SSC COMBINED GRADUATE LEVEL (CGL) TIER-I EXAM ,09-08-2015 (FIRST SITTING) – PREVIOUS YEAR PAPER

GENERAL AWARENESS

1. Peroxyacetyl nitrate is a
   (1) Acidic dye
   (2) Plant hormone
   (3) Vitamin
   (4) Secondary pollutant

   Solution : 4

2. Which of the following river does not originate in Indian territory ?
   (1) Ganga
   (2) Mahanadi
   (3) Brahmaputra
   (4) Satluj

   Solution : 3

3. To whom the line 'A thing of beauty is a joy for ever' is attributed ?
   (1) William Wordsworth
   (2) John Keats
   (3) Dr. Charles Dickens
   (4) Dr. Jonathan Swift

   Solution : 2

4. The birthday of which of the following leaders is celebrated as 'Teachers' Day' in India ?
   (1) Lala Lajpat Rai
   (2) Dr. Rajendra Prasad
   (3) S. Radhakrishnan
   (4) C. Rajgopalachari

   Solution : 3

Note: The Information Provided here is only for reference. It May vary the Original.

5. The award given for outstanding performance in sports is
(1) Dronacharya Award
(2) Bharat Ratna
(3) Padma Shri Award
(4) Arjuna Award

Solution : 4

6. Which hill station's name means 'place of the thunderbolt' ?
(1) Gangtok
(2) Shillong
(3) Oottacamand
(4) Darjeeling

Solution : 4

7. The maximum fixation of solar energy is done by
(1) Protozoa
(2) Bacteria
(3) Fungi
(4) Green plants

Solution : 4

8. The term 'brown air' is used for
(1) Acid fumes
(2) Photochemical smog
(3) Sulphurous smog
(4) Industrial smog

Solution : 2

9. Which of the following is FALSE with respect to rain water harvesting ?
(1) It is a device of water conservation.
(2) It helps raising water table.
(3) It helps meet rising water demand.
(4) It increases run-off losses.

Solution : 4

10. Where was the first conference of SAARC (South Asian Association for Regional Cooperation) held ?
(1) Kathmandu
(2) Dhaka
(3) New Delhi

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(4) Colombo

Solution : 2

11. Which among the following is not a Bretton Woods Institution ?
(1) None of these
(2) International Monetary Fund (IMF)
(3) World Bank
(4) Organisation of Economic Cooperation and Development (OECD)

Solution : 4

12. Equilibrium price in the market is determined by the
(1) equality between marginal cost and average cost.
(2) equality between total cost and total revenue.
(3) equality between average cost and average revenue.
(4) equality between marginal cost and marginal revenue.

Solution : 4

13. In the national context which of the following indicates Macro Approach ?
(1) Inflation in India.
(2) Sales of Bata Shoe Company
(3) Exports of Mangoes to UK
(4) Income from Railways.

Solution : 3

14. Internal economies
(1) arise when there is expansion in an industry.
(2) arise in an economy as it makes progress.
(3) accrue to a firm when it expands its output.
(4) arise when there is expansion in internal trade.

Solution : 1

15. The ship building yard-Mazgaon Dock is located at
(1) Vishakhapatnam
(2) Kochi
(3) Kolkata
(4) Mumbai

Solution : 4

16. Electric current is measured using which of the following instrument ?
(1) Ammeter

(2) Voltmeter
(3) Anemometer
(4) Wattmeter

Solution : 1

17. 'Agha Khan Cup' is related with which of the following sport event ?
(1) Football
(2) Cricket
(3) Hockey
(4) Table Tennis

Solution : 3

18. The legislature gains a priority over the executive in
(1) A Presidential Government
(2) A Federal Government
(3) An Authoritarian Government
(4) A Parliamentary Government

Solution : 4

19. The legislature in a democratic country can influence public opinion by
(1) Focusing attention on public issues
(2) Granting rights
(3) Enacting non-controversial laws
(4) Defining the duties of the citizens

Solution : 1

20. If the President wants to resign from his office, he may do so by writing to the
(1) Speaker of Lok Sabha
(2) Vice President
(3) Chief Justice of India
(4) Prime Minister

Solution : 2

21. Which of the following is not a Union Territory ?
(1) Dadra and Nagar Haveli
(2) Lakshadweep
(3) Puducherry
(4) Nagaland

Solution : 4

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22. The greatest king of the Pratihara dynasty was
(1) Vatsaraj
(2) Bhoj (Mihir-Bhoj)
(3) Dantidurga
(4) Nagbhatta II

Solution : 2

23. One of the features of a free market economy is
(1) active state intervention
(2) public ownership of factors of production
(3) rationing and price control
(4) consumer's sovereignty

Solution : 4

24. Gross National Product – Depreciation Allowance = ?
(1) Per Capita Income
(2) Gross Domestic Product
(3) Personal Income
(4) Net National Product

Solution : 4

25. The Panchayat Samiti remains accountable for its functions to
(1) Janpad Panchayats
(2) The Gram Panchayats and Gram Sabhas
(3) Zilla Parishads
(4) Anchal Panchayats

Solution : 3

26. Which one of the following pair is not correctly matched ?
(I) Harshvardhan – Hiuen Tsang
(2) Akbar – Todarmal
(3) Chanakya – Chandragupta
(4) Vikramaditya – Chaitanya

Solution : 4

27. The South-East trade winds are attracted towards the Indian subcontinent in the rainy season due to
(1) the development of cyclone over the equator
(2) the effect of easterlies
(3) the effect of Northern-East trade winds

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(4) the presence of low atmospheric pressure over North-West India

Solution : 4

28. The 'graded profile' of a river course is a
(1) smooth curve from source to mouth.
(2) smooth curve in the upper course.
(3) smooth curve in the middle course.
(4) smooth curve in the lower course.

