

SSC GRADUATE LEVEL TIER-I EXAM, 26-10-2014 – PREVIOUS YEAR PAPER

GENERAL AWARENESS

1. A unit price elastic demand curve will touch

- (1) both price and quantity axis
- (2) neither price axis, nor quantity axis
- (3) only price axis
- (4) only quantity axis

Solution : 2

2. India follows the policy of non -alignment which implies.

- (1) being a third world power
- (2) choosing its own policies
- (3) neutrality towards power blocs
- (4) bringing peace and amity to the world

Solution : 3

3. If the supply curve is a straight line passing through the origin, then the price elasticity of supply will be

- (1) less than unity
- (2) infinitely large
- (3) greater than unity
- (4) equal to unity

Solution : 4

4. According to Modern Theory of Rent, rent accrues to

- (1) capital only
- (2) any factor
- (3) labour only
- (4) land only

Solution : 2

5. The book which is at the centrepiece of the study of Macro – Economics was written by

- (1) Prof. Samuelson
- (2) Prof. J.M. Keynes
- (3) Prof. Benham

(4) Prof. Baumol

Solution : 2

6. The basic problem studied in Macro – Economics is

- (1) production of income
- (2) usage of income
- (3) flow of income
- (4) distribution of income

Solution : 1

7. The number of subjects incorporated in the Union List is

- (1) 97
- (2) 102
- (3) 812
- (4) 89

Solution : 1

8. Who was the French Governor of Pondicherry. Who tried to make the French Company as a powerful company ?

- (1) Thomas Arthur, Comte de Lally
- (2) Godeheu
- (3) La Bourdonnais
- (4) Joseph Francois Dupleix

Solution : 4

9. The most powerful Peshwa was

- (1) Balaji Baji Rao
- (2) Baji Rao
- (3) Madhava Rao
- (4) Balaji Vishwanath

Solution : 2

10. Democratic Socialism aims at

- (1) bringing about Socialism through peaceful means
- (2) bringing about Socialism through violent and peaceful means
- (3) bringing about Socialism through violent means
- (4) bringing about Socialism through democratic means

Solution : 4

11. Two – Party System is found in

- (1) Russia
- (2) U.S.A.
- (3) India
- (4) France

Solution : 2

12. Chief Justice of the Supreme Court is appointed by the

- (1) Speaker of the Lok Sabha
- (2) Chairman of the Rajya Sabha
- (3) Prime Minister
- (4) President

Solution : 4

13. What are the folds found in the mucous lining of the empty stomach ?

- (1) Typhlosole
- (2) Areolae
- (3) Rugae
- (4) Villi

Solution : 3

14. The first Mysore War fought between the British and Hy-der Ali in 1767 – 69 A.D., came to an end by the

- (1) Treaty of Pondicherry
- (2) Treaty of Madras
- (3) Treaty of Mysore
- (4) Treaty of Aix – la – Chapelle

Solution : 2

15. The British Government intervened in the affairs of the Company and passed an Act in 1773 A.D., known as the

- (1) Regulating Act
- (2) Pitt's India Act
- (3) Charter Act
- (4) Company Act

Solution : 1

16. Sher Shah defeated Humayun and captured Gaur in the battle of

- (1) Ghaghra in 1529 A.D.
- (2) Chausa in 1539 A.D.
- (3) Panipat in 1526 A.D.

(4) Khanwa in 1527 A.D.

Solution : 2

17. Identify the most infertile amongst the following soils.

- (1) Black cotton soil
- (2) Alluvial soil
- (3) Laterite soil
- (4) Peaty soil

Solution : 3

18. Spot the odd item of the following :

- (1) Shale
- (2) Marble
- (3) Limestone
- (4) Sandstone

Solution : 2

19. Which of the following reasons is responsible for lack of vegetation in the deserts ?

- (1) Heavy volume of sands
- (2) Absence of B-horizon in the soil
- (3) High temperature
- (4) Lack of rainfall

Solution : 4

20. Which one of the following pairs is not correctly matched ?

- (1) Khadar – Zonal soil
- (2) Podzol – Zonal soil
- (3) Chestnut – Zonal soil
- (4) Bhangar – Azonal soil

Solution : 1

21. Select the correct direction of Sirocco storm.

- (1) Sahara to Mediterranean Sea
- (2) North from U.S.A.
- (3) West from Sahara
- (4) Adriatic Sea to Italy

Solution : 1

22. Which among the following is an abiotic factor ?

- (1) Mites

- (2) Moisture
- (3) Insects
- (4) Rodents

Solution : 2

23. Leaves of many grasses are capable of folding and unfolding because
- (1) their mesophyll is not differentiated into palisade and spongy parenchyma
 - (2) they have stomata on both sides of the leaf
 - (3) they have high levels of silica
 - (4) they have specialised bulliform cells

Solution : 4

24. Pleura is the covering of
- (1) Lung
 - (2) Liver
 - (3) Kidney
 - (4) Heart

Solution : 1

25. Which one of the following is an egg-laying mammal ?
- (1) Sloth
 - (2) Duck – billed platypus
 - (3) Kangaroo
 - (4) Bandicoot

Solution : 2

26. The moderator used in a nuclear reactor is
- (1) Uranium
 - (2) Radium,
 - (3) Ordinary water
 - (4) Graphite

Solution : 3

27. Solar eclipse occurs when
- (1) the Moon does not lie on the line joining the Sun and the Earth
 - (2) the Moon comes between the Sun and the Earth
 - (3) the Sun comes between the Moon and the Earth
 - (4) the Earth comes between the Moon and the Sun

Solution : 2

28. An aspect of Input/Output controller of data logic is called
- (1) General Buffering
 - (2) Zero Buffering
 - (3) Buffering
 - (4) Data Buffering

Solution : 3

29. What does BIOS stand for ?
- (1) Basic Internal Output System
 - (2) Basic Intra Operating System
 - (3) Basic Internal Organ System
 - (4) Basic Input Output System

Solution : 4

30. The device used to convert solar energy into electricity is
- (1) Photovoltaic cell
 - (2) Daniell cell
 - (3) Electrochemical cell
 - (4) Galvanic cell

Solution : 1

31. The type of kidneys present in frog are
- (1) Mesonephros
 - (2) Metanephros
 - (3) Archinephros
 - (4) Pronephros

Solution : 1

32. A spinning neutron star is known as
- (1) White dwarf
 - (2) Black hole
 - (3) Pulsar
 - (4) Quasar

Solution : 3

33. Light year is a unit of
- (1) Light
 - (2) Current
 - (3) Distance
 - (4) Time

Solution : 3

34. The chemical name of 'Plaster of Paris' commonly used for setting broken bones is
- (1) Calcium nitrate
 - (2) Calcium sulphate
 - (3) Calcium carbonate
 - (4) Calcium chloride

