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| **PERCENTAGE** |

**Express each of the following as a fraction:**

1. **56% = (56/100) = (14/25)**
2. **4% = (4/100) = (1/25)**
3. **0.6% = (0.6/100) = (6/1000) = (3/500)**
4. **0.08% = (0.08/100) = (8/10000) = (1/1250)**

**Express each of the following as a decimal:**

1. **28% = (28/100) = 0.28**
2. **6% = (6/100) = 0.06**
3. **0.2% = (0.2/100) = 0.002**
4. **0.04% = (0.04/100) = 0.0004**

**Express each of the following as rate percent:**

1. **(1/8) = (1/8) x 100 = (100/8) = (25/2) = 12½%**
2. **0.004 = (0.004 x 100) = 0.4%**
3. **6¾ = (27/4) x 100 = 25 x 27 = 675%**
4. **What percent of 72 is 6?**

**(6/72) x 100 = (25/3)%**

1. **What percent of 7 is 84?**

**(84/7) x 100 = 1200%**

1. **What percent of 2.4 kg is 8 grams?**

**2.4 kg = 2400 grams ……(8/2400) x 100 = (1/3)%**

1. **What percent of 6.5 liters is 130 ml?**

**6.5 liters = 6500 ml ………(130/6500) x 100 = 2%**

1. **5 out of 2250 parts of earth is sulphur. What is the percentage of sulphur in earth?**

**(5/2250) x 100 = (2/9)%**

1. **If 30% of a number is 12.6, then the number is:**
2. **41 (b) 42 (c) 51 (d) 52**

**Let 30% of x = 12.6**

**Then, x = (12.6 x 100)/30 = 42**

1. **5% of (25% of Rs 1600) is:**

**(1/20)(1/4)(1600) = Rs 20.**

1. **12.5% of 192 = 50% of ?**
2. **12 (b) 24 (c) 48 (d) 96**

**(1/8)(192) = (1/2)(x) implies x = 24 x 2 = 48**

1. **What percent of 7.2 kg is 18 grams?**
2. **25% (b) 2.5% (c) 0.25% (d) 0.025%**

**7.2 kg = 7200 grams**

**(18/7200) x 100 = (1/4) = 0.25%**

1. **If 40% of 40% of x = 40, then x = ?**
2. **100 (b) 250 (c) 400 (d) 1000**

**(2/5)(2/5)(x) = 40 (or) x = (40)(25/4) = 250**

1. **What will be 160% of a number whose 200% is 140?**
2. **200 (b) 160 (c) 140 (d) 112**

**200 ………140**

**160 ……….?**

**On cross-multiplication, we get (160 x 140)/200 = 112**

1. **Calculation shows that an angle is 37½0. The size obtained by drawing and measurement is 360. Find the error percent?**
2. **1½ (b) 3 (c) 4 (d) 4¼**

**Error difference = 37½0 – 360 = 1½0**

**Error percentage = (1½) / (37½) x 100 = (3/2)(2/75)(100) = 4%**

1. **If X is 90% of Y, what percent of X is Y?**
2. **90 (b) 101.1 (c) 111.1 (d) 190**

**X = (90/100)Y ………(X/Y) = (90/100)**

**Implies (100/90)(100) = 111.1%**

1. **It is known that 20% of the mangoes are rotten. If the number of rotten mangoes is 35, then the total number of mangoes is:**
2. **150 (b) 160 (c) 175 (d) 180**

**20% of x = 35 implies (1/5)x = 35 implies x = (35)(5) = 175**

1. **If 70% of students in a school are boys and the number of girls is 504, the number of boys is:**
2. **1680 (b) 1440 (c) 1276 (d) 1176**

**70% of students are boys means remaining 30% are girls.**

**30 ………….504**

**70 ………….? By cross-multiplication we get (70 x504)/30 = 1176 boys**

1. **A student has to secure 40% marks to pass. He gets 178 marks and fails by 22 marks. The maximum marks are:**
2. **200 (b) 500 (c) 600 (d) 800**

**Pass marks = 40% of x = 178 + 22 = 200**

**Max. marks are x = (200)(5/2) = 500**

1. **In a library, 20% of books are in Hindi, 50% of the remaining are in English and the remaining 9000 are in various other languages. What is the total number of books?**