Solution : 1

29. Sink hole is a phenomenon of .....topography.
(1) Plain
(2) Desert
(3) Tundra
(4) Karst

Solution : 4

30. Kerala is famous for the cultivation of
1. Coconut
2. Black-pepper
3. Rubber
4. Rice
(1) 1, 2 and 3
(2) 1, 2 and 4
(3) 2, 3 and 4
(4) 1 and 4

Solution : 1

31. In 1939 Subhash Chandra Bose was elected as President of the Congress Party defeating
(1) Pattabhi Sitharamayya
(2) Jawaharlal Nehru
(3) Maulana Abul .Kalam Azad
(4) VB Patel

Solution : 1

32. Jallianwala incident took place at
(1) Allahabad
(2) Lucknow
(3) Surat

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(4) Amritsar

Solution : 4

33. Who was the founder of Lodhi dynasty ?
(1) Daulat Khan Lodhi
(2) Sikandar Lodhi
(3) Bahlol Lodhi
(4) Ibrahim Lodhi

Solution : 3

34. Allantois of Embryo helps in
(1) digestion
(2) respiration
(3) excretion
(4) protection

Solution : 3

35. Which one of the following animals belongs to mollusca ?
(1) Haliotis
(2) Hare
(3) Hydra
(4) Hyla

Solution : 2

36. Outside the nucleus DNA is found in
(I) Golgi bodies
(2) Mitochondria
(3) Ribosome
(4) Endoplasmic reticulum

Solution : 2

37. Animal protein is called first class protein because it is
(1) easily digestible
(2) delicious in taste
(3) cheaper in the market
(4) rich in essential amino acids

Solution : 4

38. It is easy to burst a gas-filled balloon with a neelde than with a nail. It is because

(1) nail is more longer than needle.
(2) nail exerts more pressure than needle on the balloon.
(3) needle exerts more pressure than nail on the balloon.
(4) gas is reactive with the needle.

Solution : 3

39. The longest continental Railway in the world is
(1) Trans Atlantic Railway
(2) Trans Siberian Railway
(3) Canadian Pacific Railway
(4) Canadian National Railway

Solution : 2

40. Photoperiodism affects
(1) All of these
(2) Flowering
(3) Vegetative growth
(4) Fruiting

Solution : 1

41. Match the following :

I	II
A. Ascorbic acid	1. Photosynthetic pigment
B. Chlorophyll	2. Quencher
C. Carotenoid	3. Enzyme
D. Superoxide dismutase	4. Vitamin-C

	A	B	C	D
(1)	4	1	2	3
(2)	4	2	1	3
(3)	2	4	1	3
(4)	4	1	3	2

Solution : 1

42. What is used to identify whether a data word has an odd or even number of 1's ?
(1) Carry bit
(2) Sign bit
(3) Zero bit
(4) Parity bit

Solution : 4

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43. Rearranging and allocating space in memory to provide for multiple computing tasks is called
(1) Networking
(2) Multiprogramming
(3) Multitasking
(4) Memory Management

Solution : 4

44. What happens when a drop of glycerol is added to crushed KMnO, spread on a paper ?
(1) There is a crackling sound.
(2) There is a violent explosion.
(3) There is no reaction.
(4) The paper ignites.

Solution : 2

45. Most commonly used bleaching agent is
(1) Sodium chloride
(2) Alcohol
(3) Carbon dioxide
(4) Chlorine

Solution : 4

46. The least penetrating power ray is
(1) X-Ray
(2) a-Ray
(3) ß-Ray
(4) y-Ray

Solution : 2

47. Hydrogen peroxide is an effective sterilizing agent. Which one of the following product results when it readily loses active oxygen?
(1) Nascent Hydrogen
(2) Water
(3) Hydrogen
(4) Ozone

Solution : 2

48. The velocity of sound in moist air is more than in dry air because the moist air has
(1) less density than dry air.

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(2) less pressure than dry air.
(3) more pressure than thy air.
(4) more density than dry air.

Solution : 1

49. X-rays can be used
(1) for cutting and welding of metals.
(2) to detect heart diseases.
(3) to detect defects in precious stones and diamonds.
(4) to detect gold under the earth.

Solution : 3

50. Ice is packed in saw dust because
(1) saw dust will not get melted easily.
(2) saw dust is poor conductor of heat.
(3) saw dust is a good conductor of heat.
(4) saw dust does not stick to the ice.

Solution : 2

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ENGLISH COMPREHENESION

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 No error.*

1. By May next year I have been working in this college for twenty years.
   (1) No error
   (2) By May next year
   (3) I have been working in this college
   (4) For twenty years.

   Solution : 3

2. Everyone of us should realise that any act of negligence will cause a great harm to our country's security.
   (1) No error
   (2) Everyone of us should realise that
   (3) any act of negligence will cause
   (4) a great harm to our country's security.

   Solution : 1

3. I shall look forward to being with you sometime next month.
   (1) No error
   (2) I shall look forward
   (3) To being with you
   (4) Sometime next month.

