Institute of Computer Technology
B. Tech Computer Science and Engineering
Subject: BOSS (2CSE204)
Assignment CH4 - CH9

Chapter 4 - Percentage an Problems on Ages

1. Cost Price of two laptops is same. One of the laptops is sold at a profit of 15% and the selling price of another one laptop is Rs.3400 more than the first one. The net profit is 20%. What is the cost price of each laptop?
A 36000 B 40000 C 48000 D 34000`
Solution: Let cost price of laptop be Rs. x

∴ Profit =10015xRs

∴ selling price =Rs(10015x+x)=Rs. 100115x

New selling price =Rs. (100115x−100115x×10010)

=Rs. 100115x(10090)

=Rs. 10001035x

∴ Profit =(10001035x−x)=Rs. 100035x

Now, 100035x=1050

∴ x=30,000

∴ Cost price of Laptop =Rs. 30,000

2. In an office there are 40% female employees. 50% of the male employees are UG graduates. The total 52% of employees are UG graduates out of 1800 employees. What is the number of female employees who are UG graduates?
A 362 B 412 C 396 D 428
Solution: Total employees = 1800
female employees = 40%
male employees = 60%
50% of male employees = UG graduates = 30%
Female employees who are UG graduates = 22%
22% of 1800 = 396

3. Ravi got 70% in English and 56% in Biology and the maximum marks of both papers is 100. What percent does he score in Maths, if he scores 60% marks in all the three subjects? Maximum Marks of Maths paper is 200.
A 37 B 47 C 67 D 57
Solution:70+56+x=60% of all three subjects
70+56+x=60% of 400
X=240-126=114
%=114/200*100=57%
4. Ankita is 25 years old. If Rahul's age is 25% greater than that of Ankita then how much percent Ankita's age is less than Rahul's age?
A 10 % B 20 % C 30 % D 40 %
Solution: Ankita's age = 25
Let x be the rahul age
x = 25+ 25% of 25
x = 25+ 25 x 25/100
x= 31.25
Rahul age = 31.25
Percentage decrease = (31.25-25)/31.25 * 100% = 20%
5. Mr.Ravi's salary was reduced by 25% for three months. But after the three months, his salary was increased to the original salary. What is the percentage increase in salary of Mr.Ravi?
A 33.33 % B 42.85 % C 38.50 % D 40 %
Solution: Let salary be =100
3 months salary =100-25%=75
Next 3 months salary increased =25 in 75 rs
% increase =(25/75)×100%=33.33%

6. In an election only two candidates A and B contested 30% of the voters did not vote and 1600 votes were declared as invalid. The winner, a got 4800 votes more than his opponent thus he secured 51% votes of the total voters on the voter list. Percentage votes of the loser candidate, B out of the total voters on the voter list is:
A 3 % B 4 % C 5 % D 6 %
Solution: Total voters:100%
30%did not vote,so 70%votes cast
1600 votes are invalid
valid votes=70%-1600
Step-by-step explanation: winner got 51% of total voters list and 4800 more than loser.
so loser got 51%-4800
add winner and loser and equalize with valid votes

51%+51%-4800=70%-1600
1%=100
loser votes=300/10000(total votes)
=3%

7. In a school there are 2000 students. On January 2nd, all the students were present in the school except 4% of the boys and on January 3rd, all the students are present in the school except 28/3 % of the girls, but in both the days' number of students present in the school, were same. The number of girls in the school is?
A 400 B 600 C 800 D 1200
Solution: The ratio of students who like orange and total number of student participate in the survey = \frac{34}{120} 120 34
Let x students out of 2,000 students like orange.
Thus, In this case, the ratio of students who like orange and total number of student participate in the survey = \frac{x}{2000} 2000 x
By the proportional reasoning, Both ratio must be equal.
That is, \frac{x}{2000}=\frac{34}{120} 2000 x = 120 34
⇒ x = 2000\times \frac{34}{120}x=2000× 120 34
⇒ x = \frac{68,000}{120}x=120 68,000
⇒ x = 566.666666667\approx 567x=566.666666667≈567

8. A school has raised 75% of the amount it needs for a new building by receiving an average donation of Rs. 1200 from the parents of the students. The people already solicited represents the parents of 60% of the students. If the School is to raise exactly the amount needed for the new building, what should be the average donation from the remaining students to be solicited?
A 600 B 700 C 800 D 900
Solution: Let the number of people be x who has been asked for donations.
⇒ People already solicited = 60%ofx=0.6x.
⇒ Remaining people = 40%ofx=0.4x.
⇒ Amount collected from the people solicited = 600×0.6x=360x
⇒ Here, 360x is 75% of amount collected.
⇒ So, Remaining 25% amount = 120x.
⇒ Thus, Average donation from remaining people = RemainingpeopleRemainingamount=0.4x120x=300

9. The monthly income of Shyama and Kamal together is Rs.28000. The income of Shyama and Kamal is increased by 25% and 12.5% respectively. The new income of Kamal becomes 120% of the new salary of Shyama. What is the new income of Shyama?

A 13000 B 14000 C 15000 D 16000
Solution: Let shyama's income be 'x'
Kamal's income be 'y'
x + y = 28,000 ⇒ y = 28,000-x
new incomes,
shyama's income = x + (x) 25%
kamal's income = y + (y) 12.5%
according to the question,
y + (y) 12.5% = { x + (x) 25%} 120%
1.125 y = (1.25 x) 120%
1.125 y = {1.25(28,000- y) } 120%
2.625 y = 42,000
y (Kamal's old Income) = 16,000
kamal's new income = 18,000

10. In a class of 60 students, 40% of the students passed in Reasoning, 5% of the students failed in Quants and Reasoning, and 20% of the students passed in both the subjects. Find the number of student passed only in Quants?
A 13 B 23 C 33 D 43
Solution: Total students failed = 5% of 60
= 5/100 * 60 = 3
Total students passed in both = 20% of 60 = 20/100 * 60 = 12
Total students passed in reasoning = 40% of 60 = 40/100 * 60 = 24
Students passed in reasoning only = 24 - 12 = 12
Students passed in quants = 60 - 12 - 12 - 3 = 33

11. 500 kg of ore contained a certain amount of iron. After the first blast furnace process, 200 kg of slag containing 12.5% of iron was removed. The percentage of iron in the remaining ore was found to be 20% more than the percentage in the original ore. How many kg of iron were there in the original 500 kg ore?
A 54.2 B 58.5 C 89.2 D 46.3
Solution: Let x be the original percent of iron in the ore. Then rotal iron content would be -
Total iron = 500 × x/100
Total iron = 5x
Iron that was removed in the slag is -
Iron removed = 200 × 12.5/100
Iron removed = 25 kg
Now remaining iron would be 5x-25 kg in 300 kg ore. Given that this is 20% more than original iron.

x/100 × (120/100) = (5x-25)/300
3.6x = 5x - 25
1.4x = 25
x = 17.85 %
Total iron in the original ore was thus -
Total iron = 5x
Total iron = 5 × 17.85
Total iron = 89.29 kg

12. The maximum marks per paper in 3 subjects in Mathematics, Physics and Chemistry are set in the ratio 1: 2: 3 respectively. Giri obtained 40% in Mathematics, 60% in Physics and 35% in Chemistry papers. What is overall percentage marks did he get overall?
A 44 % B 32 % C 50 % D 60 %
Solution: 40*1/100 : 60*2/100 : 35*3/100 = 0.4:1.2:1.05
Overall % =100* [0.4+1.2+1.05]/1+2+3 = 265/6 = 44.16 = 44%

13. In an examination, 50% of the students passed in Science and 75% passed in Social, while 20% students failed in both the subjects. If 270 students passed in both subjects, find the total number of students who appeared in the exam?
A 400 B 540 C 600 D 750
Solution:no of students passed in both subjects:50+75-x=80
X=45% 45% of x=270
X=270*100/45=600
14. Fresh fruits contain 75% while dry fruits contain 20% water. If the weight of dry fruits is 300 kg, what was its total weight when it was fresh?
A 900 B 850 C 920 D 960
Solution: Quantity of water in 300 kg dry fruits, = (20 /100) *300 = 60 kg
Quantity of fruit alone= 300-60 =240 kg 25 kg fruit piece in 100 kg fresh fruits
For 240 = (100 *240)/25 = 960 kg.

