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Compiled & Edited by
Arihant 'Expert Team'

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Exam info

SSC CHSL (10+2) EXAM

Computer Based Examination (Tier-I)

The Tier-I Examination will consist of Objective Type, Multiple choice questions only. The questions will be set both in English & Hindi for Part-II, III & IV.

There will be negative marking of 0.50 marks for each wrong answer. Candidates are, therefore, advised to keep this in mind while answering the questions

Exam Pattern (Tier-I)

Sections	Subjects	Questions	Marks	Duration
1.	English Language (Basic Knowledge)	25	50	60 minutes (80 minutes for PWD candidates)
2.	General Intelligence	25	50	
3.	Quantitative Aptitude (Basic Arithmetic Skill)	25	50	
4.	General Awareness	25	50	
	Total	**100**	**200**	

Indicative Syllabus for the Computer Based Examination (Tier-I):

ENGLISH LANGUAGE

Spot the Error, Fill in the Blanks, Synonyms/ Homonyms, Antonyms, Spellings/ Detecting Mis-spelt Words, Idioms & Phrases, One Word Substitution, Improvement of Sentences, Active/ Passive Voice of Verbs, Conversion into Direct/ Indirect Narration, Shuffling of Sentence parts, Shuffling of Sentences in a Passage, Cloze Passage, Comprehension Passage.

GENERAL INTELLIGENCE

It would include questions of both verbal and nonverbal type. The test will include questions on Semantic Analogy, Symbolic Operations, Symbolic/ Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/ Number Classification, Drawing Inferences, Figural Classification, Punched Hole/ Pattern-Folding & Unfolding, Semantic Series, Figural Pattern-folding and Completion, Number Series, Embedded Figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and De-coding, Other subtopics, if any Numerical Operations.

QUANTITATIVE APTITUDE

Number Systems: Computation of Whole Number, Decimal and Fractions, Relationship between numbers.

Fundamental Arithmetical Operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and Distance, Time and Work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelopiped, Regular Right Pyramid with Triangular or Square Base.

Trigonometry: Trigonometric ratios, Complementary angles, Height and Distances (simple problems only) Standard Identities like $\sin^2\theta + \cos^2\theta = 1$ etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency Polygon, Bar-diagram, Pie-chart.

GENERAL AWARENESS

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighboring countries especially pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

For VH candidates of 40% and above visual disability, there will be no component of Maps/ Graphs/ Diagrams/ Statistical Data in the General Intelligence and Quantitative Aptitude parts.

SOLVED PAPERS
2023

SSC CHSL (Tier-I)

Solved Paper

Exam Held on **March 10, 2023** (Shift-1)

Instructions

1. This paper contains 100 questions. Each question carries 2 mark.
2. This paper has 4 Part, Part 1 General English, Part 2 Reasoning Ability, Part 3 Quantitative Aptitude and Part 4 General Awareness.

Part 1 General English

1. Find the part of the given sentence that has an error in it. If there is no error, choose 'No error'.
Atmospheric rivers are long, narrow bands of moisture in the atmosphere that extends from the tropics to higher latitudes.
(a) tropics to higher latitudes.
(b) of moisture in the atmosphere that extends from the
(c) No error
(d) Atmospheric rivers are long, narrow bands

↘ ***(b)*** Part (b) of the given sentence has an error in it. As the subject of the sentence 'Atmospheric rivers' is plural, a plural verb 'extend' should be used with it.

2. Select the most appropriate 'one word' for the expression given below.
A professional rider in horse race.
(a) Jockey (b) Horse Pilot
(c) Autocrat (d) Cellar

↘ ***(a)*** 'Jockey' refers to a person who is a 'professional rider in horse race'.

3. Improve the underlined part of the sentence. Choose 'No improvement' as an answer if the sentence is grammatically correct.
The snowstorm will <u>effect thousand</u> of travellers.
(a) No improvement
(b) affect thousands
(c) effect thousands
(d) affected thousand

↘ ***(b)*** 'affect' (verb) should be used in place of 'effect' (noun) to improve the underlined part in the given sentence.

4. Select the correct indirect form of the given sentence.
The mayor said to the marshals, "Don't conduct any drill tomorrow."
(a) The mayor ordered the marshals not to conduct any drill the previous day.
(b) The mayor ordered the marshals not to conducted any drill the next day.
(c) The mayor ordered the marshals not to conduct any drill the next day.
(d) The mayor ordered the marshals not to conduct any drill tomorrow.