   Solution : 1

4. I really do regret not to learn to play the violin when I had so many opportunties to learn and practise in school.
   (1) No error
   (2) I really do regret not to learn to play the violin
   (3) When I had so many opportunities
   (4) To learn and practise in school.

   Solution : 2

5. The government granted relief payments of Rs. 5,000 each to those who injured in the fire accident.
   (1) No error

(2) The government granted
(3) Relief payments of Rs. 5,000 each
(4) To those who injured in the fire accident.

Solution : 4

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 as your answer.

6. He went there .....
(1) on foot
(2) walking on foot
(3) by foot
(4) with foot

Solution : 1

7. After your long illness I am happy to see you .....
(1) up and round
(2) up and about
(3) by and by
(4) up and down

Solution : 2

8. You must..... your career with all seriousness.
(1) pursue
(2) follow
(3) complete
(4) direct

Solution : 1

9. Making pies and cakes .....Mrs. Reddy's speciality.
(1) has
(2) are
(3) were
(4) is

Solution : 4

10. The deserted garden was infested..... weeds.
(1) with

(2) for
(3) into
(4) on

Solution : 1

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. **Devout**
(1) Pious
(2) Solemn
(3) Loyal
(4) Dedicated

Solution : 1

12. **Predilection**
(1) Preference
(2) Favour
(3) Whim
(4) Prejudice

Solution : 1

13. **Effigy**
(1) Organ
(2) Dummy
(3) Imagery
(4) Reflection

Solution : 2

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

14. **Tremulous**
(1) Healthy
(2) Steady
(3) Obese
(4) Young

Solution : 2

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15. **Fake**
(1) Wrong
(2) Fanciful
(3) Real
(4) Ideal

Solution : 3

16. **Disconsolate**
(1) Prominent
(2) Joyous
(3) Thankful
(4) Unprejudiced

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. Their attempt to get back the stolen necklace proved to be a **wild goose chase.**
(1) delayed action
(2) wise decision
(3) useless search
(4) timely action

Solution : 3

18. The day the new product was launched, people **made a beeline** to purchase it.
(1) went online
(2) rushed
(3) were doubtful
(4) refused

Solution : 2

19. **At his wit's end,** he turned to his old trade.
(1) Overjoyed
(2) After careful thinking
(3) Confidently
(4) Not knowing what to do

Solution : 4

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20. When it comes to dancing, he is **all-thumbs.**
(1) lazy
(2) an expert
(3) a trainer
(4) clumsy

Solution : 4

21. He usually goes to bed very early and rises with the lark.
(1) at midnight
(2) very late
(3) very early
(4) after sunrise

Solution : 3

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

22. The second pigeon flew just as the first **pigeon had flown.**
(1) No improvement
(2) one had done
(3) one had flown away
(4) had done

Solution : 4

23. The old man has acquired **experience through age.**
(1) No improvement
(2) developed experience
(3) experienced
(4) got experience

Solution : 1

24. Water and soil pollutants find their entry into the body through **ingestion of contaminated** water or food.
(1) No improvement
(2) digestion of contaminated
(3) injection of contaminated

(4) passage of contaminated

Solution : 1

25. He lives far **from the station.**
(1) No improvement
(2) away from the station
(3) a long way from the station
(4) off the station

Solution : 3

26. Mumbai is famous **because of** its textiles.
(1) No improvement
(2) at
(3) in
(4) for

Solution : 4

27. They **spoke** about the weather.
(1) No improvement
(2) said
(3) talked
(4) expressed

Solution : 3

28. Mr. Mukherjee knows ten languages, **isn't it ?**
(1) No improvement
(2) doesn't Mr. Mukherjee
(3) hasn't he
(4) doesn't he

Solution : 4

29. It's high time that you **go** home.
(1) No improvement
(2) are going
(3) went
(4) gone

Solution : 3

30. Drinking tea is an English **habit.**
(1) No improvement

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(2) tradition
(3) convention
(4) custom

Solution : 4

31. He **is wanting in a little** common sense.
(1) No improvement
(2) lacks
(3) is lacking in
(4) needs some

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. Medical study of skin and its diseases.
(1) Orthopaedics
(2) Dermatology
(3) Endocrinology
(4) Gynaecology

Solution : 2

33. A process involving too much official formality.
(1) Nepotism
(2) Diplomacy
(3) Bureaucracy
(4) Red-tapism

Solution : 4

34. A person who enters without any invitation.
(1) Vandal
(2) Burglar
(3) Intruder
(4) Thief

Solution : 3

35. Not suitable for eating
(1) Spicy
(2) Tasteless

Note: The Information Provided here is only for reference. It May vary the Original.

