\sqrt{3}) \times (3) = 1.5\sqrt{3} \text{ cm}^2 \text{ -----(ii)}$$

$$\begin{aligned} \Rightarrow ar(\triangle AMP) &= ar(\triangle AOP) - ar(\triangle AOM) \\ &= 6\sqrt{3} - 1.5\sqrt{3} = 4.5\sqrt{3} \text{ cm}^2 \\ \therefore ar(\triangle APB) &= 2ar(\triangle AMP) \\ &= 2 \times 4.5\sqrt{3} = 9\sqrt{3} \text{ cm}^2 \\ \Rightarrow \text{Ans} &- (D) \end{aligned}$$

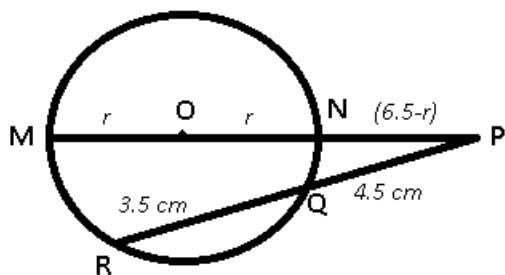
Question 93

P is a point outside the circle at distance of 6.5 cm from centre O of the circle. PR be a secant such that it intersects the circle at Q and R. If PQ = 4.5 cm and QR = 3.5 cm, then what is the radius (in cm) of the circle?

- A 1.5
- B 2
- C 2.5
- D 3

Answer: C

Explanation:



Given : OP = 6.5 cm , PQ = 4.5 cm and QR = 3.5 cm

To find : Radius of circle = $r = ?$

Solution : PM and PR are secants of the circle

$$\Rightarrow (NP) \times (MP) = (PQ) \times (PR)$$

$$\Rightarrow (6.5 - r)(6.5 + r) = (4.5)(8)$$

$$\Rightarrow 42.25 - r^2 = 36$$

$$\Rightarrow r^2 = 42.25 - 36 = 6.25$$

$$\Rightarrow r = \sqrt{6.25} = 2.5 \text{ cm}$$

\Rightarrow Ans - (C)

Question 94

What is the value of $\left[\frac{1}{(1-\tan\theta)} \right] - \left[\frac{1}{(1+\tan\theta)} \right]$?

- A $\tan\theta$
- B $\cot 2\theta$
- C $\tan 2\theta$
- D $\cot\theta$

Answer: C

Explanation:

$$\text{Expression : } \left[\frac{1}{1-\tan\theta} \right] - \left[\frac{1}{1+\tan\theta} \right]$$

$$= \frac{(1+\tan\theta)-(1-\tan\theta)}{(1-\tan\theta)(1+\tan\theta)}$$

$$= \frac{2\tan\theta}{1-\tan^2\theta}$$

$$= \left(\frac{2\sin\theta}{\cos\theta} \right) \div \left(1 - \frac{\sin^2\theta}{\cos^2\theta} \right)$$

$$= \left(\frac{2\sin\theta}{\cos\theta} \right) \div \left(\frac{\cos^2\theta - \sin^2\theta}{\cos^2\theta} \right)$$

$$= \left(\frac{2\sin\theta}{\cos\theta} \right) \times \left(\frac{\cos^2\theta}{\cos^2\theta} \right)$$

$$= \frac{2\sin\theta\cos\theta}{\cos^2\theta}$$

$$= \frac{\sin 2\theta}{\cos 2\theta} = \tan 2\theta$$

=> Ans - (C)

Question 95

If $\tan \theta + \cot \theta = x$, then what is the value of $\tan^4\theta + \cot^4\theta$?

A $(x^3 - 3)^2 + 2$

B $(x^4 - 2x) + 4$

C $x(x - 4) + 2$

D $x^2(x^2 - 4) + 2$

Answer: D

Explanation:

Given : $\tan\theta + \cot\theta = x$

Squaring both sides,

$$\Rightarrow (\tan\theta + \cot\theta)^2 = (x)^2$$

$$\Rightarrow \tan^2\theta + \cot^2\theta + 2(\tan\theta)(\cot\theta) = x^2$$

$$\Rightarrow \tan^2\theta + \cot^2\theta + 2 = x^2 \quad [\because \tan\theta\cot\theta = 1]$$

$$\Rightarrow \tan^2\theta + \cot^2\theta = x^2 - 2$$

Again squaring both sides, we get :

$$\Rightarrow (\tan^2\theta + \cot^2\theta)^2 = (x^2 - 2)^2$$

$$\Rightarrow \tan^4\theta + \cot^4\theta + 2(\tan^2\theta)(\cot^2\theta) = x^4 - 4x^2 + 4$$

$$\Rightarrow \tan^4\theta + \cot^4\theta + 2 = x^4 - 4x^2 + 4$$

$$\Rightarrow \tan^4\theta + \cot^4\theta = x^2(x^2 - 4) + 4 - 2$$

$$\Rightarrow \tan^4\theta + \cot^4\theta = x^2(x^2 - 4) + 2$$

=> Ans - (D)

Question 96

If $\tan^2\theta + \cot^2\theta = 2$, then what is the value of $2\sec\theta - \operatorname{cosec}\theta$?

