

ACE Quantitative Aptitude

Percent: The term 'percent' is derived from the Latin word 'Per centum'. It implies "out of every hundred". The symbol '%' is used to denote percentage. For example, 15% means 15 out of 100. Each ratio can be expressed as a percentage.

For example, $\frac{1}{2}$ can be expressed as a percentage by multiplying by 100; $\frac{1}{2} \times 100 = 50\%$

A given percentage value can be converted to corresponding fraction by dividing by 100.

Example: $75\% = 75$ out of hundred $\frac{75}{100} = \frac{3}{4}$

Percentage fraction conversion chart:

$\frac{1}{2} = 50\%$	$\frac{5}{6} = 83\frac{1}{3}\%$	$\frac{2}{9} = 22\frac{2}{9}\%$
$\frac{1}{3} = 33\frac{1}{3}\%$	$\frac{1}{7} = 14\frac{2}{7}\%$	$\frac{1}{10} = 10\%$
$\frac{2}{3} = 66\frac{2}{3}\%$	$\frac{2}{7} = 28\frac{4}{7}\%$	$\frac{1}{11} = 9\frac{1}{11}\%$
$\frac{1}{4} = 25\%$	$\frac{3}{7} = 42\frac{6}{7}\%$	$\frac{2}{11} = 18\frac{2}{11}\%$
$\frac{3}{4} = 75\%$	$\frac{1}{8} = 12\frac{1}{2}\%$	$\frac{1}{12} = 8\frac{1}{3}\%$
$\frac{1}{5} = 20\%$	$\frac{3}{8} = 37\frac{1}{2}\%$	$\frac{5}{12} = 41\frac{2}{3}\%$
$\frac{2}{5} = 40\%$	$\frac{5}{8} = 62\frac{1}{2}\%$	$\frac{1}{15} = 6\frac{2}{3}\%$
$\frac{3}{5} = 60\%$	$\frac{7}{8} = 87\frac{1}{2}\%$	$\frac{1}{20} = 5\%$
$\frac{4}{5} = 80\%$	$\frac{1}{9} = 11\frac{1}{9}\%$	$\frac{1}{25} = 4\%$
$\frac{1}{6} = 16\frac{2}{3}\%$		

Formula to calculate percentage value: $y\% \text{ of } x = \left(\frac{y}{100}\right) \times x$

From the above formula, we have the following result: $x\% \text{ of } y = y\% \text{ of } x$.

whenever we have two numbers a and b, one number can be expressed as a percentage of the other as follows:

$x \text{ as a percent of } y = \frac{x}{y} \times 100$, $y \text{ as a percent of } x = \frac{y}{x} \times 100$.

Percentage increase or decrease:

Percentage increase = $\frac{\text{increase in the quantity}}{\text{original quantity}} \times 100$

Percentage decrease = $\frac{\text{decrease in the quantity}}{\text{original quantity}} \times 100$

For example, if the net profit of a company grew from 50 crore in 2003 to 75 crore in 2004, then the percentage increase in the net profit from 2003 to 2004 is calculated as follows:

increase in the net profit = $(75 - 50)$ crore = 25 crore

This increase is on Rs. 50 crore.

So, Percentage increase = $\frac{\text{increase in profit from 2003 to 2004}}{\text{Net profit in 2003}} \times 100 = \frac{25}{50} \times 100 = 50\%$

When a quantity increases or decreases by some percent, the new value of the quantity can be directly calculated as follows:

If the original quantity is 120 and it increases by 25%, then the new quantity is: $1.25 \times 120 = 150$

(Here, $1.25 = 1 + 0.25$, where 0.25 is equivalent to 25%)

Similarly, if there is a decrease by 25% on 120, then the new quantity is: $0.75 \times 120 = 90$

(Here, $0.75 = 1 - 0.25$, where 0.25 is equivalent to 25%)

Some important conclusions:

(i) If x is $a\%$ more than y , then y is $\left(\frac{a}{100+a} \times 100\right)\%$ less than x .

(ii) If x is $a\%$ less than y , then y is $\left(\frac{a}{100-a} \times 100\right)\%$ more than x .

Example: If in an examination, the marks secured by Prerna are 20% less than that of Vinita, then marks secured by Vinita are how much percent more than Prerna's marks?

Solution: $a = 20\%$

According to the above formula; Required percentage = $\left(\frac{a}{100-a} \times 100\right)\% = \frac{20}{80} \times 100 = 25\%$

(iii) If a number is first increased by $a\%$ and then decreased by $a\%$ then the net effect is always a decrease which is equal to ' $a\%$ of a ' i.e., $\frac{a^2}{100}\%$

Example: The salary of a worker is first increased by 5% and then it is decreased by 5%. What is the change in his salary?

Solution: Here $a = 5\%$

There will be a net decrease; Percent decrease = $\frac{a^2}{100}\% = \frac{5^2}{100}\% = 0.25\%$

(iv) If a quantity is first changed (increased or decreased) by $a\%$ and then changed (increased or decreased) by $b\%$, then
Net change = $\left[\pm a \pm b + \frac{(\pm a)(\pm b)}{100}\right]\%$

Net change is an increase or a decrease according to the positive or negative sign, respectively of the final result.

Example: The price of an article is first increased by 20% and then decreased by 25% due to reduction in sales. Find the net percent change in the final price of the article.

Solution: $a = 20\%$, $b = 25\%$

Required percentage change = $\left(20 - 25 + \frac{20 \times (-25)}{100}\right)\% = (-5 - 5)\% = -10\%$

So, there is a net decrease of 10% in the final price of the article as the final result is negative.

(v) If the price of a commodity increases or decreases by $a\%$, then the decrease or increase in consumption, so as not to increase or decrease the expenditure is equal to $\left(\frac{a}{100 \pm a}\right) \times 100\%$

(vi) If the population of a town is P and it increases (or decreases) at the rate of $R\%$ per annum, then

(i) Population after n years = $P \left(1 \pm \frac{R}{100}\right)^n$

(ii) Population n years ago = $\frac{P}{\left(1 \pm \frac{R}{100}\right)^n}$

('+' sign for increment; '-' sign for decrement).

Some tricks to calculate faster:

(i) Splitting the percentage into parts

Example: Find 51% of 128.

Solution: $51\% \text{ of } 128 = (50 + 1)\% \text{ of } 128 = 50\% \text{ of } 128 + 1\% \text{ of } 128 = 64 + 1.28 = 65.28$

(ii) Interchanging the percentage value and the number

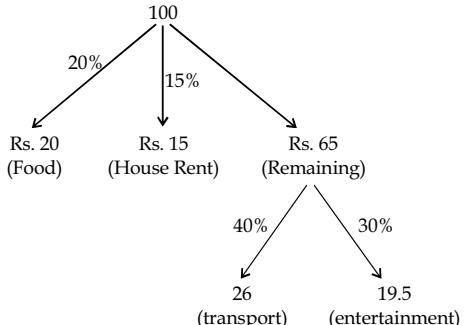
Example: Find 39% of 12.5

Solution: $39\% \text{ of } 12.5 = 12.5\% \text{ of } 39 = 4.875$

Solved Examples

1. Nikhil spent 20% of his monthly income on food and 15% on house rent. 40% of the remaining he spent on transport and 30% on entertainment. He is left with an amount of Rs. 8775 after all the expenditures. What is Nikhil's monthly income?