15. In a college election 35% voted for Person A, whereas 42% voted for Person B. The remaining people were not vote to any person. If the difference between those who vote for Person B in the election and those who are uncertain was 570, how many people are participated in the college election?
A 1500 B 2000 C 2500 D 3000
Solution: Let the number of individuals involved in election be x.
Percentage of those who were not vote = 100-(35+42) =
23%
The difference between those who voted

42% of x – 23% of x = 570
19% of x = 570
x=570*100/19 = 3000

16. In a factory there are three types of bulbs L1, L2 and L3 which produces 20%, 15% and 32% of the total products respectively. L1, L2 and L3 produces 3%, 7% and 2% defective products, respectively. Find the percentage of non-defective products?
A 46 % B 30 % C 56 % D 64 %
Solution: (20*0.97)+(15*0.93)+(32*0.98) = 19.4+13.95+31.36
= 64.71

17. James' father was 30 years old when he was born. His mother's age was 24 when his sister who is 5 years younger to him, was born. What is the difference between the age of James' father and mother?
A 8 B 9 C 10 D 11
Solution: James' age =F-30
Sister's age =F-35
M=24+ Sister's age
M=24+F-35
∴∴ F-M=11
18. The respective ratio between the present age of Monika and Deepak is 5:x. Monika is 9 years younger than Prem. Prem's age after 9 years will be 33 years. The difference between Deepak's and Monika's age is same as the present age of Prem. What is the value of x?
A 11 B 13 C 15 D 17
Solution: Present age of Parineeta is 33 - 9 = 24 years

Age of Manisha = 24 - 9 = 15 years

But from the given information, difference Mamsha and Deepali's age is 24 years

Deepali's Age =15+24=39 years

Thus, Deepali's present age is 39 years.
Now, as the ratio of Manisha's age and Deepali's age is , so...
ManishaDeepali=5xManishaDeepali=5x

1539=5x1539=5x

15x=9515x=95

x=19515x=19515

∴x=13

19. Three years ago, Poorvi was thrice as old as his sister Reena. After three years Poorvi will be twice as old as Reena. What is the present age of Reena?
A 9 years B 10 years C 11 years D 12 years
Solution: P – 3 = 3 *(R – 3) —(1)
P + 3 = 2 *(R + 3) —(2)
Solving eqn (1) and (2) R = 9

20. Fifteen years ago, Rita's mother was thrice of Rita's age and two years ago Rita's Mother was twice of Rita's age. What is the present age of Rita's Mother?
A 47 years B 49 years C 52 years D 54 years
Solution: Rita's mother age = R1
Rita's age = R2
R1 – 15 = 3 *(R2 – 15) —(1)
R1 – 2 = 2 *(R2 – 2) —(2) From eqn (1) and (2) R1 = 54
21. Mr.Suresh has three daughters namely Ramya, Anita and Kiran. Ramya is the eldest daughter of Mr.Suresh while Kiran is the youngest one. The present ages of all three of them are square numbers. The sum of their ages after 5 years is 44. What is the age of Ramya after two years?
A 18 B 17 C 16 D 15
Solution: Square numbers – a, b, c
(a + 5) + (b + 5)+ (c + 5) = 44
a + b + c = 44 – 15 = 29
Possible values of a, b, c = 4, 9, 16 [Out of 1, 4, 9, 16, 25] Ramya's present age = 16; after two years = 18
22. If 6 years are subtracted from the present age of Ravi and the remainder is divided by 12, then the present age of his grandson Pranav is obtained. If Pranav is 2 years younger to Mohit whose age is 8 years, then what is Ravi's present age?
A 72 B 74 C 76 D 78
23. One year back, Ria was six times as old as her daughter. Six years hence, Ria's age will exceed her daughter's age by 15 years. The ratio of the present ages of Ria and her daughter is?
A 15 : 4 B 19 : 4 C 15 : 2 D 19 : 2
Solution: Ages of Ria and her daughter = 6x, x

[6x + 1 + 6] – [x + 1 + 6] = 15
5x = 15; x = 3
Ratio = 6x + 1 : x + 1 = 19 : 4
24. Suresh age is 125% of what it was ten years ago, but 250/3% of what it will be after ten years. What is the present age of Suresh?
A 40 B 50 C 60 D 70
Solution: Suresh's age before 10 years = x
125x/100 = x + 10
125x = 100x + 1000 ⇒ x = 40
Present age = x + 10 = 50
25. Ajay got married 6 years ago. His present age is 5/4 times his age at the time of his marriage. Ajay's brother was 5 years younger to him at the time of his marriage. What is the present age of Ajay's brother?
A 22 B 25 C 15 D 19
Solution:present age of ajay=x;
Present age of ajays sister=y
X=(x-6)(5/4)
X=30
Present age of ajays brother=30-5=25
26. 15 years ago the average age of a family of four members was 40 years. Two children were born in this span of 15 years. The present average of the family remains unchanged. Among the two children who were born during the 15 years, if the older child at present is 8 years older than the younger one, what is the ratio of the present age of the older child to the present age of the younger Child?
A 7 : 4 B 7 : 5 C 7 : 6 D 7 : 3
Solution: 15 years ago Total age of a family of four members = 160
Sum of the Present age of a family of four members = 160 + (15*4) = 220
Sum of the Present age of a family of six members = 40*6 = 240
x+x+8 = 20
x=6
present age of the older child to the present age of the younger Child = 14:6 = 7:3
27. James' present age is 2/7th of his father's present age. James' brother is three year older to James. The respective ratio between present ages of James' father and James' brother is 14:5. What is the present age of James?
A 12 B `13 C 14 D 15
Solution: James' father present age = x
James' age = 2/7 x
James' brother age = 2/7 x + 3
x/(2/7x + 3) = 14/5

x = 42
James' age = 2/7 x = 2/7 * 42 = 12
28. Eight years ago, Poorvi's age was equal to the sum of the present ages of her one son and one daughter. Five years hence, the respective ratio between the ages of her daughter and her son that time will be 7:6. If Poorvi's husband is 7 years elder to her and his present age is three times the present age of their son, what is the present age of the daughter?
A 15 B 13 C 23 D 25
Solution: P – 8 = S + D —(1)
6D + 30 = 7S + 35 —(2)
H = 7 + P
H = 3S
3S = 7 + P —-(3)
Solving eqn (1),(2) and (3) D = 23
29. At present, the respective ratio between the ages of A and B is 3:4 and that between A and C is 1:2. Six years hence, the sum of A, B and C will be 96 years. What is the present age of A?
A 12 B 14 C 16 D 18
Solution: The ratio between A, B and C is = 3:4:6
The sum of present age of A,B and C = 96 – 18 = 78
13 x = 78
x = 6
Present age of A = 3x = 18
30. The present age of Ramya is one-fourth that of her father. After 6 years, the father's age will be twice the age of Kiran. If kiran celebrated fifth birthday 8 year ago, what is the Ramya's Present age?
A 3 B 5 C 6 D 8
Solution: Kiran's present age = 8 + 5 = 13
kiran's age after 6 years = 13 + 6 = 19
Kiran's father age = 2 * 19 = 38
Father's present age = 32
Ramya's present age = 32 / 4 = 8
31. B is eight years older than A and 8 years younger than C. 12 years hence, respective ratio of the ages of A and C will be 5:9. What is the sum of present ages of A, B and C?
A 46 B 48 C 58 D 60
Solution: B = A + 8
B = C – 8
C – 8 = A + 8
C – A = 16
4x = 16

