



SSC CGL 2012 Tier 1 1 July NZ Evening IV

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General Awareness

Instructions

For the following questions answer them individually

Question 1

Which is NOT a correct statement ?

- A Phenols are acidic
- B In benzene all the atoms lie in one plane
- C Methylated spirit contains only methanol
- D Dilute solutions contain less amount of solute

Answer: C

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Question 2

The infective stage of Malaria is

- A Gametocyte
- B Ring stage
- C Sporozoite
- D Merozoite

Answer: C

Question 3

The treaty of Versailles restored Alsace-Lorraine to:

- A Italy
- B Britain
- C France
- D Belgium

Answer: C

Question 4

The Asokan Edicts were deciphered first by :

- A Sir John Marshall
- B Sir William Jones
- C Charles Wilkins
- D James Prinsep

Answer: D

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Question 5

Which of the following is meant for the ex-situ conservation of various species ?

- A Sperm bank
- B Blood bank
- C Germplasm bank
- D Herbarium

Answer: C

Question 6

An algae type ocean deposit is:

- A Weritic remains
- B Diatom Ooze
- C Pteropod Ooze
- D Pelagic deposits

Answer: B

Question 7

Photosynthetic vesicle found in bacteria is called a:

- A Mesosome
- B Chromatophore
- C Genophore
- D Pneumatophore

Answer: B

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Question 8

What type of mirror is used in a view finding mirror of a vehicle ?

- A Convex mirror
- B Plane mirror
- C Concave mirror
- D Paraboloidal mirror

Answer: A

Question 9

What is mcommerce ?

- A machine commerce
- B mobile commerce
- C money commerce
- D marketing commerce

Answer: B

Question 10

Who said that the Directive Principles of State Policy are just like "a cheque on bank payable at the convenience of the bank" ?

- A Pandit Nehru
- B K.T. Shah
- C B.R. Ambedkar
- D N.G. Ranga

Answer: B

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Question 11

Wheat, Barley, Lemon, Orange, rye, and pearl millet belong to:

- A the same plant family
- B two plant families
- C three plant families
- D four plant families

Answer: B

Question 12

Who favoured the Arctic Home theory of the Aryans ?

- A Pargiter
- B A.C. Das
- C B.G.Tilak
- D Jacobi

Answer: C

Question 13

A plant known only in cultivation having arisen under domestication is referred to as:

- A Scion
- B Cultigen
- C Cultivar
- D Clone

Answer: B

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Question 14

The proposal for the creation of new All India Services can be considered only :

- A if majority of State Legislatures make such demand
- B if Lok Sabha passes a resolution by two thirds majority
- C if the Rajya Sabha passes a resolution by two thirds majority
- D None of the above

Answer: C

Question 15

Pyroligneous acid obtained from wood contains:

- A 10% Formaldehyde
- B 10% Acetic acid
- C 10% Formic acid
- D 10% Ethanol

Answer: B

Question 16

Union Carbide India Ltd. manufactured essentially:

- A Heavy water
- B Petrochemicals
- C Fertilizers
- D Leather goods

Answer: B

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Question 17

The iron and steel plant in Jharkhand is at:

- A Visakhapatnam
- B Bokaro
- C Burnpur
- D Vijay Nagar

Answer: B

Question 18

Who was the teacher of Gautama Buddha ?

- A Panini
- B Alara Kalama
- C Kapila
- D Patanjali

Answer: B

Question 19

Ram Sharan Sharma, who died in 2011 was an eminent

- A Chemist
- B Economist
- C Indologist
- D Archaeologist

Answer: C

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Question 20

The 36th National Games will be held in 2019 in:

- A Uttarakhand
- B Kerala
- C Karnataka
- D Goa

Answer: D

Question 21

"Eye for an eye and tooth for a tooth" is the guiding principle of:

- A Attributive theory of Justice
- B Retributive theory of Justice

- C Deterrent theory of Justice
- D Reformative theory of Justice

Answer: B

Question 22

Low cost housing is an example for:

- A Mixed wants
- B Social wants
- C Private wants
- D Merit wants

Answer: D

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Question 23

Tohra is the sacred book of:

- A Zoroastrianism
- B Confucianism
- C Taoism
- D Judaism

Answer: D

Question 24

The 98th Indian Science Congress was held in 2011 at:

- A Bengaluru
- B Bhopal
- C Chennai
- D Bhubaneshwar

Answer: C

Question 25

Drying oils contain a fairly large proportion of:

- A Unsaturated fatty acids
- B Fats
- C Proteins
- D Saturated fatty acids

Answer: A

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Question 26

Consumption for the sake of enjoying social acknowledgement is called:

- A Rational consumption
- B Social consumption
- C Conspicuous consumption
- D Demonstration consumption

Answer: C

Question 27

The red, orange and yellow colours of leaves are due to :

- A Carotenoids
- B Aldehydes
- C Tannins
- D Lignins

Answer: A

Question 28

Which bank was the first to introduce ATMs to the world?

- A Hong Kong Bank
- B Standard Chartered Bank
- C Bank of America
- D Citi Bank

Answer: D

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Question 29

We receive sunlight on earth surface. What type of light beams are these ?

- A Random
- B Parallel
- C Converging
- D Diverging

Answer: A

Question 30

The state which has registered the highest population growth rate according to 2001 census is?

- A Kerala
- B Uttar Pradesh
- C Nagaland
- D Sikkim

Answer: C

Question 31

Earth is a very big magnet. In which direction does its magnet is field extend ?

- A west to east
- B north to south
- C south to north
- D east to west

Answer: B

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Question 32

Which economist is considered to be the Master of "Partial Analysis" ?

- A Leon Walras
- B Alfred Marshall
- C J.M. Keynes
- D Lionel Robbins

Answer: B

Question 33

The authority to specify which castes shall be deemed to be scheduled castes rests with the?

- A Commissioner for Scheduled Castes and Tribes
- B Prime Minister
- C President
- D Governor

Answer: A

Question 34

Polarbears hold cures for:

- A Type II diabetes
- B Osteoporosis
- C Breast - cancer
- D Kidney failure

Answer: A

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Question 35

Which colour/colours of light has the highest velocity through vacuum ?

- A Blue
- B Red
- C Green
- D All of the above

Answer: D

Question 36

The ultimate source of energy in a hydroelectric power station is:

- A solar energy
- B the potential energy of water
- C the kinetic energy of water
- D the electrochemical energy of water

Answer: B

Question 37

Mamta Sharma was appointed in 2011 as the chairperson of:

- A National Commission for Minorities
- B National Commission for Protection of Child Right
- C National Commission for Women
- D National Commission for BCs

Answer: C

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Question 38

India making 'Double Taxation Avoidance Agreements' (DTAA) with other countries for the promotion of :

- A Bilateral trade
- B External commercial borrowings
- C Foreign direct investments
- D Foreign institutional investment

Answer: A

Question 39

The seat of Kerala High Court is located at :

- A Kottayam
- B Thiruvananthapuram
- C Kollam
- D Ernakulam

Answer: D

Question 40

The disease that kills more people than lung cancer as a consequence of air pollution is :

- A chronic bronchitis
- B asthma
- C emphysema
- D heart attack

Answer: C

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Question 41

The most densely populated state in India is :

- A Kerala
- B Uttar Pradesh
- C West Bengal
- D Tamil Nadu

Answer: C

Question 42

Brain drain has been caused by:

- A failure to recognise talent in the originating country.
- B the lure of high living standards

C lack of employment opportunities

D socioeconomic instability

Answer: C

Question 43

Human Development Index was formulated by:

A ASEAN

B IBRD

C UNDP

D UNCTAD

Answer: C

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Question 44

The biggest planet in the solar system is:

A Venus

B Jupiter

C Saturn

D Uranus

Answer: B

Question 45

Peninsular India has the following zonal soil types:

A Red and yellow soil

B Forest soil

C Saline soil

D Alluvial soil

Answer: A

Question 46

The prose collection of the Vedic poems are:

A Samhitas

B Upanishads

C Aranyakas

D Brahmanas

Answer: A

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Question 47

The study of population is known as

- A Demography
- B Climatology
- C Petrology
- D Hydrology

Answer: A

Question 48

Which of the following pairs is correctly matched ?

- A Milk of lime – sodium sulphate
- B Glauber's salt – calcium
- C Salt petre – potassium nitrate
- D Gypsum – calcium hydroxide

Answer: C

Question 49

Who is the author of the book 'Pakistan: Beyond the Crisis State' ?

- A Khuram Iqbal
- B Maleeha Lodhi
- C Amir Mir
- D M.J. Akbar

Answer: B

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Question 50

The first speaker of Lok Sabha was :

- A S. Radhakrishnan
- B M. Ananthasayanam Ayyangar
- C Sardar Hukum Singh
- D G. V. Mavlankar

Answer: D

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English

Instructions

In the following questions, some parts of the sentences have errors and some have none. Find out which part of a sentence has an error. The number of the part is your answer. If a sentence is free from error, then your answer is (d) i.e. No error.

Question 51

World is producing enough (a) / for every citizen but still there is hunger and malnutrition (b)/ and it is continuing year after year. (c) / No error (d)

- A World is producing enough
- B for every citizen but still there is hunger and malnutrition
- C and it is continuing year after year.
- D No error

Answer: D

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Question 52

The N.C.C. commandant along with his cadets (a) / are going to Delhi (b) / to participate in the Republic Day Parade. (c) / No error (d)

- A The N.C.C. commandant along with his cadets
- B are going to Delhi
- C to participate in the Republic Day Parade.
- D No Error

Answer: B

Question 53

He did not succeed (a) / to get the job (b)/ though he tried his level best. (c) / No error (d)

- A He did not succeed
- B to get the job
- C though he tried his level best.
- D No Error

Answer: B

Question 54

Many of the famous (a) / advertising offices (b) / are located at Madison Avenue. (c) / No error (d)

- A Many of the famous
- B advertising offices

C are located at Madison Avenue.

D No Error

Answer: C

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Question 55

Nature has denied us (a) / the power of closing our ears (b) / which she gave in respect of our eyes. (c) / No error (d)

A Nature has denied us

B the power of closing our ears

C which she gave in respect of our eyes.

D No Error

Answer: C

Instructions

In the following questions, sentences are given with blanks to be filled in with an appropriate word(s). Four alternatives are suggested for each question. Choose the correct alternative out of the four as your answer.

Question 56

The ladies black purse, which is on sale has a beautiful.....carved on it.

A motif

B patch

C layout

D schematic

Answer: A

Question 57

Who is the person you..... at the cinema last night?

A were recognising

B recognised

C have recognised

D had recognised

Answer: D

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Question 58

As you ___ sow shall you reap.

- A when
- B as
- C like
- D so

Answer: D

Question 59

He complimented her..... new dress.

- A for
- B of
- C on
- D about

Answer: C

Question 60

It took him a long time..... the candidate's application.

- A to considering
- B to consider and weigh
- C considering weighing
- D to consider and to weigh

Answer: B

General Science Notes for SSC CGL

Instructions

In the following questions, out of the four alternatives, choose the one which best expresses the meaning of the given word as your answer.

Question 61

Annexure

- A retirement
- B commencement
- C attachment
- D development

Answer: C

Question 62

Errand

- A energy
- B task
- C mistake
- D blunder

Answer: B

Question 63

Bequeath

- A give
- B disclose
- C scold
- D surround

Answer: A

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Question 64

Nonchalant

- A imaginary
- B casual
- C neutral
- D formal

Answer: B

Question 65

Forbearance

- A deliverance
- B patience
- C extravagance
- D relevance

Answer: B

Instructions

In the following questions, choose the word opposite in meaning to the given word as your answer.