Sol. Let the income be Rs. 100



$$\text{Final Saving} = 100 - 20 - 15 - 26 - 19.5 = \text{Rs. } 19.5; \text{ But his final saving is Rs. } 8775$$

$$19.5 \xrightarrow{(\times 450)} 8775$$

$$\text{So, Income} = \text{Rs. } 100 \times 450 = \text{Rs. } 45000.$$

2. If the price of a Commodity be raised by 40%, by how much percent must a householder reduce his consumption of that commodity, so as not to increase his expenditure?

Sol. Here, $a = 40\%$; According to the formula,
Reduction in Consumption

$$= \left(\frac{40}{(100+40)} \times 100 \right) \% = \frac{40}{140} \times 100 \\ = \frac{200}{7} \% = 28\frac{4}{7}\%$$

3. The population of a town is 352800. If it increases at the rate of 5% per annum, then what will be its population 2 years hence. Also, find the population 2 years ago.

Sol. $P = 352800$, $R = 5\%$, $n = 2$
Population after 2 years

$$= P \left(1 + \frac{R}{100} \right)^n = 352800 \times \left(1 + \frac{5}{100} \right)^2$$

$$= 352800 \times \frac{21}{20} \times \frac{21}{20} = 388962$$

Population 2 years ago

$$= \frac{P}{\left(1 + \frac{R}{100} \right)^n} = \frac{352800}{\left(1 + \frac{5}{100} \right)^2}$$

$$= 352800 \times \frac{20}{21} \times \frac{20}{21} = 320000$$

4. There are 3 contestants P, Q and R in an election. P secured 20% of the votes and Q secured 70% of the remaining votes. If R secured 4800 votes, by how many votes has the winner won the election?

Sol. Let the total number of votes be 100.

$$P \text{ secured } 20\% = 20 \text{ votes.}$$

$$\text{Remaining votes} = 100 - 20 = 80$$

$$Q \text{ secured } 70\% \text{ of } 80 = 56 \text{ votes.}$$

$$R \text{ secured } (80 - 56) = 24 \text{ votes.}$$

$$\text{But R secured } 4800 \text{ votes.}$$

$$24 \xrightarrow{(\times 200)} 4800$$

$$\text{So, winner Q won the election by } 56 - 24 = 32 \text{ votes}$$

$$32 \xrightarrow{(\times 200)} 6400 \Rightarrow 6400 \text{ votes}$$

5. Rahul answered 40% of the first 75 questions correctly in an examination consisting of 150 questions. Find the percentage of the remaining 75 questions that he needs to answer correctly in order to answer 60% of the total number of questions correctly?

Sol. 60% of total number of question = 60% of 150 = 90 questions

$$\text{Number of questions that Rahul answered correctly in the first 75 questions} = \frac{40 \times 75}{100} = 30$$

$$\text{Number of questions from the remaining 75 questions that he should answer correctly} = 90 - 30 = 60$$

$$\text{Required percentage} = \frac{60}{75} \times 100 = 60 \times \frac{4}{3} = 80\%$$

Basic MCQs

1. What is 15 percent of Rs. 34 ?
(a) Rs. 3.40 (b) Rs. 3.75 (c) Rs. 4.50
(d) Rs. 5.10 (e) None of these
2. 88% of 370+24% of 210=? = 118
(a) 256 (b) 258 (c) 268
(d) 358 (e) None of these
3. 60% of 264 is the same as:
(a) 10% of 44
(b) 15% of 1056
(c) 30% of 132
(d) 17% of 544
(e) None of these
4. 270 candidates appeared for an examination, of which 252 passed. The pass percentage is?
(a) 80% (b) $83\frac{1}{2}\%$ (c) $90\frac{1}{3}\%$
(d) $90\frac{1}{3}\%$ (e) None of these
5. How many litres of pure acid are there in 8 litres of a 20% solution?
(a) 1.4 (b) 1.5 (c) 1.6
(d) 2.4 (e) None of these
6. If 35% of a number is 12 less than 50% of that number, then the number is:
(a) 40 (b) 50 (c) 60
(d) 80 (e) None of these
7. The sum of two numbers is 2490. If 6.5% of one number is equal to 8.5% of the other, then the numbers are:
(a) 989, 1501
(b) 1011, 1479
(c) 1401, 1089
(d) 1411, 1079
(e) None of these
8. If one number is 80% of the other and the sum of their square is 656, then the numbers are:

- 21.** Mrs. Jain invests 14% of her monthly salary, i.e., Rs. 7014 in Insurance Policies. Later she invests 21% of her monthly salary on Family Mediclaim Policies; also she invests another 6.5% of her salary on Mutual Funds. What is the total annual amount invested by Mrs. Jain?
 (a) Rs. 25050
 (b) Rs. 50100
 (c) Rs. 242550
 (d) Rs. 249498
 (e) None of these
- 22.** In an examination, it is required to get 256 of the total maximum aggregate marks to pass. A student gets 192 marks and is declared failed. The difference of marks obtained by the student and that required to pass is 10%. What are the maximum aggregate marks a student can get?
 (a) 690 (b) 670 (c) 640
 (d) 680 (e) None of these
- 23.** In an election between two candidates, 60% of the voters cast their vote out of which 4% of the votes were declared invalid. A candidate got 7344 votes which were 75% of the total valid votes. Find the total no. of votes enrolled in the election?
 (a) 1700 (b) 17659 (c) 17000
 (d) 15000 (e) None of these
- 24.** Samar spends 52% of his monthly salary on household expenditure and 23% on miscellaneous expenditure. If he is left with Rs. 4500, what is his monthly salary?
 (a) Rs. 16000
 (b) Rs. 17500
- 25.** In a class of 60 students, 40% can speak only Hindi, 25% can speak only English and rest of the students can speak both the languages. How many students can speak English?
 (a) 32 (b) 28 (c) 36
 (d) 15 (e) None of these
- 26.** A, B and C invested in a business in the ratio of 3 : 2 : 5 respectively. If A earns 100% more profit than B and C earns 40% more profit than B, then what is the share of B in the profit?
 (a) Rs. 2420
 (b) Rs. 1560
 (c) Rs. 1135
 (d) Cannot be determined
 (e) None of these

Solutions

Basic MCQs

1. (d); $\frac{15}{100} \times 34 = 5.10$ Rs.

2. (b); $\frac{88}{100} \times 370 + \frac{24}{100} \times 210 - x = 118$

$$x = 325.6 + 50.4 - 118 = 376 - 118 = 258$$

3. (b); $\frac{60}{100} \times 264 = 158.40 \Rightarrow \frac{15}{100} \times 1056 = 158.40$

4. (d); Passing percentage = $\frac{252}{270} \times 100 = 93\frac{1}{3}\%$

5. (c); Litres of pure acid = $\frac{20}{100} \times 8 = 1.6$ litres

6. (d); Let the number is x

$$\frac{50}{100}x - \frac{35}{100}x = 12 \Rightarrow \frac{15x}{100} = 12$$

$$x = \frac{12 \times 100}{15} \Rightarrow x = 80$$

7. (d); Let the two numbers be x and y.

$$x + y = 2490 \Rightarrow \frac{65}{1000}x = \frac{85}{1000}y$$

$$x = \frac{17}{13}y \Rightarrow \frac{17}{13}y + y = 2490$$

$$\frac{30y}{13} = 2490 \Rightarrow y = \frac{2490 \times 13}{30}$$

$$y = 1079 \Rightarrow x = 2490 - 1079 \Rightarrow x = 1411$$

8. (c); Let the Numbers be x and y.

$$x \times \frac{80}{100} = y \Rightarrow \frac{4x}{5} = y$$

$$\frac{x}{y} = \frac{5}{4} \quad \begin{cases} x = 5k \\ y = 4k \end{cases}$$

$$x^2 + y^2 = 656 \Rightarrow 25k^2 + 16k^2 = 656$$

$$k^2 = \frac{656}{41} \Rightarrow k = 4 \Rightarrow x = 4 \times 5 = 20$$

$$y = 4 \times 4 = 16$$

Numbers are 16 and 20

9. (d); Percentage increase in salary = $\frac{900}{7200} \times 100$

$$= \frac{100}{8} = 12\frac{1}{2}\%$$

10. (a); Let the price of petrol be 100

Increase Price = 120

$$\text{Required percentage} = \frac{20}{80} \times 100$$

$$= \frac{100}{6} = 16\frac{2}{3}\%$$

11. (d); Increase Price = $\frac{110}{100} \times \frac{110}{100} \times 100 = 121$

12. (d); Increase Monthly income = $5000 \times \frac{130}{100} = 6500$ Rs.