Solution : 2

35. In our country the Van Mahotsav' Day is observed on
- (1) 10th August
 - (2) 1st July
 - (3) 2nd October
 - (4) 1st December

Solution : 2

36. Medicine of Quinine is provided by
- (1) Cinchona plant
 - (2) Money plant
 - (3) Eucalyptus plants
 - (4) Aconite plants

Solution : 1

37. The apparatus used to test acidity of aqueous solution is
- (1) pH meter
 - (2) Ammeter
 - (3) Hygrometer
 - (4) Acidmeter

Solution : 1

38. The Hutti Gold mines are located in the State of
- (1) Karnataka
 - (2) Tamil Nadu
 - (3) Andhra Pradesh
 - (4) Maharashtra

Solution : 1

39. Who was the first recipient of 'Mahathir Award' for Global Peace in August 2013 ?
- (1) Malala Yousafzai
 - (2) John Boehner

- (3) Howard Stern
- (4) Nelson Mandela

Solution : 4

40. Process through which plants reproduce

- (1) Pollination
- (2) Condensation
- (3) Eating
- (4) Evaporation

Solution : 1

41. Which river serves the largest cultivable area ?

- (1) Ganga
- (2) Saiyu
- (3) Godavari
- (4) Krishna

Solution : 1

42. In August 2013, who won the International Children's Peace Prize ?

- (1) Malala Yousafzai
- (2) Angela Merkel
- (3) A.P.J. Abdul Kalam
- (4) Silvio Berlusconi

Solution : 1

43. Who is the present President of Pakistan ?

- (1) Asif All Zardari
- (2) Nawaz Sharif
- (3) Raza Rabbani
- (4) Mamnoon Hussain

Solution : 4

44. Who had been selected for the Rajiv Gandhi National Sadbhavana Award 2013 ?

- (1) Amjad All Khan
- (2) Gautam Ghosh
- (3) Aashish Khan
- (4) Muzaffar Ali

Solution : 1

45. Who was elected as the Ninth President of International Olympic Committee (IOC)

on 10th September, 2013?

- (1) Thomas Bach
- (2) Ching – Kuo – Wu
- (3) Serge' Bubka
- (4) Richard Carrion

Solution : 1

46. The Indian Grandmaster who won the Commonwealth Chess Championship in 2013 is

- (1) Koneru Humpy
- (2) Magnus Carlsen
- (3) Abhijeet Gupta
- (4) Vishwanathan Anand

Solution : 3

47. Who had been selected for the Tagore Award for Cultural Harmony in 2013 ?

- (1) Kiran Bedi
- (2) Chetan Anand
- (3) Zubin Mehta
- (4) Anita Desai

Solution : 3

48. Who won the U.S. Open Men's Singles in 2013 in Lawn Tennis ?

- (1) Andy Murray
- (2) Roger Federer
- (3) Rafael Nadal
- (4) Novak Djokovic

Solution : 3

49. On which date did the Rajya Sabha pass " The Marriage Laws" (Amendment) Bill 2012 ?

- (1) 18th August, 2013
- (2) 5th August, 2013
- (3) 26th August, 2013
- (4) 23rd August, 2013

Solution : 3

50. Which of the following was the first Indian exclusive defence satellite which was successfully launched on 29 August, 2013 ?

- (1) GSAT – 7

(2) MIG - 47

(3) GSET - 4

(4) GSAT - 6

Solution : 1



ENGLISH COMPREHENSION

Directions (1-5) : In the following questions, some parts of the sentences have errors and some are correct. Find out which part of a sentence has an error. The number of that part is the answer. If a sentence is free from error, your answer is (4) i.e. No error.

1. The new device (1)/ aims at eliminating (2)/ the risk of short – circuiting. (3) / No error (4)

Solution : 3

2. I wish to heartily (1)/ congratulate you for (2)/ your astounding success, (3)/No error (4)

Solution : 2

3. The visitor took the vacant seat (1)/ next from mine (2)/ one of the many huge sofas in the room. (3)/ No error (4)

Solution : 2

4. He was (1)/ a learnt man among lords, (2)/ and a lord among learned men. (3)/No error (4)

Solution : 2

5. With our great annoyance (1)/ we found the ground (2)/ filled with broken glasses. (3)/ No error (4)

Solution : 1

Directions (6-10) : 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.

6. Her true feelings manifested themselves in her sarcastic remarks, only then was her.....revealed.

- (1) sarcasm
(2) charm
(3) sweetness
(4) bitterness

Solution : 4

7. The book provides an overview of European wines that should prove inviting to both the virtual..... and the experienced connoisseur.
(1) zealot

- (2) glutton
- (3) prodigal
- (4) novice

Solution : 4

8. The sun is shining brightly, please..... the light.

- (1) take off
- (2) put on
- (3) put off
- (4) put out

Solution : 4

9. This practice was broughtto prevent certain abuses.

- (1) down
- (2) off
- (3) about
- (4) in

Solution : 4

10. This package was supposedyesterday.

- (1) to be delivering
- (2) not to be delivered
- (3) to have been delivered
- (4) to deliver

Solution : 2

Directions (11-13) : In the following questions, out of the four alternatives, choose the one which best expresses the meaning of the given word.

11. Garble

- (1) Confuse
- (2) Hide
- (3) Communicate
- (4) Explain

Solution : 1

12. Pinnacle

- (1) Capsule
- (2) Heart
- (3) Summit
- (4) Pit

Solution : 3

13. Brutalize
 (1) Stir
 (2) Ill-treat
 (3) Devise
 (4) Strike

Solution : 2

Directions (14-16) : In the following questions, choose the word opposite in meaning to the given word as your answer.

14. Denounce
 (1) Signify
 (2) Confirm
 (3) Grant
 (4) Praise

Solution : 4

15. Cease
 (1) Abandon
 (2) Initiate
 (3) Confront
 (4) Confiscate

Solution : 2

16. Seamy
 (1) Honest
 (2) Pure
 (3) Unpleasant
 (4) Sincere

Solution : 2

Directions (17-21) : In the following questions, four alternatives are given for the Idiom/Phrase printed in **bold** in the sentence. Choose the alternative which best expresses the meaning of the Idiom/ Phrase.

17. The secretary's thoughtless remark **added fuel to the fire**.
 (1) added humour to the situation
 (2) worsened the difficult situation
 (3) helped in improving the situation
 (4) prevented the situation

Solution : 2

18. He could not get money from his master because he **rubbed him up the wrong way**.

- (1) irked or irritated him
- (2) asked him to speed up
- (3) suggested a wrong method
- (4) advised him to be strict

Solution : 1

19. Ask Mr. Das. He can give you all the news you need : he is always **in the swim**.

- (1) giving news to others
- (2) at the swimming pool
- (3) in search of news
- (4) well-informed and up-to-date

Solution : 4

20. You have been trying to solve this puzzle for a long time, be careful so that you avoid **barking up the wrong tree**.