↘ ***(c)*** 'The mayor ordered the marshals not to conduct any drill the next day' is the correct indirect form of the given sentence.

5. Choose the word that can substitute the given group of words.
Containing more words than necessary
(a) Revenant (b) Platonic
(c) Laconic (d) Verbose

↘ ***(d)*** The word 'Verbose' means using more words than necessary and therefore long and boring.

6. Choose the word that is opposite in meaning to the given word.
Adequate
(a) Indolent
(b) Wanting
(c) Superficial
(d) Taunting

↘ ***(b)*** The word 'Adequate' means good enough or large enough for a particular purpose. So, 'wanting' from the given options is opposite in meaning to 'Adequate'.

7. In the following question, out of the given four alternatives, select the alternative which best expresses the meaning of the Idiom/Phrase.
To meet one's Waterloo
(a) To meet one's look alike
(b) To face the reality
(c) To be badly defeated in a contest
(d) To realise one's mistake

↘ *(c)* The idiom 'To meet one's Waterloo means to be defeated by someone who is too strong for you or by a problem that is too difficult for you.

8. Rearrange the parts of the sentence in correct order.
In a recent study,
P. little free time like a single parent nurse caring for
Q. more than one child and working long hours are
R. we showed that people on low incomes with
S. set to lose out most as energy prices rise
(a) PQSR (b) SPQR
(c) RPQS (d) RQSP

↘ *(c)* The correct order to form a meaningful sentence is RPQS.

9. Choose the word that can substitute the given group of words.
One who does not know reading or writing.
(a) Fastidious (b) Scholar
(c) Illiterate (d) Erudite

↘ *(c)* 'Illiterate' refers to 'one who does not know reading or writing'.

10. Choose the incorrectly spelt word.
(a) Transparent (b) Letter
(c) Scatter (d) Monstar

↘ *(d)* Option (d) contians the incorrectly spelt word. The correct spelling is 'Monster'.

11. Select the correct passive form of the given sentence.
She forgot the papers in the car.
(a) The papers was forgotten by her in the car.
(b) The papers are forgotten by her in the car.
(c) The papers were forgotten by her in the car.
(d) The papers had been forgotten by her in the car.

↘ *(c)* 'The papers were forgotten by her in the car.' is the correct passive form of the given sentence.

12. Rearrange the parts of the sentence in correct order.
P. some 81 percent of the reefs in the area had become severely bleached
Q. warm seawater were particularly brutal in the Northern part of
R. Australia's famous Great Barrier Reef, where surveys reported that
S. from late 2015 to the middle of 2016, the effects of overly
(a) SQRP (b) QRPS
(c) PSQR (d) SPQR

↘ *(a)* The correct order to form a meaningful sentence is SQRP.

13. Find the part of the given sentence that has an error in it. If there is no error, choose 'No error'.
It turns out that my father isn't alone.
(a) No error (b) It turns out
(c) that my father (d) isn't alone.

↘ *(a)* The given sentence is grammatically correct and contextually meaningful.

14. Choose the word that is opposite in meaning to the given word.
Objurgation
(a) Commination (b) Hamper
(c) Reproof (d) Endorsement

↘ *(d)* 'Objurgation' means to scold severely. So, 'Endorsement' is opposite in meaning to it as it means an occasion when someone gives official public support to a particular person or thing.

15. Fill in the blank with the most suitable word.
One may ..... what he only holds in trust; he shares what is his own.
(a) appropriate
(b) allocate
(c) appellate
(d) apply

↘ *(b)* 'Allocate' is the most suitable word to fill in the blank as it means to officially given something to someone.

16. Choose the word that can substitute the given group of words.
A remedy for all ills
(a) Rustic (b) Panacea
(c) Libertine
(d) Convalescent

↘ *(b)* 'Panacea' means something that will solve all problems or cure all illnesses.

17. Choose the word that means the same as the given word.
Eagerly
(a) Plainly (b) Avidly
(c) Perfunctorily (d) Neatly

↘ *(b)* 'Avidly' means is an extremely eager or interested way. So, it means the same as 'Eagerly'.

18. Select the word that is opposite in meaning (antonym) to the word given below.
Celestial
(a) Terrestrial (b) Stellar
(c) Heavenly (d) Divine

↘ *(a)* 'Celestial' means of or from the sky or outside the world. 'Terrestrial' is opposite in meaning to 'celestial' as it means relating to Earth.