13. (e); Money left = $100\% - 20\% - [100\% - 20\%] \frac{25}{100}\%$
 $= 100\% - 20\% - 20\% = 60\%$
 $\therefore 60\% = 480 \Rightarrow 100\% = \frac{480}{60} \times 100 = \text{Rs. } 800$

14. (b); Let the number will be

$$\text{Increased number} = \frac{x + \frac{120}{100}x}{y + \frac{350}{100}y} = \frac{\frac{11}{100}}{\frac{27}{100}} \Rightarrow \frac{220x}{450y}$$

$$\frac{x}{y} = \frac{11}{27} \times \frac{45}{22}$$

Original Fraction $\Rightarrow \frac{x}{y} = \frac{5}{6}$

15. (e); Let the number be x and y

$$x - y = 1600 \Rightarrow \frac{75}{1000}x = \frac{125}{1000}y$$

$$x = \frac{5}{3}y \Rightarrow \frac{5}{3}y - y = 1600$$

$$\frac{2y}{3} = 1600 \Rightarrow y = 2400$$

$$x = 1600 + 2400 = 4000$$

Practice MCQs for Prelims Level-1 & Level-2

Level - 1

1. (c); Let first number and second number be x and y respectively

$$\text{Then, } 45 \times \frac{x}{100} = 60 \times \frac{y}{100}$$

$$3x = 4y \quad \dots \text{(i)}$$

$$\text{And } \frac{x+y}{2} = x - 10$$

$$x - y = 20 \quad \dots \text{(ii)}$$

From (i) and (ii)

$$y = 60$$

80% of second number = 48

2. (d); Juice I 17 : 3

Juice II 9 : 1 or 18 : 2 (making total quantity of both juices same)

Both the juices are mixed in the ratio of 3:2

	Juice I	17	3	Guava	Sugar	Pomegranate	
	Juice II	18	2	2	4	36	
				51	9		100

3. (d); total advertisement time = $20 \times 10 + 10 \times 15 = 350$ sec

$$\text{Required \%} = \frac{350}{30 \times 60} \times 100 = 19\frac{4}{9}\%$$

4. (e); Let the two-digit no. be $(10a + b)$, where a is tens digit and b is unit digit.

ATQ

$$(10a + b) + 0.2(10a + b) = (10b + a)$$

$$11a = 8.8b$$

$$\left(\frac{a}{b} = \frac{4}{5}\right)$$

Since the no. is two-digit number. So the only possible no. is 45 and reverse of it is 54.

So 40% of no. = 18

5. (e); Let the marked price of the T.V be Rs. 'x'

Then ATQ

$$x \times 0.04 \times 0.8 = 114.4$$

$$x = \text{Rs. } 3575$$

6. (d); Let the income of Maanik be Rs. 100x
 Then expenditure = $100x - 15x = \text{Rs. } 85x$

$$\text{Next year expenditure} = 85x \times \frac{4}{3} = \text{Rs. } \frac{340x}{3}$$

Since saving % remains same for the next year

$$\text{So next year income} = \frac{340x}{3} \times \frac{100}{85} = \text{Rs. } \frac{400x}{3}$$

$$\text{So \% increment in income} = \frac{\frac{400x}{3} - 100x}{100x} \times 100 = 33\frac{1}{3}\%$$

7. (d); let students in class B = x

$$\text{Students in class A} = x + \frac{50}{100} \times x = 1.5x$$

$$\text{Boys in class A} = \frac{70}{100} \times 1.5x = 1.05x$$

$$\text{Girls in class A} = 1.5x - 1.05x$$

$$= 0.45x = \text{girls in class B}$$

$$\text{Required \%} = \frac{0.45x}{x} \times 100 = 45\%$$

8. (c); Let the unit digit and tens digit of the number be y and x respectively.

$$\text{Original number} = (10x + y)$$

ATQ

$$1.75(10x + y) = 10y + x$$

$$x:y = 1:2$$

let the unit and tens digits be 1a and 2a respectively

$$\text{Now, } (21a) + 9 = 2(12a)$$

$$a = 3$$

unit digit = 6

and tens digit = 3

Sum of both the digits = 9

$$9. (c); \frac{30a}{100} = 720 \times \frac{40}{100}$$

$$a = 960$$

$$\frac{15b}{100} = 1080 \times \frac{25}{100}$$

$$b = 1800$$

$$(960 + 1800) \times \frac{40}{100} = \frac{4c}{5}$$

$$c = 1380$$

$$20\% \text{ of } (a + c - b) = (960 + 1380 - 1800) \times \frac{20}{100} = 108$$

10. (a): Let Sahil's marks = $80x$
 So, Sumit's marks = $\frac{80x \times 112.5}{100} = 90x$
 So, Ajay's marks = $\frac{90x \times 106.2}{100} = 96x$

ATQ,

Ajay's marks is 40 more than the Sahil's marks

$$\Rightarrow 96x - 80x = 40$$

$$\Rightarrow x = 2.5$$

$$\text{Total marks scored by all three} = (80 + 90 + 96) \times 2.5 \\ = 266 \times 2.5 = 665$$

11. (c): Let the amount of X and Z be Rs a and b respectively
 Amount of Y = $\frac{a+b}{2}$

ATQ

$$\frac{a+b}{2} - \frac{a}{5} = b$$

$$5b = 3a$$

Amount of X=Rs 5p

Amount of Z=Rs 3p

Amount of Y= Rs 4p

Required % = 25%

12. (d): let numbers be a and b respectively
 ATQ, 12.5% of a = 62.5% of b

$$\frac{a}{b} = \frac{5}{1} \text{ or } a = 5x, b = x$$

$$a^2 + b^2 = 416$$

$$25x^2 + x^2 = 416$$

$$x^2 = 16$$

x=4 (neglecting negative value since numbers are positive)