(3) Uneatable
(4) Inedible

Solution : 4

36. A recurrent compulsive urge to steal.
(1) Kleptomania
(2) Pneumonia
(3) Insomnia
(4) Nymphomania

Solution : 1

37. Act of injuring another's reputation by any slanderous communication.
(1) Defamation
(2) Orchestration
(3) Aberration
(4) Misrepresentation

Solution : 1

38. A story in which animals or objects speak and give wholesome moral lesson.
(1) Legend
(2) Fable
(3) Parable
(4) Allegory

Solution : 2

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) Fasimmile
(2) Facsimile
(3) Facsimilee
(4) Fasirnile

Solution : 2

40. (1) Aquarim
(2) Acquariam
(3) Aquarium
(4) Acquerium

Solution : 3

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

PASSAGE-I

(Question Nos. 41-45)

The instinctive, natural way to express anger is to respond aggressively. Anger is a natural, adaptive response to threats; it inspires powerful, often aggressive, feelings and behaviours, which allow us to fight and to defend ourselves when we are attacked. On the other hand, we can't physically lash out at every person or object that irritates or annoys us; laws, social norms and common sense place limits on how far our anger can take us. People use a variety of both conscious and unconscious processes to deal with their angry feelings. The three main approaches are' expressing, suppressing and calming. Expressing your angry feelings in an assertive not aggressive – manner is the healthiest way to express anger. Being assertive doesn't mean being pushy or demanding; it means being respectful of yourself and others. Anger can be suppressed and then converted or redirected . This happens when you hold in your anger, stop thinking about it and focus on something positive.

41. What does the author mean by being assertive ?
(1) Being calm
(2) Being pushy
(3) Being demanding
(4) Being respectful

Solution : 4

42. How, according to the author, can one suppress anger ?
(1) By redirecting anger.
(2) By holding one's anger.
(3) By thinking about one's anger.
(4) By converting anger.

Solution : 2

43. How does a person naturally express anger ?
(1) By adapting strong behaviour.
(2) By inspiring powerful feelings.
(3) By responding aggressively.

(4) By defending oneself.

Solution : 3

44. Which one of the following places limits on how far we can take our anger ?
(1) Law
(2) Behaviour
(3) Feelings
(4) Instinct

Solution : 1

45. According to the author, how should people deal with their anger ?
(1) Expressing unconsciously
(2) Express it assertively
(3) Express it aggressively
(4) Expressing consciously

Solution : 2

PASSAGE-II

(Question Nos. 46-50)

The crowd surged forward through the narrow streets of Paris. There was a clatter of shutters being closed hastily by trembling hands-the citizens of Paris knew that once the fury of the people was excited there was no telling what they might do. They came to an old house which had a workshop on the ground floor. A head popped out of the door to see what it was all about "Get him! Get Thimonier! Smash his devilish machines!" yelled the crowd.

They found the workshop without its owner. M. Thimonier had escaped by the back door. Now the fury of the demonstrators turned against the machines that were standing in the shop, ready to be delivered to buyers. They were systematically broken up and destroyed – dozens of them. Only when the last wheel and spindle had been trampled under foot did the infuriated crowd recover their senses.

"That is the end of M'Sieur Thimonier and his sewing machines," they said to one another and went home satisfied. Perhaps now they would find work, for they were all unemployed tailors and seamstresses who believed that their livelihood was threatened by that new invention.

46. The people thought that
(1) they would be deprived of their livelihood.
(2) their lives were in danger.

(3) Thimonier was mad.
(4) t he sewing machine was dangerous.

Solution : 1

47. Shutters were being closed because the shopkeepers
(1) wanted to support the crowd.
(2) wanted to attack the crowd.
(3) wanted to protect Thimonier.
(4) feared their shops would be destroyed.

Solution : 4

48. The passage throws light on
(1) how dangerous an invention can be.
(2) why inventions should be avoided.
(3) how a well-meant invention can be misunderstood.
(4) what mischief an inventor can do to ordinary people.

Solution : 3

49. The crowd was protesting against
(1) Thimonier for keeping the invention a secret.
(2) the closings of workshops.
(3) the misdoings of Thimonier.
(4) the newly invented sewing machine.

Solution : 4

50. The aim of the crowd was to
(1) destroy the sewing machines
(2) kill Thimonier
(3) drive Thimonier away
(4) humiliate Thimonier

Solution : 2

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QUANTITATIVE APTITUDE

1. In ΔABC, a line through A cuts the side BC at D such that BD : DC = 4 : 5. If the area of $\Delta ABD = 60\ cm^2$, then the area of ΔADC is
   (1) 90 cm^2
   (2) 50 cm^2
   (3) 60 cm^2
   (4) 75 cm^2

Solution : 4
(4)

Let, $AE \perp BC$

$$\therefore \frac{\text{Area of } \Delta ABD}{\text{Area of } \Delta ADC}$$

$$= \frac{\frac{1}{2} \times BD \times AE}{\frac{1}{2} \times CD \times AE}$$

$$\Rightarrow \frac{60}{\Delta ADC} = \frac{BD}{CD}$$

$$\Rightarrow \frac{60}{\Delta ADC} = \frac{4}{5}$$

$$\Rightarrow \Delta ADC = \frac{60 \times 5}{4}$$

= 75 sq. cm.

2. A tangent is drawn to a circle of radius 6 cm from a point situated at a distance of 10 cm from the centre of the circle. The length of the tangent will be
   (1) 7 cm

(2) 4 cm
(3) 5 cm
(4) 8 cm

Solution : 4

.(4)

AB is a tangent. OB is radius of circle.

$OB \perp AB$

OB = 6 cm.

OA = 10 cm.

$\therefore AB = \sqrt{OA^2 - OB^2}$

$= \sqrt{10^2 - 6^2} = \sqrt{100 - 36}$

$= \sqrt{64} = 8$ cm.