- (1) trying to solve problems
- (2) trying to find something at a wrong place
- (3) keep working constantly
- (4) climbing the wrong tree

Solution : 2

21. I'll be able to do my job very well when **I know the ropes**.

- (1) become bolder
- (2) work in silence
- (3) learn the procedures
- (4) gain confidence

Solution : 3

Directions (22-31) : In the following questions, a part of the sentence is printed in bold. Below are given alternatives to the **bold** part at (1), (2), (3) which may improve the sentence. Choose the correct alternative. In case no improvement is needed your answer is (4).

22. Ram **filled ink into his pen** before leaving for school.

- (1) filled ink in his pen
- (2) filled ink on his pen
- (3) filled his pen with ink

(4) No improvement

Solution : 3

23. The toys he bought for Suzy **are too good to be cheap.**

(1) are so much good to be cheap

(2) were so good to be cheap

(3) are so good that to be cheap

(4) No improvement

Solution : 4

24. **I did one mistake in** the dictation test today.

(1) I made a mistake in

(2) I did a mistake at

(3) I did a mistake in

(4) No improvement

Solution : 1

25. John has been detained **at a meeting.**

(1) by the meeting

(2) in meeting

(3) on a meeting

(4) No improvement

Solution : 4

26. The butler was as devoted as **a faithful dog.**

(1) a faithful cat

(2) a faithful friend

(3) a faithful pet

(4) No improvement

Solution : 4

27. The government representative **furnished the reporters all details.**

(1) provided the reporters all details

(2) furnished the reporters with all the details

(3) furnished reporters all details

(4) No improvement

Solution : 2

28. It was raining so heavily yesterday that **I could not move out for my usual walk.**

- (1) I could not go out for my usual walk
- (2) I could not go to my usual walk
- (3) I could not move for my usual walk
- (4) No improvement

Solution : 1

29. There is **an error in grammar** in this sentence.

- (1) a written error
- (2) a gramettical error
- (3) a grammar error
- (4) No improvement

Solution : 2

30. He denied that he **had not forged** my signature.

- (1) would not forge
- (2) did not forge
- (3) had forged
- (4) No improvement

Solution : 3

31. To his astonishment and admiration he **got the information** that it was only the picture of a curtain.

- (1) found
- (2) received the information
- (3) saw clearly
- (4) No improvement

Solution : 2

Directions (32-38) : In the following questions, out of the four alternatives, choose the one which can be substituted for the given words/sentence.

32. Study of caves

- (1) Speleology
- (2) Seismology
- (3) Topology
- (4) Numismatics

Solution : 1

33. Government by the few

- (1) Oligarchy
- (2) Autocracy

(3) Monarchy

(4) Anarchy

Solution : 1

34. Materials that change naturally by the action of bacteria

(1) Inflammable

(2) Perishable

(3) Biological

(4) Biodegradable

Solution : 4

35. Having a stale smell or taste

(1) Rancid

(2) Insipid

(3) Savoury

(4) Tepid

Solution : 1

36. A wooden object used for connecting animals that are pulling a vehicle

(1) Rein

(2) Leash

(3) Whip

(4) Yoke

Solution : 4

37. A man who knows a lot about things like food, music and art

(1) Priest

(2) Optimist

(3) Hostage

(4) Connoisseur

Solution : 4

38. A doctor who specializes in diseases of the nose

(1) Rhinologist

(2) Otologist

(3) Pathologist

(4) Podiatrist

Solution : 1

Directions (39-40) : In the following questions, four words are given in each question, out of which only one word is correctly spelt. Find the correctly spelt

word.

39. (1) Inteligibelly
(2) Inteligibillity
(3) Intelligibility
(4) Inteligibility

Solution : 3

40. (1) Exterpate
(2) Extirpeit
(3) Extirpate
(4) Extripaite

Solution : 3

Directions (41-50) : In the following questions, you have two brief passages with 5 questions following each passage. Read the passages carefully and choose the best answer to each question out of the four alternatives.

PASSAGE-I

(Q. Nos. 41 to 45)

A crucial element that defines the soap opera is the open ended nature of the narrative, with stories spanning several episodes. One of the defining features that makes a television program a soap opera, according to Albert Moran is "that form of television that works with a continuous open narrative. Each episode ends with a promise that the storyline is to be continued in another episode."

In 2012, Robert Lloyd of the Los Angeles Times wrote of daily dramas, "Although melodramatically eventful, soap operas such as this also have a luxury of space that makes them seem more naturalistic, indeed, the economics of the form demand long scenes, and conversations that a 22- episodes-per – season weekly series might dispense with in half a dozen lines of dialogue may be drawn out, as here, for pages. You spend more time even with the minor characters, the apparent villains grow less apparently villainous."

Soap opera storylines run concurrently, intersect and lead into further developments. An individual episode of a soap opera will generally switch between several different concurrent narrative threads that may at times interconnect and effect one another or may run entirely independent of each other. Evening soap operas and serials that run for only a part of the year tend to bring things to a dramatic end of season cliffhanger.

41. A soap opera has the space for it to be more
(1) artistic
(2) naturalistic
(3) dramatic

(4) tragic

Solution : 2

42. The economics of a soap opera form demands for it to have

- (1) long scenes
- (2) luxurious space
- (3) melodramatic events
- (4) promising storylines

Solution : 1

43. An individual episode of a soap opera generally switches between

- (1) more time spent with minor characters.
- (2) apparent villains that grow less apparent villainous.
- (3) successive intersections of events.
- (4) different concurrent narrative threads.

Solution : 4

44. Soap operas that run for a part of the year usually end in

- (1) a cliff
- (2) an episode
- (3) a cliffhanger
- (4) a sequence

Solution : 3

45. What does the author mean by the open – ended nature of soap operas ?

- (1) Each episode ends with a promise that the storyline is to be continued in another episode
- (2) Every episode has a different story
- (3) Every episode ends abruptly
- (4) Consecutive episodes have no connection

Solution : 1

PASSAGE-II

(Q. Nos. 46 to 50)

Two or three days and nights went by; I reckon I might say they swum by, they slid along so quiet and smooth and lovely. Here is the way we put it in the time. It was a monstrous big river down there sometimes a mile and a half wide; we ran nights, and laid up and hid daytimes; soon as night was most gone we stopped navigating and tied up – nearly always in the dead water under a towhead; and then cut young cottonwoods and willows, and hid the raft with them. Then we set out the lines. Next we slid into the river and had a swim, so as to freshen up and

cool off; then we set down on the sandy bottom where the water was about knee deep and watched the daylight come. Not a sound anywhere – perfectly still just like the whole world was asleep only sometimes the bullfrogs a cluttering maybe. The first thing to see, looking away over the water was a kind of dull line – that was the woods on the other side; you couldn't make anything else out; then a pale place in the sky; then more paleness spreading around; then the river softened up away off, and wasn't black any more, but gray; you could see little dark spots drifting along ever so far away – trading scows and such things and long black streaks – rafts; sometimes you could hear a sweep creaking or jumbled up voices, it was so still and sounds come so far and by and by you could see a streak on the water which you know

by the look of the streak that there's a snag there in a swift current which breaks on it and makes that streak look that way.