Smallest number = x = 4

Sum of numbers = $5x + x = 6x = 24$

$$\text{Required \%} = \frac{4}{24} \times 100 = 16\frac{2}{3}\%$$

13. (d): let Anurag got x marks

$$\text{Marks obtained by Mahesh} = \frac{130}{100} \times x = 1.3x$$

$$\text{Marks obtained by Sanjay} = \frac{80}{100} \times 1.3x = 1.04x$$

$$\text{Marks obtained by Karan} = \frac{125}{100} \times 1.04x = 1.3x$$

$$\text{Required \%} = \frac{1.3x-x}{x} \times 100 = 30\%$$

14. (d): ATQ, $\frac{50}{100}y - \frac{10}{100}x = 170$

$$\frac{40}{100}x = \frac{30}{100}y \Rightarrow \frac{x}{y} = \frac{3}{4}$$

$$\frac{50}{100} \times \frac{4}{3}x - \frac{10}{100}x = 170$$

$$x = 300 \Rightarrow y = 400$$

$$\text{Required answer} = x + y = 300 + 400 = 700$$

15. (d): let maximum marks be x

$$\frac{56}{100}x - 10 = \frac{48}{100}x + 6$$

$$x = 200$$

$$\text{Marks of Sanjay} = \frac{56}{100}x = 112$$

$$\text{Passing marks} = 112 - 10 = 102$$

$$\text{Pass \%} = \frac{102}{200} \times 100 = 51\%$$

16. (b): Let 2 digit number be $10a + b = x$

Now, reversing of the 2 digit number becomes $10b+a$

According to the question,

$$10b+a = 10a+b+63$$

$$9b-9a = 63$$

$$b-a=7 \quad \dots (1)$$

$$a+b=11 \quad \dots (\text{Given}) \quad (2)$$

Solving equation (1) &(2), we get $a=2, b=9$

Original number = $10a+b = 29$

Required number = $x+15 = 44$

17. (b): let marks scored by Ravi = x

$$\text{Marks of Ronit} = \frac{90}{100}x = 0.9x$$

$$\text{Marks of Raj} = \frac{130}{100} \times 0.9x = 1.17x$$

$$\text{Marks of Jai} = \frac{120}{100} \times 1.17x = 1.404x$$

$$\text{Required \%} = \frac{1.404x}{x} \times 100 = 140.4\%$$

18. (d): Difference = 40% of $(P+5000)$ - 40% of P
 $= 40\% \text{ of } 5000 = 2000$

19. (a): let D be 100x

$$C = \frac{110}{100} \times 100x = 110x$$

$$B = \frac{130}{100} \times 110x = 143x$$

$$A = \frac{120}{100} \times 143x = 171.6x$$

$$\text{Required \%} = \frac{171.6x-100x}{100x} \times 100 = 71.6\%$$

20. (d): $\frac{40}{100}y - \frac{20}{100}x = 270$

$$\Rightarrow 2y - x = 1350 \dots (i)$$

$$\text{and } \frac{40}{100}x - \frac{20}{100}y = 0$$

$$2x - y = 0 \quad \dots (ii)$$

On solving (i) & (ii)

$$x = 450$$

$$y = 900$$

Required sum = 1350

21. (d): Second no. = $\frac{100 \times 12}{100} = 12$

$$\therefore \text{first no.} = 12^3 \times \frac{3}{2} = 1728 \times \frac{3}{2} = 2592$$

$$\therefore \text{Required sum} = 12 + 2592 = 2604$$

22. (b): let total marks = 100x

ATQ

$$20x + 75 = 55x - 20x$$

$$15x = 75$$

$$x = 5$$

$$\text{Passing marks} = 20x + 75 = 175$$

23. (b): Atq,

$$x - 0.3y = 310 \quad \dots (i)$$

$$x + 0.5y = 550 \quad \dots (ii)$$

Dividing (i) by (ii)

$$\frac{x-0.3y}{x+0.5y} = \frac{310}{550}$$

$$x + 0.5y = 550$$

$$\Rightarrow 55(x - 0.3y) = 31(x + 0.5y)$$

$$\Rightarrow 55x - 16.5y = 31x + 15.5y$$

$$\Rightarrow 24x = 32y$$

$$\frac{x}{y} = \frac{32}{24}$$

$$x : y = 4 : 3$$

- 24. (b):** Let expenses of Shivam, Dharam and Harish be Rs S, Rs D and Rs H respectively.

ATQ

$$S + D + H = 4660$$

$$\frac{125}{100} \times D + D + \frac{100}{85} \times D = 4660$$

$$D \left(\frac{5}{4} + 1 + \frac{20}{17} \right) = 4660$$

$$D = \text{Rs } 1360$$

$$\text{So, expense of Shivam} = \frac{125}{100} \times 1360 = \text{Rs } 1700$$

- 25. (c):** Let first part and second part be x and y respectively.

ATQ

$$\frac{80}{100} \times x = \frac{70}{100} \times y + 3 \quad \dots \dots \text{(i)}$$

$$\frac{50}{100} \times y = \frac{40}{100} \times x + 15 \quad \dots \dots \text{(ii)}$$

From (i) and (ii)

$$x = 100 \text{ and } y = 110$$

$$\therefore \text{The required number} = 100 + 110 = 210$$

- 26. (d):** let total marks be P.

ATQ,

$$\frac{30}{100} \times P + 45 = \frac{40}{100} \times P - 30$$

$$0.1P = 75$$

$$P = 750$$

$$\text{Passing marks} = \frac{40}{100} \times 750 - 30 = 270$$

$$\therefore \text{passing percentage} = \frac{270}{750} \times 100 = 36\%$$

- 27. (e):** let total sale of company be Rs.x

ATQ,

$$20000 \times \frac{4}{100} + (x - 20000) \times \frac{6}{100} = 3800$$

$$800 + (x - 20000) \times \frac{6}{100} = 3800$$

$$(x - 20000) = \frac{3000 \times 100}{6}$$

$$x = \text{Rs } 70000$$

- 28. (b):** Population after 2 years

$$= 15000 \times \frac{120}{100} \times \frac{120}{100} = 21600$$

- 29. (e):** Required amount = $(12000 + 9000) \times \frac{100}{70}$

$$= 21000 \times \frac{100}{70} = \text{RS } 30000$$

Level - 2

- 1. (a):** Let total marks be 'X'

ATQ,

$$48\% \text{ of } X - 60 = 33\% \text{ of } X + 15$$

$$0.48X - 0.33X = 75$$

$$0.15X = 75$$

$$X = 500$$

$$\text{Passing marks} = 500 \times \frac{48}{100} - 60 = 180$$

$$\text{Marks obtained by Veer} = 500 \times \frac{54}{100} = 270$$

$$\text{Required marks} = 270 - 180 = 90$$

- 2. (a):** ATQ, $40,000 \times \frac{110}{100} \times \frac{(100-X)}{100} \times \frac{120}{100} = 44880$

$$x = 15$$

- 3. (a):** Let the total number of students in the university be x

$$\text{Valid votes} = \frac{xx80}{100} - 120 = \frac{4x}{5} - 120$$

Atq,

$$\frac{3x}{8} + \left(\frac{3x}{8} - 30 \right) = \frac{4x}{5} - 120$$

$$\Rightarrow \frac{3x}{4} - 30 = \frac{4x}{5} - 120$$

$$x = 1800$$

No. of students who do not cast their votes =

$$1800 \times \frac{20}{100} = 360$$

- 4. (d):** Let the total sum of money be Rs. 100x

Then,

$$\text{Anmol's share} = \frac{20}{100} \times 100x = \text{Rs. } 20x$$

$$\text{Golu's share} = \frac{50}{100} \times (100x - 20x) = \text{Rs. } 40x$$

$$\text{Yash's share} = \text{Rs. } (40x - 1200)$$

$$\text{Shivam's share} = 100x - [20x + 40x + 40x - 1200] = \text{Rs. } 1200$$

ATQ,

$$40x - 1200 - 20x = 400$$

$$20x = 1600$$

$$x = 80$$

Required difference = $40x - 1200 = \text{Rs. } 2000$

- 5. (d):** Total votes = 60,000

Total Polled votes = 42,000

$$\text{Votes cost in favor of B} = 60000 \times \frac{40}{100} = 24000$$

$$\text{Votes Cost in Favor of A} = 42000 - 24000 = 18000$$

Required difference = $24000 - 18000$

$$= 6000$$

- 6. (b):** let income and expenditure of Manoj be Rs 8x and 5x respectively

$$\text{Saving of Manoj} = 8x - 5x = 3x$$

$$\text{Income of Manoj after 20\% increase} = 8x \times \frac{120}{100} = 9.60x$$

$$\text{New saving of Manoj} = 3x \times \frac{310}{300} = 3.1x$$

$$\text{New expenditure} = 9.60x - 3.1x = 6.5x$$

$$\text{Required percentage} = \frac{6.5x - 5x}{5x} \times 100 = 30\%$$

- 7. (c):** Let income of Anurag = 9P Rs.