**Let total books in library = 100x.**

**Hindi books = 20x Remaining = 100x – 20x = 80x**

**In this English books are 40x and**

**books on other languages are 40x = 9000 (given)**

**(40x) ……………9000**

**(100x) …………. ? On cross-multiplication we get**

**Total books = (100x)(9000)/(40x) = 22500**

1. **Swathi spends 40% of her salary on food, 25% on house rent, 15% on entertainment and 5% on conveyance. If her saving at the end of a month is Rs 12000, then what is her monthly salary in rupees?**
2. **Rs 40000 (b) Rs 50000 (c) Rs 60000 (d) Rs 80000**

**Saving = 100 – (40 + 25 + 15 + 5) = 15**

**15% of x = 12000 (given) x = (12000 x 100)/15 = Rs 80000**

1. **In an examination, 1100 boys and 900 girls appeared. 50% of the boys and 40% of the girls passed the examination. The percentage of candidates failed is:**
2. **44.4 (b) 45 (c) 45.5 (d) 54.5**

**Boys failed = 50% of 1100 = 550 Girls failed = 60% of 900 = 540**

**Total failed = 550 + 540 = 1090 (out of total students 1100 + 900 = 2000 in the college)**

**Failed percentage= (1090/2000) x 100 = 54.5%**

1. **A school has only three classes which contain 40, 50 and 60 students respectively. The pass percentage of these classes are 10, 20 and 10 respectively. Find the pass percentage of the school?**
2. **13.33 (b) 15 (c) 16.66 (d) 20**

**Total students in all three classes = 40 + 50 + 60 = 150**

**Passed students in all three classes = (10% of 40) + (20% of 50) + (10% of 60)**

**= 4 + 10 + 6 = 20**

**Pass percentage = (20/150) x 100 = (40/3) = 13.33%**

1. **Anil secured 50% marks in Hindi, 60% in English and 70% in Mathematics as well as Science. What were his total marks if the maximum marks obtainable in each of these 4 subjects was 50?**
2. **100 (b) 120 (c) 125 (d) 150**

**If the max. marks are 100 for each subject, then 50 + 60 + 70 + 70 = 250**

**If the max. marks are 50 then (250/2) = 125**

**ANALOGY**

‘Analogy’ means ‘Correspondence’. In questions based on analogy, a particular relationship is given and another similar relationship has to be identified from the alternatives provided. Therefore, analogy tests are meant to test a candidate’s overall knowledge, power of reasoning and ability to think concisely and accurately. Below are given some common relationships which will help you detect most analogies better.

**KINDS OF RELATIONSHIPS**

|  |  |  |  |
| --- | --- | --- | --- |
| **Instrument** | **Measurement** | **Quantity** | **Unit** |
| Thermometer | Temperature | Length | Metre |
| Anemometer | Wind speed | Mass | Kilogram |
| Barometer | Atmospheric Pressure | Energy/Work | Joule |
| Balance | Mass | Time | Seconds |
| Sphygmomanometer | Blood Pressure | Current | Ampere |
| Hygrometer | Humidity | Pressure | Pascal |
| Ammeter | Current | Area | Hectare |
| Screw Gauge | Thickness | Temperature | Degrees |
| Seismograph | Earthquakes | Volume | Litre |
|  |  |  |  |
| **Individual** | **Group** | **Animal** | **Young one** |
| Sailors | Crew | Horse | Pony |
| Cattle | Herd | Cat | Kitten |
| Flowers | Bouquet | Butterfly | Caterpillar |
| Grapes | Bunch | Lion | Cub |
| Singer | Chorus | Cow | Calf |
| Sheep | Flock | Insect | Larva |
| Riders | Cavalcade |  |  |
| Bees | Swarm |  |  |
| Man | Crowd |  |  |
| Artist | Troupe |  |  |
| Fish | Shoal |  |  |
| Soldiers | Army |  |  |
|  |  |  |  |
| **Male** | **Female** | **Individual** | **Dwelling Place** |
| Horse | Mare | Dog | Kennel |
| Dog | Bitch | Bee | Apiary |
| Lion | Lioness | Horse | Stable |
| Tiger | Tigress | Lion | Den |
| Sorcerer | Sorceress | Monk | Monastery |
| Drone | Bee | Fish | Aquarium |
| Nephew | Niece | Birds | Aviary |