19. In the following question, out of the given four alternatives, select the alternative which best expresses the meaning of the Idiom/Phrase.
To be in two minds
(a) To be less effective
(b) To be over confident
(c) In a dilemma
(d) To migrate

↘ *(c)* The idiom 'To be in two minds' means to be unable to decide what to do or what you think about something.

20. Choose the sentence with no spelling error.
(a) I do not require any technichal knowledge or expertise.
(b) I do not requir any technical knowledge or expertice.
(c) I do not require any technical knowledge or expertise.
(d) I do not require any technical knowlege or expertice.

↘ *(c)* The sentence given in option (c) does not contain any spelling error in it.

Directions (Q. Nos. 21-25) *In the following passage some of the words have been deleted. Read the passage carefully and select the correct answer for the given blank out of the four alternatives.*

The difference between the solar radiation absorbed and the thermal radiation emitted to space (1) ..... radiation budget of the Earth. Since there is no appreciable long-term trend in planetary temperature, it may be (2) ..... that this budget is essentially zero on a global long term average.

The rate of temperature change in any region is directly (3) ..... to energy budget of the region and inversely proportional to its heat capacity.

While the radiation (4) ..... may dominate the average energy budget of many surfaces, nonradiative energy transfer and storage also are (5) ..... important when local changes are considered.

21. Select the most appropriate option to fill in blank number 1.
(a) placates (b) determines
(c) duplicates (d) examines

↘ ***(b)*** 'determines' is most appropriate to fill in blank number 1.

22. Select the most appropriate option to fill in blank number 2.
(a) concluded (b) faded
(c) exercised (d) pleaded

↘ ***(a)*** 'concluded' is most appropriate to fill in the blank number 2.

23. Select the most appropriate option to fill in blank number 3.
(a) hospitable (b) twisted
(c) symmetrical (d) proportional

↘ ***(d)*** 'proportional' is most appropriate to fill in the blank number 3.

24. Select the most appropriate option to fill in blank number 4.
(a) heat (b) crescent
(c) balance (d) budget

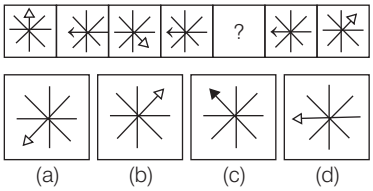
↘ ***(d)*** 'budget' is most appropriate to fill in the blank number 4.

25. Select the most appropriate option to fill in blank number 5.
(a) cynically (b) generally
(c) modestly (d) manually

↘ ***(b)*** 'generally' is most appropriate to fill in blank number 5.

Part 2 Reasoning Ability

26. Select the figure from the given options that can replace the question mark (?) in the following series.

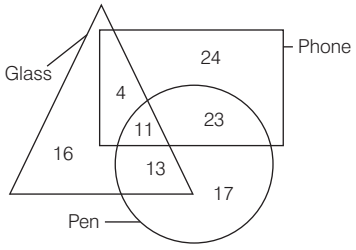


↘ ***(d)*** Here, the arrow head moves 3 steps in clockwise direction alternatively from 1st figure to 3rd figure and so on. So, option figure (d) will replace the question mark (?) in the given series.

27. Select the option that is related to the fifth word in the same way as the second word is related to the first word and the fourth word is related to the third word.
Truck : Vehicle :: Burger : Food :: Glass : ?
(a) Furniture (b) Electronics
(c) Crockery (d) Grocery

↘ ***(c)*** Truck is a type of vehicle. Burger is a type of food. Similarly, a glass is a type of crockery.

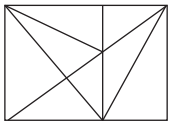
28. How many glass are both phone and pen?



(a) 13 (b) 24
(c) 11 (d) 15

↘ ***(c)*** Number of glass that are both phone and pen will be enclosed by circle, triangle and rectangle i.e. 11.

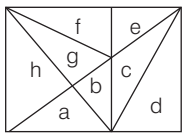
29. How many triangles are there in the given figure?