46. They stopped navigating

- (1) at night
- (2) at dusk
- (3) at daytime
- (4) at dawn

Solution : 1

47. After a swim in the moor they

- (1) set down on the sandy bottom where the water was about ankle deep and watched the daylight come.
- (2) set down on the sandy bottom where the water was about knee deep and watched the daylight come.
- (3) set down on the sandy shore and watched the daylight come.
- (4) set down on the sandy bottom and watched the daylight come.

Solution : 2

48. In the stillness of the night

- (1) sounds come so far
- (2) the bullfrogs also were asleep
- (3) the whole world was asleep
- (4) a sweep creaking or jumbled up voices could be heard

Solution : 3

49. The streak on the water looks as it does because

- (1) the swift current has broken the streak
- (2) the streak has been swept by the swift current to the shore.
- (3) of a snag there in the swift current which breaks on it.

(4) the streak has been swept by the swift current.

Solution : 3

50. How did the days and nights go by, according to the writer?

(1) They slid along so quiet and smooth and lovely.

(2) They slid along so smooth and quietly.

(3) They slid along so smooth and soft and quietly.

(4) They slid along so quietly and smooth and softly.

Solution : 1



QUANTITATIVE APTITUDE

1. Solve for x :

$$3^x - 3^{x-1} = 486.$$

- (1) 7
(2) 9
(3) 5
(4) 6

Solution : 4

$$(4) 3^x - 3^{x-1} = 486$$

$$\Rightarrow 3^{x-1} (3 - 1) = 486$$

$$\Rightarrow 3^{x-1} \times 2 = 486$$

$$\Rightarrow 3^{x-1} = \frac{486}{2} = 243$$

$$\Rightarrow 3^{x-1} = 3^5 \Rightarrow x - 1 = 5$$

$$\Rightarrow x = 5 + 1 = 6$$

2. A can do a piece of work in 4 days and B can do it in 12 days. In how many days will they finish the work, both working together ?

- (1) 4 days
(2) 6 days
(3) 2 days
(4) 3 days

Solution : 4

$$(4) A's 1 day's work = \frac{1}{4}$$

$$B's 1 day's work = \frac{1}{12}$$

$$(A + B)'s 1 day's work$$

$$= \frac{1}{4} + \frac{1}{12}$$

$$= \frac{3+1}{12} = \frac{4}{12} = \frac{1}{3}$$

$$\therefore \text{Required time} = 3 \text{ days}$$

3. A can do $\frac{1}{4}$ of a work in 10 days. B can do $\frac{1}{3}$ of the work in 20 days. In how many days can both A and B together do the work ?

- (1) 30 days

- (2) 32 days
 (3) 24 days
 (4) 25 days

Solution : 3

∴ (3) A does $\frac{1}{4}$ work in 10 days

∴ A will do 1 work in

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

Similarly, B will do the same work

$$\text{in } 20 \times 3 = 60 \text{ days}$$

∴ (A + B)'s 1 day's work

$$= \frac{1}{40} + \frac{1}{60}$$

$$= \frac{3+2}{120} = \frac{5}{120} = \frac{1}{24}$$

∴ Required time = 24 days

4. A and B can together finish a work in 30 days. They worked at it for 20 days and then B left. The remaining work was done by A alone in 20 more days. A alone can finish the work in
- (1) 60 days
 (2) 54 days
 (3) 48 days
 (4) 50 days

Solution : 1

(1) (A + B) together do the work in 30 days.

$$\therefore (A + B)\text{'s 1 day's work} = \frac{1}{30}$$

$$\therefore (A + B)\text{'s 20 days' work} = \frac{20}{30} = \frac{2}{3}$$

$$\text{Remaining work} = 1 - \frac{2}{3} = \frac{1}{3}$$

$$\therefore \text{Time taken by A in doing } \frac{1}{3}$$

work = 20 days

$$\therefore \text{Time taken in doing 1 work} = 20 \times 3 = 60 \text{ days.}$$

5. A circular wire of diameter 112 cm is cut and bent in the form of a rectangle whose sides are in the ratio of 9 : 7. The smaller side of the rectangle is

- (1) 77 cm
(2) 97 cm
(3) 67 cm
(4) 87 cm

Solution : 1

(1) Circumference of circular shape = $\pi \times \text{diameter}$

$$= \frac{22}{7} \times 112 = 352 \text{ cm}$$

= length of wire

\therefore Perimeter of rectangle

= 2 (length + breadth)

$$\Rightarrow 2(l + b) = 352$$

$$\Rightarrow l + b = \frac{352}{2} = 176$$

\therefore Smaller side of rectangle

$$= \frac{7}{16} \times 176$$

$$= 77 \text{ cm}$$

6. A piece of cloth measured with a metre stick, one cm short, is 100 metres long. Reckoning the metre stick as being right, the actual length of the cloth (in cm) is

- (1) 3,900
- (2) 9,900
- (3) 8,000
- (4) 6,100

Solution : 2

$$(2) \because 1 \text{ metre} \equiv 99 \text{ cm}$$

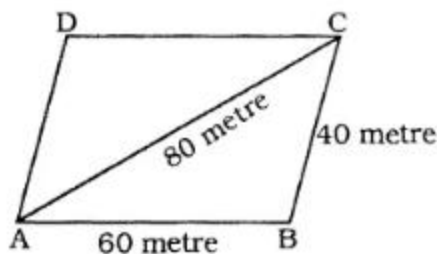
$$\therefore 100 \text{ metre} \equiv 9900 \text{ cm}$$

7. A parallelogram has sides 60 m and 40m and one of its diagonals is 80 m long. Its area is

- (1) $500 \sqrt{15} \text{ m}^2$
- (2) $600 \sqrt{15} \text{ m}^2$
- (3) $400 \sqrt{15} \text{ m}^2$
- (4) $450 \sqrt{15} \text{ m}^2$

Solution : 2

(2)



Semiperimeter of $\Delta ABC(s)$

$$= \frac{a + b + c}{2}$$

$$= \frac{60 + 40 + 80}{2} = 90 \text{ metre}$$

\therefore Area of ΔABC

$$= \sqrt{s(s-a)(s-b)(s-c)}$$

$$= \sqrt{90(90-60)(90-40)(90-80)}$$

$$= \sqrt{90 \times 30 \times 50 \times 10}$$

$$\begin{aligned}
 &= \sqrt{3 \times 30 \times 30 \times 5 \times 10 \times 10} \\
 &= 30 \times 10 \sqrt{15} \\
 &= 300 \sqrt{15} \text{ sq. metre} \\
 \therefore \text{Area of } \square ABCD \\
 &= 2 \times \text{Area of } \triangle ABC \\
 &= 2 \times 300 \sqrt{15} \\
 &= 600 \sqrt{15} \text{ sq. metre}
 \end{aligned}$$