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| **Study** | **Topic** | **Worker** | **Tool** |
| Seismology | Earthquakes | Soldier | Gun |
| Botany | Plants | Chef | Knife |
| Zoology | Animals | Doctor | Stethoscope |
| Pathology | Diseases | Surgeon | Scalpel |
| Astrology | Future |  |  |
| Anthropology | Mankind | **Worker** | **Product** |
| Nephrology | Kidney | Mason | Wall |
| Haematology | Blood | Chef | Food |
| Palaeontology | Fossils | Choreographer | Ballet |
| Pedology | Soils | Editor | Newspaper |
| Cardiology | Heart | Producer | Film |
|  |  |  |  |
| **Worker** | **Working Place** | **Product** | **Raw Material** |
| Chef | Kitchen | Prism | Glass |
| Farmer | Field | Metal | Ore |
| Pilot | Cockpit | Wine | Grapes |
| Beautician | Parlour | Oil | Seed |
| Artist | Theatre | Paper | Wood Pulp |
| Scientist | Laboratory |  |  |
| Driver | Cabin | **Word** | **Synonym** |
| Painter | Gallery | Abode | Dwelling Place |
| Worker | Factory | Ban | Prohibition |
| Gambler | Casino | Abduct | Kidnap |
|  |  | Dearth | Scarcity |
| **Word** | **Intensity** | Sedate | Calm |
| Anger | Rage | Brim | Edge |
| Wish | Desire | Solicit | Request |
| Sink | Drown | Presage | Predict |
| Quarrel | War | Haughty | Proud |
| Error | Blunder | Flaw | Defect |
| Famous | Renowned | Fierce | Violent |
| Unhappy | Sad | Fallacy | Illusion |
| Refuse | Deny | Substitute | Replace |
| Crime | Sin | Assign | Allot |
|  |  |  |  |
| **Word** | **Antonym** | **Word** | **Antonym** |
| Attack | Defend | Advance | Retreat |
| Best | Worst | Fresh | Stale |
| Ignore | Notice | Condense | Expand |
| Chaos | Peace | Gradual | Abrupt |
| Robust | Weak | Gentle | Harsh |
| Cardial | Hostile | Mourn | Rejoice |
| Lethargy | Alertness | Kindle | Extinguish |

**EXERCISE – 1**

1. Newspaper : Press :: Cloth : ?
2. Textile (b) Fibre (c) Factory (d) Mill
3. Cattle : Herd :: Sheep : ?
4. Flock (b) Swarm (c) Crowd (d) Shoal
5. Forecast : Future :: Regret : ?
6. Present (b) Punishment (c) Past (d) Sins
7. Breeze : Cyclone :: Drizzle : ?
8. Earthquake (b) Storm (c) Flood (d) Downpour
9. Oxygen : Burn :: Carbon dioxide : ?
10. Isolate (b) Foam (c) Explode (d) Extinguish
11. Import : Export :: Expenditure : ?
12. Deficit (b) Revenue (c) Debt (d) Tax
13. Command : Order :: Confusion : ?
14. Discipline (b) Clarity (c) Chaos (d) Problem
15. Conference : Chairman :: Newspaper : ?
16. Reporter (b) Distributor (c) Printer (d) Editor
17. Giant : Dwarf :: Genius : ?
18. Wicked (b) Gentle (c) Idiot (d) Tiny
19. Man : Biography :: Nation : ?
20. Leader (b) People (c) Geography (d) History
21. Reading : Knowledge :: Work : ?
22. Experience (b) Engagement (c) Employment (d) Tiredness
23. Enough : Excess :: Sufficiency : ?
24. Adequacy (b) Surplus (c) Competency (d) Import
25. Disease : Pathology :: Planet : ?
26. Astrology (b) Geology (c) Astronomy (d) Geography
27. Imprison : Jail :: Exile : ?
28. Country (b) Punishment (c) Banish (d) Depart
29. Cunning : Fox :: Timid : ?
30. Horse (b) Ant (c) Ass (d) Rabbit
31. Ocean : Pacific :: Island : ?
32. Greenland (b) Ireland (c) Netherlands (d) Borneo
33. Proteins : Growth :: Carbohydrates : ?
34. Energy (b) Strength (c) Resistance (d) Diseases
35. Girl : Beautiful :: Boy : ?
36. Smart (b) Heroic (c) Courageous (d) Handsome
37. Penology : Punishment :: Seismology : ?
38. Law (b) Liver (c) Earthquakes (d) Medicine
39. Sports : Logo :: Nation : ?
40. Anthem (b) King (c) Animal (d) Emblem