Question 66

Amenable

- A acquiescent
- B distrustful
- C inattentive
- D unwilling

Answer: D

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Question 67

Conspicuous

- A blatant
- B definite
- C obvious
- D obscure

Answer: D

Question 68

Reproof

- A approbation
- B apposition
- C condemnation
- D appropriation

Answer: A

Question 69

Niggard

- A avaricious
- B extravagant
- C generous
- D miserly

Answer: C

Question 70

Exotic

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- A conventional
- B poor
- C inexpensive
- D indigenous

Answer: D

Instructions

In the following questions, four alternatives are given for the idiom/phrase printed in bold. Choose the alternative which best expresses the meaning of the idiom/phrase as your answer.

Question 71

His speech has **taken the wind out of my sails** .

- A made my words or actions ineffective
- B made me depressed
- C made me think of the future
- D made me remember my past

Answer: A

Question 72

There is no point in discussing the new project with him as he always **pours cold water on any new ideas**.

- A puts off
- B dislikes
- C disapproves of
- D postpones

Answer: C

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Question 73

Regardless of what her parents said, she wanted to **let her hair down** that night.

- A really enjoy
- B wash her hair
- C comb her hair
- D work till late

Answer: A

Question 74

I **jumped out of my skin** when the explosion happened.

- A was in panic
- B was excited
- C was nervous
- D was angry

Answer: A

Question 75

She didn't realize that the clever salesman was **taking her for a ride**.

- A trying to trick her
- B taking her in a car
- C pulling her along
- D forcing her to go with him

Answer: A

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Instructions

In the following questions, a part of the sentence is printed in bold. Below are given alternatives to the bold part at (a), (b) and (c) which may improve the sentence. Choose the correct alternative. In case no improvement is needed, your answer is (d).

Question 76

It took her a long time to get **past her failure in the medical examination**.

- A through
- B over
- C by
- D No improvement

Answer: B

Question 77

The boy wanted to ask his father for money, but waited for a **propitious occasion**.

- A protective
- B prophetic
- C prospective
- D No improvement

Answer: D

Question 78

I did not agree with him; he appeared to be **so bigoted for me to concur**.

- A much
- B very
- C too
- D No improvement

Answer: C

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Question 79

As soon as she noticed the workmen, she asked them what they have been doing.

- A have done
- B had been
- C are doing
- D No improvement

Answer: B

Question 80

He was asleep before the mother tucked him off.

- A through
- B away
- C in
- D No improvement

Answer: C

Instructions

In the following questions, out of the four alternatives, choose the one which can be substituted for the given words/ sentence.

Question 81

A raised place on which offerings to a God are made

- A rostrum
- B church
- C altar
- D mound

Answer: C

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Question 82

Something that cannot be explained

- A unthinkable
- B impregnable
- C mysterious
- D inexplicable

Answer: D

Question 83

A written declaration made on oath in the presence of a magistrate

- A affidavit
- B dossier
- C voucher
- D document

Answer: A

Question 84

A person who thinks only about himself and not about others' needs

- A egomaniacal
- B egoistic
- C egotistic
- D egocentric

Answer: D

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Question 85

A guidepost pointing out the way for a place

- A fingerpost
- B lamppost
- C checkpost
- D lastpost

Answer: A

Instructions

In the following questions, there are four different words out of which one is correctly spelt. Find the correctly spelt word as your answer.

Question 86

- A digresion
- B digrestion
- C digression
- D degression

Answer: C

Question 87

- A presumpchous
- B presuntous
- C presumptuous
- D presomptous

Answer: C

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Question 88

- A equalibirium
- B equilibrium
- C equilibrum
- D equilbirium

Answer: B

Question 89

- A vaterinerian
- B veterinarian
- C vetarinerian
- D veterinerian

Answer: B

Question 90

- A marrytime
- B marytime
- C maritime
- D meritime

Answer: C

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Instructions

In the following questions, you have a brief passage with 5 questions. Read the passage carefully and choose the best answer to each question out of the four alternatives.

“People very often complain that poverty is a great evil and that it is not possible to be happy unless one has a lot of money. Actually, this is not necessarily true. Even a poor man, living in a small hut with none of the comforts and luxuries of life, may be quite contented with his lot and achieve a measure of happiness. On the other hand, a very rich man, living in a palace and enjoying everything that money can buy, may still be miserable, if, for example, he does not enjoy good health or his only son has taken to evil ways. Apart from this, he may have a lot of business worries which keep him on tenterhooks most of the time. There is a limit to what money can buy and there are many things, which are necessary for a man’s happiness and which money cannot procure. Real happiness is a matter of the right attitude and the capacity of being contented with whatever you have is the most important ingredient of this attitude”.

Question 91

The phrase “on tenterhooks” means :

- A in a state of thoughtfulness
- B in a state of anxiety
- C in a state of sadness
- D in a state of forgetfulness

Answer: B

Question 92

It is true that :

- A money alone can give happiness
- B money always gives happiness
- C money seldom gives happiness
- D money alone cannot give happiness

Answer: D

Question 93

A rich man’s life may become miserable if he:

- A has evil son, bad health and business worries
- B does not enjoy good health
- C has business worries
- D has business worries and his only son has taken to evil ways.

Answer: A

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Question 94

'Which of the following is the most appropriate title to the passage?'

- A Poverty a great evil
- B The key of happiness
- C Contentment, the key to happiness
- D Money and contentment

Answer: C

Question 95

Which of the following statements is true?

- A Only a poor but contented man can be happy
- B A poor but contented man can never be happy
- C A poor but contented man can be happy
- D A poor but contented man is always happy

Answer: C

Instructions

In the following questions, you have a brief passage with 5 questions. Read the passage carefully and choose the best answer to each question out of the four alternatives.

The problem of water pollution by pesticides can be understood only in context, as part of the whole to which it belongs – the pollution of the total environment of mankind. The pollution entering our waterways comes from many sources, radioactive wastes from reactors, laboratories, and hospitals; fallout from nuclear explosions; domestic wastes from cities and towns; chemical wastes from factories. To these is added a new kind of fallout – the chemical sprays applied to crop lands and gardens, forests and fields. Many of the chemical agents in this alarming melange initiate and augment the harmful effects of radiation, and within the groups of chemicals themselves there are sinister and little – understood interactions, transformations, and summations of effect.

Ever since the chemists began to manufacture substances that nature never invented, the problem of water purification have become complex and the danger to users of water has increased. As we have seen, the production of these synthetic chemicals in large volume began in the 1940's. It has now reached such proportion that an appalling deluge of chemical pollution is daily poured into the nation's waterways. When inextricably mixed with domestic and other wastes discharged into the same water, these chemicals sometimes defy detection by the methods in ordinary use by purification plants. Most of them are so complex that they cannot be identified. In rivers, a really incredible variety of pollutants combine to produce deposits that sanitary engineers can only despairingly refer to as "gunk".

Question 96

All the following words mean 'chemicals' except

- A sands
- B substances
- C pesticides
- D deposits

Answer: A

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Question 97

The main argument of paragraph 1 is:

- A that there are sinister interaction in the use of chemicals
- B that there are numerous reasons for contamination of water supplies
- C that there are many dangers from nuclear fallout
- D that pesticides are dangerous

Answer: B

Question 98

The word 'gunk' in the last line refers :

- A to the waste products deposited by sanitary engineers
- B to the debris found in rivers
- C to unidentifiable chemicals found in water
- D to the domestic water supplies

Answer: C

Question 99

Water pollution can only be understood

- A in relation to world contamination
- B by the whole human race
- C in cotext
- D in relation to the number of pesticides that exist

Answer: A

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Question 100

Water contamination has become serious.

- A since water pollution was difficult to assess
- B since nature has taken a hand in pollution
- C since chemists began to use new substances
- D since businessmen authorised the use of chemicals.

Answer: C

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Instructions

For the following questions answer them individually

Question 101

If $\cot A + \operatorname{cosec} A = 3$ and A is an acute angle, then the value of $\cos A$ is :

- A 4/5
- B 1
- C 1/2
- D 3/4

Answer: A

Explanation:

$\operatorname{cosec} A + \cot A = 3$
 $\operatorname{cosec}^2 A - \cot^2 A = 1$;
 $\operatorname{cosec} A - \cot A = 1/(\operatorname{cosec} A + \cot A)$
 So $\operatorname{cosec} A - \cot A = 1/3$
 $2 \operatorname{cosec} A = 10/3$ or $\operatorname{cosec} A = 5/3$.
 Hence $\sin A = 3/5$
 $\cos^2 a = 1 - \sin^2 a$
 So, $\cos^2 a = 1 - (9/25) = 16/25$
 $\cos A = 4/5$.
 Option A is the correct answer.

General Science Notes for SSC CGL

Question 102

A three digit number $4a3$ is added to another three digit number 984 to give the four digit number $13b7$ which is divisible by 11. Then the value of $(a+b)$ is:

- A 11
- B 12
- C 9
- D 10

Answer: D

Explanation:

it is given that three digit number $4a3$ is added to another three digit number 984 to give the four digit number $13b7$ which is divisible by 11

$$400 + 10a + 3 + 984 = 1300 + 10b + 7$$

$$10a - 10b = -80$$

$$b - a = 8 \dots (1)$$

$13b7$ is divisible by 11 and hence using its divisibility rule we can say that $9 - b$ will be of the form $11k$ and hence b can only take 9 value and so $a = 1$

$$a + b = 1 + 9 = 10$$

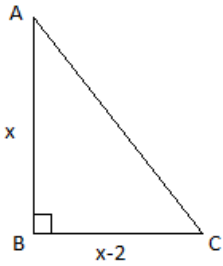
Question 103

In a right angled triangle ABC , $\angle B$ is the right angle and $AC = 2\sqrt{5}$ cm. If $AB - BC = 2$ cm then the value of $(\cos^2 A - \cos^2 C)$ is :

- A 2/5
- B 3/5
- C 1/2
- D 3/10

Answer: B

Explanation:



By Pythagoras theorem,

$$x^2 + (x - 2)^2 = 20$$

$$x^2 + x^2 + 4x + 4 = 20$$

$$2x^2 + 4x + 4 = 20$$

$$x^2 + 2x + 2 = 10$$

Solving the quadratic equation we get

$$x=4 \text{ and } x=-2$$

Since x cannot be negative $x=4$.

$$AC = 2\sqrt{5}$$

$$\cos A = \frac{x}{2\sqrt{5}}$$

$$\cos^2 A = \frac{x^2}{20} = \frac{16}{20} = \frac{4}{5}$$

$$\cos C = \cos(90 - A) = \sin A = \frac{x-2}{2\sqrt{5}}$$

$$\sin^2 A = \frac{(x-2)^2}{20} = \frac{4}{20} = \frac{1}{5}$$

$$(\cos^2 A - \cos^2 C) = \cos^2 A - \sin^2 A = \frac{4}{5} - \frac{1}{5} = \frac{3}{5}$$

Hence Option B is the correct answer.