3. A ship after sailing 12 km towards south from a particular place covered 5 km more towards east. Then the straightway distance of the ship from that place is
(1) 11 km
(2) 18 km
(3) 15 km
(4) 13 km

Solution : 4

(3)

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$\therefore$ OB = $\sqrt{OA^2 + AB^2}$

$= \sqrt{12^2 + 5^2}$

$= \sqrt{144 + 25} = \sqrt{169}$

= 13 km.

4. The sides of a triangle having area 7776 sq. cm are in the ratio 3 : 4 : 5. The perimeter of the triangle is

(1) 432 cm

(2) 400 cm

(3) 412 cm

(4) 424 cm

Solution : 1

4. (1) Let the sides of triangle be $3x$, $4x$ and $5x$ units.

Here, $(3x)^2 + (4x)^2 = (5x)^2$

Hence, it is a right angled triangle.

Area of ΔABC

$= \frac{1}{2} \times AB \times BC$

$\Rightarrow \frac{1}{2} \times 3x \times 4x = 7776$

$\Rightarrow 6x^2 = 7776$

$\Rightarrow x^2 = \frac{7776}{6} = 1296$

$\Rightarrow x = \sqrt{1296} = 36$ cm.

$\therefore$ Perimeter of triangle

$= 3x + 4x + 5x$

$= 12x = 12 \times 36$

$= 432$ cm.

5. Two chords of length a unit and b unit of a circle make angles 60° and 90° at the centre of a circle respectively, then the correct relation is

(1) b = 3/2a

(2) b = √2a

(3) b = 2a

(4) b = √3a

Solution : 2

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(2)

OA = OB = OC = OD = radius(r)

$\angle OAB = 90°$; AB = b, CD = a

From ΔOAB,

$OA^2 + OB^2 = AB^2$

$\Rightarrow r^2 + r^2 = b^2 \Rightarrow 2r^2 = b^2$

$\Rightarrow r^2 = \frac{b^2}{2}$

$\Rightarrow r = \frac{b}{\sqrt{2}}$ .....(i)

In ΔOCD,

$\angle COD = 60°$;

$\therefore \angle OCD = \angle ODC = 60°$

$\therefore$ OC = CD

$\Rightarrow r = a$ .....(ii)

From equations (i) and (ii),

$\frac{b}{\sqrt{2}} = a \Rightarrow b = \sqrt{2}\ a$

6. In a parallelogram PQRS, angle P is four times of angle Q, then the measure of ZR is

(1) $144°$
(2) $36°$
(3) $72°$
(4) $130°$

Solution : 1

(1)

$\angle SPQ + \angle PQR = 180°$

$\Rightarrow 4\angle PQR + \angle PQR = 180°$

$\Rightarrow 5\angle PQR = 180°$

$\Rightarrow \angle PQR = \frac{180°}{5} = 36°$

$\therefore \angle SRQ = 180° - 36° = 144°$

7. The sum of four numbers is 48. When 5 and 1 are added to the first two; and 3 and 7 are subtracted from the 3rd and 4th, the numbers will be equal. The numbers are

(1) 9, 7, 15, 17

(2) 4, 12, 12, 20

(3) 5, 11, 13, 19

(4) 6, 10, 14, 18

Solution : 4

(4) Let four numbers be a, b, c and d respectively.

$\therefore a + b + c + d = 48$ .....(i)

and,

$a + 5 = b + 1 = c - 3 = d - 7 = x$

(let)

$\therefore a = x - 5;\ b = x - 1,$

$c = x + 3,\ d = x + 7$

From equation (i),

$x - 5 + x - 1 + x + 3 + x + 7 = 48$

$\Rightarrow 4x + 4 = 48$

$\Rightarrow 4x = 48 - 4 = 44$

$\Rightarrow x = \frac{44}{4} = 11$

$\therefore a = x - 5 = 11 - 5 = 6$

$b = x - 1 = 11 - 1 = 10$

$c = x + 3 = 11 + 3 = 14$

$d = x + 7 = 11 + 7 = 18$

8. The least number that should be added to 2055, so that the sum is exactly divisible by 27 is

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(1) 28
(2) 24
(3) 27
(4) 31

Solution : 2

(2) 27) 2055 (76
189
165
162
3

∴ Required number = 27 – 3 = 24

9. A and B together can do a piece of work in 6 days. If A can alone do the work in 18 days, then the number of days required for B to finish the work is
(1) 10
(2) 12
(3) 9
(4) 15

Solution : 3

. (3) (A + B)'s 1 day's work = $\frac{1}{6}$

A's 1 day's work = $\frac{1}{18}$

∴ B's 1 day's work = $\frac{1}{6} - \frac{1}{18}$

$= \frac{3-1}{18} = \frac{2}{18} = \frac{1}{9}$

∴ Required time = 9 days

10. A pipe can fill a tank in x hours and another can empty it in y hours. They can together fill it in (y > x)
(1) $\frac{xy}{y-x}$ hours
(2) x- y hours
(3) y- x hours
(4) $\frac{xy}{x-y}$ hours

Solution : 1

).(1) When both pipes are opened simultaneously, part of the tank filled in 1 hour

$$= \frac{1}{x} - \frac{1}{y} = \frac{y-x}{xy}$$

$\therefore$ Required time $= \frac{xy}{y-x}$ hours

11. Two poles of height 7 metre and 12 metre stand on a plane ground. If the distance between their feet is 12 metre, the distance between their top will be
(1) 15 metre
(2) 13 metre
(3) 19 metre
(4) 17 metre

Solution : 2

(2)