x = 4
12 years hence, A = 5x, C = 9x B = A + C => A= 20, B = 28, C = 36
Sum of present ages of A, B and C = 20 + 28 + 36 – 36 = 48 years.
32. The sum of present ages Ria and Abi is 48 years. Today Abi is 4 years older than Shweta. The respective ratio of the present ages of Ria and Shweta is 4:7. What was Abi's age two years ago?
A 30 B 32 C 28 D 34
Solution: R + A = 48 —(1)
A = S + 4 –(2)
R/S = 4/7
R + S + 4 = 48 => R + S = 44
11x =44
x = 4
Shweta's age = 28
Abi's present age = 28 + 4 = 32
Abi's age two years ago = 30
33. The sum of the ages of 4 members of a family 5 year ago was 94 year. Today when the daughter has been married off and replaced by a daughter-in-law, the sum of their ages is 92 year. Assuming that there has been no other change in the family structure and all the people are alive, what is the difference between the age of daughter and the age of daughter in law?
A 22 B 25 C 19 D 18
Solution: 5 year ago, Sum of the ages of 4 members = 94
Present age with daughter = 94 + 20 = 114
Present age with daughter-in-law = 92
Difference between the age of daughter and the age of daughter in law = 114 – 92 = 22 years.
34. Ajay's present age is 1.5 times of Himanshu's present age. If after 4 years, Ajay's age will be twice of Himanshu's age 4 years ago. What is the difference between the present ages of Ajay and Himanshu?
A 12 B 23 C 15 D 17
Solution: A = 1.5 * H
A + 4 = 2 * (H – 4)
A + 4 = 2H – 8
A + 12 = 2H
1.5H + 12 = 2H
H = 24
A = 24 * 1.5 = 36
Difference = 36 – 24 = 12

35. If Saurabh is as much elder than Shyam as he is younger to Suresh and sum of the ages of Shyam and Suresh is 46 year, then what will be the age of Saurabh after five years?
A 25 B 26 C 27 D 28
Solution: Let the present ages of Saurabh is x year and he is younger to Suresh by y year
Then Suresh's age = x + y
Shyam's age = x – y
(x + y) + (x – y) = 46
x = 23
The age of Saurabh after five years is – 28

Chapter 5 - Ratio and Proportion

1. If A : B : C = 2 : 3 : 4 then A:B:Cis equal to:
B C A
4 : 9 : 16. B. 8 : 9 : 12. C. 8 : 9 : 16. D. 8 : 9 : 24.
Solution: Let the values of A,B,C be 2x , 3x , 4x respectively.
Therefore A/B= 2x/3x
B/C= 3x/4x
C/A= 4x/2x
= 2x/3x * 4x/3x * 2x/4x
= 4/9
A/B:B/C:C/A = 4:9:1

2. If A : B = 2 : 3, B : C = 4 : 5, C : D = 6 : 7, then A : B : C : D is:
A. 16 : 22 : 30 : 35. B. 16 : 24 : 15 : 35. C. 16 : 24 : 30 : 35. D. 18 : 24 : 30 : 35.

Solution: a:b=2:3,b:c=4:5,c:d=6:7
a:b=2×8:3×8=16:24b:c=4×6:5×6=24:30c:d=6×5:7×5=30:35soa:b:c:d=16:24:30:35

3. If 0.75 : x :: 5 : 8 then equal to :
A. 1.12. B. 1.20. C. 1.25. D. 1.30.

Solution: 0.75/x = 5/8 By cross multiplying, we get 5x = 0.75*8 Therefore, x= 6/5 = 1.2
4. If x : y = 5 : 2 then (8x + 9y) : (8x + 2y) is :
A. 22 : 29. B. 26 : 61. C. 29 : 22. D. 61 : 26.
Solution: If x : y = 5 : 2, then (8x + 9y) : (8x + 2y) is
Put x = 5k and y = 2k

8x+2y8x+9y=8×5k+2×2k8×5k+9×2k=44k58k=2229
Hence ratio is 29:22

5. The salaries of A, B, C are in the ratio 2 : 3 : 5. If the increments of 15%, 10% and 20% allowed respectively in their salaries, then what will be the new ratio of their salaries ?
A. 3 : 3 : 10. B. 10 : 11 : 20. C. 23 : 33 : 60. D. Cannot be determined.
Solution: Let A=2k, B=3k and C=5k .
A's new salary =115100=115100 of
2k=(115100×2k)=2310k=(115100×2k)=2310k
B's new salary =110100=110100 of
3k =(110100×3k)=3310k=(110100×3k)=3310k
C's new salary =120100=120100 of 5k=(120100×5k)=6k=(120100×5k)=6k
∴∴ New ratio =23k10:33k10:6k=23:33:60=23k10:33k10:6k=23:33:60.
6. If RS. 782 be divided into three parts, proportional to 1:2:3, then the first part is : 2 3 4
A. Rs. 182. B. Rs. 190. C. Rs. 196. D. Rs. 204.
Solution: Given ratio = 21:32:43 ..... Multiplying by 12

= 6:8:9

∴ 1st part = Rs. (782×236) = Rs. 204

7. Two numbers are in the ratio 3 : 5. If 9 is subtracted from each, the new numbers are in the ratio 12 : 23. The smaller number is :
A. 27. B. 33. C. 49. D. 55.
Solution:

Let the numbers be 3X and 5X
So 3X-9 :5X-9 is 12:23
solve for X we get X=11
and the numbers are 33 and 55
(33–9)/(55–9)=24/46=12/23
Numbers are 33 and 55

8. Two numbers are in the ratio 1 : 2. If 7 added to both, their ratio changes to 3 : 5. The greatest number is :
A. 24. B. 26. C. 28. D. 32.
Solution: Let smaller no be 1x and greater no be 2x
1x:2x
When we add 7

1x+7:2x+7=3:5
1x+7/2x+7=3/5
Cross multiply
(1x+7)5=(2x+7)3
5x+35=6x+21
35–21=6x-5x
14=x
Therefore smaller no is 14
Greater no is 14*2=28

9. In a bag, there are coins of 25p, 10p and 5p in the ratio of 1 : 2 : 3. If there are Rs. 30 in all, how many 5p coins are there ?
A. 50. B. 100. C. 150. D. 200.
Solution: Let the number of 25 p, 10 p and 5 p coins be x, 2x, 3x respectively
Then, sum of their values
=Rs.(25x100+10×2x100+5×3x100)=Rs.60x100∴60x100=30⇔x=30×10060=50Hence,thenumberof5pcoins=(3×50)=150

10. Salaries of Ravi and Sumit are in the ratio 2 : 3. If the salary of each is increased by Rs. 4000, the new ratio becomes 40 : 57. What is Sumit's present salary ?
A. Rs. 17,000. B. Rs. 20,000. C. Rs. 25,500. D. None of these.
Solution: let salary of Ravi = 2x

salary of sumit = 3x

Salaries increased by Rs 4000

New ratio is 40 : 57

According to the given question -

$$\frac{2x + 4000}{3x + 4000} = \frac{40}{57}$$

$$57(2x + 4000) = 40(3x + 4000)$$

$$114x + 228000 = 120x + 160000$$

$$120x - 114x = 228000 - 160000$$

$$6x = 68000$$

$$x = \frac{68000}{6}$$

$$x = 11333.33$$

Salary of Sumit 3x = 3(11333.33) = Rs 34000.

$$\textbf{Sumit salary} = \textbf{Rs 34000}$$

1

11. If Rs. 510 be divided among A, B, C in such a way that A gets 2 of what B gets and B gets 1 of

what C gets, then their shares are 3 4

respectively :

Rs. 120, Rs. 240, RS. 150. B. Rs. 60, Rs. 90, RS. 360. C. Rs. 150, Rs. 300, RS. 60. D. None of these.

Solution: Let the share of C be ₹x.