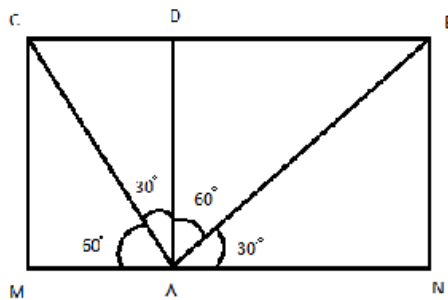
Question 104

A boy standing in the middle of a field, observes a flying bird in the north at an angle of elevation of 30° and after 2 minutes, he observes the same bird in the south at an angle of elevation of 60° . If the bird flies all along in a straight line at a height of 50 m, then its speed in km/h is :

- A 4.5
- B 3
- C 9
- D 6

Answer: D

Explanation:



From the diagram,

Height = AD = $50\sqrt{3}$ m

$\angle BAN = 30^\circ$

$\angle CAM = 60^\circ$

$\therefore \angle BAD = 90^\circ - 30^\circ = 60^\circ$

$\therefore \angle CAD = 90^\circ - 60^\circ = 30^\circ$

From $\triangle ABD$,

$\tan \angle BAD = \text{Perpendicular} / \text{Base}$

$\tan 60^\circ = BD / AD$

$\sqrt{3} = BD / (50\sqrt{3})$

$BD = 50 \times 3 = 150$ m

From $\triangle ACD$,

$\tan \angle CAD = \text{Perpendicular} / \text{Base}$

$\tan 30^\circ = CD / AD$

$1/\sqrt{3} = CD / (50\sqrt{3})$

$CD = 50$ m

\therefore Distance travelled by the bird

= BC = BD + CD = 150 m + 50 m = 200 m = 0.200 km

Time taken to cover this distance = 2 minutes = $2/60$ hr = $1/30$ hr

\therefore Speed

= Distance travelled / Time required

= 0.200×30 km/hr

= 0.200×30 km/hr

= 6 km/hr

Option D is the correct answer

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Question 105

The perimeter of an isosceles, right angled triangle is $2p$ unit. The area of the same triangle is :

A $(3 - 2\sqrt{2})p^2$ sq.unit

B $(2 + \sqrt{2})p^2$ sq.unit

C $(2 - \sqrt{2})p^2$ sq.unit

D $(3 - \sqrt{2})p^2$ sq.unit

Answer: A

Explanation:

lets assume the sides to be (a,b,c) . (In isosceles $a=b$; also as it is right angled $c = a \times \sqrt{2}$)(c is the hypotenuse)

$a+b+c = 2p$

$a+a+\sqrt{2} a = 2p$

$a = \frac{2p}{2+\sqrt{2}}$

Now area of triangle (A) = $\frac{1}{2} \times ab$

$$A = \frac{1}{2} \times a^2$$

$$A = \frac{1}{2} (2 + \sqrt{2})^2$$

$$= 2p^2 / (4 + 4\sqrt{2} + 2)$$

$$= 2p^2 / (6 + 4\sqrt{2})$$

$$= p^2 / (3 + 2\sqrt{2})$$

$$A = (3 - 2\sqrt{2})p^2 \text{ sq.unit}$$

Question 106

ΔABC and ΔDEF are similar and their areas be respectively 64 cm² and 121 cm². If EF = 15.4 cm, BC is:

A 12.3 cm

B 11.2 cm

C 12.1 cm

D 11.0 cm

Answer: B

Explanation:

ΔABC and ΔDEF are similar.

$$\frac{\Delta ABC}{\Delta DEF} = \left(\frac{BC}{EF}\right)^2$$

$$\frac{64}{121} = \left(\frac{BC}{15.4}\right)^2$$

$$BC = 11.2$$

Question 107

If G is the centroid of ΔABC and $AG = BC$, then $\angle BGC$ is:

A 75°

B 45°

C 90°

D 60°

Answer: C

Explanation:

$$AG = 2GM$$

As $AG = BC$ for the given condition

$$2GM = BC \text{ (where M is the midpoint of BC)}$$

thus $BM = MG = MC$

$\angle MGB$ and $\angle GBM$ are equal

$\angle MGC$ and $\angle GCM$ are equal

so $\angle MGB + \angle MGC = \angle GBM + \angle GCM$

that is $\angle BGC = \angle GBM + \angle GCM$

As the sum of all three angles is 180°

$\angle BGC$ is 90°

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Question 108

If $\tan(x + y) \tan(x - y) = 1$, then the value of $\tan x$ is :

A $\sqrt{3}$

- B 1
C 1/2
D 1/√3

Answer: B

Explanation:

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

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

$$\tan(x + y)\tan(x - y) = 1$$

$$\frac{\tan x + \tan y}{1 - \tan x \tan y} \times \frac{\tan x - \tan y}{1 + \tan x \tan y} = 1$$

$$\frac{\tan^2 x - \tan^2 y}{1 - \tan^2 x \tan^2 y} = 1$$

$$\tan^2 x - \tan^2 y = 1 - \tan^2 x \tan^2 y$$

$$\tan^2 x + \tan^2 x \tan^2 y = 1 + \tan^2 y$$

$$\tan^2 x(1 + \tan^2 y) = 1 + \tan^2 y$$

$$\tan^2 x = 1$$

$$\tan x = 1$$

Option B is the correct answer.

Question 109

In a partnership business, A invests 1/6th of the capital for 1/6 of the total time, B invests 1/4 of the capital for 1/4 of the total time and C, the rest of the capital for the whole time. Out of a profit of 19,400, B's share is :

- A 2000
B 1200
C 1600
D 1800

Answer: D

Explanation:

let the total capital be Rs z and total time be y

hence ratio of profit division for A,B,C will be

$$\frac{z}{6} \times \frac{y}{6} : \frac{y}{4} \times \frac{z}{4} : y \times \frac{7z}{12}$$

$$A:B:C = 4:9:84$$

$$\text{hence profit for B} = \frac{9}{97} \times 19400 = 1800$$

Question 110

A jar contains a mixture of two liquids A and B in the ratio 4 : 1. When 10 litre of the mixture is replaced with liquid B, the ratio becomes 2 : 3. The volume of liquid A present in the jar earlier was:

- A 20 litre
- B 10 litre
- C 16 litre
- D 15 litre

Answer: D

Explanation:

$$\frac{QNR}{total} = \frac{QNR(initial)}{total} \left(1 - \frac{\text{Replaced Quantity}}{total}\right)$$

QNR is the quantity which has not entered again

so here QNR is A

$$\frac{A}{5x} = \frac{4x}{5x} \left(1 - \frac{10}{5x}\right)$$

$$A = 4(x-2)$$

$$B = 5x - 4x + 8 = x+3$$

$$\frac{4x-8}{x+3} = \frac{2}{3}$$

$$12x - 24 = 2x + 6$$

$$10x = 30$$

$$x = 3$$

$$\text{so volume} = 5x = 5 \times 3 = 15 \text{ ltr}$$

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Question 111

If $(5x^2 - 3y^2) : xy = 11:2$, and x,y are positive, then the value of x/y is:

- A 7/2
- B 5/2
- C 3/2
- D 5/3

Answer: C

Explanation:

it is given that $(5x^2 - 3y^2) : xy = 11:2$

let divide the numerator and denominator of left hand side of the given equation by y^2

we will get ,

$$5\left(\frac{x}{y}\right)^2 - 3 = \frac{11}{2}$$

$$\text{let } \frac{x}{y} = k$$

$$\text{So, } \frac{5k^2 - 3}{k} = \frac{11}{2}$$

Solving this we get , $k = \frac{3}{2}$

$$\text{hence } \frac{x}{y} = \frac{3}{2}$$

Question 112

By decreasing 15° of each angle of a triangle, the ratios of their angles are 2:3:5, The radian measure of greatest angle is :

- A $11\pi/24$
- B $\pi/12$
- C $\pi/24$
- D $5\pi/24$

Answer: A

Explanation:

After decreasing 15° from each angle of triangle let the values of corresponding angles be $2x$, $3x$ and $5x$ so that their ratio would be $2x:3x:5x$ or $2:3:5$.

Thus the value of angles of triangle must be $(2x + 15^\circ)$, $(3x + 15^\circ)$ and $(5x + 15^\circ)$.

We know that,

Sum of angles of triangle = 180°

$$\therefore (2x + 15^\circ) + (3x + 15^\circ) + (5x + 15^\circ) = 180^\circ$$

$$10x + 45^\circ = 180^\circ$$

$$x = 13.5^\circ$$

Hence, the value of the greatest angle of triangle = $5x + 15^\circ = 5 \times 13.5 + 15 = 82.5^\circ$

$$= \frac{82.5}{180} \pi$$

$$= 11\pi/24$$

Hence, the radian measure of greatest angle is $11\pi/24$

Question 113

The least value of $4\operatorname{cosec}^2 \alpha + 9\sin^2 \alpha$ is:

- A 14
- B 10
- C 11
- D 12

Answer: D

Explanation:

We know that $\operatorname{cosec} \alpha = 1/\sin \alpha$, hence applying A.M \geq G.M logic, we get

$$\text{A.M of given equation} = (4 \operatorname{cosec}^2 \alpha + 9 \sin^2 \alpha) / 2 \dots (1)$$

$$\text{G.M of given equation} = \sqrt{4 \operatorname{cosec}^2 \alpha \cdot 9 \sin^2 \alpha}$$

$$= \sqrt{4 \cdot 9}$$

$$= \sqrt{36} = 6 \dots (2)$$

Now, we know that A.M \geq G. M

From equations (1) and (2) above we get,

$$\Rightarrow (4 \operatorname{cosec}^2 \alpha + 9 \sin^2 \alpha) / 2 \geq 6$$

Multiplying both sides by 2

$$(4 \operatorname{cosec}^2 \alpha + 9 \sin^2 \alpha) \geq 12$$

The minimum value will be 12.

Option D is the correct answer.