**EXERCISE – 2**

1. Mountain : Valley :: Genius : ?
2. Brain (b) Idiot (c) Intelligence (d) Think
3. Doctor : Patient :: Lawyer : ?
4. Customer (b) Accused (c) Magistrate (d) Client
5. Prison : Jailor :: Museum : ?
6. Manager (b) Monitor (c) Curator (d) Warden
7. Chef : Restaurant :: Druggist : ?
8. Medicine (b) Pharmacy (c) Store (d) Chemist
9. Mathematics : Numbers :: History : ?
10. People (b) Events (c) Dates (d) Wars
11. Bag : Luggage :: Ship : ?
12. Coal (b) Stock (c) Cargo (d) Weight
13. Happiness : Sorrow :: Comfort : ?
14. Hardship (b) Rest (c) Poverty (d) Difficulty
15. Drummer : Orchestra :: Minister : ?
16. Voter (b) Constituency (c) Department (d) Cabinet
17. Starvation : Nutrition :: Exhaustion : ?
18. Energy (b) Bravery (c) Freshness (d) Courage
19. Author : Book :: Choreographer : ?
20. Drama (b) Ballet (c) Ball (d) Opera
21. Face : Expression :: Hand : ?
22. Waving (b) Handshake (c) Work (d) Gesture
23. Water : Ocean :: Snow : ?
24. Peaks (b) Hail (c) Glacier (d) Mountain
25. Waves : Air :: Ripples : ?
26. Wind (b) Water (c) Storm (d) Smoke **Choose a word from the given alternatives, that belongs to the same group:**
27. Canada : Chile : Germany
28. Spain (b) Paris (c) Chicago (d) Ottawa
29. Liver : Heart : Kidney
30. Blood (b) Nose (c) Lung (d) Urine
31. Dozen : Score : Decade
32. Number (b) Measurement (c) Counting (d) Century
33. Flood : Fire : Cyclone
34. Damage (b) Earthquake (c) Rain (d) Accident **Choose the most appropriate description about the given three words:**
35. Press : Television : Cinema
36. They are means of entertainment.
37. They are means of mass media.
38. They give worldwide news.
39. All are mass reaching effect.

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| 1 (d)Just as newspaper is prepared in a press, cloth is manufactured in the mill. |
| 2(a) Herd is a group of cattle. Similarly, flock is a collection of sheep. |
| 3(c) Forecast is for future happenings and Regret is for past actions. |
| 4(d) Second is more intense than the first. |
| 5(d) Oxygen helps in burning while carbon dioxide extinguishes fire. |
| 6(b) The words in each pair are antonyms. ‘Expenditure’ opposite is ‘Revenue’ |
| 7(c) The words in each pair are synonyms. ‘Chaos’ means ‘in confusion state’ |
| 8(d) Chairman is the highest authority in a conference. Similarly, editor is the highest authority in a newspaper agency. |
| 9(c) The words in each pair are opposites of each other. Opposite of ‘Genius’ is ‘Idiot’ meaning ‘Useless’. |
| 10(d) Second contains the story of the first. |
| 11(a) Second is acquired from the first. |
| 12(b) Sufficiency indicates ‘enough’ and ‘surplus’ indicates ‘excess’. |
| 13(c) Diseases are studied under Pathology. Similarly, planets are studied in Astronomy. |
| 14(c) The words in each pair are synonyms. |
| 15(c) Fox is a cunning animal and ass is a timid animal. |
| 16(a) The largest ocean is Pacific Ocean. Similarly, the largest planet is Greenland. |
| 17(a) Proteins are essential for growth. Similarly, carbohydrates are essential for providing energy. |
| 18(d) ‘Beautiful’ describes the quality of prettiness in girls while ‘handsome’ describes the quality of prettiness in boys |
| 19(c) Penology’ is the study of punishment. Similarly, seismology’ is the study of earthquakes. |
| 20(d) Second is a symbol of the first |

**PRACTICE EXERCISE – 2**

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| 1(b) The words in each pair are opposites of each other. |
| 2(d) First works for the second. |
| 3(c) First is managed by the second. |
| 4(b) Second is the working place of the first. |
| 5(b) Mathematics is the theory of numbers and History is the theory of past events. |
| 6(c) Second is the load carried by the first. |
| 7(a) The words in each pair are opposites of each other. |
| 8(d) First is a member of the second. |
| 9(a) First denotes the lack of second. |
| 10(b) First composes the second. |
| 11(d) Second is a way of expressing an idea with the first. |
| 12(c) Ocean is a moving body of water. Similarly, glacier is a moving body of snow. |
| 13(b) Waves travel in air; ripples travel in water. |
| 14(a) All are countries. |
| 15(c) All are internal organs of human body. |
| 16(d) All are terms used for a definite number of items. |
| 17(b) All are natural calamities. |
| 18(b) |