Then, share of B = ₹ 1/4 x

Share of A = ₹ 2/3*1/4 x = ₹ 1/6 x

A/Q x + 1/4 x + 1/6 x = 510

=> 17/12 x = 510

=> x = 510*12/17 = 30*12 = 360

Share of C = ₹360

Share of B = ₹ 1/4*360 = ₹ 90

Share of A = ₹ 1/6*360 = ₹ 60

12. The sum of three numbers is 98. If the ratio of the first to the second is 2 : 3 and that of the second to the third is 5 : 8, then second number is :

A. 20. B. 30. C. 48. D. 58.

Solution: Let the three parts be A, B, C. Then,

A : B = 2 : 3 and B : C = 5 : 8

=(5×35):(8×35)=3:245⇒A:B:C=2:3:245=10:15:24⇒B=98×1549=30

13. A fraction which bears the same ratio to 1that 3 does to 5is equal to:

A. 1. B. 1. C. 3. D. 55.

55 11 11

Solution:

x:(1/27) = (3/11):(5/9)

Cross multiplying

x * (5/9) = (1/27) * (3/11)

x = 1/55

14. A sum of Rs. 1300 is divided among P, Q, R and S such that P's share = Q's share = R's share = 2.

Then, P’s share is : A. Rs. 140. B. Rs. 160. C. Rs. 240. D. Rs. 320.

Solution: P+Q+R+S=RS.1300.00

P/Q =Q/R=R/S= 2/3

3P=2Q ,

3Q=2R,

3R=2S

i.e. Q=3/2 P,

R= 3/2 Q = (3/2)(3P/2)=9P/4,

& S= 3R/2= 3/2 * 9P/4 = 27P/8

We Know That

P+Q+R+S=1300 substitute Q,R,S values

=== P+ 3P/2 + 9P/4 +27P/4= 1300

=== P(1+3/2+9/4+27/8)= 1300

=== P (8+12+18+27)= 8* 1300

=== 65P= 10400

=== P= 10400/65

=== p= 160

P's share is Rs 160 /-

15. A and B together have Rs. 1210. If 4 of A’s amount is equal to 2 of B’s amount, how much amount

does B have? 15 5

Rs. 460. B. Rs. 484. C. Rs. 550. D. Rs. 664.

Solution:

$$\frac{4}{15} A = \frac{2}{5} B$$

$$\Rightarrow A = \left(\frac{2}{5} x \frac{15}{4}\right) B$$

$\Rightarrow A = \frac{3}{2} B$

$\Rightarrow \frac{A}{B} = \frac{3}{2}$

$\Rightarrow A : B = 3 : 2.$

$\therefore$ B's share = Rs. $\left(1210 \times \frac{2}{5}\right)$ = Rs. 484.

16. Two number are respectively 20% and 50% more than a third number. The ratio of the two numbers is :
A. 2 : 5. B. 3 : 5. C. 4 : 5. D. 6 : 7.
Solution: Let the third number be r.
So, first number = r + 20% of r = r + (20/100)*r
First number = r + 0.2r = 1.2r
Second number = r + 50% of r = r + (50/100)*r
Second number = r + 0.5r = 1.5r
Ratio of two numbers = First number / Second Number
= 1.2r / 1.5r
= 4/5 or 4:5

17. Seats for Mathematics, Physics and Biology in a school are in the ratio 5 : 7 : 8. There is a propasal to increase these seats by 40%, 50% and 75% respectively. What will be the ratio of increased seats ?
A. 2 : 3 : 4. B. 6 : 7 : 8. C. 6 : 8 : 9. D. None of these.
Solution: Originally, let the number of seats for Mathematics, Physics and Biology be 5x, 7x and 8x respectively.
Number of increased seats are (140% of 5x), (150% of 7x) and (175% of 8x).

$\Rightarrow \left(\frac{140}{100} \times 5x\right)$, $\left(\frac{150}{100} \times 7x\right)$ and $\left(\frac{175}{100} \times 8x\right)$

$\Rightarrow 7x, \frac{21x}{2}$ and $14x.$

$\therefore$ The required ratio = $7x : \frac{21x}{2} : 14x$

$\Rightarrow 14x : 21x : 28x$
$\Rightarrow 2 : 3 : 4.$

18. The ratio of the number of boys and girls in a college is 7 : 8. If the percentage increase in the number of boys and girls be 20% and 10% respectively, what will be the new ratio ?
A. 8 : 9. B. 17 : 18 C. 21 : 22. D. Cannot be determined.
Solution: Ratio of number of boys and girls in a college = 7 : 8.
Let the number of boys be 7x & number of girls be 8x.
Also given that,
Percentage increase in boys = 20%.
⟹ Number of boys = 7x * (100 + 20)/100
⟹ Number of boys = 7x * 120/100
⟹ Number of boys = 42x/5
Similarly,
Percentage increase in girls = 10%
⟹ Number of girls = 8x * (100 + 10)/100
⟹ Number of girls = 8x * 110/100
⟹ Number of girls = 44x/5
Hence,
New ratio = (42x/5) / (44x/5)
⟹ New ratio = 42x/5 * (5x/44)
⟹ New ratio = 21/22
⟹ New ratio = 21 : 22

19. A sum of money is to be distributed among A, B, C, D in the proportion of 5 : 2 : 4 : 3. If C gets Rs. 100 more than D, what is B's share ?
A. Rs. 500. B. Rs. 1500. C. Rs. 2000. D. None of these .
Solution: let x be the ratio factor .
so , 5x+2x+4x+3x = total money .
so, we can say 5*x is the money given to A,
2*x is the money given to B,
4*x is the money given to C,
3*x is the money given to D.
now , it is said that C gets 1000 more than D .
ie difference between the amount C and D get is 1000.
so ,
4*x-3*x=1000.
x=1000.
so we found the ratio factor to be 1000.
now the amount of money B get is equal to 2*x = 2*1000= 2000.
therefore the share of B is 2000.

20. If 40% of a number is equal to two-third of another number, what is the ratio of first number to the second number ?
A. 2 : 5. B. 3 : 7. C. 5 : 3. D. 7 : 3.
Solution:

Let 40% of A = $\frac{2}{3}$ B

Then, $\frac{40A}{100} = \frac{2B}{3}$

$\Rightarrow \frac{2A}{5} = \frac{2B}{3}$

$\Rightarrow \frac{A}{B} = \left(\frac{2}{3} \times \frac{5}{2}\right) = \frac{5}{3}$

$\therefore$ A : B = 5 : 3.

21. Ratio of the earnings of A and B is 4 : 7. If the earnings of A increase by 50% and those of B decrease by 25%, the new ratio of their earnings becomes 8 : 7. What are A's earnings ? :
A. Rs. 21,000. B. Rs. 26,000. C. Rs. 28,000. D. Rs. None of these.
Solution: Ratio of earning of A and B =4:7
Let the earning of A and B is 400x and 700x
Earning of A after increasing 50%=400x+200x=600x
Earning Of B after decreasing 25%
=700x+700x*25/100=700x+175x=875x
New ratio of their earning
=600x/875=8/7
100x=8*875/175=8*5=40
So A's actual earning
=400x=4*40=160 unit

2
22. In a mixture of 60 litres, the ratio of milk and water is 2 : 1. If this ratio is to be 1 : 2, then the quantity of water to be further added is ::
A. 20 litres. B. 30 litres. C. 40 litres. D. 60 litres.
Solution: Quantity of Milk = 60*(2/3) = 40 liters
Quantity of water = 60-40 = 20 liters

As per question we need to add water to get quantity 2:1

=> 40/(20+x) = 1/2
=> 20 + x = 80
=> x = 60 liters
23. The third proportional to (x2 − y2) and (x − y) is :
A. (x + y). B. (x − y). C. (x + y)/(x − y). D. (x − y)/(x + y).
Solution: et the third proportional to $(x^2 - y^2)$ and (x - y) be P.
Therefore, $(x^2 - y^2)$, (x - y) and P are in proportion.
=> $(x^2 - y^2) : (x - y) = (x - y) : P$
=> $(x^2 - y^2)/(x - y) = (x - y)/P$
=> $P = (x - y)^2/(x^2 - y^2)$
=> P = (x - y)(x - y)/(x + y)(x - y)
=> P = (x - y)/(x + y).
Therefore, the third proportional to $(x^2 - y^2)$ and (x - y) is (x - y)/(x + y).