So, income of Veer will = 10P Rs.

$$\text{Expenditure of Anurag} = 9P \times \frac{60}{100} = 5.4P \text{ Rs.}$$

$$\text{Expenditure of Veer} = 5.4P \times \frac{26}{27} = 5.2P \text{ Rs.}$$

ATQ –

$$(10P - 5.2P) - (9P - 5.4P) = 2400$$

$$4.8P - 3.6P = 2400$$

$$P = 2000$$

$$\text{Required difference} = 5.4 \times 2000 - 5.2 \times 2000 = 400 \text{ Rs.}$$

Chapter 04

Profit and Loss

Cost Price (CP): The money paid by the shopkeeper to the manufacturer or whole -seller to buy goods is called the cost price (cp) of the goods purchased by the shopkeeper.

Selling Price (SP): The price at which the shopkeeper sells the goods is called selling price (s.p) of the goods sold by the shopkeeper to the customer.

Profit: If the selling price of an article is more than its cost price, then the dealer (or shopkeeper) makes a profit (or gain)

$$\text{i.e., Profit} = \text{SP} - \text{CP}; \text{SP} > \text{CP}$$

Loss: If the selling price of an article is less than its cost price, the dealer suffers a loss

$$\text{i.e., Loss} = \text{CP} - \text{SP}; \text{CP} > \text{SP}$$

Some Important Formulae:

(i) Profit = SP - CP

(ii) Loss = CP - SP

(iii) Profit percentage = $\left(\frac{\text{Profit}}{\text{CP}} \times 100 \right) \%$

(iv) Loss percentage = $\left(\frac{\text{Loss}}{\text{CP}} \times 100 \right) \%$

(v) $\text{S.P} = \left(\frac{(100 + \text{Profit}\%)}{100} \times \text{CP} \right) = \left(\frac{(100 - \text{Loss}\%)}{100} \times \text{CP} \right)$

(vi) $\text{C.P} = \left(\frac{100 \times \text{SP}}{100 + \text{Profit}\%} \right) = \left(\frac{100 \times \text{SP}}{100 - \text{Loss}\%} \right)$

(vii) $\text{SP} = (100 + x)\% \text{ of CP}; \text{ when Profit} = x\% \text{ of CP}$

(viii) $\text{SP} = (100 - x)\% \text{ of CP}; \text{ when Loss} = x\% \text{ of CP}$

Example 1: A man purchases an item for Rs. 120 and he sells it at 20 percent profit, find his selling price

Sol. $\text{SP} = \left(\frac{100 + \text{Profit}\%}{100} \right) \times \text{CP} = \frac{100 + 20}{100} \times 120 = \frac{120}{100} \times 120 = \text{Rs. } 144$

Note: Profit /Loss percentage is always calculated on C.P. unless otherwise stated.

Example 2: Find the cost price of an article which is sold for Rs. 200 at a loss of 20%

Sol. $\text{CP} = \frac{100}{100 - \text{Loss}\%} \times \text{SP} = \frac{100}{100 - 20} \times 200 = \text{Rs. } 250$

Concept 1:

MARK UP AND DISCOUNT

Marked Price: To avoid loss due to bargaining by the customer and to get profit over the cost price, the trader increases the cost price. This increase is known as markup and the increased price (i.e., cp+markup) is called the marked price or printed price or list price of the goods.

$$\text{Marked Price} = \text{CP} + \text{markup}$$

$$\text{Marked Price} = \text{CP} + \frac{(\% \text{marked}) \times \text{CP}}{100}$$

Generally goods are sold at marked price, if there is no further discount, then in this case selling price equals marked price.

Discount: Discount means reduction of marked price to sell at a lower rate or literally discount means concession. Basically, it is calculated on the basis of marked price.

$$\text{Selling price} = \text{Marked price} - \text{Discount}$$

$$\text{Selling price} = \text{MP} - \frac{(\% \text{Discount}) \times \text{MP}}{100}$$

Example: If the cost price of an articale is Rs. 300 and the percent markup is 30%. What is the marked price?

Sol. $\text{MP} = \text{CP} + (\% \text{markup on CP}) = 300 + \frac{30}{100} \times 300 = \text{Rs. } 390$

Concept 2:

Dishonest Dealer Case: If a trader professes to sell his goods at cost price, but uses false weights, then

$$\% \text{ gain} = \frac{\text{Error}}{\text{True value} - \text{Error}} \times 100 \quad \Rightarrow \% \text{ gain} = \frac{\text{True weight} - \text{False weight}}{\text{False weight}} \times 100$$

Example: A shopkeeper sold an article at cost price but use the weight of 960 gm in place of 1 kg weight. Find his profit%?

$$\text{Sol. } \text{Profit\%} = \frac{\text{True weight} - \text{False weight}}{\text{False weight}} \times 100 = \frac{1000 - 960}{960} \times 100 = \frac{40}{960} \times 100 = \frac{25}{6} = 4 \frac{1}{6}\%$$

Concept 3:

Where two articles are sold at same price but one of them at a profit and another at a loss and the percentage profit is the same as the percentage loss, In this case there is always a loss.

$$\text{Loss\%} = \left(\frac{\text{Common Profit or Loss\%}}{10} \right)^2 = \left(\frac{\% \text{ value}}{10} \right)^2$$

Example: Each of two car is sold for Rs. 1000. The first one is sold at 25% profit and the other one at 25% loss. What is the percentage loss or gain in the deal?

Sol. Total s.p = Rs. 2000

$$\text{CP of 1st car} = \frac{100 \times 1000}{125} \quad [:\text{ Profit} = 25\%]$$

$$= \text{Rs. 800}$$

$$\text{CP of 2nd car} = \frac{100 \times 1000}{75} \quad [:\text{ Loss} = 25\%]$$

$$= \text{Rs. } 1333\frac{1}{3}$$

$$\text{Total CP} = \text{Rs. } 2133\frac{1}{3} \quad \Rightarrow \text{Loss\%} = \frac{\text{CP} - \text{SP}}{\text{CP}} \times 100 = \frac{2133\frac{1}{3} - 2000}{2133\frac{1}{3}} \times 100 = 6.25\%$$

or, Using Shortcut Formula

$$\text{Loss\%} = \left(\frac{\% \text{ value}}{10} \right)^2 = \left(\frac{25}{10} \right)^2 = 6.25\%$$

Concept 4:

When two successive discounts on an article are $x\%$ and $y\%$ resp. then net discount: $\left(x + y - \frac{xy}{100} \right)\%$

Example: A shopkeeper given two successive discount of 50% and 50% find the real (equivalent) discount?