(a) 21 (b) 22
(c) 20 (d) 19

↘ ***(a)*** Number of single triangles = 8 (a to h)

Number of triangles taking two single triangle at a time = 7



(ab, bc, ce, ef, gh, ah, bg)

Number of triangles taking three single triangles at a time = 3 (abc, efg, bgf)

Number of triangles taking more than three single triangle at a time = 3

(abcd, efgh, bcefg)

Total number of triangles
= 8 + 7 + 3 + 3 = 21

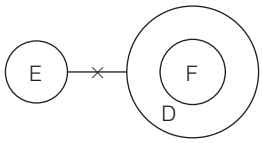
30. In the following question below are given some statements followed by some conclusions based on those statements. Taking the given statements to be true even if they seem to be at variance from commonly known facts. Read all the conclusions and then decide which of the given conclusion logically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

Statements
I. No E is F.
II. All F are D.

Conclusions
I. No E is D.
II. Some D are F.
III. No F is E.

(a) Both Conclusions I and III follows
(b) All conclusion follows
(c) Both Conclusions I and II follows
(d) Both Conclusions II and III follows

↘ ***(d)*** From the given statements.



Conclusions
I. (×) II. (✓) III. (✓)
So, both Conclusions II and III follows.

31. By Interchanging the given two numbers (Not digits) which of the following equation will be not correct?
3 and 8
I. $6 \div 2 \times 8 + 3 - 1 = 17$
II. $9 + 3 - 6 \div 2 \times 8 = 6$
(a) Neither I nor II
(b) Only II
(c) Both I and II
(d) Only I

↘ ***(c)*** By interchanging 3 and 8, the equation
I. $6 \div 2 \times 8 + 3 - 1 = 17$
$\Rightarrow \quad 6 \div 2 \times 3 + 8 - 1 = 17$

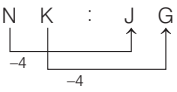
$\Rightarrow \quad 3\times3+8-1=17$
$\Rightarrow \quad 17-1=17$
$\Rightarrow \quad 16\neq17$
II. $9+3-6\div2\times8=6$
$\Rightarrow \quad 9+8-6\div2\times3=6$
$\Rightarrow \quad 17-3\times3=6$
$\Rightarrow \quad 17-9=6$
$\Rightarrow \quad 8\neq6$
So, both equations are not correct.

32. Select the option in which the numbers shares the same relationship in set as that shared by the numbers in the given set.
(**Note** Operations should be performed on the whole numbers, without breaking down the number into its constituent digits. E.g., 13-Operations on 13 such as adding/subtracting/ multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)
(136, 48, 184)
(189, 37, 226)
(a) (211, 17, 238)
(b) (203, 69, 262)
(c) (148, 84, 222)
(d) (116, 62, 178)

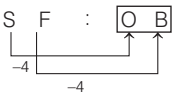
↘ *(d)* Here,
(136, 48, 184) $\Rightarrow 136+48=184$
(189, 37, 226) $\Rightarrow 189+37=226$
Similarly,
(116, 62, 178) $\Rightarrow 116+62=178$

33. In the following question, select the related letters from the given alternatives.
NK : JG :: SF : ?
(a) OB (b) UA
(c) BU (d) AS

↘ *(a)* Here,

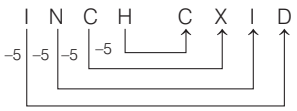


Similarly,

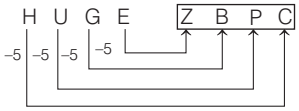


34. In a certain code language, 'INCH' is coded as 'CXID'. What is the code for 'HUGE' in that code language?
(a) ZCPC (b) ZBQC
(c) ZBPC (d) ZBPD

↘ *(c)* Here,



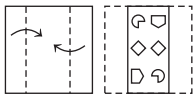
Similarly,

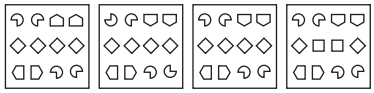


35. If 34 C 59 D 16 = –9 and 61 C 32 D 14 = 43, then 58 C 7 D 11 = ?
(a) 59 (b) 63
(c) 62 (d) 64

↘ *(c)* Here 'C' = '–' and 'D' = +
As, 34 C 59 D 16 = –9
$\Rightarrow \quad 34-59+16=-9$
$\Rightarrow \quad 50-59=-9$
$\Rightarrow \quad -9=-9$
Also, 61 C 32 D 14 = 43
$\Rightarrow \quad 61-32+14=43$
$\Rightarrow \quad 75-32=43$
$\Rightarrow \quad 43=43$
So, 58 C 7 D 11 = 58 – 7 + 11
= 69 – 7 = 62

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





↘ *(c)* When opened the paper will appear as shown in option figure (c).