24. The ratio of third proportional to 12 and 30 and the mean proportional between 9 and 25 is : A. 2 : 1. B. 5 : 1. C. 7 : 15. D. 9 : 14.
Solution: Let the third proportional to 12 and 30 be x.

Then, 12 : 30 :: 30 : x <=> 12x = 30 x 30 <=> x = (30*30\12)
= 75.
Third proportional to 12 and 30 = 75.

Mean proportional between 9 and 25 = sqrt(9)*sqrt(25) = 15.

Required ratio = 75 : 15 = 5 : 1.
25. The prices of a scooter and a T.V. are in the ratio 7 : 5. If the scooter costs Rs. 8000 more than a T.V. set, then the price of a T.V. set is :
A. Rs. 20,000. B. Rs. 24,000. C. Rs. 28,000. D. Rs. 32,000.
Solution: If we Assume Scooter cost + TV set Cost= 'x'
Scooter cost =7x/12
TV set cost =5x/12
As per the problem,
Scooter cost = 8000 + Tv set cost,
7x/12 = 8000 + 5x/12,
7x/12-5x/12= 8000
2x/12 = 8000
x/6 = 8000
x= 48000
scooter cost = 48000*7/12 = 28000.

Tv set cost = 48000*5/12 = 20000.

26. An amount os Rs. 2430 is divided among A, B and C such that if their shares be reduced by Rs. 5, Rs. 10 and Rs. 15 respectively, the remainders shall be in the ratio of 3 : 4 : 5.Then, B's share was :
A. Rs. 605. B. Rs. 790. C. Rs. 800. D. Rs. 810.
Solution: ∵ Remainder = Rs. [2430 - (5 + 10 + 15)] = Rs. 2400
∴ B's share = Rs. [(2400 x 4/12) + 10] = Rs. 810
27. The ratio between two numbers is 3 : 4 and their L.C.M. is 180. The first number is :
A. 60. B. 45. C. 20. D. 15.
Solution: let the number be 3x and 4x
product of two numbers =lcm x hcf
3x * 4x=180 x hcf
(here hcf =x
because hcf is the common between two numbers
and I the number are 3x and 4x)
3x*4x=180*x
12 x^2/x=180
12x=180
x=15
first number =3*x=3*15=45

28. An alloy is to contain copper and zinc in the ratio 9 : 4. The zinc required to be melted with 24 kg of copper is:
A. 102 kg. B. 101 kg. C. 92 kg. D. 9 kg.
Solution: Copper : Zinc = 9 : 4
Copper melted = 24 kg
Zinc melted = x kg
9 / 4 = 24 / x
9x = 24*4
9x = 96
x = 96 / 9
= 32 / 3
= 10.66666....
≈ 11 kg

3 3 3
29. 15 litres of mixture contains 20% alcohol and the rest water. If 3 litres of water be mixed with it, the percentage of alcohol in the mixture would be :
A. 15%. B. 162%. C. 17%. D. 181%.

Solution: Water become = 12 + 3 = 15 liter.
Toatl mixture = 15 + 3 = 18 liter.
Now, % of Alcohal into new mixture = (3*100/18) = 16.66%.
3 2
30. 20 litres of a mixture contains milk and water in the ratio 5 : 3. If 4 litres of this mixture be replaced by 4 litres of milk, the ratio of milk to water in new mixture would be :
A. 2 : 1. B. 7 : 3. C. 8 : 3. D. 4 : 3.
Solution: 20 litres of mixture contains 5/8 x 20 = 12.50 litres of milk and 7.5 L water.
Removing 4 litre mixture means removing :
milk 4 x 5/8 = 2.5 L & 1.5 L water.
New milk content after adding 4 L pure milk = 12.5 - 2.5 + 4 = 14 L
Milk:water is 14:6 or 7:3

31. The age of A and B are in the ratio 3 : 1.Fifteen years hence, the ratio will be 2 : 1. Their present ages are :
A. 30 years, 10 years. B. 45 years, 15 years. C. 21 years, 7 years. D. 60 years, 20 years.
Solution: The ratio of ages ,

=> 3:1

Let the age of raju be 3x .

And age of biju be x.

From the question,

$$=> \frac{3x+15}{x+15} = \frac{2}{1}$$

$$=> 2x + 30 = 3x + 15$$

=> x=15.

So, The age of raju is 3×15 =45years.

The age of biju=> 15.
32. The speeds of three cars in the ratio 5 : 4 :6. The ratio between the time taken by them to travel the same distance is :
A. 5 : 4 : 6. B. 6 : 4 : 5. C. 10 : 12 : 15. D. 12 : 15 : 10.

Solution: Given, the ratio of the three car's speed will be 5 : 4 : 6
We know,
$\text{Speed } = \frac{\text{distance}}{\text{time}}$
Since, the distance is same for the given cars,
Taking distance = D,
$\text{Speed } = \frac{\text{D}}{\text{time}}$
Let the time taken by the 3 cars be termed as t_1, t_2, t_3.
Given,
Ratio of Speeds = 5:4:6
$Speed_1 : Speed_2 : Speed_3 = 5 : 4 : 6$

$t_1 : t_2 : t_3 = \frac{1}{5} : \frac{1}{4} : \frac{1}{6}$
LCM of 5, 4 and 6 will be 60.

Hence, the ratio of the time taken by the cars will be 12: 15: 10

33. The sides of a triangle are in the ratio 1 1 1and its perimeter is 104 cm. The length of the 2: :

longest side is :
3 4 52 cm. B. 48 cm. C. 32 cm. D. 26 cm.
Solution: he sides be x/2,x/3,x/4
the sum of sides i.e. perimeter is 104
then, x/2 + x/3 + x/4 = 104
13x/12 = 104
x = 104 * 12 /13
x=8*13
x=96
the longest side is x/2
96/2
48.

34. In a school, 19% of the boys are same in number as 1th of the girls. What is the ratio of boys to girls in that school ?
A 3 : 2. B. 5 : 2. C. 2 : 1. D. 4 : 3.
Solution: Let number of boys = B
and number of girls = G
Then, 10% of B = 14 of G14 of G= B10=G4=BGB10=G4=BG

= =104=52=B:G=104=52=B:G = 5 : 2.
35. x varies inversely as square of y. Given that y=2 for x=1. The value of x for y=6 will be equal to :
A. 3. B. 9. C. 1. D. 1.
Solution: x∞1y2x∞1y2
(Inversely proportional)
x=ky2x=ky2
(y=2) for (x=1)(y=2) for (x=1) (Given)
Therefore, 1=k(2)2=>1=k41=k(2)2=>1=k4
k = 4
Therefore, For y = 6
x=4(6)2=19
3 9

36. If 10% of x=20% of y, then x : y is equal to :
A. 1 : 2. B. 2 : 1. C. 5 : 1. D. 10 : 1.
Solution: 10% of x=10*x/100*=x/10
20% of y=20*y/100*=y/5
Given that
10% of x=20% of y

x/10=y/5=2y/10
x=2y
x/y=2/1
x:y=2:1

37. Zinc and copper are melted together in the ratio 9 : 11. What is the weight of melted mixture, if 28.8 kg of zinc has been consumed in it ?
A. 58 kg. B. 60 kg. C. 64 kg. D. 70 kg.
Solution: For 9 kg zinc, mixture melted = (9 + 11) kg
For 28.8 kg zinc , mixture melted = (209×28.8)(209×28.8)g = 64 kg.

38. The least whole number which when subtracted from both the items of the ratio 6 : 7 gives a ratio less than 16 : 21 is :
A. 2. B. 3. C. 4. D. 6.
Solution: Let the whole number is X.
Now, according to question,
(6 -X) /(7 -X) < 16/21.
21 *(6 -X) < 16 *(7 -X)

126 - 21X < 112 - 16X
126 - 112 < - 16X + 21X
14 < 5X
5X > 14
X > 2.8
So, Least such whol number would be 3.