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Question 114

The greatest number that will divide 19,35 and 59 to leave the same remainder in each case is:

- A 9
- B 6
- C 7
- D 8

Answer: D

Explanation:

Let the same remainder in every case be y

hence we need to find HCF of $19-y$, $35-y$ and $59-y$

using difference method ,

$$35 - y - 19 + y = 16$$

$$59 - y - 35 + y = 24$$

HCF of 16 and 24 is 8

hence 8 is the highest number which on dividing 19, 35 and 59 will leave same remainder

Question 115

The average temperature of Monday, Tuesday and Wednesday was 30°C and that of Tuesday, Wednesday and Thursday was 33°C . If the temperature on Monday was 32°C , then the temperature on Thursday was :

- A 33°C
- B 30°C
- C 41°C
- D 32°C

Answer: C

Explanation:

$$\text{Average} = \frac{\text{Sum of Elements}}{\text{Number of Elements}}$$

it is given that average temperature of Monday, Tuesday and Wednesday was 30°C and that of Tuesday, Wednesday and Thursday was 33°C

$$\text{Sum of temperatures on Monday, Tuesday, Wednesday} = 30 \times 3 = 90 \dots(1)$$

$$\text{Sum of temperatures on Thursday, Tuesday, Wednesday} = 33 \times 3 = 99 \dots(2)$$

$$\text{it is given that temperature on Monday} = 32 \dots(3)$$

hence using equation 1 and 3

$$\text{Tuesday} + \text{Wednesday} = 90 - 32 = 58 \dots(4)$$

using equation 2 and 4

$$\text{Thursday} = 99 - 58 = 41 \text{ Celsius}$$

Question 116

If $a = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$ and $b = \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}}$ then $\frac{a^2}{b} + \frac{b^2}{a}$

- A 900

- B 970
C 1030
D 930

Answer: B

Explanation:

Give : $a = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}}$

$$\Rightarrow a = \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}}$$

$$\Rightarrow a = \frac{(\sqrt{3}-\sqrt{2})^2}{3-2}$$

$$\Rightarrow a = 5 - 2\sqrt{6}$$

Squaring both sides, we get : $a^2 = 49 - 20\sqrt{6}$

Similarly, $b = 5 + 2\sqrt{6}$ and $b^2 = 49 + 20\sqrt{6}$

To find : $\frac{a^2}{b} + \frac{b^2}{a}$

$$= \frac{a^3+b^3}{ab} = \frac{(a+b)(a^2+b^2-ab)}{ab}$$

$$= \frac{[(5-2\sqrt{6})+(5+2\sqrt{6})][(49-20\sqrt{6})+(49+20\sqrt{6})-(5-2\sqrt{6})(5+2\sqrt{6})]}{(5-2\sqrt{6})(5+2\sqrt{6})}$$

$$= \frac{10[49+49-(25-24)]}{25-24}$$

$$= 10 \times 97 = 970$$

\Rightarrow Ans - (B)

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Question 117

The next term of the series -1, 6,25, 62,123, 214,_____ is :

- A 345
B 143
C 341
D 343

Answer: C

Explanation:

let the missing term be y

here the given pattern is -1, 6,25, 62,123, 214 , y

$$-1 \quad 6 \quad 25 \quad 62 \quad 123 \quad 214 \quad y$$

$$7 \quad 19 \quad 37 \quad 61 \quad 91 \quad y-214$$

$$12 \quad 18 \quad 24 \quad 30 \quad 36$$

and hence $y - 214 - 91 = 36$

$$y = 305 + 36 = 341$$

Question 118

O is the circum centre of the triangle ABC with circumradius 13 cm. Let BC = 24 cm and OD is perpendicular to BC. Then the length of OD is.

- A 7cm
- B 3cm
- C 4cm
- D 5cm

Answer: D

Explanation:

Given, Cord BC = 24, radius OB = 13. D be the mid point of BC, then OD will be perpendicular to BC.

So, BOD forms a right triangle.

$$\begin{aligned} \text{so, } OD &= \sqrt{OB^2 - BM^2} \\ &= \sqrt{13^2 - 12^2} \\ &= 5 \end{aligned}$$

Question 119

If $ax + by = 6$, $bx - ay = 2$ and $x^2 + y^2 = 4$, then the value of $(a^2 + b^2)$ would be:

- A 10
- B 2
- C 4
- D 5

Answer: A

Explanation:

it is given that

$$ax + by = 6 \dots\dots\dots(1)$$

$$bx - ay = 2 \dots\dots\dots(2)$$

$$\text{and } x^2 + y^2 = 4$$

now multiply 1 and 2nd equation by a and b respectively

we get

$$a^2x + aby = 6a$$

$$b^2x - aby = 2b$$

adding above equations we get,

$$a^2 + b^2 x = 6a + 2b$$

$$x = \frac{6a+2b}{a^2+b^2}$$

Similarly,

$$\text{we get } y = \frac{6a-2b}{a^2+b^2}$$

putting above values in $x^2 + y^2 = 4$

we get, $a = 1$ and $b = 3$

hence $1^2 + 3^2 = 10$

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Question 120

The area of the largest triangle that can be inscribed in a semi circle of radius x in square unit is :

- A $4x^2$
- B x^2
- C $2x^2$
- D $3x^2$

Answer: B

Explanation:

The largest triangle that can be inscribed in a semi circle of radius x must have either base or height twice of radius.

$$\begin{aligned}\text{Area of triangle} &= \frac{bh}{2} \\ &= \frac{2x \times x}{2} \\ &= x^2\end{aligned}$$

Question 121

D and E are the midpoints of AB and AC of $\triangle ABC$; BC is produced to any point P; DE, DP and EP are joined. Then,

- A $\triangle PED = \frac{1}{4} \triangle ABC$
- B $\triangle PED = \triangle BEC$
- C $\triangle ADE = \triangle BEC$
- D $\triangle BDE = \triangle BEC$

Answer: A

Explanation:

Area of a triangle = $\frac{1}{2} \times \text{base} \times \text{height}$

Given, D and E are the mid-points of AB and AC of $\triangle ABC$

$$\therefore \frac{AE}{AC} = \frac{AD}{AB} = \frac{1}{2}$$

$\triangle ABC$ and $\triangle ADE$ are similar by SAS (Side, Angle and Side) as $\frac{AE}{AC} = \frac{AD}{AB}$ and common angle $\angle A$

$$\therefore \frac{DE}{BC} = \frac{1}{2}$$

As, E is mid-point of AC

$$\therefore AC = 2AE$$

$$DE = BC/2 \text{ ----- equ.(1)}$$

Now, the height of triangle ABC is AF.

Now, AT will be half of AF as $\triangle ADE$ is in a proportion of 1: 2 with $\triangle ABC$.

QP = TF as both are the perpendicular distances between same parallel lines.

$$\therefore QP = AF/2 \text{ ----- equ(2)}$$

$$\text{Area of triangle PED} = \frac{1}{2} \times QP \times DE$$

From equation 1 and 2

$$\text{Area of triangle PED} = \frac{1}{2} \times \frac{AF}{2} \times \frac{BC}{2} \text{ ----- equ (3)}$$

$$\text{Area of triangle ABC} = \frac{1}{2} \times AF \times BC \text{ ----- equ(4)}$$

Dividing equation 3 and 4, we have

$$\frac{\text{Area of triangle PED}}{\text{Area of triangle ABC}} = \frac{\frac{1}{2} \times \frac{AF}{2} \times \frac{BC}{2}}{\frac{1}{2} \times AF \times BC} = \frac{1}{4}$$

$$\triangle PED = \frac{1}{4} \triangle ABC$$

Question 122

If $a + 1/a = 1$, then the value of $a^2 + 1/a^2$ is :

- A -2
- B 2
- C -1
- D 4

Answer: C

Explanation:

it is given that $a + 1/a = 1$

and we need to find value of $a^2 + \frac{1}{a^2}$

$$a^2 + \frac{1}{a^2} = (a + \frac{1}{a})^2 - 2$$

$$= 1^2 - 2 = -1$$

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Question 123

The mean of 19 observations is 24. If the mean of the first 10 observations is 17 and that of the last 10 observations is 24, find the 10th observation.

- A 65
- B 37
- C -46
- D 53

Answer: C

Explanation:

it is given that mean of 19 observations is 24

$$\text{mean} = \frac{\text{Sum}}{\text{Number of Elements}}$$

$$24 = \frac{\text{Sum}}{19}$$

$$\text{Sum} = 456$$

It is given that mean of the first 10 observations is 17 and that of the last 10 observations is 24

$$\text{Sum of first 10 terms} = 17 \times 10 = 170$$

$$\text{Sum of last 10 terms} = 24 \times 10 = 240$$

$$10\text{th term} = (170 + 240) - 456$$

$$= -46$$

Question 124

A watch is sold at a profit of 30%. Had it been sold for Rs. 80 less, there would have been a loss of 10%. What is the cost price in rupees ?

- A 150
- B 200

C 400

D 800

Answer: B

Explanation:

let the cost price of the watch be Rs y

if the watch is sold at 30% profit then Selling Price = $1.3y$

it is given that if it would sold it for 80 Rs less then there would be 10% loss

that is $1.3y - 80 = 0.9y$

$0.4y = 80$

$y = 200$

Question 125

A train overtakes two persons who are walking in the same direction in which the train is running, at the rate of 2 kmph and 4 kmph and passes them completely in 9 and 10 seconds respectively. The length of the train (in metres)

A 72

B 45

C 54

D 50

Answer: D

Explanation:

Speed of person 1 = 2 kmph

Relative speed of train with respect to person 1 = $s - 2$ kmph

Time taken by train to cross person 1 = 9 seconds = $9/3600$ hours

Speed of person 2 = 4 kmph

Relative speed of train with respect to person 2 = $s - 4$ kmph

Time taken by train to cross person 2 = 10 seconds = $10/3600$ hours

The distance covered is equal to the length of the train.

Since the length of train is constant, the product of speed and time n must be the same.

$$(s - 2) \times \frac{9}{3600} = (s - 4) \times \frac{10}{3600}$$

$$(s - 2)(9) = s - 4(10)$$

$$9s - 18 = 10s - 40$$

$$s = 22 \text{ kmph}$$

$$\text{Length of train} = (s - 2) \times \frac{9}{3600}$$

$$= 20 \times \frac{9}{3600}$$

$$= \frac{1}{20} \text{ kms}$$

$$= 50 \text{ m}$$

Hence Option D is the correct answer

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Question 126

The length of the common chord of two circles of radii 15 cm and 20 cm whose centres are 25 cm apart is (in cm) :

A 20

B 30

C 24

D 15

Answer: C

Explanation:

the length of common cord be 'x'. Radii be r_1, r_2 . Distance between the centres be 'd'. Then ,
 $\sqrt{(r_1+r_2+d)(r_1+r_2-d)(r_1-r_2+d)(-r_1+r_2+d)}$

$$x = \frac{d}{\sqrt{(15+20+25)(15+20-25)(15-20+25)(-15+20+25)}}$$

$$x = \frac{25}{25} = 24$$

Question 127

If a commission of 10% is given on the marked price of a work, the publisher gains 20%. If the commission is increased to 15%, the gain percent is:

A 15%

B $16 \frac{2}{3} \%$

C $13 \frac{1}{3} \%$

D $15 \frac{1}{6} \%$

Answer: C

Explanation:

Let CP = 100 and Marked Price = X.

SP = 100 + 20% of 100 = 120.

10% commission was given on SP. SP = X - 10% of X

120 = X - (10X/100)

X = 1200/9 = 133.33. So, MP = 133.33.

If 15% commission was given, then

SP = 133.33 - 15% of 133.33 = SP = 133.33 - 20

SP = 113.33.

Gain = 133.33 - 100.

% Gain = 13.33%.

Question 128

$$\text{If } 2\sqrt{x} = \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} + \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}}$$

A 6

B 30

C $\sqrt{15}$

D 16

Answer: D

Explanation:

it is given that

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

$$\text{here, } \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} = \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}-\sqrt{3}} \times \frac{\sqrt{5}+\sqrt{3}}{\sqrt{5}+\sqrt{3}} = \frac{(\sqrt{5}+\sqrt{3})^2}{2}$$

$$\text{similarly, } \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}} = \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}+\sqrt{3}} \times \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}-\sqrt{3}} = \frac{(\sqrt{5}-\sqrt{3})^2}{2}$$

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

$$8 = 2\sqrt{x}$$

$$x = 16$$

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Question 129

If $x = 2 + \sqrt{3}$, then the value, $\sqrt{x} + \frac{1}{\sqrt{x}}$

- A $\sqrt{3}$
- B $\sqrt{6}$
- C $2\sqrt{6}$
- D 6

Answer: B

Explanation:

$$x = 2 + \sqrt{3}$$

$$\frac{1}{x} = 2 - \sqrt{3}$$

$$(\sqrt{x} + \frac{1}{\sqrt{x}})^2 = x + \frac{1}{x} + 2$$

$$(\sqrt{x} + \frac{1}{\sqrt{x}})^2 = 4 + 2 = 6$$

$$\sqrt{x} + \frac{1}{\sqrt{x}} = \sqrt{6}$$

so the answer is option B.