37. Arrange the given words in the sequence in which they occur in the dictionary.
1. Mayor 2. Maybe
3. May 4. Mayst
5. Mayfly
(a) 3, 2, 1, 4, 5
(b) 3, 2, 1, 5, 4
(c) 3, 2, 5, 1, 4
(d) 3, 2, 4, 5, 1

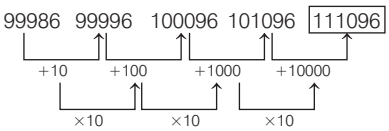
↘ *(c)* According to the dictionary, give words are
May < Maybe < Mayfly < Mayor
(3) (2) (5) (1)
< Mayst
(4)

38. In the following question, select the odd word pair from the given alternatives.
(a) Crockery - Cup
(b) Rodent - Lizard
(c) Insect - Butterfly
(d) Amphibian - Frog

↘ *(b)* Cup is a crockery. Butterfly is an insect and frog is an amphibian. But lizard is not a rodent.

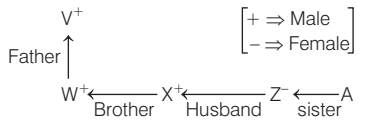
39. In the following question, select the missing number from the given series.
99986, 99996, 100096, 101096, ?
(a) 1110096
(b) 100096
(c) 111096
(d) 110096

↘ *(c)* Pattern of the given series is



40. W is the brother of X. V is the father of W. X is the husband of Z. Z is the sister of A. Who is the father-in-law of Z?
(a) A (b) W
(c) V (d) X

↘ *(c)* According to the given information,



Clearly, V is the father-in-law of Z.

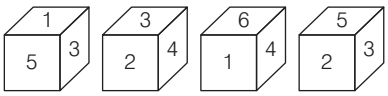
41. In a certain code language, 'BR-EW' is coded as '8', 'CA-LF' is coded as '14'. What is the code for 'DA-WN' in that code language?
(a) 32 (b) 30
(c) 36 (d) 34

↘ *(a)* Here, B R – E W
2 18 5 23
$\Rightarrow \quad (5+23)-(2+18)=8$
C A – L F
3 1 12 6
$\Rightarrow \quad (12+6)-(3+1)=14$
Similarly,
D A – W N
4 1 23 14
$\Rightarrow \quad (23+14)-(4+1)=\boxed{32}$

42. Words given on the left side of (::) are related with each other by some Logic/Rule/ Relation. Select the missing word/word pair on the right side of (::) from the given alternatives based on the same Logic/Rule/ Relation.
Odometer : Distance Travelled by a Vehicle :: Barometer : ?
(a) Temperature
(b) Length
(c) Atmospheric pressure
(d) Distance

↘ *(c)* An odometer is an instrument used to measure the distance travelled by a vehicle. Similarly, a barometer is an instrument used to measure atmospheric pressure.

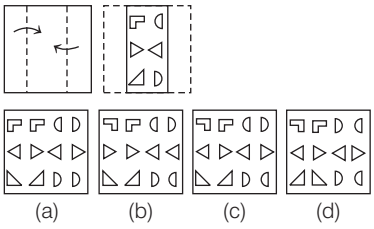
43. Four different positions of the same dice are shown, the six faces of which are numbered from 1 to 6. Select the number that will be on the face opposite to the one having '1'.



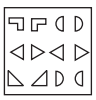
(a) 5 (b) 6
(c) 4 (d) 2

↘ *(d)* From figure 1 and 3,
Adjacent face having 1= 5, 3, 6 and 4
So, opposite to the face having 1 = 2.

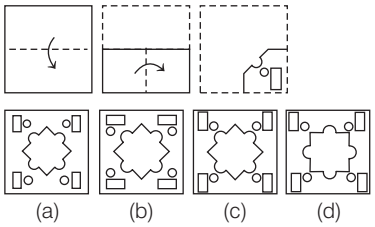
44. A piece of paper is folded and punched as shown below in the question figures, From the given answer figures, Indicate how it will appear when opened?



↘ *(c)* When opened, the paper will appear a shown in option figure (c),



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



↘ *(c)* When opened, the paper will appear as shown in figure (c).