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| **PROFIT & LOSS** |

**Cost Price (C.P): The price at which an article is purchased, is called its cost price.**

**Selling Price (S.P): The price at which an article is sold, is called its selling price.**

**Profit or Gain = SP – CP Loss = CP – SP**

**Profit percentage or loss percentage is always calculated on cost price only.**

**Profit percentage = (Profit/CP) x 100% Loss percentage = (Loss/CP) x 100%**

1. **A man buys a toy for Rs250 and sells it for Rs300. Find his profit?**

Profit = Rs300 – Rs250 = Rs50

1. **A man purchases an article for Rs500 and sells it for Rs450. Find his loss?**

Loss = Rs500 – Rs450 = Rs50

1. **A man buys an article for Rs250 and sells it for Rs300. Find his gain percent?**

Profit = 300 – 250 = Rs50

Profit percent = (50/250)100 = 20%

1. **A man buys a pen for Rs250 and sells it for Rs200. Find his loss percent?**

Loss = 250 – 200 = Rs50

Loss percent = (50/250)100 = 20%

1. **Harish bought a pre-used laptop for Rs12000 and spent Rs2000 on its repairs. He sold it for Rs16800. Find his profit percent?**

Total Cost Price = 12000 + 2000 = Rs14000 and SP = Rs16800

SP > CP, profit = Rs2800 profit percent = (2800/14000)100 = 20%

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| 1. **A man buys an article for Rs275 and sells it for Rs286. Find his gain percent?**   4% is the answer   1. **If a mobile phone is purchased for Rs4900 and sold for Rs4655, find the loss percent?**   5% is the answer |

1. **Find SP, when CP = Rs5625 and gain = 20%**

100 …………..5625

120……………? (120 x 5625)/100 = Rs6750

1. **Find SP, when CP = Rs8040 and loss = 15%**

100 ………….8040

85………………? (85 x 8040)/100 = Rs6834

1. **Find CP, when SP = Rs4060 and gain = 16%**

116…………..4060

100………….? (100 x 4060)/116 = Rs3500

1. **Find CP, when SP = Rs5170, loss = 12%**

88……………5170

100………….? (100 x 5170)/88 = Rs5875

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| 1. **When a commodity is sold for Rs3480, there is a loss of 25%. What is the cost price of the commodity?**   Rs4640 is the answer   1. **A man sold an item for Rs1980 and gaining 10%. The item was bought for:**   Rs1800 is the answer   1. **A loss of 5% was suffered by selling an item for Rs4085. Find the cost price of the item?**   Rs4300   1. **Find the CP of an article which is sold at a loss of 25% for Rs1500?**   Rs2000   1. **A man buys 10 articles for Rs800 and sells them at the rate of Rs125 per article. Find his gain percent?**   56 ¼% is the answer   1. **An umbrella marked at Rs80 is sold for Rs68. Find the rate of discount?**   15% is the answer |

1. **By selling a watch for Rs1440 a man loses 10%. At what price should he sell it in order to gain 15%?**

90………..1440

115………..? (115 x 1440)/90 = Rs1840

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| 1. **By selling a watch for Rs1140, a man loses 5%. For how much should he sell it to gain 5%?**   Rs1260 is the answer   1. **On selling an article for Rs240, a trader loses 4%. In order to gain 10%, he must sell that article for:**   Rs275 is the answer   1. **A retailer buys furniture for Rs22500. His overhead expenses are Rs1500. He sells the furniture for Rs30000. The profit percent of the retailer is:**   25% is the answer   1. **If the selling price of an article is (4/3) times its cost price, the profit percent is:**   33.33% is the answer   1. **There would be 10% loss if a toy is sold at Rs1080 per piece. At what price should it be sold to earn a profit of 20%?**   Rs1440 is the answer |

1. **By selling an article for Rs1950, a dealer makes a profit of 30%. By how much should he increase his selling price so as to make a profit of 40%?**

130…………….1950

140……………….? (140 x 1950)/130 = Rs2100

Difference = 2100 – 1950 = Rs150

1. **If books bought at prices ranging from Rs200 to Rs350 are sold at prices ranging from Rs300 to Rs425, what is the greatest possible profit that might be made in selling 8 books?**

Greatest profit is possible when the CP is minimum and the SP is maximum.