Question 130

If 12 men or 18 women can reap a field in 14 days, then working at the same rate, 8 men and 16 women can reap the same field in :

- A 9 days
- B 5 days
- C 7 days
- D 8 days

Answer: A

Explanation:

$$\text{Work done by a man in 1 day} = \frac{1}{14 \times 12} = \frac{1}{168}$$

$$\text{Work done by 8 men in 1 day} = \frac{8}{168} = \frac{1}{21}$$

$$\text{Work done by a woman in 1 day} = \frac{1}{14 \times 18} = \frac{1}{252}$$

$$\text{Work done by 16 women in 1 day} = \frac{16}{252}$$

$$\text{Work done by 8 men and 16 women in one day} = \frac{1}{21} + \frac{16}{252}$$

$$= \frac{12}{252} + \frac{16}{252} = \frac{28}{252} = \frac{1}{9}$$

Hence it takes 9 days for them to complete the work.

Hence Option A is the correct answer.

Question 131

By selling 9 articles for a rupee, a man incurred a loss of 4%. To make a gain of 44%, the number of articles to be sold for a rupee is :

- A 5
- B 3
- C 4
- D 6

Answer: D

Explanation:

Given, 9 SP = 1 Rs

In this transaction, man incurred a loss of 4%. i.e. $9 CP \times 0.96 = 1 \text{ Rs} \Rightarrow CP = 11.57 \text{ Paise}$

So cost of 1 article is = CP = 11.57 Paise

To make a profit of 44% selling price should be $SP = 1.44 \times 11.57 = 16.67 \text{ Paise}$

So number of article sold in Rs 1 = $100/16.67 = 6$

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Question 132

$$1 - \frac{\sin^2 A}{1+\cos A} + \frac{1+\cos A}{\sin A} - \frac{\sin A}{1-\cos A}$$

- A $\cos A$
- B 0
- C 1
- D $\sin A$

Answer: A

Explanation:

$$\frac{\sin^2 A}{1+\cos A} - \frac{\sin A}{1-\cos A} = \frac{\sin^2 A(1-\cos A) + \sin A(1+\cos A)}{1^2 - \cos^2 A} = \frac{\sin^2 A(1-\cos A) + \sin A(1+\cos A)}{\sin^2 A}$$

$$\frac{\sin^2 A(1-\cos A) + \sin A(1+\cos A)}{\sin^2 A} = (1 - \cos A) + \frac{(1+\cos A)}{\sin A}$$

$$\frac{\sin^2 A}{1+\cos A} - \frac{\sin A}{1-\cos A} = (1 - \cos A) + \frac{(1+\cos A)}{\sin A}$$

$$1 - \frac{\sin^2 A}{1+\cos A} + \frac{1+\cos A}{\sin A} - \frac{\sin A}{1-\cos A}$$

$$= 1 - \left[(1 - \cos A) + \frac{1+\cos A}{\sin A} \right] + \frac{(1+\cos A)}{\sin A}$$

$$= 1 - (1 - \cos A) - \frac{1+\cos A}{\sin A} + \frac{(1+\cos A)}{\sin A} = \cos A$$

Hence Option A is the correct answer.

Question 133

If $a^3 - b^3 = 56$ and $a - b = 2$, then the value of $(a^2 + b^2 + ab)$ is :

- A 10
- B 12
- C 28
- D 18

Answer: C

Explanation:

it is given that $a^3 - b^3 = 56$

we know $a^3 - b^3 = (a - b)(a^2 + b^2 + ab)$

$a - b = 2$ (Given)

hence

$$(a^2 + b^2 + ab) = \frac{56}{2} = 28$$

Question 134

If $\tan\theta - \cot\theta = a$ and $\cos\theta \sin\theta = b$, then the value of $(a^2 + 4)(b^2 - 1)^2$ is:

A 4

B 1

C 2

D 3

Answer: A

Explanation:

$$\sin(2a) = 2\sin(a/2)\cos(a/2)$$

$$\cos(2a) = 2\cos^2a - 1 = 1 - 2\sin^2a$$

$$\sin^2a + \cos^2a = 1$$

$$\operatorname{cosec}^2a - \cot^2a = 1$$

Given,

$$\tan\theta - \cot\theta = a$$

$$\left(\frac{\sin\theta}{\cos\theta}\right) - \left(\frac{\cos\theta}{\sin\theta}\right) = a$$

$$\frac{(\sin^2\theta - \cos^2\theta)}{\cos\theta\sin\theta} = a$$

$$= -2\cos 2\theta / \sin 2\theta = a$$

$$a = -2\cot 2\theta$$

Also given, $\cos\theta - \sin\theta = b$

Squaring both sides and using $(a - b)^2 = a^2 + b^2 - 2ab$, we get,

$$\cos^2\theta + \sin^2\theta - 2\cos\theta\sin\theta = b^2$$

$$1 - \sin 2\theta = b^2$$

We have to find the value of

$$(a^2 + 4)(b^2 - 1)^2$$

$$(4\cot^2 2\theta + 4)(1 - \sin 2\theta - 1)^2$$

$$4(\operatorname{cosec}^2 2\theta)(-\sin 2\theta)^2$$

$$= 4$$

Option A is the correct answer.

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Question 135

Area of the trapezium formed by x axis; y axis and the lines $3x + 4y = 12$ and $6x + 8y = 60$ is:

A 37.5 sq. unit

B 31.5 sq. unit

C 48 sq. unit

D 36.5 sq. unit

Answer: B

Explanation:

The points of the lines $3x+4y=12$ and $6x+8y=60$ on the coordinate axis are $(3,0),(0,4)$; $(10,0),(0,7.5)$ respectively.

Distance between the lines $3x+4y=12$ and $6x+8y=60$ is ($6x+8y=60$ is same as $3x+4y=30$)

$$\frac{c_1-c_2}{\sqrt{a^2+b^2}} = \frac{30-12}{\sqrt{3^2+4^2}} = 3.6$$

Length of parallel sides is 5 & 12.5

$$\text{Area of trapezium} = \frac{1}{2}(a+b)h = \frac{1}{2}(5+12.5)3.6 = 31.5$$

Question 136

Area of the triangle formed by the graph of the line $2x - 3y + 6 = 0$ along with the coordinate axes is

- A 1/2 sq. units
- B 3/2 sq. units
- C 3 sq. units
- D 6 sq. units

Answer: C

Explanation:

the line $2x - 3y + 6 = 0$ meets the coordinate axes at $(-3,0)$ and $(0,2)$.

So, base=2 and height = 3

$$\text{Area of the triangle} = \frac{bh}{2} = 3$$

Question 137

If $(a^2 - b^2) \sin \theta + 2ab \cos \theta = a^2 + b^2$, then the value of $\tan \theta$ is

- A $\frac{a^2+b^2}{2ab}$
- B $\frac{a^2-b^2}{2}$
- C $\frac{a^2-b^2}{2ab}$
- D $\frac{a^2+b^2}{2}$

Answer: C

Explanation:

$$\cos(a - b) = \cos a \cos b + \sin a \sin b$$

$$(a^2 - b^2) \sin \theta + 2ab \cos \theta = a^2 + b^2$$

$$\frac{a^2-b^2}{a^2+b^2} \sin \theta + \frac{2ab}{a^2+b^2} \cos \theta = \frac{a^2+b^2}{a^2+b^2}$$

$$\text{Let } \frac{(a^2-b^2)}{a^2+b^2} = \sin A,$$

$$\text{then } \frac{2ab}{a^2+b^2} = \cos A$$

$$\sin A \sin \theta + \cos A \cos \theta = 1$$

$$\cos(A - \theta) = 1$$

$$A - \theta = 0^\circ \text{ (as, } \cos 0^\circ = 1)$$

$$\theta = A$$

$$\therefore \tan \theta = \tan A$$

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

$$\tan\theta = \frac{(a^2 - b^2)}{2ab}$$

$$\tan\theta = \frac{(a^2 - b^2)}{2ab}$$

Option C is the correct answer.

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Question 138

Prabhat took a certain amount as a loan from a bank at the rate of 8% p.a. simple interest and gave the same amount to Ashish as a loan at the rate of 12% p. a. If at the end of 12 years, he made a profit of 960 in the deal, then the original amount was:

- A 3356
- B 1000
- C 2000
- D 3000

Answer: C

Explanation:

$$\text{Simple Interest} = \frac{P \times R \times T}{100}$$

profit made = Rs 960

R (at which loan is taken) = 8%

R(at which it is given to friend) = 12%

$$\text{i.e. } \frac{P \times 12 \times 12}{100} - \frac{P \times 8 \times 12}{100} = 960$$

$$P \frac{4 \times 12}{100} = 960$$

P = Rs 2000

Question 139

AB is a diameter of a circle with centre O. CD is a chord equal to the radius of the circle. AC and BD are produced to meet at P. Then the measure of $\angle APB$ is :

- A 120°
- B 30°
- C 60°
- D 90°

Answer: C

Explanation:

Given CD is equal to the radius. Thus triangle OCD is an equilateral triangle. $\therefore \angle COD = 60^\circ$

Triangles OCA and triangles ODB are isosceles triangles as their two sides are radii.

In triangle OCA, OC = OA (both are radius)

$\therefore \angle OAC = \angle OCA$ (angles opposite to the equal sides are equal)

Let $\angle OAC = \angle OCA = a$

Thus $\angle AOC = 180^\circ - 2a$

In triangle ODB, OD = OB (both are radius)

$\therefore \angle OBD = \angle ODB$ (angles opposite to the equal sides are equal)

Let $\angle OBD = \angle ODB = b$

Thus $\angle BOD = 180^\circ - 2b$

Sum of angles in a straight line = 180°
 \therefore At point O, $(180^\circ - 2a) + 60^\circ + (180^\circ - 2b) = 180^\circ$
 $2a + 2b = 240^\circ$
 $a + b = 120^\circ$
 In triangle PAB, $\angle APB + a + b = 180^\circ$
 $\angle APB = 180^\circ - a - b$
 $\angle APB = 180^\circ - 120^\circ = 60^\circ$

Question 140

R and r are the radius of two circles ($R > r$). If the distance between the centre of the two circles be d, then length of common tangent of two circles is :

- A $\sqrt{r^2 - d^2}$
- B $\sqrt{d^2 - (R - r)^2}$
- C $\sqrt{(R - r)^2 - d^2}$
- D $\sqrt{R^2 - d^2}$

Answer: B

Explanation:

We have, Hypotenuse² = base² + perpendicular²

Radii of the circles which intersect the tangents are parallel as both of them are perpendicular to the tangent.

Now, we draw a line parallel to the line which joins the centre of both the circles which intersects the extended radius of small circle at A and let the extended length be 'a'

So, $R = r + a$ i.e $a = R - r$

Now a right angled triangle is formed as shown in the figure as tangents and radii intersect at 90°

Applying Pythagoras theorem:

$$(\text{Length of tangent})^2 + a^2 = d^2$$

$$(\text{Length of tangent})^2 = d^2 - (R - r)^2$$

$$\text{Length of tangent} = \sqrt{d^2 - (R - r)^2}$$

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Question 141

P is a point outside a circle and is 13 cm away from its centre. A secant drawn from the point P intersects the circle at points A and B in such a way that PA = 9 cm and AB = 7 cm. The radius of the circle is :

- A 5.5cm
- B 5cm
- C 4cm
- D 4.5cm

Answer: B

Explanation:

PC = 13 cm, PA = 9 cm and AB = 7 cm.