46. Select the option in which the numbers shares the same relationship in set as that shared by the numbers in the given set.
(**Note** Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13-Operations on 13 such as adding/ subtracting/ multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)
(17, 12, 10)
(25, 23, 4)
(a) (9, 19, 15) (b) (18, 17, 3)
(c) (31, 27, 8) (d) (28, 42, 12)

↘ *(c)* Here,
$(17, 12, 10) \Rightarrow (17-12)\times 2 = 5\times 2 = 10$
$(25, 23, 4) \Rightarrow (25-23)\times 2 = 2\times 2 = 4$
Similarly,
$(31, 27, 8) \Rightarrow (31-27)\times 2 = 4\times 2 = 8$

47. Select the option that is related to the fourth number in the same way as the first number is related to the second number and the fifth number is related to the sixth number.
123 : 492 :: ? : 312 :: 32 : 128
(a) 98 (b) 78
(c) 48 (d) 68

↘ *(b)* Here,
$123 : 492 \Rightarrow 123\times 4 = 492$
$32 : 128 \Rightarrow 32\times 4 = 128$
So, $? : 312 \Rightarrow ?\times 4 = 312$
$\Rightarrow \quad ? = \frac{312}{4} = 78$

48. In the following question, select the odd letter/ letters from the given alternatives.
(a) KGC (b) ZVR
(c) PLH (d) TPK

↘ *(d)* Here,
$K \xrightarrow{-4} G \xrightarrow{-4} C$
$Z \xrightarrow{-4} V \xrightarrow{-4} R$
$P \xrightarrow{-4} L \xrightarrow{-4} H$
$T \xrightarrow{-4} P \xrightarrow{-5} K$
So, TPK does not follow the pattern –4, – 4.

49. Select the option in which the numbers share the same relationship in set as that shared by the numbers in the given set.
(**Note :** Operations should be performed on the whole numbers, without breaking down the numbers into its constituent digits. E.g. 13-Operations on 13 such as adding/ subtracting/ multiplying etc. to 13 can be performed. Breaking down 13 into 1 and 3 and then performing mathematical operations on 1 and 3 is not allowed)
(32, 39, 46)
(54, 51, 48)
(a) (85, 45, 24)
(b) (48, 30, 12)
(c) (72, 44, 36)
(d) (64, 43, 17)

↘ *(b)* Here,
$(32, 39, 46) \Rightarrow (32 + 46)\div 2 = 39$
$(54, 51, 48) \Rightarrow (54 + 48)\div 2 = 51$
Similarly,
$(48, 30, 12) \Rightarrow (48 + 12)\div 2 = 30$

50. A series is given with one term missing. Select the correct alternative from the given ones that will complete the series.
DMQ, HUZ, LCI, PKR, ?
(a) TMO
(b) TRA
(c) TSA
(d) TSB

↘ *(c)* The pattern of the given series is,
$D \xrightarrow{+4} H \xrightarrow{+4} L \xrightarrow{+4} P \xrightarrow{+4} T$
$M \xrightarrow{+8} U \xrightarrow{+8} C \xrightarrow{+8} K \xrightarrow{+8} S$
$Q \xrightarrow{+9} Z \xrightarrow{+9} I \xrightarrow{+9} R \xrightarrow{+9} A$

Part 3 Quantitative Aptitude

51. Simple interest and compound interest (Compounding annually) on a principal at a certain rate of interest for 2 yrs is ₹ 1600 and ₹1760 respectively. What is the principal?

(a) ₹ 10000
(b) ₹ 7000
(c) ₹ 6000
(d) ₹ 4000

➘ *(d)* Let, the principal be ₹ P and rate of interest be R% per amount.

$T = 2$ yrs

$$\therefore \quad SI = \frac{P \times R \times T}{100}$$

$$\Rightarrow \quad 1600 = \frac{P \times R \times 2}{100}$$

$$\Rightarrow \quad R = \frac{1600 \times 100}{2P}$$

$$\Rightarrow \quad R = \frac{80000}{P}\%$$

$$\text{Now, } CI = P\left[\left(1+\frac{R}{100}\right)^T - 1\right]$$

$$\Rightarrow \quad 1760 = P\left[\left(1+\frac{80000}{100 \times P}\right)^2 - 1\right]$$

$$\Rightarrow \quad \frac{1760}{P} + 1 = \left(1+\frac{800}{P}\right)^2$$

$$\Rightarrow \quad \frac{1760+P}{P} = \left(\frac{P+800}{P}\right)^2$$

$$\Rightarrow 1760 + P = \frac{P^2 + (800)^2 + 2 \times P \times 800}{P}$$

$$\Rightarrow 1760P + P^2 = P^2 + 640000 + 1600P$$

$$\Rightarrow \quad 1760P - 1600P = 640000$$

$$\Rightarrow \quad P = \frac{640000}{160}$$

$$= 4000$$

Hence, principal is ₹ 4000.