8. The cost price of a table is 3,200. A merchant wants to make 25 % profit by selling it. At the the time of sale he declares a discount of 20 % on the marked price. The marked price (in r) is
- (1) 5,000
 - (2) 6,000
 - (3) 4,000
 - (4) 4,500

Solution : 1

• (1) Let the marked price of table be Rs. x .

$$\therefore \frac{x \times 80}{100} = \frac{3200 \times 125}{100}$$

$$\Rightarrow x \times 80 = 3200 \times 125$$

$$\Rightarrow x = \frac{3200 \times 125}{80} = \text{Rs. } 5000$$

9. A shopkeeper allows a discount of 12.5 % on the marked price of a certain article and makes a profit of 20 %. If the article costs the shopkeeper 210, then the marked price of the article will be
- (1) 387
 - (2) 350
 - (3) 386
 - (4) 288

Solution : 4

(4) Marked price of article

= Rs. x

$$\therefore \frac{x \times (100 - 12.5)}{100} = \frac{210 \times 120}{100}$$

$$\Rightarrow x \times 87.5 = 210 \times 120$$

$$\Rightarrow x = \frac{210 \times 120}{87.5} = \text{Rs. } 288$$

10. A businessman allows a discount of 10 % on the marked price. What percent above the cost price must he mark his goods to make a profit of 17 per cent ?

(1) 27 %

(2) 18%

(3) 30 %

(4) 20 %

Solution : 3

(3) C.P. of article = Rs. 100

and marked price of article

= Rs. x (let)

$$\therefore x \times \frac{90}{100} = 117$$

$$\Rightarrow x = \frac{117 \times 100}{90} = \text{Rs. } 130$$

i.e. 30% above the cost price.

11. Some bricks are arranged in an area measuring 20 cu. m. If the length, breadth and height of each brick is 25 cm, 12.5 cm and 8 cm respectively, then in that pile the number of bricks are (suppose there is no gap in between two bricks)

(1) 6,000

(2) 8,000

(3) 4,000

(4) 10,000

Solution : 2

(2) Volume of pile = 20 cu.
metre

$$= 20 \times (100)^3 \text{ cu.cm.}$$

Volume of one brick

$$= (25 \times 12.5 \times 8) \text{ cu.cm.}$$

\therefore Required number of bricks

$$= \frac{20 \times 100 \times 100 \times 100}{25 \times 12.5 \times 8} = 8000$$

12. The average salary, per head, of all the workers of an institution is 60. The average salary of 12 officers is = 400; the average salary, per head, of the rest is 56. The total number of workers in the institution is

(1) 1030

(2) 1035

(3) 1020

(4) 1032

Solution : 4

(4) Number of other workers
except officers = x

$$\therefore 12 \times 400 + x \times 56 = (x + 12) \times 60$$

$$\Rightarrow 4800 + 56x = 60x + 720$$

$$\Rightarrow 60x - 56x = 4800 - 720$$

$$\Rightarrow 4x = 4080$$

$$\Rightarrow x = \frac{4080}{4} = 1020$$

\therefore Total number of workers
= $1020 + 12 = 1032$

13. Charging 30% above its production cost a radio maker puts a label of 286 on a radio as its price. But at the time of selling it, he allows 10% discount on the labelled price. What will his gain be ?

(1) 257.40

(2) 254.40

(3) 198

(4) 37.40

Solution : 4

(4) Production cost of radio =
Rs. x

$$\therefore \frac{x \times 130}{100} = 286$$

$$\Rightarrow x = \frac{286 \times 100}{130} = \text{Rs. } 220$$

\therefore Selling price = 90% of 286

$$= \frac{286 \times 90}{100} = \text{Rs. } 257.40$$

Profit = Rs. (257.40 - 220)
= Rs. 37.40

14. In an election, a candidate who gets 84 % of the votes is elected by a majority of 476 votes. What is the total number of votes polled ?

- (1) 900
(2) 810
(3) 600
(4) 700

Solution : 4

(4) Total number of votes
polled = x

$$\therefore \frac{x \times 84}{100} - \frac{x \times 16}{100} = 476$$

$$\Rightarrow \frac{68x}{100} = 476$$

$$\Rightarrow x = \frac{476 \times 100}{68} = 700$$

15. A man having height 169 cm is standing near a pole. He casts a shadow 130 cm long. What is the length of the pole if it gives a shadow 420 cm long ?

- (1) 550 cm
(2) 589 cm
(3) 323 cm
(4) 546 cm

Solution : 4

$$\begin{aligned}
 (4) \quad & \frac{\text{Height of man}}{\text{Height of pole}} \\
 &= \frac{\text{Length of shadow of man}}{\text{Length of shadow of pole}} \\
 \Rightarrow & \frac{169}{\text{Height of pole}} = \frac{130}{420} \\
 \Rightarrow & \text{Height of pole} \times 130 \\
 &= 169 \times 420 \\
 \Rightarrow & \text{Height of pole} = \frac{169 \times 420}{130} \\
 &= 546 \text{ cm}
 \end{aligned}$$

16. 555 was to be divided among A, B and C in the ratio of $1/4 : 1/5 : 1/6$. But by mistake it was divided in the ratio of $4 : 5 : 6$. The amount in excess received by C was
- (1) 72
 - (2) 75
 - (3) 22
 - (4) 52

Solution : 1

(1) Case I

$$\begin{aligned}
 A : B : C &= \frac{1}{4} : \frac{1}{5} : \frac{1}{6} \\
 &= \frac{1}{4} \times 60 : \frac{1}{5} \times 60 : \frac{1}{6} \times 60 \\
 &\quad [\text{LCM of 4, 5 and 6} = 60] \\
 &= 15 : 12 : 10 \\
 \text{Sum of ratios} &= 15 + 12 + 10 \\
 &= 37 \\
 \therefore \text{C's share} &= \frac{10}{37} \times 555 \\
 &= \text{Rs. 150}
 \end{aligned}$$

Case II

$$A : B : C = 4 : 5 : 6$$

$$\text{Sum of ratios} = 4 + 5 + 6 = 15$$

$$\therefore \text{Cs share} = \frac{6}{15} \times 555$$

$$= \text{Rs. } 222$$

$$\therefore \text{Required answer}$$

$$= \text{Rs. } (222 - 150)$$

$$= \text{Rs. } 72$$

17. The average of 50 numbers is 38. If two numbers, namely 45 and 55 are discarded, the average of the remaining numbers is
- (1) 37.5
 - (2) 37.9
 - (3) 36.5
 - (4) 37.0