Least CP = 200 x 8 = Rs1600

Greatest SP = 425 x 8 = Rs3400

Required profit = 3400 – 1600 = Rs1800

1. **A trader lost 20% by selling a watch for Rs1024. What percent shall he gain or lose by selling it for Rs1472?**

1024………….80

1472…………? (1472 x 80)/1024 = 115 15% profit

1. **The original price of a TV set is Rs90000. The price is discounted by 20% and then raised by 10%, what is its new price?**

New price = 110% of 80% of Rs90000 = (110/100)(80/100)(90000) = Rs79200

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| 1. **If the selling price of 10 articles is the same as the cost price of 11 articles, then find gain percent?**   10% is the answer |

1. **A mobile dealer marks a mobile with a price which is 20% more than the cost price and allows a discount of 10% on cash. Find his gain percent?**

Marked price = 20% more than cost price = 120

Discount = 10% of 120 = 12

Selling price = 120 – 12 = 108

Gain% = 108 – 100 = 8%

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| 1. **Cost price = Rs480, gain = 25%, selling price = ?**   Rs600 is the answer   1. **Selling price = Rs990, loss = 10%, cost price = ?**   Rs1100 is the answer |

1. **How much percent above the cost price should a shopkeeper mark his goods so that after allowing a discount of 10%, he gains 26%?**

After allowing 10% discount (90/100)x = 126 implies x = (126 x 100)/90 = Rs140

1. **By selling 200 oranges, a man gains the selling price of 40 oranges. Find his gain percent?**

We know that SP = CP + Profit

SP (200) = CP (200) + SP (40) SP (160) = CP (200)

Implies that (SP/CP) = (200/160) Gain = 200 – 160 = 40

Gain percent = (40/160)(100) = 25%

1. **A man purchased a watch for Rs4000 and sold it at a gain of 20% of the selling price. Find the selling price of the watch?**

Let the SP = 100x We know that SP = CP + P

100x = 4000 + 20x On solving x = 50

Therefore SP = 100 x 50 = Rs5000

1. **By selling a table for Rs300 instead of Rs400, 5% more is lost. Find the cost price of the table?**

5 percent makes difference = Rs100

100 percent (cost price) implies ………..? (100 x 100)/5 = Rs2000

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| 1. **If 5% more is gained by selling an article for Rs3500 than by selling it for Rs3400, find the cost price of the article?**   Rs2000 is the answer   1. **The selling price of 12 articles is equal to the cost price of 15 articles. Find the gain percent?**   25% is the answer   1. **If the cost price of 15 tables be equal to the selling price of 20 tables. Find the loss percent?**   25% is the answer   1. **By selling 36 bananas, a vendor loses the selling price of 4 bananas. His loss percent is:**   10% loss is the answer   1. **By selling 100 bananas, a fruit seller gains the selling price of 20 bananas. Find his gain percent?**   25% is the answer   1. **A man sells 320 mangoes at the cost price of 400 mangoes. His gain percent is:**   25% is the answer   1. **If the selling price of 18 articles is equal to the cost price of 21 articles. Find the loss or gain percent?**   16.66% profit |

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| **RATIO & PROPORTION** |

1. **Divide Rs672 in the ratio 5 : 3**

Sum of the shares = 5 + 3 = 8

First part = 672 (5/8) = Rs420

Second part = 672 (3/8) = Rs252

1. **If 15% of x is the same as 20% of y, then x : y is:**
2. **3 : 4 (b) 4 : 3 (c) 17 : 16 (d) 16 : 17**

15% of x = 20% of y implies 15x = 20y implies (x/y) = (20/15) = (4/3) = 4 : 3

1. **If 7 : x = 17.5 : 22.5, then the value of x is:**
2. **5.5 (b) 6 (c) 7.5 (d) 9**

Product of means = Product of extremes

17.5x = (7)(22.5) implies x = (7)(22.5)/(17.5) = 9

1. **If 0.4 of a number is equal to 0.06 of another number, then the ratio of the numbers is:**
2. **2 : 3 (b) 3 : 4 (c) 3 : 20 (d) 20 : 3**

0.4A = 0.06B Implies (A/B) = (0.06/0.4) = (6/40) = (3/20) = 3 : 20

1. **Two whole numbers whose sum is 72 cannot be in the ratio:**
2. **5 : 7 (b) 3 : 5 (c) 4 : 5 (d) 3 : 4**

The sum of the ratio terms must divide 72. So, the ratio cannot be 3 : 4

1. **A and B together have Rs12100 with them. If (4/15) of A’s amount is equal to (2/5) of B’s amount, how much amount does B have?**
2. **Rs4660 (b) Rs4840 (c) Rs5500 (d) Rs6640**