From the external point P we have drawn a tangent at point L. Then we have drawn CL.

According to the property of tangent [A tangent to a circle is perpendicular to the radius at the point of tangency.] we can say, $PL \perp LC$.

\therefore For $\triangle PLC$, $PL^2 + LC^2 = PC^2$ equ(1)

We know that, if a secant segment and tangent segment are drawn to a circle from the same external point, the product of the length of the secant segment and its external part equals the square of the length of the tangent segment.

According to this property: $(PL)^2 = PA \times PB$

$$(PL)^2 = PA \times (PA + AB)$$

$$(PL)^2 = 9 \times (9 + 7)$$

$$(PL)^2 = 144$$

From (1) we can say,

$$144 + LC^2 = 13^2$$

$$LC^2 = 169 - 144 = 25$$

$$LC = 5 \text{ cm.}$$

Question 142

If $a + \frac{1}{a+2} = 0$, then the value of $(a + 2)^2 + \frac{1}{(a+2)^3}$ is

A 2

B 6

C 4

D 3

Answer: A

Explanation:

it is given that $a + \frac{1}{a} = -2$

it is possible only when $a = -1$

hence $a + 2 = 1$

and so

$$(a + 2)^2 + \frac{1}{(a+2)^3} = -1^2 + \frac{1}{-1^2} = 2$$

Question 143

If α is a positive acute angle and $2\sin\alpha + 15\cos^2\alpha = 7$, then the value of $\cot\alpha$ is:2

A $\frac{3}{4}$

B $\frac{2}{3}$

C $\frac{\sqrt{5}}{2}$

D $\frac{2}{\sqrt{5}}$

Answer: A

Explanation:

$\sin^2\alpha + \cos^2\alpha = 1$ (identity)

$$\cos^2\alpha = 1 - \sin^2\alpha$$

$$2\sin\alpha + 15\cos^2\alpha = 7$$

put $1 - \sin^2\alpha$ instead of $\cos^2\alpha$

$$2\sin\alpha + 15(1 - \sin^2\alpha) = 7$$

$$-15\sin^2\alpha + 2\sin\alpha + 8 = 0$$

Let $\sin\alpha = x$

$$-15x^2 + 2x + 8 = 0$$

Solving for x we get,

$$x = \frac{4}{5} \text{ and } x = -\frac{2}{3}$$

$x = \frac{4}{5}$ is the real solution

$$\sin\alpha = \frac{4}{5}$$

$$\sin^2\alpha = \frac{16}{25}$$

$$\sin^2\alpha + \cos^2\alpha = 1 \Rightarrow \sin^2\alpha = 1 - \cos^2\alpha$$

$$1 - \cos^2\alpha = \frac{16}{25} \Rightarrow \cos^2\alpha = \frac{9}{25} \Rightarrow \cos\alpha = \frac{3}{5}$$

$$\cot \alpha = \frac{\cos \alpha}{\sin \alpha} = \frac{3/5}{4/5} = 3/4$$

Option A is the correct answer.

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Question 144

$\frac{1+876542 \times 876544}{876543 \times 876543}$ is equal to

- A 3
- B 0
- C 1
- D 2

Answer: C

Explanation:

$$\frac{1+(a-1)(a+1)}{a^2} = 1$$

and as $\frac{1+876542 \times 876544}{876543 \times 876543}$ is of the same form so it is equal to 1

Question 145

The perimeters of two similar triangles $\triangle ABC$ and $\triangle PQR$ are 36 cm and 24 cm respectively. If $PQ = 10$ cm, then AB is:

- A 25 cm
- B 10 cm
- C 15 cm
- D 20 cm

Answer: C

Explanation:

In Similar triangles, corresponding sides are of same proportion.

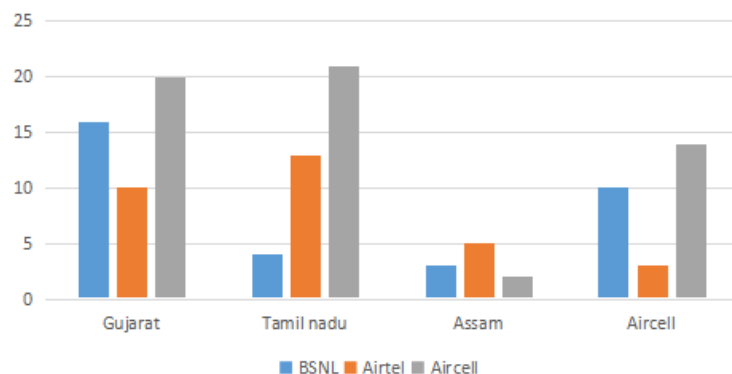
$$\frac{\text{Perimeter } \triangle ABC}{\text{Perimeter } \triangle PQR} = \frac{AB}{PQ}$$

$$\frac{36}{24} = \frac{AB}{10}$$

$$AB = 15$$

Instructions

The number of mobile simcards in 4 states are given in multiple bar diagrams. Study the diagram and answer the questions.



Question 146

In Assam, the ratio of Aircell simcard and Airtel simcard sold is:

- A 3 : 2
- B 2 : 5
- C 5 : 2
- D 2 : 3

Answer: B

Explanation:

In Assam, no. of aircel simcards sold = 2

no. of airtel simcards sold = 5

ratio = 2 : 5

so the answer is option B.

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Question 147

In which state are there the largest number of owners of Airtel simcard ?

- A Tamil Nadu
- B Gujarat
- C Kerala
- D Assam

Answer: A

Explanation:

airtel simcards sold in gujrat = 10

airtel simcards sold in tamilnadu = 13

airtel simcards sold in assam = 5

airtel simcards sold in kerala = 3

so the answer is option A.

Question 148

Average of simcard sold in the four states in lakhs is

- A 30.25
- B 40.5
- C 35
- D 33.75

Answer: A

Explanation:

simcards sold in Gujrat = $16+10+20 = 46$

simcards sold in Tamilnadu = $4+13+21 = 38$

simcards sold in Assam = $3+5+2 = 10$

simcards sold in kerala = $10+3+14 = 27$

total = 121

average = $\frac{121}{4} = 30.25$

so the answer is option A.

Question 149

The range of BSNL simcard sold in the 4 states in lakhs is :

A 12

B 15

C 14

D 13

Answer: D

Explanation:

Range = largest number - smallest number

16 BSNL simcards were sold in Gujrat, is the largest number &

3 BSNL simcards were sold in assam is the smallest number

so, range = $16 - 3 = 13$

so the answer is option D.

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Question 150

Of all the simcards sold in all the four states, the number of simcards sold in Gujarat is (approx)

A 40%

B 38%

C 35%

D 42%

Answer: B

Explanation:

simcards sold in Gujrat = $16+10+20 = 46$

simcards sold in Tamilnadu = $4+13+21 = 38$

simcards sold in Assam = $3+5+2 = 10$

simcards sold in kerala = $10+3+14 = 27$

total = 121

percentage of simcards sold in Gujarat = $\frac{46}{121} = 38.02 \sim 38\%$

so the answer is option B.

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Question 153

CFIL : XURQ :: ORUX : ?

- A ROLI
- B RITO
- C LIFC
- D MJFC

Answer: C

Explanation:

Expression = CFIL : XURQ :: ORUX : ?

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
 ↓ ↓ ... ↓ ↓
 Z Y X W V U T S R Q P O N M L K J I H G F E D C B A

Pairs of opposite letters are used.

- O -> L
- R -> I
- U -> F
- X -> C

Thus, ORUX : **LIFC**

=> Ans - (C)

Question 154

CFIL : ABCD :: ?? : WXYZ

- A YBEH
- B DCBA
- C JHPS
- D XURO

Answer: A

Explanation:

Expression = CFIL : ABCD :: ?? : WXYZ

The pattern followed is :

C	F	I	L
(-2)	(-4)	(-6)	(-8)
A	B	C	D

Similarly, for WXYZ :

Y	B	E	H
(-2)	(-4)	(-6)	(-8)
W	X	Y	Z

=> Ans - (A)

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Question 155

Zoology : Animal :: Psychology : ??

- A Animal
- B Humanbeing
- C Animal and humanbeing
- D Plant

Answer: C

Explanation:

Zoology is the scientific study of animals. Similarly, Psychology is study of the mind and how it functions. It is the study of human and animal behaviour.

=> Ans - (C)

Question 156

Life starts : Embryo :: Life ends : ___?___

- A Old age
- B Dead body
- C Illness
- D Death

Answer: B

Explanation:

Life starts with the formation of embryo. When life ends dead body is left.

=> Ans - (B)

Question 157

Man : Mammal :: ___?___

- A Hail : Snow
- B Native : Inhabitant
- C Offspring : Family
- D Liberty : Literate

Answer: C

Explanation:

Man is a mammal. Man belongs to the class Mammal. Similarly, offspring is a part of family.

=> Ans - (C)

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Question 158

1: 8:: 4 :?_

- A 64
- B 512

C 128

D 32

Answer: D

Explanation:

Expression = $1:8::4:_?$

Both the numbers on the left are multiplied by 4.

$$\text{Eg} = 1 \times 4 = 4$$

$$\text{Similarly, } 8 \times 4 = 32$$

=> Ans - (D)

Question 159

6: 2:: 8 :__?__

A 1

B 3

C 7

D 5

Answer: B

Explanation:

Expression = $6:2::8:___?$

The pattern followed is $= 6 - 2 = 4; \frac{4}{2} = 2$

Similarly, $8 - 2 = 6; \frac{6}{2} = 3$

=> Ans - (B)

Instructions

Find the odd number/ letters/number pair from the given alternatives.

Question 160

A 81

B 93

C 66

D 72

Answer: A

Explanation:

Among the given numbers, only $81 = 9^2$ is a perfect square, hence it is the odd one.

=> Ans - (A)

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Question 161

A Frog

- B Tortoise
- C Crab
- D Fish

Answer: A

Explanation:

Frog is an amphibian, hence it is the odd one out.

=> Ans - (A)

Question 162

- A 186 - 69
- B 168 - 570
- C 1001 - 100
- D 5270 - 2936

Answer: A

Explanation:

The sum of digits are same only in the first option.

(A) : $1+8+6 = 15 = 6+9$

(B) : $1+6+8 = 15$; $5+7+0 = 12$

(C) : $1+0+0+1 = 2$; $1+0+0 = 1$

(D) : $5+2+7+0 = 14$; $2+9+3+6 = 20$

=> Ans - (A)

Question 163

- A (64, 216)
- B (216, 02)
- C (343, 01)
- D (125, 27)

Answer: B

Explanation:

Except in (216, 02), in all other pairs both the numbers are perfect cubes.

=> Ans - (B)

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Question 164

- A Jammu and Kashmir
- B Haryana
- C Himachal Pradesh
- D Arunachal Pradesh

Answer: D

Explanation:

Jammu and Kashmir, Haryana and Himachal Pradesh are northern states of India, while Arunachal Pradesh is situated in the east, hence it is the odd one out.

=> Ans - (D)

Question 165

- A IVEF
- B VEENS
- C EINN
- D VEIIDD

Answer: D

Explanation:

(A) : IVEF = FIVE

(B) : VEENS = SEVEN

(C) : EINN = NINE

(D) : VEIIDD = DIVIDE

=> Ans - (D)

Question 166

- A 17
- B 27
- C 37
- D 47

Answer: B

Explanation:

Among the given numbers, only 27 is a non prime, else all are prime numbers.