39. A certain amount was divided among between A and B in the ratio 4 : 3. If B's share was Rs. 4800, the amount was :
A. Rs. 11,200. B. Rs. 6400. C. Rs. 19,200. D. Rs. 39,200.
Solution: Let A get=₹ 4x
Let B get=₹ 3x
B share=₹4800
Given=₹4x
A/Q
3x=4800
x=4800/3
x=1600
We got x=1600
A=4x=4×1600=₹6400
B=3x=3×1600=₹4800
Total Money=6400+4800

=11200

40. What is the ratio whose terms differ by 40 and the measure of which 2?
7
16 : 56. B. 14 : 56. C. 15 : 56. D. 16 : 72.
Solution: let's say one term is x and the other is y.
x/y = 2/7 therefore x = (2/7)y
from the ratio above we know y must be bigger than x as x is proportionate to 2, y is proportionate to 7
therefore x = y - 40
we have two terms for x, equating them gives
(2/7)y = y - 40
rearranging gives
(-5/7)y = -40 so y = 56
therefore x = 16
Ratio is 16:56

Chapter No.6 - Profit & Loss , Simple & Compound Interest

1. Shan bought 30 liters of milk at the rate of Rs.8 per liter. He got it churned after spending Rs.10 and 5kg of cream and 30 liter of toned milk were obtained. If he sold the cream at Rs.30 per kg and toned milk at Rs.4 per liter, his profit in the transaction is:
A) 10% B) 9% C) 8% D) 7%
CP =Rs.(30 x 8 + 10) = Rs.250 SP = Rs. (30 x 5 + 30 x 4) = Rs.270 Gain% = (20/250 x 100)% = 8%
2. A trader wants to sell a watch at 25% profit. If its cost price was Rs.x more, an extra profit of Rs.50 would be made on it. Find x(in Rs.)
A) 100 B) 125 C) 150 D) 200
Let the intial CP be 100 then SP is 125 with 25% profit.
Now to get a profit of 50Rs. more, profit= 50+25=75
So profit of 25% =75
Then let the new CP be y.
y*25%=75
y=300
According to question 100+x=300
x=200
3. The Selling price of 12 articles equals the cost price of 15 articles. find the profit/loss percentage?
A) 25% profit B) 20% profit C) 25% loss D) 20% loss
SP of 12 = Cost price of 15.
Loss = 15 – 12 = 3

Loss% = (3*100)/12 = 25%

4. Vijay marked his camera at 50% above his cost price. He sold it after allowing discount and still made a profit of 20%. What is the discount percentage he offered on it?

A) 20% B) 25% C) 30% D) 35%

Let the CP be 100

Marked Price = 50% of 100+ 100 = 150

(SP-CP)/CP*100 = 20

 SP = 120

Discount offered = 150-120 = 30

Discount% = 30/150*100 = 20%

5. Francis and George started a business with investments of Rs.7000 and Rs.10000. After x months, Francis left. After two more months David joined the business with an investment of Rs.10000. If the annual profit is shared among David, Francis and George in the ratio 10:7:24, find the respective time periods of David, Francis and George for which they stayed that year.

A) 5:5:12 B) 1:1:3 C) 1:1:4 D) 1:1:2

Investment ratio of Francis and George = 7 : 10

Investment ratio of David and George = 1 : 1

Profit ratio of David and George = 1 : 1

Here, David = 10x

Francis = 7x

George = 24x

Here, with investment of 10,000, George's profit is 2x/month

So, with investment of 10,000, David's profit is 10x, so he would be stayed for 5 month.

Now, Francis got 7x profit with investment of 7000.

If, 10,000 = 2x

7000 = ?

(7000 x 2x)/10000 = 1.4x /month

1.4x 1month

7x ? months

 7/1.4 = 5months

Now, ratio of staying in month = 5 : 5 : 12

6. Ram and Shyam started a business with investments of Rs.40000 and Rs.60000. At the end of one year, out of the total Ram got Rs.2000 less profit than Shyam. Find the total profit (in Rs.)

A) 12000 B) 10000 C) 8000 D) 16000

Solution: $\boldsymbol{Ramshyam=46}$

Guess total profit = 10x

Here 6x – 4x =2000

2x = 2000

X = 1000
Total profit = 10 * 1000 = 10,000

7. Arun and Bharat started a business with investments of Rs.10000 and Rs.15000 respectively. Arun being a working partner gets Rs.100 every month as salary from the profit. At the end of one year the business makes a profit of Rs.4800. Find the total share of Arun out of this amount (in Rs.)
A) 2880 B) 26400 C) 3240 D) 2760
Arun/Bharat = 2/3
Annual profit = Arun's profit + Bharat's profit + Arun's Salary
 2x + 3x + 12(100) = 4800
 5x = 4800 – 1200
 5x = 3600
 x = 720
Arun's profit = 2x + 1200
= 720 X 2 + 1200
= 2640
8. Arun sold two napkins at same price.He earned 10% profit on one napkin and suffered 10% loss on the other, what was his overall profit/loss percentage?
A) No profit B) 1% profit C) 1% loss D) None of these
Let us assume that the sale price for each item was 100
 Item 1

Profit % = (sp-cp)/CP *100
10 = (100-x)/X*100
x = 10000/110 = 90.90909
Cost of item 1 = 90.90
 Item 2

Loss% = (CP-SP)/CP*100
10 =(X-100)/X*100
x = 111.1111
Cost of Item 2 = 111.11
 Total Cost = 90.90 +111.11 =202.02
 Total Sales = 100+100 = 200
 Net Loss = 2.02
 Loss% = (2.02/200)*100

= 1.01% ~ 1%
9. The sale price of an article including the sale tax is Rs. 616. The rate of sale tax is 10%. If the shopkeeper has made a profit of 12%, the cost price of the article is

A) 500 B) 600 C) 515 D) 575

∴ S.P. = x+12% of x
= 112x/100 = 28x/25
28x/25 +10% of 28x/25 =616
⇒ x = Rs 500

10. When a article is sold for Rs.3400, there is a loss of 2%. What is the cost price of the commodity?
A) Rs 3500.50 B) Rs 3200 C) Rs 3400.56 D) Rs 3469.34
Loss = 2% so,
98%……3400
100%……x
x = (3400×100)/98 = 3469.34

11. A certain sum is invested for T years. It amounts to Rs. 400 at 10% per annum. But when invested at 4% per annum, it amounts to Rs. 200. Find the time (T)?
A) 39 years B) 45 years C) 41 years D) 50 years
Time (T) = (A1-A2) ×100÷A2R1−A1R2
= [400−200]×100÷[200×10−400×4]
= 20000/400 = 50 years.

12. A sum of Rs. 800 amounts to Rs. 920 in 3 years at simple interest. If the interest rate is increased by 3%, it would amount to how much?
A) 780 B) 992 C) 848 D) 700
Principal = Rs.800, Amount = Rs.920, T = 3years
Simple interest = 920−800 = 120
∴ Rate % = 120×100/800×3 = 5%
If rate % is increased by 3%, i.e., rate % = 8%, then
SI = 800×3×8/100 = 192
∴ Amount = Rs.800+Rs.192 = Rs.992

13. If simple interest on a certain sum of money for 4 years at 5% per annum is same as the simple interest on Rs. 560 for 10 years at the rate of 4% per annum then the sum of money is:
A) 1180 B) 1120 C) 1200 D) 1250

14. Nishu invested an amount of Rs. 13,900 divided in two different schemes A and B at the simple interest rate of 14% p.a. and 11% p.a. respectively. If the total amount of simple interest earned in 2 years be Rs. 3508, what was the amount invested in Scheme B?
A) 6400 B) 6500 C) 7200 D)
 Let the investment in scheme A be Rs.x and the investment in scheme B be Rs.(13900−x)
 We know that SI = P×R×T/100
 Simple Interest for Rs.x in 2 years at 14% p.a = x×14×2/100 = 28x/100

 Simple Interest for Rs.(13900−x) in 2 years at 11% p.a.