(4/15)A = (2/5)B Implies (A/B) = (2/5)(15/4) = (3/2) = 3 : 2

B’s share = 12100(2/5) = Rs4840

1. **Five bananas and four apples cost as much as three bananas and seven apples. The ratio of the cost of one banana to that of one apple is:**
2. **3 : 2 (b) 4 : 3 (c) 3 : 4 (d) 1 : 3**

Let the cost of each banana be x rupees and that of each apple be y rupees. Then

5x + 4y = 3x + 7y implies 2x = 3y implies (x/y) = (3/2) = 3 : 2

1. **The salaries of A, B and C are in the ratio of 1 : 2 : 3. The salary of B and C together is Rs60000. By what percent is the salary of C more than that of A?**
2. **50% (b) 100% (c) 150% (d) 200%**

Let the salaries of A, B and C be x, 2x and 3x respectively.

Then 2x + 3x = 60000 implies x = (60000/5) = 12000

A’s salary = x = Rs12000

B’s salary = 2x = 2 x 12000 = Rs24000

C’s salary = 3x = 3 x 12000 = Rs36000

Excess of C’s salary over A’s = (24000/12000)(100) = 200%

1. **The speeds of three cars are in the ratio 5 : 4 : 6. The ratio between the times taken by them to travel the same distance is:**
2. **5 : 4 : 6 (b) 6 : 4 : 5 (c) 10 : 12 : 15 (d) 12 : 15 : 10**

Speeds and time taken are inverse proportional to each other.

Time taken = (1/5) : (1/4) : (1/6) LCM = 60

Ratio = 12 : 15 : 10

1. **Pencils, Pens and Exercise books in a shop are in the ratio of 10 : 2 : 3. If there are 120 pencils, the number of books in the shop is:**
2. **36 (b) 48 (c) 72 (d) 84**

Pencils = 10x = 120 implies x = 12 Books = 3x = 3 x 12 = 36

1. **The ratio of the number of boys and girls in a school is 3 : 2. If 20% of the boys and 25% of the girls are scholarship holders, the percentage of the school students who are not scholarship holders is:**
2. **56 (b) 70 (c) 78 (d) 80**

Let the boys and girls be 300 and 200 respectively.

Boys with no scholarship = 80% of 300 = 240

Girls with no scholarship = 75% of 200 = 150

Therefore 390 students out of 500 were no scholarship.

= (390/500)(100) = 78%

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| **SIMPLE INTEREST** |

**RULE: SI = PTR/100 P = Principal T = Time period (in years)**

**R = Rate percent per annum**

**P = 100I/TR T = 100I/PR R = 100I/PT Amount = Principal + SI**

1. **Find the simple interest on Rs5000 for 6 years at 5 percent per annum?**

SI = PTR/100 = 5000 x 6 x 5/100 = Rs1500

1. **A man will get Rs870 as simple interest on Rs7250 at 4% per annum in how many years?**

T = 100I/PR = (100 x 870)/(7250 x 4) = 3 years

1. **The simple interest on a certain sum for 3 years at 9½% per annum to Rs15960. Find the principal?**

P = 100I/TR = (100 x 15960 x 2)/(3 x 19) = Rs56000

1. **At simple interest, a sum doubles after 20 years. Find the rate of interest per annum?**

**RULE: Rate of interest = (How many times it is increased/No. of years taken) x 100**

= (1/20)(100) = 5% per annum

1. **A sum of money, put at simple interest, trebles itself in 15 years. Find the rate percent per annum?**

Rate percent = (2/15)(100) = (40/3) = 13.33% per annum

1. **In how many years will a sum of money double itself at 12% per annum?**

**RULE: Time period = (How many times it is increased/Rate of interest) x 100**

T = (1/12)(100) = (25/3) years = 8 (1/3) years = 8 years and 4 months

1. **A sum of money amounts Rs7670 in 3 years and Rs8060 in 4 years. Find the sum?**

P + 3I = Rs7670 and P + 4I = Rs8060 on solving I = Rs390

By introducing I value in equation (1) we get P + 3(390) = 7670 (OR) P = Rs6500

1. **A certain sum of money at simple interest amounts to Rs12600 in 2 years and to Rs13500 in 5 years. Find the rate percent per annum?**

P + 2I = Rs12600 P + 5I = Rs13500 3I = Rs900 (or) Interest for 1 year = Rs300

By introducing I value we get, P = Rs12000

Rate percent = 100I/PT = (100 x 300)/(12000 x 1) = 2.5 percent per annum

1. **A lent Rs60000 to B for 2 years and Rs15000 to C for 4 years and received altogether from both Rs9000 as simple interest. Find the rate of interest?**

5% is the answer

1. **A borrowed Rs50000 from B at simple interest. After 4 years, B received Rs10000 more than the amount given to B on loan. Find the rate of interest?**

5% is the answer

1. **A sum of money doubles itself in 5 years. It will become 4 times of itself in how many years?**

15 years is the answer

1. **If 1 rupee produces Rs 9 as interest in 60 years at simple interest, find the rate percent per annum?**

15% per annum

1. **In how many years will a certain sum amounts to 6 times itself at 25% per annum simple interest?**

Let the sum be P.