Solution : 1

(1) Sum of 50 numbers

$$= 50 \times 38 = 1900$$

Sum of 48 numbers

$$= 1900 - 45 - 55 = 1800$$

\therefore Required average

$$= \frac{1800}{48} = 37.5$$

18. In what time will 8,000, at 3% per annum, produce the same interest as 6,000 does in 5 years at 4 % simple interest ?
- (1) 5 years
 - (2) 6 years
 - (3) 3 years
 - (4) 4 years

Solution : 1

(1) Required time = t years

$$\text{S.I.} = \frac{\text{Principal} \times \text{Rate} \times \text{Time}}{100}$$

$$\therefore \frac{6000 \times 4 \times 5}{100} = \frac{8000 \times 3 \times t}{100}$$

$$\Rightarrow 6000 \times 4 \times 5 = 8000 \times 3 \times t$$

$$\therefore t = \frac{6000 \times 4 \times 5}{8000 \times 3} = 5 \text{ years}$$

19. The reciprocal of $x + \frac{1}{x}$ is

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

(4) $\frac{1}{x} + x$

Solution : 1

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

$$\therefore \text{Its reciprocal} = \frac{x}{x^2 + 1}$$

20. What is the value of

$$\frac{2.75 \times 2.75 \times 2.75 - 2.25 \times 2.25 \times 2.25}{2.75 \times 2.75 + 2.75 \times 2.25 + 2.25 \times 2.25} \text{ is}$$

(1) 3

(2) $3/2$

(3) 1

(4) $1/2$

Solution : 4

(4) Let $2.75 = a$ and $2.25 = b$

$$\begin{aligned}\therefore \text{Expression} &= \frac{a^3 - b^3}{a^2 + ab + b^2} \\ &= \frac{(a - b)(a^2 + ab + b^2)}{a^2 + ab + b^2} \\ &= a - b = 2.75 - 2.25 \\ &= 0.50 = \frac{1}{2}\end{aligned}$$

21. The value of $1 - \frac{a}{1 - \frac{1}{1 + \frac{a}{1 - a}}}$

is

- (1) a
- (2) $1 - a$
- (3) 1
- (4) 0

Solution : 4

$$\begin{aligned}(4) \text{ Expression} &= 1 - \frac{a}{1 - \frac{1}{1 + \frac{a}{1 - a}}} \\ &= 1 - \frac{a}{1 - \frac{1}{\frac{1 - a + a}{1 - a}}} \\ &= 1 - \frac{a}{1 - \frac{1}{1 - a}} \\ &= 1 - \frac{a}{1 - (1 - a)} = 1 - \frac{a}{1 - 1 + a} \\ &= 1 - 1 = 0\end{aligned}$$

22. The value of $\frac{(243)^{\frac{n}{5}} \times 3^{2n+1}}{9^n \times 3^{n-1}}$ is

- (1) 3
- (2) 9
- (3) 6
- (4) 12

Solution : 2

(2) Expression

$$\begin{aligned}
 &= \frac{(243)^{\frac{n}{5}} \times 3^{2n+1}}{9^n \times 3^{n-1}} \\
 &= \frac{(3^5)^{\frac{n}{5}} \times 3^{2n+1}}{(3^2)^n \times 3^{n-1}} = \frac{(3)^{5 \times \frac{n}{5}} \times 3^{2n+1}}{3^{2n} \times 3^{n-1}} \\
 &= \frac{3^n \times 3^{2n+1}}{3^{2n} \times 3^{n-1}} = \frac{3^{3n+1}}{3^{3n-1}} \\
 &= 3^{3n+1-3n+1} = 3^2 = 9 \\
 &[a^m \times a^n = a^{m+n}; a^m \div a^n = a^{m-n} \\
 & ; (a^m)^n = a^{mn}]
 \end{aligned}$$

23. A speed of 45 the same as

- (1) 12.5 metre/second
- (2) 13 metre/second
- (3) 15 metre/second
- (4) 12 metre/second

Solution : 1

(1) Speed = 45 kmph

$$\begin{aligned}
 &= \left(\frac{45 \times 1000}{60 \times 60} \right) \text{ metre/second} \\
 &= \left(\frac{45 \times 5}{18} \right) \text{ metre/second} \\
 &= 12.5 \text{ metre/second}
 \end{aligned}$$

24. A train travelling of 55 km/hr travels X to place Y speed is increased km/hr., then the time of journey is reduced by

- (1) 25 minutes
- (2) 35 minutes
- (3) 20 minutes
- (4) 30 minutes

Solution : 3

(3) Distance between stations

X and Y = Speed \times Time

$$= 55 \times 4 = 220 \text{ km.}$$

New speed = $55 + 5 = 60$ kmph

$$\therefore \text{Required time} = \frac{220}{60}$$

$$= \frac{11}{3} \text{ hours}$$

= 3 hours 40 minutes.

\therefore Required answer

= 4 hours – 3 hours 40 minutes

= 20 minutes

25. If a, b, c are positive and $a + b + c = 1$, then the least value

$$\frac{1}{a} + \frac{1}{b} + \frac{1}{c} \text{ is}$$

- (1) 9
- (2) 5
- (3) 3
- (4) 1

Solution : 1

(1) The value of $\frac{1}{a} + \frac{1}{b} + \frac{1}{c}$ will be minimum, if values of a, b and c be maximum.

$$a + b + c = 1$$

\therefore Values of a, b and c will be maximum if

$$a = b = c$$

$$\therefore a = b = c = \frac{1}{3}$$

$$\therefore \frac{1}{a} + \frac{1}{b} + \frac{1}{c} = 3 + 3 + 3 = 9$$

26. In a $\triangle ABC$, $\angle A + \angle B = 118^\circ$ $\angle A + \angle C = 96^\circ$. find the value of $\angle A$.