= (13900−x)×11×2/100
= 22(13900−x)/100
 Total interest=Rs.3508

⇒ 28x/100 + 22(13900−x)/100 = 3508
⇒28x+305800−22x = 350800
⇒6x = 45000
⇒x = 45000/6
⇒x = 7500
 Investment in Scheme B = 13900−7500 = 6400Rs

15. The difference between the simple interest received from two different sources on Rs. 1500 for 3 years is Rs. 13.50. The difference between their rate of interest is:
A) 0.20% B) 0.30% C) 0.50% D) 0.80%
Let r1 and r2 be the required rate of interest.
Then
⇒ 13.50= 1500*3*r1/100-1500*3*r2/100
⇒ r1-r2=135/450
⇒ r1-r2=0.3
16. What will be the ratio of simple interest earned by certain amount at the same rate for 4 years and 12years?
A) 1:4 B) 1:2 C) 3:1 D) 1:3
Let the principal for both the case be Rs. P and the rate of interest be R% p.a.
Required ratio = P×R×4 /100 : P×R×12 / 100 = 1:3.
17. Sankar borrowed some money at the rate of 4% pa for the first 4 years, 6% for the next 3 years and 7% for the next 10 years. If the total interest paid by him is Rs.8528,how much money did he borrow?
A) 7200 B) 8200 C) 8328 D) None of these
Let Wasim borrowed Rs.x
⇒x*4*4/100 + x*6*3/100 + x*7*10/100
=8528
⇒16x/100+18x/100+70x/100 = 8528
⇒104x/100 = 8528
⇒x/100 = 82
∴ x = Rs.8200
18. A sum of money trebles itself in 16 years. In how many years it would become double itself in how many years?
A) 4 B) 5 C) 8 D) 8.5
Principal=x, SI=2x, T=16yrs

Rate= (2x*100)/(x*16) = 12.5%
Now for double
SI=x, R=12.5%, P=x
Time=(x*100)/(x*12.5) = 8yrs

19. If the annual rate of simple interest increases from 10% to 12(1/2)%,annual income increases by 2500 then the principal(Rs)
A) 1,02,500 B) 1,25,000 C) 10,000 D) 1,00,000
Change in SI = 25/2 - 10 = 5/2%
∴% 2.5 of principal = ₹ 2500
Principal = (SI × 100) /(R × T)
∴ Principal = (2500 × 100) /(2.5 × 1)
= ₹ 100000

20.Babu takes a loan Rs.2000 at 5% simple interest. He returns Rs.1000 at the end of 1 year. How much amount should he pay to clear the due in 2 years.
A) 1000 B) 1150 C) 2150 D) None of these
Amount left to be paid
= 1000+ 2000 x 5 /100 + 2000 x 5/100
= 1150

21. The Simple interest on a certain sum for 2 years at 10% per annum is Rs. 90. The corresponding compound interest is:
A) 97 B) 90 C) 94.50 D) 100
Principle = (100 x interest) / (time x rate)
⇒ Principle = (100 x 90) / (2 x 10) = Rs. 450
C.I. = [450 x (1 + 10/100)2 - 450] = Rs. 94.50

22. If the difference between the simple interest and compound interests on some principal amount at 20% for 3 years is Rs. 48, then the principal amount is
A) 636 B) 650 C) 375 D) 400
Given, T = 3yrs Rate. Interest = 20% Principal = x
∴S.I = (x∗T∗R)/100
⟹S.I = x∗3∗20/100
⟹S.I = 3x5
⟹Amount on SI = x + 3x/5 = 8x/5
∴Amount on C.I = x∗(1+Rate/100)T
⟹Amount on C.I = x∗(1+20/100)3
⟹Amount on C.I = x∗(6/5)3
⟹Amount on C.I = 216x/125
Amount on C.I – Amount on S.I = C.I−S.I
⟹216x/125 − 8x/5 = 48
⟹(216x − 200x)/125 = 48
⟹x = 375

23. Divide Rs. 3903 between A and B, so that A's Share at the end of 7 years may equal to B's share at the end of 9 years, compound interest being at 4 percent.
A) 2018 and 1885 B) 2028 and 1875
C) 2008 and 1895 D) 2038 and 1865
A's present share = x
B's present share = 3903-x
We have x*(1+4/100)7 = (3903-x)* (1 + 4/100)9
∴ x/(3903-x) = (1+4/100)2 = (26/25)2 = 676/625
Dividing Rs. 3903 in the ratio of 676 : 625
∴ A's present share = 676/(676 + 625) of Rs .3903 = Rs. 2028
B's present share = Rs. 3903 - Rs. 2028 = Rs. 1875
24. If a sum on compound interest becomes three times in 4 years, then with the same interest rate, the sum will become 27 times in:
A) 8 years B) 12 years C) 24 years D) 36 years
Amount =Principal (1+r/100)t
P(1+r/100)4 = 3P
⇒(1+r/100)4 = 3
P(1+r/100)n = 27P
⇒ (1+r/100)n = 33
⇒ (1+r/100)n = [(1+r/100)4]3
⇒ n=4 X 3 = 12
25. In what time will Rs. 64,000 amount to Rs.68921 at 5% per annum interest being compounded half yearly?
A) 3 years B) 2 years C) 2(1/2) years D) 1(1/2) years
CA = P(1+r/100)2t
69821 = 64000(1+5/100)2t
69821/64000 = (4041)2t (4041)3 = (4041)2t 3 = 2t t = 3/2 Hence The required time is 1.5 Years.
26. If the difference between the CI and SI on a sum of money at 5% per annum for 2years is Rs.16.Find the Simple Interest ?
A) 180 B) 460 C) 520 D) 640
CI-SI = 96
⟹ [P x (1+r/100)2-P] – (P x r x 2 / 100) =16
⟹41P/400 – P/10 = 16
⟹P= 6400
Therefore SI = 6400 x 5 x 2/100 = 640
27. The difference between CI and SI on an amount Rs. 15000 for 2 year is Rs.96. What is the rate of interest per annum ?
A) 12 B) 10 C) 8 D) 7
CI-SI = 96
⟹ [15000 x (1+r/100)2-15000] – (15000 x r x 2 / 100) =96

⟹15000[(100+r2) -1 – 2r/100] = 96
⟹r2 = 96 x 2/3 = 64
⟹r= 8%

28. Rohit borrowed Rs. 1200 at 12% PA .He repaid Rs. 500 at the end of 1 year. What is the amount required to pay at the end of 2nd year to discharge his loan which was calculated in CI

A) 945.28 B) 1106.00 C) 1107.55 D) 1100.65

CI at the end of 1st year
= 1200 * (1+(12 /100)) = 1344
CI = 1344-1200 = 144
500 paid then remaining amount = 1344 – 500
= 844
At the end of 2nd year 844*[(1+(12/100)] =945.28

29. A sum of money invested at CI to Rs.800 in 3 years and to Rs.840 in 4 years. Find rate of interest PA ?

A) 6% B) 5% C) 4% D) 2%

Simple interest for one year=840−800=40Rs.
Rate of interest = (40*100)/800 = 5%

30. The effective annual rate of interest corresponding to the nominal rate of 4% per annum payable half yearly is

A) 4% B) 4.4% C) 4.04% D) 4.2%

Amount of Rs. 100 for 1 year when compounded half-yearly}
=Rs. [100 × (1 + 2 / 100)2] = Rs. 104.04 ∴ Effective rate = (104.04−100)% =4.04%

Chapter No.8 & 9: - Problems on Numbers, Calendar, Clock

1. If March 1, 2006 was a Wednesday, which day was it on March 1, 2002?

A) Wednesday B) Thursday C) Friday D) Saturday

Total number of odd days between the years 2002 and 2006 = (2006 - 2002) + 1 = 5 odd days.
The year 2004 is a leap year, it has two odd days. So, one extra odd day is added.
So, if it was Wednesday on March 1, 2006, it would be (Wednesday - 5) Friday on March 1, 2002.