Sol. Let MP = Rs. 100

Cost after 1st discount of 50% = $100 - 50\% \text{ of } 100 = \text{Rs. 50}$

Cost after 2nd discount of 50% = $50 - 50\% \text{ of } 50 = \text{Rs. 25}$

Price after both discount = Rs. 25

$$\% \text{ discount} = \frac{100 - 25}{100} \times 100 = 75\%$$

or, Using Shortcut Formula

$$\begin{aligned} \% \text{ discount} &= x + y - \frac{xy}{100} && [\text{where } x = 50\%, y = 50\%] \\ &= 50 + 50 - \frac{50 \times 50}{100} = 100 - 25 = 75\% \end{aligned}$$

Solved Examples

1. There is a profit of 20% on the cost price of an article. Find the profit percent when calculated on selling price?

Sol. Let the cost price of an article be Rs. 100
then, Profit = 20% of 100 = Rs. 20

$$\text{Selling price} = \text{Cost price} + \text{profit} \\ = 100 + 20 = \text{Rs. } 120$$

$$\text{Profit \% when calculated on SP} \\ = \frac{20}{120} \times 100 = \frac{100}{6}\%$$

2. By selling a bicycle for Rs. 2850, a shopkeeper gains 14%. If the profit is reduced to 8%, find the selling price of bicycle?

$$\text{Sol. } CP = \frac{SP \times 100}{100 + \text{Profit \%}} = \frac{2850 \times 100}{100 + 14} \\ = \frac{2850 \times 100}{114} = \text{Rs. } 2500$$

SP of article for 8% Profit

$$SP = \frac{CP \times (100 + \text{Profit \%})}{100} = \frac{2500 \times 108}{100} \\ = 25 \times 108 = \text{Rs. } 2700$$

3. The selling price of 12 articles is equal to the cost price of 15 articles. Find the gain percent?

Sol. Let the CP of 1 article = Rs. x
Cost Price of 15 article = Rs. 15x

Selling Price of 12 article = Rs. 15x

$$SP \text{ of 1 article} = \text{Rs. } \frac{15x}{12}$$

$$Gain = \frac{15x}{12} - x = \frac{3x}{12} = \frac{x}{4}$$

$$Gain \% = \frac{Gain \times 100}{CP} = \frac{\frac{x}{4} \times 100}{x} = 25\%$$

4. A fruit seller buys some fruits at the rate of 11 for Rs. 10 and the same number at the rate of 9 for Rs. 10. If all the fruits are sold for Rs. 1 each. Find the gain or loss percent?

Sol. In these types of question, we have to take the LCM of number of individual things.

Number of fruits of each type he bought

$$= \text{LCM of 11 and 9} = 99$$

$$\text{Total number of fruits} = 99 \times 2 = 198$$

$$CP \text{ of 198 fruits} = \frac{10}{11} \times 99 + \frac{10}{9} \times 99 \\ = 90 + 110 = \text{Rs. } 200$$

$$SP = 198 \times 1 = \text{Rs. } 198$$

$$Loss \% = \frac{CP - SP}{CP} \times 100 = \frac{200 - 198}{200} \times 100 \\ = \frac{2}{200} \times 100 = 1\%$$

5. A book vendor sold a book at a loss of 10%. Had he sold it for Rs. 108 more, he would have earned a profit of 10%. Find the cost of the book.

Sol. Let the CP of article = x

$$SP = \frac{x(100-10)}{100} = \frac{90x}{100} = \frac{9x}{10} \text{ [Loss of 10\%]}$$

$$\frac{9x}{10} + 108 = \frac{110x}{100} \text{ [If vendor sold for Rs. 108 more]}$$

$$\frac{110x}{100} - \frac{9x}{10} = 108 \Rightarrow \frac{11x}{10} - \frac{9x}{10} = 108 \\ 2x = 1080 \Rightarrow x = \text{Rs. } 540$$

6. A person bought some article at the rate of 5 per rupee and the same number at the rate of 4 per rupee. He mixed both the types and sold at the rate of 9 for Rs. 2. In this business he suffered a loss of Rs. 3. Find the total no. of articles bought by him?

Sol. Let the person buys 10 articles

$$\text{Total CP} = \text{Rs. } \left(5 \times \frac{1}{5} + 4 \times \frac{1}{4} \right) = \text{Rs. } \left(1 + \frac{5}{4} \right) = \text{Rs. } \frac{9}{4}$$

$$\text{SP of 10 articles} = \frac{2}{9} \times 10 = \text{Rs. } \frac{20}{9}$$

$$\text{Loss} = \text{Rs. } \left(\frac{9}{4} - \frac{20}{9} \right) = \left(\frac{81-80}{36} \right) = \text{Rs. } \frac{1}{36}$$

$$\text{If loss is Rs. } \frac{1}{36}, \text{ then number of articles} = 10$$

$$\text{If loss is Rs. 3, number of articles} = 36 \times 10 \times 3 = 1080$$

7. A man buys a field of agricultural land for Rs. 360000. He sell $\frac{1}{3}$ rd at a loss of 20% and $\frac{2}{5}$ th at a gain of 25%. At what price must he sell the remaining field so as to make an overall profit of 10%?

$$\text{Sol. SP of total agricultural field} = \text{Rs. } \left(360000 \times \frac{110}{100} \right)$$

$$= \text{Rs. } 396000 \quad \text{[overall profit of 10\%]}$$

SP of $\frac{1}{3}$ rd of the field

$$= \frac{1}{3} \times 360000 \times \frac{80}{100} \quad \text{[Loss of 20\%]} \Rightarrow \text{Rs. } 96000$$

SP of $\frac{2}{5}$ th of the field

$$= \frac{2}{5} \times 360000 \times \frac{125}{100} \quad \text{[Gain of 25\%]} \Rightarrow \text{Rs. } 180000$$

SP of the remaining field

$$= \text{Rs. } (396000 - 96000 - 180000) = \text{Rs. } 120000$$

8. One trader calculates the percentage of profit on the buying price and another calculates on the selling price. When their selling price are the same, then difference of their actual profit is Rs. 85 and both claim to have made 20% profit. What is the selling price of each?

Sol. For first trader,

Let the CP of the article of Rs. 100, SP = Rs. 120

For second trader, SP of the article = Rs. 120

Gain = 20% [For both the traders]

Let the CP be x

$$\frac{120-x}{120} \times 100 = 20 \Rightarrow 120 - x = \frac{20}{5} \times 6$$

$$\Rightarrow 120 - x = 24 \Rightarrow x = 120 - 24 = \text{Rs. } 96$$

$$\text{Gain} = \text{Rs. } 24 \quad [\text{SP} - \text{CP}]$$

$$\text{Difference of gain} = 24 - 20 = \text{Rs. } 4$$

If the difference of gain be Rs. 4, then

$$SP = \text{Rs. } 120$$

When the difference be Rs. 85, then

$$SP = \frac{120}{4} \times 85 = \text{Rs. } 2550$$

9. If the sales tax be reduced from $3\frac{1}{2}\%$ to $3\frac{1}{3}\%$. What difference does it make to person who purchases an article whose marked price is Rs. 8400?

Sol. Initial sales tax, $= 3\frac{1}{2}\%$ Final sales tax $= 3\frac{1}{3}\%$

Difference in percentage of sales tax

$$= \left(3\frac{1}{2} - 3\frac{1}{3} \right) \%$$

$$\text{Req. diff.} = \frac{1}{6}\% \times 8400 = \frac{1}{6} \times \frac{1}{100} \times 8400 = \text{Rs. } 14$$

10. A man sells two cycle for Rs. 1710. The cost price of the first is equal to the selling price of the second. If the first is sold at 10% loss and the second at 25% gain, what is his total gain or loss?

Sol.