- A 0
- B 1
- C $2\sqrt{2}$
- D $\sqrt{2}$

Answer: D

Explanation:

Given : $\tan^2\theta + \cot^2\theta = 2$

$\Rightarrow \tan^2\theta + \cot^2\theta - 2 = 0$

$\Rightarrow \tan^2\theta + \cot^2\theta - 2(\tan\theta)(\cot\theta) = 0$ [$\because \tan\theta\cot\theta = 1$]

$\Rightarrow (\tan\theta - \cot\theta)^2 = 0$

$\Rightarrow \tan\theta - \cot\theta = 0$

$\Rightarrow \tan\theta = \cot\theta$

$\Rightarrow \tan\theta = \tan(90^\circ - \theta)$

$\Rightarrow \theta = 90^\circ - \theta$

$\Rightarrow \theta + \theta = 2\theta = 90^\circ$

$\Rightarrow \theta = \frac{90}{2} = 45^\circ$

$\therefore 2\sec\theta - \operatorname{cosec}\theta$

$= 2\sec(45^\circ) - \operatorname{cosec}(45^\circ)$

$= 2\sqrt{2} - \sqrt{2} = \sqrt{2}$

\Rightarrow Ans - (D)

Instructions

The table given below represents the amount of education loan (in crores) disbursed by 5 banks of a country over 5 years.

Year	Amount of education loan disbursed (in crores)				
	Bank 1	Bank 2	Bank 3	Bank 4	Bank 5
2010	265	65	138	109	80
2011	295	118	165	123	103
2012	317	85	195	125	140
2013	323	103	178	142	143
2014	352	122	211	157	158

Question 97

What is the percentage increase in education loan disbursed by Bank 2 from 2010 to 2014?

- A 85.42
- B 87.69
- C 89.21
- D 83.18

Answer: B

Explanation:

Education loan disbursed by Bank 2 in 2010 = 65

Education loan disbursed by Bank 2 in 2014 = 122

$$\Rightarrow \% \text{ increase} = \frac{(122-65)}{65} \times 100$$

$$= \frac{5700}{65} = 87.69\%$$

\Rightarrow Ans - (B)

Question 98

Which banks show a continuous trend of increase/decrease in loan amount disbursed over 5 years?

- A Bank 1 and Bank 4
- B Bank 1, Bank 4 and Bank 3
- C Bank 1, Bank 4 and Bank 5
- D Bank 4 and Bank 5

Answer: C

Explanation:

Loan disbursed by bank 2 increased in 2011 and decreased in 2012. Similarly, loan disbursed by bank 2 increased in 2012 and decreased in 2013.

Only Banks 1,4 and 5 show a continuous trend of increase/decrease in loan amount disbursed over 5 years.

\Rightarrow Ans - (C)

Question 99

What can be said about the two following ratios?

- I. Loan amount disbursed by Bank 1 in 2011/ Loan amount disbursed by Bank 2 in 2014
- II. Loan amount disbursed by Bank 3 in 2014/ Loan amount disbursed by Bank 4 in 2011

- A I > II
- B I < II
- C I = II
- D No relation

Answer: A

Explanation:

I. Loan amount disbursed by Bank 1 in 2011/ Loan amount disbursed by Bank 2 in 2014

$$= \frac{295}{122} = 2.41$$

II. Loan amount disbursed by Bank 3 in 2014/ Loan amount disbursed by Bank 4 in 2011

$$= \frac{211}{123} = 1.71$$

\Rightarrow I > II

\Rightarrow Ans - (A)

Question 100

Which of the following is the correct order of percentage increase in loan amount disbursed by the given banks from 2010 to 2014?

- A Bank 3 > Bank 5 > Bank 2 > Bank 1 > Bank 4
- B Bank 2 > Bank 3 > Bank 5 > Bank 1 > Bank 4
- C Bank 5 > Bank 2 > Bank 3 > Bank 4 > Bank 1
- D Bank 2 > Bank 5 > Bank 4 > Bank 3 > Bank 1

Answer: C

Explanation:

Percentage increase in loan amount disbursed by the given banks from 2010 to 2014 :

$$\text{Bank 1 : } \frac{(352-265)}{265} \times 100 = 32.8\%$$

$$\text{Bank 2 : } \frac{(122-65)}{65} \times 100 = 87.7\%$$

$$\text{Bank 3 : } \frac{(211-138)}{138} \times 100 = 52.9\%$$

$$\text{Bank 4 : } \frac{(157-109)}{109} \times 100 = 44\%$$

$$\text{Bank 5 : } \frac{(158-80)}{80} \times 100 = 97.5\%$$

=> Bank 5 > Bank 2 > Bank 3 > Bank 4 > Bank 1

=> Ans - (C)