2. The angle between the minute hand and the hour hand of a clock when the time is 8.30, is

A) 80° B) 76° C) 75° D) 74°

Angle between hands of a clock When the minute hand is behind the hour hand, the angle between the two hands at M minutes past H 'o clock

=30 $(H-M5)+M2$ degree When the minute hand is ahead of the hour hand, the angle between the two hands at M minutes past H 'o clock = 30$(M5-H)-M2$ degree
Here H = 8, M = 30 and minute hand is behind the hour hand. Hence the angle = 30$(H-M5)+M2$
= 30(8−305)+302
= 30(8−6) + 15
= 30 × 2 + 15
= 75°

3. How many times in a day, are the hands of a clock in straight line but opposite in direction?
A) 22 B) 23 C)24 D) 25

4. What was the day of the week on 28th May, 2006?
A) Thursday B) Friday C) Saturday D) Sunday

28 May, 2006 = (2005 years + Period from 1.1.2006 to 28.5.2006) Odd days in 1600 years = 0 Odd days in 400 years = 0 5 years = (4 ordinary years + 1 leap year) = (4 x 1 + 1 x 2) ≡ 6 odd days
Jan. Feb. March April May (31 + 28 + 31 + 30 + 28) = 148 days ∴ 148 days = (21 weeks + 1 day) ≡ 1 odd day. Total number of odd days = (0 + 0 + 6 + 1) = 7 ≡ 0 odd day. Given day is Sunday

5. What will be the day of the week 15th August, 2010?
A) Sunday B) Monday C) Tuesday D) Friday

15th August, 2010 = (2009 years + Period 1.1.2010 to 15.8.2010) Odd days in 1600 years = 0 Odd days in 400 years = 0 9 years = (2 leap years + 7 ordinary years) = (2 x 2 + 7 x 1) = 11 odd days ≡ 4 odd days. Jan. Feb. March April Mayb June July Aug. (31 + 28 + 31 + 30 + 31 + 30 + 31 + 15) = 227 days ∴ 227 days = (32 weeks + 3 days) ≡ 3 odd days. Total number of odd days = (0 + 0 + 4 + 3) = 7 ≡ 0 odd days. Given day is Sunday.

6. Today is Monday. After 61 days, it will be:
A) Wednesday B) Saturday C) Tuesday D) Thursday

Each day of the week is repeated after 7 days. So, after 63 days, it will be Monday. ∴ After 61 days, it will be Saturday.

7. How many times in a day, the hands of a clock are straight?
A) 12 B) 24 C) 44 D) 56

Therefore, in 24 hours, the hands coincide or are in opposite direction 44 times a day.

8. On 8th February 2005, it was Tuesday. What was the day of the week on 8 February 2004?
A) Tuesday B) Monday C) Sunday D) Wednesday

The year 2004 is a leap year. It has 2 odd days. ∴ The day on 8th Feb, 2004 is 2 days before the day on 8th Feb, 2005. Hence, this day is Sunday.

9. If the 3rd day of a month is Monday, which one of the following will be the fifth day from 21st of this month

A) Monday B) Tuesday C) Wednesday D) Friday

It's asking for the fifth day from 21st means indirectly it asking for the 26th day of the month.

So if the third day is Monday

Then after adding some 7s and taking it to the nearest Monday from 26th.

It would be 3+7+7+7 i.e. 24th.

Therefore 24th will also be Monday

So now 26th will be Wednesday.

10. March 1st is Wednesday. Which month of the same year starts with the same day?

A) October B) November C) December D) None of these

From March 1st to November 1st is 245 days which is a multiple of 7,

245/7 = 35 weeks,

thus November will also begin on a Wednesday.

11. If Arun's birthday is on May 25 which is Monday and his sister's birthday is on July 13. Which day of the week is his sister's birthday?

A) Monday B) Wednesday C) Thursday D) Friday

Reference day : May 25th Monday Days from May 25th to July 13 = 6 + 30 +13 = 49 No of odd days : 49/7 = 0

Therefore, his sister's birthday will also be Monday.

12. By how many degrees does the minute hand move in the same time, in which the hour hand move by 280?

A) 168 B) 336 C) 196 D) 376

If we count from 12 The hour hand moves till 9 and then 10 degress 90 degrees - 3 h or 180 min 10 degress-20 min So total min = 9 × 60 + 20 = 540 + 20 = 560 min 60 min - 360º 560 min- (360 × 560)/60 Total degrees= 3360 º

13. How many degrees will the minute hand move, in the same time in which the second hand move 4800?

A) 60 B) 40 C) 90 D) 80

1min = 60secs

 in 4800, 4800/60 mins will be covered

80 mins = 80 degrees

14. How many degrees does an hour hand move in 20 minutes?

A) 9 B) 10 C) 11 D) 10.5

For a minute, the hour hand rotates by 30/60 = 1/2 degrees. Hence, for 20 minutes it rotates by an angle of 20*1/2 = 10 degrees.

15. From noon, by how many degrees has the minute hand moved to 2:40 ?

A) 950° B) 960° C) 970° D) 980°

After noon to 2.40

Total minutes = 60x2 + 40
= 120 + 40
= 160 minutes
60 minutes = 360
160 minutes = ?
(360x160)/60 = 960

16. A clock loses 5 seconds an hour and is set right on Sunday at noon. What time will it indicate on the following Monday at noon?
A) 11:56 a.m. B) 11:58 a.m C) 12:02 p.m. D) 12:04 p.m
There are total 24 hours from Sunday noon to Monday noon
Clock loses 5 sec/hour
So it loses 120 seconds total, 120 seconds = 2 minutes
So at Monday noon it would be 11.58 am

17. The difference between a number and its three-fifth is 50. What is the number?
A) 75 B) 100 C) 125 D) None of these
Let the no. Be x
According to the question,
Number – (3/5)(of number) = 50
x – (3x/5) = 50
(5x – 3x)/5 =50
2x/5 = 50
2x = 50×5
x = 250⁄2
x = 125

18. A number is doubled and 9 is added. If the resultant is trebled, it becomes 75. What is that number?
A) 3.5 B) 6 C) 8 D) None of these
Let the number is x
It is doubled = 2x
Then added 9 = 2x+9
Resultant is tripled. = 3(2x+9)
According to the given question :
 3(2x + 9) = 75
 6x + 27 = 75
 6x = 75 - 27
 6x = 48
 x = 48/6 = 8.
 x = 8
Hence, the original number is 8.

19. Find the number which when multiplied by 15 is increased by 196.

A) 14 B) 20 C) 26 D) 28

Let the number be x,

Then,

We can say that,

⇒ 15x = x + 196

⇒ 15x – x = 196

⇒ 14x = 196

⇒ x = 196/14

⇒ x = 14.

∴ The number is 14. Which when multiplied 15, gets increased by 196.

20. A number whose fifth part increased by 4 is equal to its fourth part diminished by 10, is:

A) 240 B) 260 C) 270 D) 280

Let the number be x

(x/5) + 4 = (x/4) -10

(x/4) – (x/5) =10 + 4

5x – (4x/20) = 14

(x/20) = 14

x = 280

21. If the sum of a number and its square is 182, what is the number?

A) 15 B) 26 C) 28 D) None of these

Let's guess that number is x

here, x2 + x = 182

x2 + x – 182 = 0

x2 + 14x – 13x – 182 = 0

x(x + 14) – 13(x + 14) = 0

x – 13 = 0 or x + 14 = 0

x = 13 x = -14

Therefore, the answer is none of these.

22. The product of two numbers is 45 and the sum of their squares is 106. The numbers are:

A) 3 and 15 B) 5 and 9 C) 45 and 1 D) None of these

For, 5 and 9,

(5)2 + (9)2 = 25 + 81 = 106

And,

9 x 5 = 45.

Hence, they satisfy the given condition.

23. The sum of the squares of three consecutive natural numbers is 2030. What is the middle number?

A) 25 B) 26 C) 27 D) 28

Let the numbers be x-1, x, x+1.
(x-1)2 + x2 + (x+1)2 = 2030
x2 + 1 – 2x + x2 + x2 + 1 + 2x = 2030
3x2 + 2 = 2030
3x2 = 2028
x2 = 676
x = 26

24. The sum of digits of a two-digit number is 9 less than the number. Which of the following digits is at unit's place of the number?
A) 1 B) 2 C) 4 D) Data inadequate