- (1) 36°
- (2) 40°
- (3) 30°
- (4) 34°

Solution : 4

(4) In $\triangle ABC$,

$$\angle A + \angle B + \angle C = 180^\circ$$

$$\angle A + \angle B = 118^\circ$$

$$\therefore \angle C = 180^\circ - 118^\circ = 62^\circ$$

$$\therefore \angle A + \angle C = 96^\circ$$

$$\Rightarrow \angle A + 62^\circ = 96^\circ$$

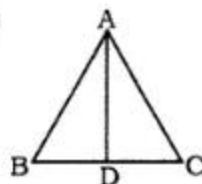
$$\Rightarrow \angle A = 96^\circ - 62^\circ = 34^\circ$$

27. In $\triangle ABC$, if $AD \perp BC$, then $AB^2 + CD^2$ is equal

- (1) $2 BD^2$
- (2) $BD^2 + AC^2$
- (3) $2 AC^2$
- (4) None of these

Solution : 2

(2)



In $\triangle ABD$,

$$AB^2 = AD^2 + BD^2$$

In $\triangle ADC$,

$$AC^2 = AD^2 + CD^2$$

$$\therefore AB^2 + CD^2 = AD^2 + BD^2 + CD^2$$

$$= AD^2 + CD^2 + BD^2$$

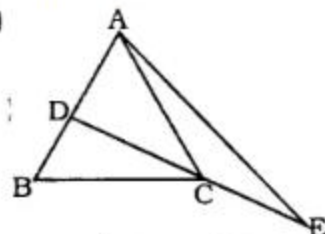
$$= AC^2 + BD^2$$

28. ABC is an equilateral triangle and CD is the internal bisector of $\angle C$. If DC is produced to E such that $AC = CE$, then $\angle CAE$ is equal to

- (1) 45°
- (2) 75°
- (3) 30°

(4) 15° **Solution : 4**

(4)



$$\angle BCD = \angle DCA = 30^\circ$$

$$\angle DCE = 180^\circ$$

$$\therefore \angle ACE = 180^\circ - 30^\circ = 150^\circ$$

$$AC = CE$$

$$\therefore \angle CAE = \angle CEA = \frac{30^\circ}{2} = 15^\circ$$

29. If $x(x-3) = -1$, then the value of $x^3(x^3-18)$ is

(1) -1

(2) 2

(3) 1

(4) 0

Solution : 1

$$(1) x(x-3) = -1$$

$$\Rightarrow x^2 - 3x = -1$$

$$\Rightarrow x^2 - 3x + 1 = 0$$

$$\text{Expression} = x^3(x^3 - 18)$$

$$= x^6 - 18x^3$$

$$\text{On dividing } x^6 - 18x^3 \text{ by } x^2 - 3x + 1$$

$$\begin{array}{r}
 x^2 - 3x + 1 \overline{) x^6 - 18x^3} \quad (x^4 + 3x^3 + 8x^2 + 3x \\
 \underline{-x^6 + 3x^5 - x^4} \\
 3x^5 - x^4 - 18x^3 \\
 \underline{-3x^5 + 9x^4 - 3x^3} \\
 8x^4 - 21x^3 \\
 \underline{-8x^4 + 24x^3 - 8x^2} \\
 3x^3 - 8x^2 \\
 \underline{-3x^3 + 9x^2 - 3x} \\
 x^2 - 3x
 \end{array}$$

$$\therefore x^6 - 18x^3 = (x^4 + 3x^3 + 8x^2 + 3x)$$

$$(x^2 - 3x + 1) + x^2 - 3x$$

$$= 0 + x(x-3) = -1$$

30. The value of $(1001)^3$ is

(1) 1003003001

(2) 100303001

(3) 100300301

(4) 103003001

Solution : 1**(1) Look at the pattern :**

$$1001 \times 1001 = 1002001$$

$$1001 \times 1001 \times 1001 = 1003003001$$

31. If $a(2 + \sqrt{3}) = b(2 - \sqrt{3})$ then the value of

$$\frac{1}{a^2 + 1} + \frac{1}{b^2 + 1} \text{ is}$$

(1) -5

(2) 1

(3) 4

(4) 9

Solution : 2

$$(2) a(2 + \sqrt{3}) = b(2 - \sqrt{3}) = 1$$

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

$$= \frac{2 - \sqrt{3}}{4 - 3} = 2 - \sqrt{3}$$

$$\text{and } b = \frac{1}{2 - \sqrt{3}}$$

$$= \frac{2 + \sqrt{3}}{(2 - \sqrt{3})(2 + \sqrt{3})} = \frac{2 + \sqrt{3}}{4 - 3}$$

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

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

$$= 4 + 3 - 4\sqrt{3} + 1 = 8 - 4\sqrt{3}$$

$$b^2 + 1 = (2 + \sqrt{3})^2 + 1$$

$$= 4 + 3 + 4\sqrt{3} + 1 = 8 + 4\sqrt{3}$$

$$\begin{aligned}
 &\therefore \frac{1}{a^2+1} + \frac{1}{b^2+1} \\
 &= \frac{1}{8-4\sqrt{3}} + \frac{1}{8+4\sqrt{3}} \\
 &= \frac{8+4\sqrt{3}+8-4\sqrt{3}}{(8-4\sqrt{3})(8+4\sqrt{3})} \\
 &= \frac{16}{64-16 \times 3} = \frac{16}{64-48} \\
 &= \frac{16}{16} = 1
 \end{aligned}$$

If $x \sin^2 60^\circ - \frac{3}{2} \sec 60^\circ$

32. $\tan^2 30^\circ + \frac{4}{5} \sin^2 45^\circ \tan^2 60^\circ$

= 0 then x is

(1) $-\frac{1}{15}$ (2) -4 (3) $-\frac{4}{15}$

(4) -2

Solution : 3

$$(3) x \sin^2 60^\circ - \frac{3}{2} \sec 60^\circ \cdot \tan^2 30^\circ$$

$$+ \frac{4}{5} \sin^2 45^\circ \cdot \tan^2 60^\circ = 0$$

$$\Rightarrow x \cdot \left(\frac{\sqrt{3}}{2} \right)^2 - \frac{3}{2} \times 2 \cdot \left(\frac{1}{\sqrt{3}} \right)^2$$

$$+ \frac{4}{5} \times \left(\frac{1}{\sqrt{2}} \right)^2 \times (\sqrt{3})^2 = 0$$

$$\Rightarrow \frac{3x}{4} - \frac{3}{2} \times 2 \times \frac{1}{3} + \frac{4}{5} \times \frac{1}{2} \times 3 = 0$$

$$\Rightarrow \frac{3x}{4} - 1 + \frac{6}{5} = 0$$

$$\Rightarrow \frac{3x}{4} = 1 - \frac{6}{5} = \frac{5-6}{5} = \frac{-1}{5}$$

$$\Rightarrow x = -\frac{1}{5} \times \frac{4}{3} = \frac{-4}{15}$$

33. If $\triangle ABC$ is right – angle at B, $AB = 6$ units, $\angle C = 30^\circ$ then AC is equal to

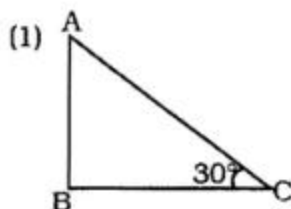
(1) 12 units

(2) 15 units

(3) 8 units

(4) 10 units

Solution : 1



In ΔABC ,

$$\sin 30^\circ = \frac{AB}{AC}$$

$$\Rightarrow \frac{1}{2} = \frac{6}{AC} \Rightarrow AC = 2 \times 6$$

$$= 12 \text{ units}$$

If $7 \sin \alpha = 24 \cos \alpha$; $0 < \alpha$

34. $< \frac{\pi}{2}$, then the value of

$14 \tan \alpha - 75 \cos \alpha - 7 \sec \alpha$ is equal to

- (1) 3
- (2) 4
- (3) 1
- (4) 2

Solution : 4

$$(4) 7 \sin \alpha = 24 \cos \alpha$$

$$\Rightarrow \frac{\sin \alpha}{\cos \alpha} = \frac{24}{7} \Rightarrow \tan \alpha = \frac{24}{7}$$