AB = 7 metre CD = 12 metre

$\therefore$ CE = CD − DE

= 12 − 7 = 5 metre

$\therefore$ From ΔAEC,

$AC = \sqrt{AE^2 + EC^2}$

$= \sqrt{12^2 + 5^2}$

$= \sqrt{144 + 25} = \sqrt{169}$

= 13 metre

12. The maximum value of $\sin^4\theta + \cos^4\theta$ is
(1) 1/3
(2) 1
(3) 1/3
(4) 3

Solution : 2

. (2) Expression

$= \sin^4\theta + \cos^4\theta$

$= (\sin^2\theta)^2 + (\cos^2\theta)^2$

$= (\sin^2\theta + \cos^2\theta)^2 - 2 \sin^2\theta. \cos^2\theta.$

$= 1 - 2 \sin^2\theta. \cos^2\theta.$

$$= 1 - \frac{4\sin^2\theta.\cos^2\theta}{2}$$

$[\because \sin 2\theta = 2 \sin\theta . \cos\theta]$

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

$$= 1 - \frac{1 - \cos 4\theta}{4}$$

$[\because 1 - \cos 2\theta = 2\cos^2\theta]$

$$= 1 - \frac{1}{4} + \frac{\cos 4\theta}{4}$$

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

$(\cos 4\theta \leq 1)$

OR

The value of $\sin^4\theta + \cos^4\theta$ will be maximum if $\theta = 0°$

$\therefore$ Required value $= (\sin 0)^4 + (\cos 0)^4 = 0 + 1 = 1$

13. Find the value of tan 4° tan 43° tan 47: tan 86°

(1) 2/3

(2) 1

(3) 1/2

(4) 2

Solution : 2

. (2) $\tan 86° = \cot (90° - 86°)$

$= \cot 4°.$

$\tan 47° = \cot (90° - 47°)$

$= \cot 43°$

$\therefore$ (tan 4°. tan 86°) (tan 43°.tan 47°)

= (tan 4° : cot 4°) (tan 43°.cot 43°)

= 1 ($\because$ $\tan\theta \cdot \cot\theta = 1$)

14. A square is inscribed in a quarter-circle in such a manner that two of its adjacent vertices lie on the two radii at an equal distance from the centre, while the other two vertices lie on the circular arc. If the square has sides of length x, then the radius of the circle is

(1) $\sqrt{2}x$

(2) $\frac{16x}{\pi+4}$

(3) $\frac{2x}{\sqrt{\pi}}$

(4) $\frac{\sqrt{5}x}{\sqrt{2}}$

Solution : 4

(4)

OE = OF

EF = x units

$\therefore$ From ΔOEF,

$2\,OE^2 = EF^2$

$\Rightarrow \sqrt{2} \times OE = EF = x$

$\Rightarrow OE = \frac{x}{\sqrt{2}}$

BE = diagonal of square EFBC

$= \sqrt{2}\,x$

$\therefore OB = \sqrt{OE^2 + EB^2}$

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

$= \sqrt{\frac{x^2}{2} + 2x^2}$

$= \sqrt{\frac{x^2 + 4x^2}{2}}$

$= \sqrt{\frac{5x^2}{2}} = \frac{\sqrt{5}x}{\sqrt{2}}$ units

15. 10% discount and then 20% discount in succession is equivalent to total discount of
(1) 28%
(2) 15%
(3) 30%
(4) 24%

Solution : 1

(1) Single equivalent discount

$$= \left(x + y - \frac{xy}{100}\right)\%$$

$$= \left(10 + 20 - \frac{10 \times 20}{100}\right)\%$$

$$= (30 - 2)\% = 28\%$$

16. The marked price of a watch was Rs. 720. A man bought the same for Rs. 550.80 after getting two successive discounts, the first being 10%. The second discount rate is
(1) 18%
(2) 12%
(3) 14%
(4) 15%

Solution : 4

(4) Marked price = Rs. 720

Discount= 10%

∴ After a discount of 10%,

$$\text{S.P.} = \text{Rs.} \left(\frac{720 \times 90}{100}\right)$$

= Rs. 648

Final S.P. = Rs. 550.80

∴ Discount = Rs. (648 – 550.80)

= Rs. 97.2

If the second discount be x%, then

$$\frac{648 \times x}{100} = 97.2$$

$$\Rightarrow x = \frac{97.2 \times 100}{648} = 15\%$$

17. A tap can empty a tank in 30 minutes. A second tap can empty it in 45 minutes. If both the taps operate simultaneously, how much time is needed to empty the tank ?
(1) 30 minutes
(2) 18 minutes
(3) 14 minutes
(4) 15 minutes

Solution : 2

(2) Part of tank emptied by both pipes in 1 minute

$$= \frac{1}{30} + \frac{1}{45} = \frac{3+2}{90}$$

$$= \frac{5}{90} = \frac{1}{18}$$

∴ Required time = 18 minutes

18. The perimeter of one face of a cube is 20 cm. Its volume will be
(1) 625 cm^3
(2) 100 cm^3
(3) 125 cm^3
(4) 400 cm^3

Solution : 3

(3) Perimeter of a face of cube
= 20 cm.
∴ An edge of cube

$$= \frac{20}{4} = 5 \text{ cm.}$$

∴ Volume of cube = $(\text{edge})^3$
= $(5)^3$ = 125 cu. cm.