5P = Interest = (P)(25)(t)/100 implies t = 20 years

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| **COMPOUND INTEREST** |

**RULE: If Principal = Rs P, Time = t years and Rate = r% per annum and compound interest reckoned annually, then**

**Amount after t years = P [ 1 + (r/100)]t**

1. **Find compound interest on Rs62500 at 16% per annum for 2 years, compounded annually?**

**Amount = 62500 [ 1 + (16/100) ]2 = 62500(116/100)2 = 62500(29/25)(29/25)**

**= Rs84100**

**CI = Rs84100 – Rs62500 = Rs21600**

1. **Find the amount of Rs75000 at compound interest at 4% per annum for 2 years is:**

**Amount = 75000 [ 1 + (4/100)]2 = 75000 (104/100)2 = 75000(26/25)(26/25) = Rs81120**

1. **Find compound interest on Rs50000 at 12% per annum for 1 year, compounded half-yearly?**

**First half-year: 6% of 50000 = Rs3000**

**Now the principal for second half-year = 50000 + 3000 = Rs53000**

**Second half-year = 6% of Rs53000 = Rs3180**

**Total compound interest = 3000 + 3180 = Rs6180**

1. **A sum amounts to Rs13520 in 2 years at 4% compound interest. Find the sum (principal)?**

**Amount = P [ 1 + (r/100)]t 13520 = P[1+(4/100)]2**

**13520 = P[104/100]2 = P[26/25]2**

**(13520)(25)(25)/(26)(26) = P On solving Principal = Rs12500**

1. **At what rate percent compound interest will Rs62500 amount to Rs90000 in 2 years?**

**Amount = P [ 1 + (r/100)]t 90000 = 62500[1+(r/100)]2**

**(90000/62500) = [1+(r/100)]2 (30/25) = [1+(r/100)]**

**(30/25) – 1 = (r/100) implies (5/25)(100) = r Rate percent = 20**

1. **Find the difference between simple interest and the compound interest on Rs8000 at 5% per annum for 1 year?**

**No difference (nil)**

1. **The simple interest on a sum of money for 2 years is Rs1000 and the compound interest on the same sum at the same rate for the same time is Rs1040. Find the rate of interest?**

**SI for first year and second year are same i.e. Rs500**

**CI for first year is Rs500 and second year Rs540, this means Rs40 is the interest on Rs500**

**Rate of interest = (40/500)(100) = 8%**

1. **The simple interest on a sum of money for 3 years is Rs2400 and the compound interest on the same sum, at the same rate for 2 years is Rs1700. Find the rate of interest?**

**SI is same for all the three years i.e. Rs800**

**CI for first year is Rs800 and second year Rs900**

**this means Rs100 is the interest on Rs800**

**Rate of interest = (100/800)(100) = 12 ½% per annum**

1. **The simple interest on a certain sum for 2 years at 10% per annum is Rs9000. Find the corresponding compound interest?**

**SI per year = Rs4500**

**CI = 4500 + 4500 + 10% of 4500 = Rs9450**

1. **SI on a certain sum at 4% per annum for 2 years is Rs8000. Find the CI on the same sum for the same period?**

**SI per year = Rs4000**

**CI = 4000 + 4000 + 4% of 4000 = Rs8160**

1. **A sum of money placed at compound interest doubled itself in 5 years. It will amount to eight times itself in how many years?**

**1 becomes 2 (in 5 years)**

**2 becomes 4 (in 5 years)**

**4 becomes 8 (in 5 years) Total time required = 15 years**

1. **A sum of money at compound interest amounts to thrice itself in 3 years. In how many years will it be 9 times itself?**

**6 years is the answer**

1. **If the compound interest on a certain sum for 2 years at 5% per annum is Rs4100. Find the simple interest?**

**Rs4000 is the answer**

1. **The compound interest on a certain sum of money for 2 years at 10% per annum is Rs4200. Find the simple interest on the same sum at the same rate and same time will be how much?**

**Rs4000 is the answer**