52. What is the value of $\frac{\cos(50°+A) - \sin(40°-A)}{\cos 40° \sec 40°}$?

(a) 1 (b) 2 (c) 0.5 (d) 0

➘ *(d)* $\frac{\cos(50°+A) - \sin(40°-A)}{\cos 40° \sec 40°}$

$$= \frac{\cos(90°-(40°-A)) - \sin(40°-A)}{\cos 40° \sec 40°}$$

$$= \frac{\sin(40°-A) - \sin(40°-A)}{\cos 40° \sec 40°}$$

$$[\because \cos(90-\theta) = \sin\theta]$$

$$= \frac{0}{\cos 40° \sec 40°} = 0$$

53. What is the value of $(a-b)(b+a)(a^2+b^2)(2b^4+2a^4)$?

(a) $a^4 - b^4$ (b) $a^8 - b^8$
(c) $2(a^8 - b^8)$ (d) $(a^8 - b^8)/2$

➘ *(c)* $(a-b)(b+a)(a^2+b^2)(2b^4+2a^4)$

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

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

$$[\because (x-y)(x+y) = x^2 - y^2]$$

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

$$[\because (x-y)(x+y) = x^2 - y^2]$$

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

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

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

$$= 2((a^4)^2 - (b^4)^2)$$

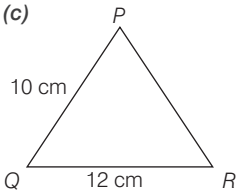
$$[\because (x-y)(x+y) = x^2 - y^2]$$

$$= 2(a^8 - b^8)$$

54. In a $\Delta PQR, PQ = 10$ cm, $QR = 12$ cm and semiperimeter is 17 cm. What is the length of PR?

(a) 15 cm (b) 7 cm
(c) 12 cm (d) 10 cm

➘ *(c)*



Here, $PQ = a = 10$ cm

$QR = b = 12$ cm

and let $PR = c$

$$\text{Semi-perimeter} = \frac{a+b+c}{2}$$

$$\Rightarrow \quad 17 = \frac{10+12+c}{2}$$

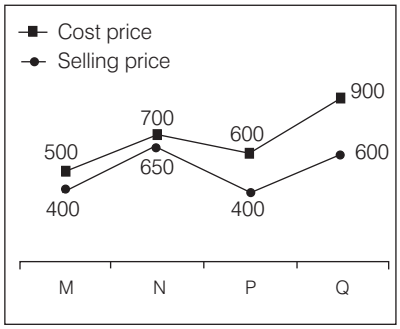
$$\Rightarrow \quad 34 = 22 + c$$

$$\Rightarrow \quad c = 34 - 22$$

$$\Rightarrow \quad c = 12 \text{ cm}$$

Hence, $PR = 12$ cm

55. The line chart given below shows the cost price and selling price of four articles.



What is the ratio of average selling price of M and N to the average cost price of P and Q?

(a) 19 : 29 (b) 10 : 7
(c) 7 : 10 (d) 31 : 18

➘ *(c)* Average selling price of M and N

$$= \frac{400+650}{2}$$

$$= \frac{1050}{2} = 525$$

Average cost price of P and Q

$$= \frac{600+900}{2}$$

$$= \frac{1500}{2} = 750$$

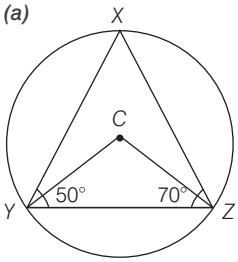
Now, required ratio = 525:750

$$= 21:30 = 7:10$$

56. In a triangle XYZ, C is circumcentre of this triangle. $\angle Y = 50°$ and $\angle Z = 70°$. What is the value of $\angle YCZ$?

(a) 120° (b) 140°
(c) 150° (d) 100°

➘ *(a)*



In ΔXYZ,

$\angle X + \angle Y + \angle Z = 180°$

[Angle sum property of triangle]

$$\Rightarrow \quad \angle X + 50° + 70° = 180°$$

$$\Rightarrow \quad \angle X = 180° - 120°$$

$$\Rightarrow \quad \angle X = 60°$$

Now, $\angle YCZ = 2\angle X$