19. If the area of a circle is A, radius of the circle is r and circumference of it is C, then
(1) A/r = C
(2) rC = 2A
(3) C/A = r/2
(4) AC = $r^2/4$

Solution : 2

Note: The Information Provided here is only for reference. It May vary the Original.

(2) $A = \pi r^2$

$C = 2\pi r$

$\therefore \frac{A}{C} = \frac{\pi r^2}{2\pi r} = \frac{r}{2}$

$\Rightarrow rC = 2A$

20. The average weight of 15 oarsmen in a boat is increased by 1.6 kg when one of the crew, who weighs 42 kg is replaced by a new man. Find the weight of the new man (in kg).
(1) 67
(2) 65
(3) 66
(4) 43

Solution : 3

(3) Weight of new oarsman

$= (42 + 15 \times 1.6)$ kg.

$= (42 + 24)$ kg. $= 66$ kg.

21. What is the Arithmetic mean of the first 'n' natural numbers ?
(1) $\frac{n(n+1)}{2}$
(2) $\frac{n+1}{2}$
(3) $\frac{n^2(n+1)}{2}$
(4) $2(n+1)$

Solution : 2

(2) Sum of first n natural numbers

$= \frac{n(n+1)}{2}$

$\therefore$ Required average

$= \frac{n(n+1)}{2 \times n} = \frac{n+1}{2}$

22. A shopkeeper bought 30 kg of rice at the rate of Rs. 70 per kg and 20 kg of rice at the rate of Rs. 70.75 per kg. If he mixed the two brands of rice and sold the mixture at Rs. 80.50 per kg, his gain is
(1) Rs. 450
(2) Rs. 510
(3) Rs. 525

Note: The Information Provided here is only for reference. It May vary the Original.

(4) Rs. 485

Solution : 2

(2) C.P. of 50 kg of rice

= Rs. (30 × 70 + 20 × 70.75)

= Rs. (2100 + 1415)

= Rs. 3515

S.P. of 50 kg. of rice

= Rs. (50 × 80.50) = Rs. 4025

Profit = Rs. (4025 – 3515)

= Rs. 510

23. Allowing 20% and 15% successive discounts, the selling price of an article becomes Rs. 3.060; then the marked price will be

(1) Rs. 4,000

(2) Rs. 4,400

(3) Rs. 5,000

(4) Rs. 4,500

Solution : 4

(4) Marked price of article

= Rs. x (let)

According to the question,

$$x \times \frac{80}{100} \times \frac{85}{100} = 3060$$

$$\Rightarrow x = \frac{3060 \times 100 \times 100}{80 \times 85}$$

= Rs. 4500

24. Eighteen years ago, the ratio of A's age to B's age was 8 : 13. Their present ratios are 5 : 7. What is the present age of A ?

(1) 60 years

(2) 70 years

(3) 50 years

(4) 40 years

Solution : 3

(3) 18 years ago,

A's age = $8x$ years

B's age = $13x$ years

$\therefore$ At present,

$$\frac{8x+18}{13x+18} = \frac{5}{7}$$

$\Rightarrow 56x + 126 = 65x + 90$

$\Rightarrow 65x - 56x = 126 - 90$

$\Rightarrow 9x = 36 \Rightarrow x = \frac{36}{9} = 4$

$\therefore$ A's present age = $8x + 18$

$= 8 \times 4 + 18$

= 50 years

25. 729 ml of a mixture contains milk and water in the ratio 7 : 2. How much more water is to be added to get a new mixture containing milk and water in the ratio 7 : 3 ?

(1) 81 ml

(2) 60 ml

(3) 71 ml

(4) 52 ml

Solution : 1

$\therefore$ In 729 ml of mixture,

Milk = $\frac{7}{9} \times 729 = 567$ ml

Water = $\frac{2}{9} \times 729 = 162$ ml.

Let x ml of water be mixed.

$$\frac{567}{162 + x} = \frac{7}{3}$$

$\Rightarrow 162 \times 7 + 7x = 567 \times 3$

$\Rightarrow 1134 + 7x = 1701$

$\Rightarrow 7x = 1701 - 1134 = 567$

$\Rightarrow x = \frac{567}{7} = 81$ ml.

26. In certain years a sum of money is doubled to itself at 6 1/4 % simple interest per annum, then the required time will be

(1) 16 Years

(2) 12 1/2 years

(3) 8 years

(4) 10 2/3 years

Solution : 1

∵ According to the question,

If principal be Rs. x, then

S.I. = Rs. x

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

$$= \frac{x \times 100}{x \times \frac{25}{4}}$$

$$= \frac{400}{25} = 16 \text{ years}$$

27. The length of the portion of the straight line $3x + 4y = 12$ intercepted between the axes is

(1) 5

(2) 3

(3) 4

(4) 7

Solution : 1

(1)

Putting $x = 0$ in $3x + 4y = 12$

$3 \times 0 + 4y = 12$

$\Rightarrow y = \frac{12}{4} = 3$

∴ Point of intersection on y – axis = (0, 3)

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Again, putting $y = 0$ in $3x + 4y = 12$