$$\sec \alpha = \sqrt{1 + \tan^2 \alpha} = \sqrt{1 + \left(\frac{24}{7}\right)^2}$$

$$= \sqrt{1 + \frac{576}{49}} = \sqrt{\frac{49 + 576}{49}}$$

$$= \sqrt{\frac{625}{49}} = \frac{25}{7}$$

$$\therefore \cos \alpha = \frac{1}{\sec \alpha} = \frac{7}{25}$$

$$\therefore 14 \tan \alpha - 75 \cos \alpha - 7 \sec \alpha$$

$$= 14 \times \frac{24}{7} - 75 \times \frac{7}{25} - 7 \times \frac{25}{7}$$

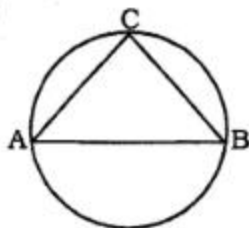
$$= 48 - 21 - 25 = 2$$

35. $\angle ACB$ is an angle in the semicircle of diameter $AB = 5$ and $AC : BC = 3 : 4$. The area of the triangle ABC is

- (1) 6.5 sq. cm
- (2) 4 sq. cm
- (3) 12 sq. cm
- (4) 6 sq. cm

Solution : 4

(4)



Angle at the semi-circle is a right angle.

$$\therefore \angle ACB = 90^\circ$$

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

$$AC = 3x \text{ cm. } BC = 4x \text{ cm.}$$

$$\therefore (3x)^2 + (4x)^2 = (5)^2$$

$$\Rightarrow 9x^2 + 16x^2 = 25 \Rightarrow 25x^2 = 25$$

$$\Rightarrow x^2 = 1$$

$$\Rightarrow x = 1$$

$$\therefore \text{Area of } \triangle ABC = \frac{1}{2} \times BC \times AC$$

$$= \frac{1}{2} \times 4 \times 3 = 6 \text{ sq.cm.}$$

36. A, B and C are three points on a circle such that the angles subtended by the chords AB and AC at the centre O are 90° and 110° respectively. Further suppose that the centre 'o' lies in the interior L BAC. The L BAC is

(1) 40°

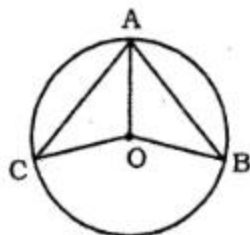
(2) 80°

(3) 160°

(4) 20°

Solution : 2

(2)

In $\triangle OAB$

$$\angle AOB = 90^\circ$$

$$OA = OB = \text{radii}$$

$$\therefore \angle OAB = \angle OBA = \frac{180^\circ - 90^\circ}{2}$$

$$= 45^\circ$$

In $\triangle AOC$,

$$\angle AOC = 110^\circ$$

$$OA = OC$$

$$\therefore \angle OAC = \angle ACO = \frac{180^\circ - 110^\circ}{2}$$

$$= \frac{70^\circ}{2} = 35^\circ$$

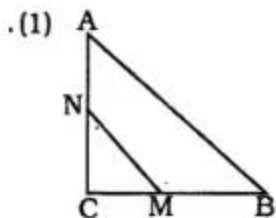
$$\therefore \angle CAB = \angle BAO + \angle OAC$$

$$= 45^\circ + 35^\circ = 80^\circ$$

37. If the lengths of the sides AB, BC and CA of a triangle ABC are 10 cm, 8 cm and 6 cm respectively and if M is the mid - point of BC and MN \parallel AB to cut AC at N, then the area of the trapezium ABMN is equal to

- (1) 18 sq. cm.
- (2) 20 sq. cm.
- (3) 12 sq. cm.
- (4) 16 sq. cm.

Solution : 1



$$\therefore 8^2 + 6^2 = 10^2$$

$\therefore \Delta ABC$ is a right angled triangle.

$$CM = MB = 4 \text{ cm.}$$

N is the mid point of AC.

$$\therefore CN = 3 \text{ cm.}$$

\therefore Area of trapezium ABMN
 = Area of ΔABC - Area of ΔCMN

$$= \frac{1}{2} \times 6 \times 8 - \frac{1}{2} \times 3 \times 4$$

$$= 24 - 6 = 18 \text{ sq. cm.}$$

38. A type of graph in which a circle is divided into sectors such that each sector represents a proportion of the whole is a

- (1) Line graph
- (2) Stem and leaf chart
- (3) Bar graph
- (4) Pie chart

Solution : 4

39. The value of x which satisfies the equation $2 \operatorname{cosec}^2 30^\circ + x$

$$\sin^2 60^\circ - \frac{3}{4} \tan^2 30^\circ = 10 \text{ is}$$

- (1) 2
- (2) 3
- (3) 0
- (4) 1

Solution : 2

$$(2) 2 \operatorname{cosec}^2 30^\circ + x \sin^2 60^\circ - \frac{3}{4}$$

$$\tan^2 30^\circ = 10$$

$$\Rightarrow 2 \times (2)^2 + x \times \left(\frac{\sqrt{3}}{2}\right)^2 - \frac{3}{4} \times$$

$$\left(\frac{1}{\sqrt{3}}\right)^2 = 10$$

$$\Rightarrow 8 + \frac{3x}{4} - \frac{3}{4} \times \frac{1}{3} = 10$$

$$\Rightarrow \frac{3x}{4} = 10 + \frac{1}{4} - 8$$

$$\Rightarrow \frac{3x}{4} = \frac{9}{4} \Rightarrow 3x = 9$$

$$\Rightarrow x = \frac{9}{3} = 3$$

40. If $2 \sin \theta + \cos \theta = \frac{7}{3}$ then the value of $(\tan^2 \theta - \sec^2 \theta)$ is

(1) 0

(2) -1

(3) $\frac{3}{7}$ (4) $\frac{7}{3}$

Solution : 2

$$(2) \tan^2 \theta - \sec^2 \theta = -(\sec^2 \theta - \tan^2 \theta) = -1.$$

41. From a point 20 m away from the foot of a tower, the angle of elevation of the top of the tower is 30° . The height of the tower is

(1) $10\sqrt{3}$ m

(2) $20\sqrt{3}$ m

(3) $\frac{10}{\sqrt{3}}$ m (4) $\frac{20}{\sqrt{3}}$ m

Solution : 4