=> Ans - (B)

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Question 167

- A 63852
- B 52638
- C 28761
- D 85362

Answer: C

Explanation:

Except in the number 28761, in all others the digits are the same, i.e. combination of '2,3,5,6,8'.

=> Ans - (C)

Question 168

- A Number
- B Form
- C Weight
- D Size

Answer: A

Explanation:

Number is different from the others. Form, weight and size represent a shape.

=> Ans - (A)

Question 169

- A Commission
- B Team
- C Agenda
- D Board

Answer: C

Explanation:

Except Agenda, all other denotes a group of persons.

=> Ans - (C)

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Question 170

- A Addition
- B Subtract
- C Multiplication
- D Division

Answer: B

Explanation:

Except Subtract, all others are Nouns. The Noun for Subtract (Verb) is Subtraction.

=> Ans - (B)

Instructions

A series is given, with one term missing. Choose the correct alternative from the given ones that will complete the series.

Question 171

DF, GJ, IM, NQ, RT, ?

- A UW
- B YZ
- C XZ

D UX

Answer: D

Explanation:

The first letter of each term in even place is the next letter from the first letter of the previous term.
The first letter of sixth term is U since the second letter of the previous term is T.

Hence Option B and Option C can be neglected.

The second letter of each term in even place is the third letter from the first letter of the term.

The second letter of sixth term is X.

The missing term is UX.

Hence Option D is the correct answer.

Question 172

B I P ? D

A W

B S

C R

D U

Answer: A

Explanation:

Each letter in the series is the seventh letter from the preceding term. The seventh letter from P is W.

Hence Option A is the correct answer.

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Question 173

AAC BBD CCE DDF EEG F?

A FG

B GH

C FH

D DG

Answer: C

Explanation:

Each letter of a term is the next letter of the corresponding letters in the preceding term.

The last term is EEG . Hence the next term is FFH.

Hence Option C is the correct answer.

Question 174

RAZ SBY TCX UDW VEV ?

A WFU

B FWU

C XGX

D ZAT

Answer: A

Explanation:

First and second letters of the a term is the next letter of the corresponding letters in the preceding term. The last letter of a term is the previous letter of the last letter in the preceding term.

Fifth Term is VEV. Hence the sixth term is WFU.

Hence Option A is the correct answer.

Instructions

(2526) : Which one set of letters when sequentially placed at the gaps in the given letter series shall complete it?

Question 175

a_ba_c_aad_aa_ea

A babbd

B babbc

C bacde

D babbb

Answer: C

Explanation:

Option C : a**b**ba**a**cc**a**ad**a**ae**a**

All the terms in the series repeat twice except the first and the last term.

Hence Option C is the correct answer.

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Question 176

aa_aa bb_b_aa_aa bb_bb.

A bbbba

B aabbb

C babba

D bbbaa

Answer: C

Explanation:

Split the letter series into series of 5 letters each.

Option C : aa**b**aa bb**a**bb aab**a**aa bba**b**

The middle letter in each series is different from the rest of the terms.

Hence Option C is the correct answer.

Instructions

For the following questions answer them individually

Question 177

If DEAF is equal to 32, what will be LEAF ?

A 48

- B 50
- C 52
- D 56

Answer: A

Explanation:

If A=1, B=2 and so on, then the values of D+E+A+F=16 hence it is coded as $16 \times 2 = 32$. similarly, L+E+A+F=24, therefore it will be coded as $24 \times 2 = 48$. hence the correct answer is option A.

Question 178

In a certain code, "CERTAIN" is coded as "XVIGZRM", "SEQUENCE" is coded as "HVJFVMXV", How would "REQUIRED" be coded ?

- A VJIFWTRV
- B WVJRIFVI
- C IVJFRIVW
- D FJIVWVIR

Answer: C

Explanation:

The code for each of the letters are given :

- R -> I
- E -> V
- Q -> J
- U -> F
- I -> R
- R -> I
- E -> V
- D -> W

Thus, REQUIRED : **IVJFRIVW**

=> Ans - (C)

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Question 179

If P denotes \div , Q denotes \times , R denotes $+$, and S denotes $,$ then, $18 Q 12 P 4 R 5 S 6 ?$

- A 53
- B 51
- C 57
- D 95

Answer: A

Explanation:

$18 Q 12 P 4 R 5 S 6$ will translate to $18 \times 12 \div 4 + 5 - 6$. on applying the rules of BODMAS will be equal to 53. therefore the correct answer is option A.

Question 180

Find the wrong number in the series from the given alternatives.

17, 36, 53, 68, 83, 92

- A 53
- B 68
- C 83
- D 92

Answer: C

Explanation:

The terms in the series are $17 + (17+19) + (17+19+17) + (17+19+17+15) + (17+19+15+15) + (17+19+15+13+11)$.
Each term adds the odd number which precedes the one added to the previous term, except for the fifth term.
The correct sequence would be 17,36,53,68,81,92.
Hence Option C is the correct answer.

Question 181

From the given alternatives select the word which cannot be formed using the letters of the given word.
'CONSTITUTIONAL'

- A LOCATION
- B TUTION
- C TALENT
- D CONSULT

Answer: C

Explanation:

From the given alternatives the word which cannot be formed using the letters of the given word 'CONSTITUTIONAL' is TALENT as there is no 'E' in 'CONSTITUTIONAL'.
hence the correct answer is optnio C.

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Question 182

If $25 \div 5 = 15$, $30 \div 6 = 20$, then $35 \div 7 = ?$

- A 20
- B 50
- C 25
- D 75

Answer: C

Explanation:

the pattern that can be seen is that
 $25/5 = 5 \times 3$
 $30/6 = 5 \times 4$
by similar logic $35/7 = 5 \times 5 = 25$.
hence the correct answer is option C

Question 183

If $33 + 45 = 30$, $90 + 26 = 40$, then $30 + 45 = ?$

- A 14
- B 16
- C 18
- D 15

Answer: D

Explanation:

The sum of digits of the number will be multiplied by 5.

Eg = $33 + 45 = 3 + 3 + 4 + 5 = 15$; $1 + 5 = 6$; $6 \times 5 = 30$

and $90 + 26 = 9 + 0 + 2 + 6 = 17$; $1 + 7 = 8$; $8 \times 5 = 40$

Similarly, $30 + 45 = 3 + 0 + 4 + 5 = 12$; $1 + 2 = 3$; $3 \times 5 = 15$

=> Ans - (D)

Question 184

It was Shriram's and Sreedevi's 12th Wedding Anniversary. Shriram said, "When we got married, Sreedevi was $\frac{3}{4}$ th of my age, but now she is $\frac{5}{6}$ th of my age". What actually are their present ages ?

- A Shriram 36, Sreedevi 30
- B Shriram 30, Sreedevi 24
- C Shriram 40, Sreedevi 34
- D Shriram 38, Sreedevi 32

Answer: A

Explanation:

Let the present age of Shriram be $6x$

=> Present age of Sreedevi = $5x$

Also, 12 years ago, Sreedevi was $\frac{3}{4}$ th of Shriram's age

$$\Rightarrow 5x - 12 = \frac{3}{4}(6x - 12)$$

$$\Rightarrow 20x - 48 = 18x - 36$$

$$\Rightarrow x = 6$$

=> Shriram's present age = $6 \times 6 = 36$ years

Sreedevi's present age = $6 \times 5 = 30$ years

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Question 185

If $64 + 14 = 5$, $92 + 31 = 7$, $26 + 11 = 6$, then $56 + 22 = ?$

- A 39
- B 7

C 36

D 11

Answer: B

Explanation:

The sum of digits of the second number is subtracted from the sum of digits of first number.

$$\text{Eg} = (6 + 4) - (1 + 4) = 10 - 5 = 5$$

$$\text{and } (9 + 2) - (3 + 1) = 11 - 4 = 7$$

$$\text{and } (2 + 6) - (1 + 1) = 8 - 2 = 6$$

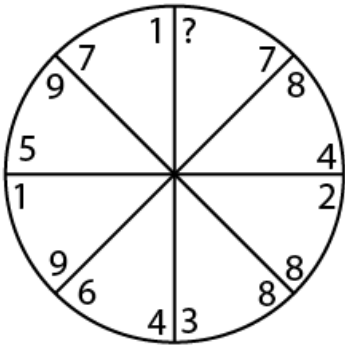
$$\text{Similarly, } (5 + 6) - (2 + 2) = 11 - 4 = 7$$

=> Ans - (B)

Instructions

Select the missing number from the given responses.

Question 186



A 2

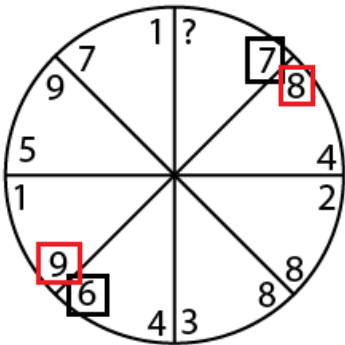
B 4

C 3

D 6

Answer: A

Explanation:



Let the missing term be x .

For each sector in the circle the values the difference between the value in red box will be the same as the difference between the values in the black boxes.

$$\text{Hence } 3 - 1 = 4 - x$$

$$x = 2$$

Hence Option A is the correct answer.

Question 187

7	6	9
2	8	4
4	3	?
36	42	26

- A 2
- B 3
- C 4
- D 5

Answer: A

Explanation:

(Value in row 1 + value in row 2) × Value in Row 3 = Value in Row 4

Let the unknown be x .

$$(9+4) \times x = 26$$

$$\text{Hence } x = \frac{26}{13}$$

$$x = 2$$

Hence Option A is the correct answer

General Science Notes for SSC CGL

Instructions

For the following questions answer them individually

Question 188

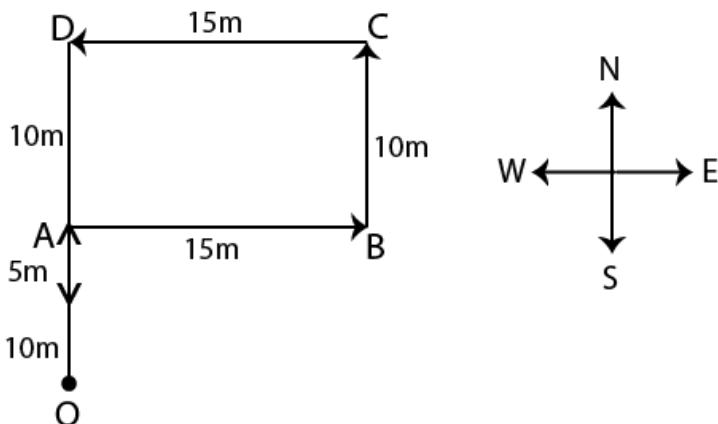
Sherly starting from a fixed point goes 15 m towards North and then after turning to his right he goes 15 m. Then he goes 10,15 and 15 metres after turning to his left each time. How far is he from his starting point ?

- A 5 metres
- B 10 metres
- C 20 metres
- D 15 metres

Answer: B

Explanation:

The path of Sherley can be traced as O-A-B-C-D-E as shown:



it can be seen that the distance between start and finish points is 10m. hence the correct answer is option B.