$3x + 4 \times 0 = 12$

$\Rightarrow 3x = 12 \Rightarrow x = 4$

$\therefore$ Point of intersection on x-axis $= (4,0)$

$\therefore OA = 4$ and $OB = 3$

$\therefore AB = \sqrt{OA^2 + OB^2}$

$= \sqrt{4^2 + 3^2} = \sqrt{16+9}$

$= \sqrt{25} = 5$ units

28. The value of

$$\frac{1}{\sqrt{7}-\sqrt{6}} - \frac{1}{\sqrt{6}-\sqrt{5}} + \frac{1}{\sqrt{5}-2} - \frac{1}{\sqrt{8}-\sqrt{7}} + \frac{1}{3-\sqrt{8}} \text{ is}$$

(1) 7

(2) 0

(3) 1

(4) 5

Solution : 4

(4) $\frac{1}{\sqrt{7}-\sqrt{6}}$

$= \frac{\sqrt{7}+\sqrt{6}}{(\sqrt{7}-\sqrt{6})(\sqrt{7}+\sqrt{6})}$

(rationalising the denominator)

$= \frac{\sqrt{7}+\sqrt{6}}{7-6} = \sqrt{7} + \sqrt{6}$

Similarly,

$\frac{1}{\sqrt{6}-\sqrt{5}} = \sqrt{6} + \sqrt{5}$;

$\frac{1}{\sqrt{5}-2} = \sqrt{5} + 2$

$\frac{1}{\sqrt{8}-\sqrt{7}} = \sqrt{8} + \sqrt{7}$.

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

Note: The Information Provided here is only for reference. It May vary the Original.

$\therefore$ Expression

$= (\sqrt{7}+\sqrt{6}) - (\sqrt{6}+\sqrt{5}) +$

$(\sqrt{5}+2) - (\sqrt{8}+\sqrt{7}) +$

$(3+\sqrt{8})$

$= \sqrt{7} + \sqrt{6} - \sqrt{6} - \sqrt{5} +$

$\sqrt{5} + 2 - \sqrt{8} - \sqrt{7} + 3 +$

$\sqrt{8} = 2 + 3 = 5$

29. The population of a town increases by 5% every year. If the present population is 9261, the population 3 years ago was
(1) 8000
(2) 5700
(3) 6000
(4) 7500

Solution : 1

(1) $P = P_o\left(1+\frac{R}{100}\right)^T$

$\Rightarrow 9261 = P_o\left(1+\frac{5}{100}\right)^3$

$\Rightarrow 9261 = P_o\left(1+\frac{1}{20}\right)^3$

$\Rightarrow 9261 = P_o\left(\frac{21}{20}\right)^3$

$\Rightarrow P_o = \frac{9261\times 20\times 20\times 20}{21\times 21\times 21}$

$= 8000$

30. A farmer travelled a distance of 61 km in 9 hrs. He travelled partly on foot at the rate of 4 km/hr and partly on bicycle at the rate of 9 km/hr. The distance travelled on foot is
(1) 14 km
(2) 171cm
(3) 16 km
(4) 15 km

Solution : 3

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(3) Let the distance covered on foot be x km.

$\therefore$ Distance covered by cycle

$= (61 - x)$ km.

According to the question,

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}}$$

$$\Rightarrow \frac{x}{4} + \frac{61 - x}{9} = 9$$

$$\Rightarrow \frac{9x + 244 - 4x}{36} = 9$$

$$\Rightarrow 5x = 9 \times 36 - 244$$

$$\Rightarrow 5x = 324 - 244 = 80$$

$$\Rightarrow x = \frac{80}{5} = 16 \text{ km.}$$

31. Walking at the rate of 4 kmph a man covers certain distance in 2 hrs 45 min. Running at a speed of 16.5 kmph the man will cover the same distance in how many minutes ?

(1) 50 min.

(2) 35 min.

(3) 40 min.

(4) 45 min.

Solution : 3

(3) 2 hours 45 minutes

$$= \left(2 + \frac{45}{60}\right) \text{ hours}$$

$$= \left(2 + \frac{3}{4}\right) \text{ hours} = \frac{11}{4} \text{ hours}$$

$\therefore$ Distance = Speed × Time

$$= 4 \times \frac{11}{4} = 11 \text{ km.}$$

$\therefore$ Time taken in covering 11 km at 16.5 kmph

$$= \frac{11}{16.5} \text{ hour}$$

$$= \left(\frac{11 \times 10 \times 60}{165}\right) \text{ minutes}$$

= 40 minutes

Note: The Information Provided here is only for reference. It May vary the Original.

32. If x = 332, y = 333, z = 335, then the value of $x^3 + y^3 + z^3 - 3xyz$ is
(1) 10000
(2) 7000
(3) 8000
(4) 9000

Solution : 2

(2) $x = 332,\ y = 333,\ z = 335$

$\therefore x + y + z = 332 + 333 + 335$

$= 1000$

$\therefore x^3 + y^3 + z^3 - 3xyz$

$= \frac{1}{2}(x + y + z)[(x - y)^2 + (y - z)^2] + (z - x)^2]$

$= \frac{1000}{2}[(332 - 333)^2 + (333 - 335)^2 + (335 - 332)^2]$

$= 500(1 + 4 + 9) = 500 \times 14$

$= 7000$

33. 1f $2 + x\sqrt{3} = \frac{1}{2+\sqrt{3}}$ then the simplest vlaue of x is
(1) – 1
(2) 1
(3) – 2
(4) 2

Solution : 1

(1) $2 + x\sqrt{3}$

$= \frac{1}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}}$

(On rationalising the denominator)

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

$\Rightarrow x\sqrt{3} = -\sqrt{3} \Rightarrow x = -1$

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