	1 st Cycle	2 nd Cycle	Total
CP	100	$100 \left(\frac{100}{125} \right) = 80$	180
SP	$100 \left(\frac{90}{100} \right) = 90$	100	190

$$\text{Total CP} = (\text{CP of 1st Cycle}) + (\text{CP of 2nd Cycle}) \\ = 100 + 80 = \text{Rs. } 180$$

$$\text{Total SP} = (\text{SP of 1st Cycle}) + (\text{SP of 2nd Cycle}) \\ = 90 + 100 = \text{Rs. } 190$$

$$\text{CP : SP} = 180 : 190 = 18 : 19$$

$$\text{Profit} = \frac{19-18}{19} \times 1710 = \text{Rs. } 90$$

11. Ashish bought an article with 20% discount on the labelled price. He sold the article with 30% profit on the labelled price. What was his percent profit on the price he bought?

Sol. Let the labelled price of the article be Rs. x

$$\text{Cost Price} = x \left(\frac{100-20}{100} \right) = \text{Rs. } \frac{4x}{5}$$

$$\text{Selling Price} = x \left(\frac{100+30}{100} \right) = \text{Rs. } \frac{13x}{10}$$

$$\text{Profit} = \frac{13x}{10} - \frac{4x}{5} = \frac{13x-8x}{10} = \frac{x}{2} \quad [\text{SP} - \text{CP}]$$

$$\% \text{ Profit} = \frac{\frac{x}{2}}{\frac{4x}{5}} \times 100 = \frac{5}{8} \times 100 = \frac{125}{2} = 62.5\%$$

12. A shopkeeper sold an article for Rs. 400 after giving 20% discount on the labelled price and made 20% profit on cost price. What was the percentage profit, had he not given the discount?

Sol. Labelled Price $= \frac{400 \times 100}{80} = \text{Rs. } 500$ [Before discount of 20%]

$$\text{Cost Price of article} = \frac{400 \times 100}{120} = \text{Rs. } \frac{1000}{3}$$

[20% profit on CP]

$$\text{Profit\%} = \frac{\frac{500 - 1000}{3}}{\frac{1000}{3}} \times 100 = \frac{\frac{1500 - 1000}{3}}{\frac{1000}{3}} \times 100 \\ = \frac{500}{1000} \times 100 = 50\%$$

13. A reduction of 20% in the price of mangoes enables a person to purchase 12 more for Rs. 15. Find the price of 16 mangoes before reduction?

Sol. Let the price of 1 mango be x paise

$$\text{Number of mangoes for Rs. } 15 = \frac{1500}{x}$$

[Rs. 1 = 100 paise]

$$\text{New price of one mango} = (80\% \text{ of } x) \text{ paise}$$

$$= \frac{80}{100} \times x = \frac{4}{5}x \text{ paise}$$

$$\text{Number of mangoes for Rs. } 15 = \left(\frac{1500 \times 5}{4x} \right)$$

$$\frac{7500}{4x} - \frac{1500}{x} = 12 \quad [\text{Diff. as mentioned in the Ques.}]$$

$$x = 31.25$$

$$\text{Cost of 16 mangoes before reduction} = \frac{31.25 \times 16}{100} = \text{Rs. } 5$$

14. A garment company declared 15% discount for wholesale buyers. Mr. Hemant bought garments from the company for Rs. 8500 after getting discount. The fixed up selling price of garments in such a way that he earned a profit of 10% on original company price. What is the total selling price?

Sol. Original Company price $= \frac{8500 \times 100}{100-15} = \text{Rs. } 10000$

Let the total selling price be Rs. x.

Now, according to the question,

$$\frac{x-10000}{10000} \times 100 = 10 \quad [\text{Profit of } 10\%]$$

$$100x - 1000000 = 100000 \Rightarrow x = \text{Rs. } 11000$$

Total selling price = Rs. 11000

15. A publisher published 5000 books in 5 lakh rupees. If he gives 500 books in free, $\frac{2}{3}$ rd of the rest he sell on 20% discount and remaining $\frac{1}{3}$ rd on M.P. He also gives 20% commission of the total selling. Find the profit% of the publisher if market price of each book is Rs. 200?

Sol. Total number of books = 5000
 he gives free book = 500
 $SP \text{ of I}^{\text{st}} \text{ part} = 3000 \times 200 \times \frac{4}{5} = \text{Rs. } 480000$
 [20% Discount on $\frac{2}{3}$ rd of rest]
 $SP \text{ of II}^{\text{nd}} \text{ part} = 1500 \times 200 = \text{Rs. } 300000$
 [Price is MP of $\frac{1}{3}$ rd of the rest]

Total SP = $480000 + 300000 = \text{Rs. } 780000$
 $\text{Total SP after Commission} = \frac{80}{100} \times 780000$
 [20% Commission]
 $= \text{Rs. } 624000$
 Total CP = Rs. 5,00,000, Total SP = Rs. 6,24,000
 Net profit = $6,24,000 - 5,00,000 = 1,24,000$
 $\text{Profit\%} = \frac{124000}{500000} \times 100 = 24.8\%$

Basic MCQs

1. A man buys an article for Rs. 27.50 and sells it for Rs. 28.60. Find the gain percent?
 (a) 4% (b) 3% (c) 5%
 (d) 10% (e) None of these
2. If a radio is purchased for Rs. 490 and sold for Rs. 465.50. Find the loss%?
 (a) 6% (b) 5% (c) 4%
 (d) 3% (e) None of these
3. Find SP when CP = Rs. 56.25 and Gain = 20%?
 (a) Rs. 72 (b) Rs. 67.5 (c) Rs. 50
 (d) Rs. 75 (e) None of these
4. Find SP when CP = Rs. 80.40, loss = 5%?
 (a) Rs. 81 (b) Rs. 84.72
 (c) Rs. 76.38 (d) Rs. 82.9
 (e) None of these
5. Find CP when SP = Rs. 40.60, gain = 16%?
 (a) Rs. 35 (b) Rs. 50 (c) Rs. 75
 (d) Rs. 89 (e) None of these
6. If the cost price is 96% of the selling price, then what is the profit percent?
 (a) 5.72% (b) 3.72% (c) 8.92%
 (d) 2.8% (e) None of these
7. A discount dealer professes to sell his goods at cost price but uses a weight of 960 gms instead of 1 Kg weight. Find his gain%?
 (a) $\frac{27}{4}\%$ (b) $\frac{8}{3}\%$ (c) $\frac{25}{6}\%$
 (d) $\frac{21}{4}\%$ (e) None of these
8. A man sold two cows at Rs. 1995 each. On one he lost 10% and on the other he gained 10%. What is his gain or loss percent?
 (a) 4% (b) 2% (c) 0.5%
 (d) 1% (e) None of these
9. Two discounts of 40% and 20% equal to a single discount of?
 (a) 48% (b) 53% (c) 52%
 (d) 60% (e) None of these
10. Amit purchased 13 chairs at Rs. 115 each and sold all at Rs. 1220. Then find the profit or Loss on the transaction
 (a) Rs. 280 Loss
 (b) Rs. 275 Loss
 (c) Rs. 325 Profit
 (d) Rs. 350 Profit
 (e) None of these
11. Some articles were bought at 6 articles for Rs. 5 and sold at 5 articles for Rs. 6. Gain percent is:

Practice MCQs for Prelims Level-1 & Level-2

Level - 1

1. A shopkeeper earns profit of $16\frac{2}{3}\%$ after selling a book at 12.5% discount on the printed price. Then, find the ratio of the cost price & printed price of the book?
 (a) 1 : 2 (b) 2 : 3 (c) 3 : 4
 (d) 4 : 5 (e) 5 : 6
2. A salesman has 6 red and 5 black shirts. If two shirts are picked up randomly, then what is the probability of getting shirts of same color?
 (a) $6/11$ (b) $5/11$ (c) $10/11$
 (d) $7/11$ (e) $4/11$