Question 189

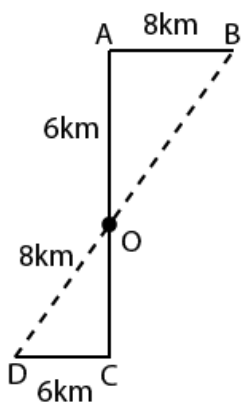
Ram and Sham start walking in opposite directions. Ram covers 6 kms and Sham 8 kms. Then Ram turns right and walks 8 kms and Sham turns left and walks 6 kms. How far each is from the starting point?

- A 8 kms
- B 9 kms
- C 10 kms
- D 11 kms

Answer: C

Explanation:

The paths of Ram and Shyaam can be traced as AB and CD respectively as shown.



thus the total distance of both from their starting points will be OB and OD respectively: which will be both equal to $\sqrt{8^2 + 6^2} = 10$
hence the correct answer is option C.

Instructions

Two statements are followed by two conclusions numbered I and II. Which one of the four alternatives is correct ?

Question 190

Statements :

- I. All teachers are aged.
- II. Some women are teachers.

Conclusions :

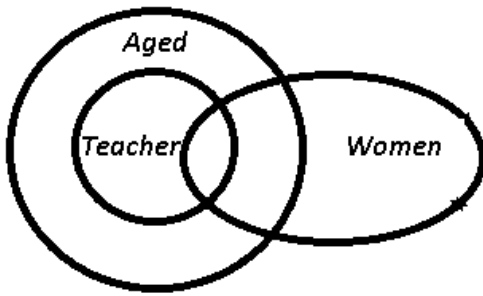
- I. All aged are women.
- II. Some women are aged.

- A Only conclusion I follows
- B Only conclusion II follows
- C Neither conclusion I nor II follows
- D Both conclusions I and II follow

Answer: B

Explanation:

The venn diagram for above statements is :



Conclusions :

- I. All aged are women = false
- II. Some women are aged = true

Thus, only conclusion II follows

=> Ans - (B)

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Question 191

Statements :

- I. All skaters are good swimmers.
- II. All good swimmers are runners.

Conclusions

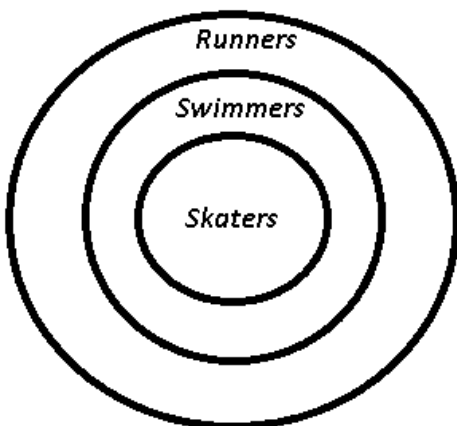
- I. Some runners are skaters.
- II. Some skaters are good swimmers.

- A Only conclusion I follows
- B Only conclusion II follows
- C Both conclusions I and II follow
- D Neither conclusion I nor II follows

Answer: C

Explanation:

The venn diagram for above statements is :



Conclusions

- I. Some runners are skaters = true
- II. Some skaters are good swimmers = true

Thus, both conclusions I and II follow

=> Ans - (C)

Instructions

For the following questions answer them individually

Question 192

If Alphabets are serially numbered, one of the answers given below has not a meaningful word hidden in it. Identify the answer.

- A 5, 1, 3, 5, 20, 8, 18
- B 18, 5, 8, 1, 3, 5, 20
- C 20, 5, 8, 1, 3, 5, 18
- D 5, 18, 5, 8, 1, 3, 5, 20

Answer: D

Explanation:

If Alphabets are serially numbered, then

- (A) : 5, 1, 3, 5, 20, 8, 18 = Eacethr
- (B) : 18, 5, 8, 1, 3, 5, 20 = rehacet
- (C) : 20, 5, 8, 1, 3, 5, 18 = tehacer
- (D) : 5, 18, 5, 8, 1, 3, 5, 20 = erehacet

The first three words combine to form the word 'TEACHER' while no meaningful word can be formed from the last group of letters.

=> Ans - (D)

Question 193

If LUXOR is coded as 30, then GUILDS will be coded as ?

- A 36
- B 38
- C 24
- D 40

Answer: C

Explanation:

If LUXOR is coded as 30, then the pattern we can infer is as follows:

if we assign 1=A then B=2 and so on we will find the value of L+U+X+O+R=90 which when divided by 3 will give the value 30. similarly, for GUILDS the value will be 7+9+12+4+19+21=72 which when divided by 3 gives 24. hence the answer is option C.

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Question 194

In the following list of English alphabets, one alphabet has not been used. Identify the same.

XNFAPSRWLTMDXMGBCXQJLOPVRCQJZOHSGODIPTSMRABEFGNUNE

- A I
- B K
- C J
- D V

Answer: B

Explanation:

Going by the options, we see that :

X N F A P S R W L T M D E X M G B C X Q J L O P V R C Q J Z O H S G O D I P T S M R A B E F G N U N E

Clearly, among the options given, only 'K' is not used.

Ans - (B)

Question 195

How many 9's are followed by and preceded by numbers divisible by 2 ?

8 9 6 5 3 5 9 6 8 3 4 9 6 5 2 6 9 7 3 7 2 9 4 1 3 7 9 4 1 7 3 4 9 8 4 5 3 9 7 6 1 5 3 1 9 5 7 4 2 9 6 8 5 3 2 9 5 7 4 8 9 4 5 1

A 6

B 8

C 10

D 12

Answer: A

Explanation:

We need to find the number of 9's immediately preceded and followed by a number divisible by 2

=> We need to find :(even) 9 (even)

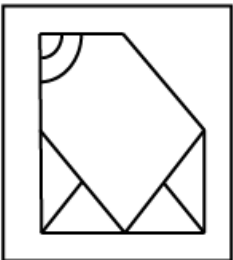
8 9 6 5 3 5 9 6 8 3 4 9 6 5 2 6 9 7 3 7 2 9 4 1 3 7 9 4 1 7 3 4 9 8 4 5 3 9 7 6 1 5 3 1 9 5 7 4 2 9 6 8 5 3 2 9 5 7 4 8 9 4 5 1

Thus, there are '6' such 9's

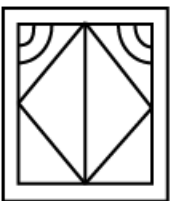
Ans - (A)

Question 196

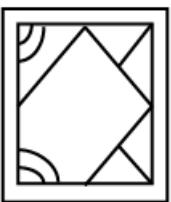
From the given answer figures, select the one in which the question figure is hidden/embedded

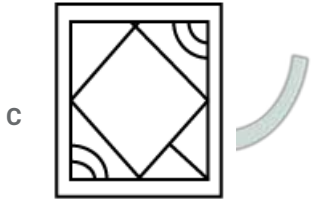


A



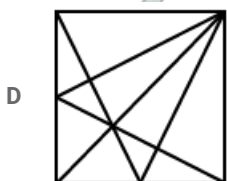
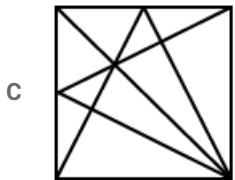
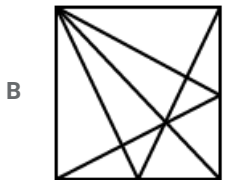
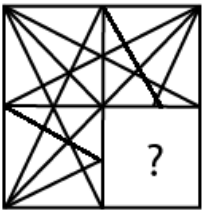
B





Answer: B

Question 197

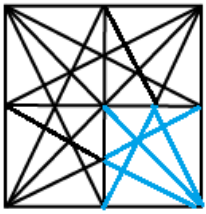


Answer: C

Explanation:

When we complete the above figure, we get :

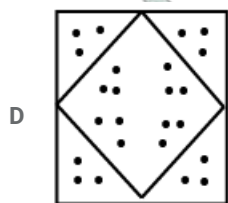
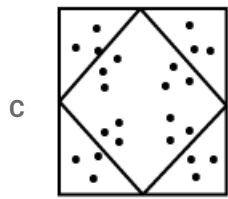
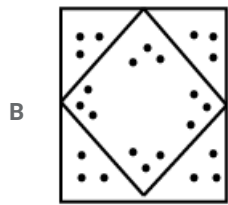
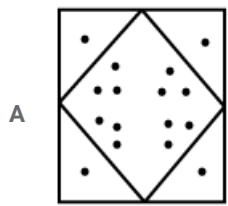
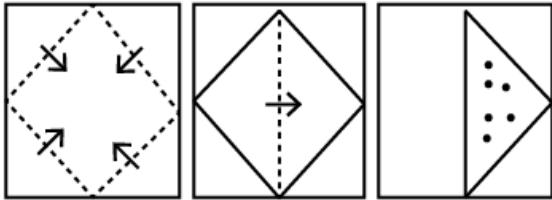
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Now, the third figure resembles the above missing part in blue colour.

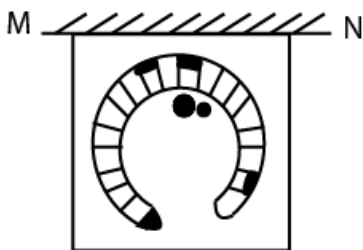
=> Ans - (C)

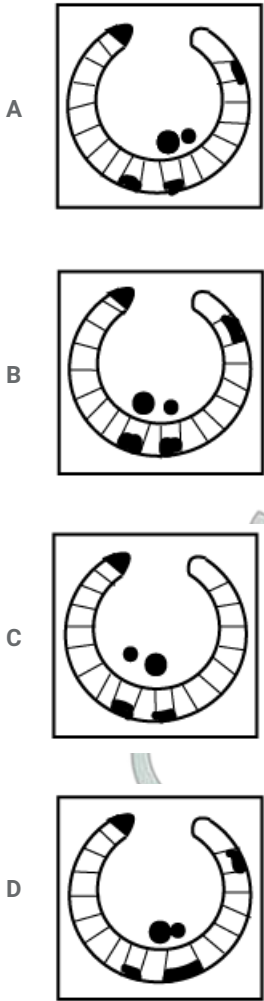
Question 198



Answer: D

Question 199





Answer: A

Explanation:

Since the mirror is in horizontal position, the image will just appear upside down.

In the figure, the bigger dot is on the left of the smaller and they have a gap between them, similarly in the mirror image it will appear as it is.

=> (C) & (D) are eliminated.

In the figure, one dot is in the front of half filled box, and the other is not, it will appear as it is in the mirror

=> (B) is also eliminated.

Ans - (A)

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Question 200

Identify the set for the word 'STAR'.

Matrix I

	0	1	2	3	4
0	G	V	E	A	C
1	R	O	N	G	S
2	M	N	E	S	H
3	O	T	I	T	A
4	N	S	N	E	F

Matrix II

	5	6	7	8	9
5	R	E	O	N	C
6	N	P	V	E	S
7	M	T	I	O	N
8	E	A	I	C	C
9	N	T	A	R	S

A 23, 76, 33, 98

B 14, 87, 98, 97

C 69, 96, 03, 56

D 99, 31, 86, 98

Answer: D

Explanation:

(A) - 23, 76, 33, 98 = STTR

(B) - 14, 87, 98, 97 = SIRA

(C) - 69, 96, 03, 56 = STAE

(D) - 99, 31, 86, 98 = **STAR**

=> Ans - (D)

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