31. A salesman marks a bat and a ball 25% and 40% above their cost price respectively and salesman allowed discount of 15% on each bat & ball. If cost price of a bat is 260% more than that of a ball and profit earned on selling a ball is Rs.38, then find difference in selling price of a bat & a ball.
 (a) Rs.527 (b) Rs.375 (c) Rs.497
 (d) Rs.456 (e) Rs.332
32. A salesman bought 50 phones from manufacturer for Rs.780000. He spent Rs.20000 on transportation of phones. If salesman marks each phone 20% above the cost price of each phone and sold each phone at 8% discount, then find profit earned by salesman on a phone.
 (a) Rs.1756 (b) Rs.1608 (c)Rs.1520
 (d) Rs.1872 (e) Rs.1664
33. Marked price of a jeans is 50% above its cost price and marked price of a shirt is 70% above its cost price. Cost price of both jeans & shirt is same. If 20% discount is given on each article and difference between profit earned on shirt and jeans is Rs. 320, then find selling price of shirt.
 (a) 2520 Rs. (b) 2320 Rs. (c)3020 Rs
 (d) 2720 Rs. (e) 3120 Rs.
34. A manufacturer of tables wants to earn 20% profit on total manufacturing cost after giving a discount of 28% on MRP. But due to fire in the store he lost 10% of tables manufactured by him, then find at what discount percentage should he sell the remaining tables, if he still wants to earn 20% profit on total manufacturing cost?
 (a) 25% (b) 15% (c) 10%
 (d) 20% (e) 18%
35. Marked price of a bat is Rs 350. A shopkeeper gives a discount of Rs x and makes a profit of $12\frac{1}{2}\%$. If manufacturing cost of bat is Rs 280, then find the discount percent given by shopkeeper on bat?
 (a) 10% (b) 6% (c) 4%
 (d) 3% (e) 5%
36. Retailer mark up an article 35% above its cost price and earn Rs 480 by giving 20% discount on the marked price. If he sells article at 15% discount on marked price then, find retailer's profit on selling one article.
 (a) 885 Rs. (b) 875 Rs. (c) 855 Rs.
 (d) 845 Rs. (e) 840 Rs.
37. There is some profit when an article is sold for Rs. 840. However, when the same article is sold for Rs. 480, there is some loss. If the value of profit is two times the value of loss, then find the selling price when the article is sold at profit of $37\frac{1}{2}\%$.
38. Retailer mark up an article 35% above its cost price and earn Rs 96 by giving 20% discount on the marked price. If he sells article at 15% discount on marked price then, find retailer's profit on selling one article.
 (a) 118 (b) 177 (c) 236
 (d) 214 (e) 154
39. When an article is sold at 40% discount, a loss of 10% occurs but when it sold at 20% discount then there is a profit of Rs.7.5. What is the cost price of the article?
 (a) 37.5 Rs
 (b) 40 Rs
 (c) 66.67 Rs
 (d) 48 Rs
 (e) 39.2 Rs
40. 20% of product bought by a shopkeeper is damaged and are sold at 30% discount. Remaining products is sold at a discount of 10%. If difference between total selling price of products sold at 30% discounts and 10% discount is 29,000, Then find the sum of marked price of all product? (in rs)
 (a) 50,000 (b) 40,000 (c) 25,000
 (d) 75,000 (e) 60,000

Practice MCQs for Mains

Directions (1-2): Abhishek bought some chairs and tables from a shopkeeper. The marked price of a chair and a table were in the ratio 5 : 8. The shopkeeper gave discounts of 20% and 25% on the chair & the table respectively. The ratio of number of chairs and tables bought by Abhishek is 6 : 5.

1. If Abhishek sells each chair and table bought by him at discounts of 25% and 20% respectively after marking up the prices of both by 50% and gives one table free for every four chairs bought by a customer and only $\frac{2}{3}$ rd of the total chairs are sold in bunch of four chairs, then what is

the net profit /loss % made by Abhishek after selling all of the items which he bought from the shopkeeper?

- (a) $6\frac{2}{3}\%$ (b) $3\frac{1}{3}\%$
 (c) $2\frac{1}{2}\%$ (d) $4\frac{1}{4}\%$ (e) $5\frac{1}{3}\%$

2. If the marked price of a table set by the shopkeeper was Rs.300 more than that of a chair and the total expenditure made by Abhishek in purchasing the chairs and tables from the shopkeeper was Rs.108000, then how many chairs were purchased by Abhishek?

- (a) 150 (b) 60
 (c) 120 (d) 90 (e) 140

3. A garment company declared 17% discount for wholesale buyers. Mr Sameer bought garments from the company for Rs. 1660 after getting discount. He fixed up the selling price of garments in such a way that he earned a profit of 7% on original company price. What is the selling price ?
 (a) Rs. 2130 (b) Rs. 2140
 (c) Rs. 2410

- 19.** Shopkeeper sells two articles - M & N. He marks article - M 20% above its cost price and he gave 5% discount on it. Cost price of article - N is 20% more than cost price of article - M. If shopkeeper sold article - M at Rs.285 and article - N at 15% profit, then find selling price of article - N.
 (a) Rs.345 (b) Rs.230 (c) Rs.460
 (d) Rs.414 (e) Rs.322
- 20.** Marked price of an article is Rs 250 more than cost price of that article and it is sold at a discount of 15% on marked price. Find the cost price of the article if the profit percent earned is 27.5%?
 (a) Rs 600 (b) Rs 550 (c) Rs 500
 (d) Rs 750 (e) Rs 900
- 21.** Abhishek makes a profit of Rs.110, if he sells a certain number of pens he has at the price of Rs. 2.5 per pen and incurs a loss of Rs. 55, if he sells the same number of pens for Rs. 1.75 per pen. How many pens does Abhishek have?
 (a) 220
 (b) 240
 (c) 200
 (d) Cannot be determined
 (e) None of these
- 22.** Ram purchased a Computer set of Rs. 12500 and spent Rs.300 on transportation and Rs. 800 on installation. At what price should he sell it so as to earn an overall profit of 15%?
 (a) Rs. 14560
 (b) Rs. 14375
 (c) Rs. 15460
- 23.** Mahesh purchased 25 kg of rice @ 32 per kg and 15 kg of rice @ Rs. 36 per kg. He mixed the two varieties of rice and sold it @ Rs. 40.20 per kg. What is the per cent profit earned?
 (a) 25 (b) 40 (c) 30
 (d) 20 (e) None of these
- 24.** While selling a watch, a shopkeeper gives a discount of 15%. If he gives a discount of 20%, he earns Rs. 51 less as profit. What is the original price of the watch?
 (a) Rs. 920
 (b) Rs. 985
 (c) Rs. 1125
 (d) Rs. 1020
 (e) None of these
- 25.** A shopkeeper purchased 245 pieces of an article at Rs. 30 per piece. He spent Rs. 980 on transport and Rs. 1470 on packing the articles. He sold the articles at the rate of Rs. 50 per piece. What is the percent profit earned?
 (a) 25% (b) 20% (c) 28%
 (d) 22.5% (e) None of these
- 26.** An article is marked for sale at Rs. 504. The shopkeeper gives a discount of 5% on the sale price and still earns a profit of 20%. What could be the purchase price of the article?
 (a) Rs. 399 (b) Rs. 405 (c) Rs. 403
 (d) Rs. 400 (e) None of these
- 27.** A shopkeeper sold an article for Rs. 400 after giving 20% discount on the labelled price and made 30%
- profit on the cost price. What would have been the percentage profit, had he not given the discount?
 (a) 25% (b) 35% (c) 50%
 (d) 62.5% (e) None of these
- 28.** Suresh purchased a TV set for Rs. 11250. He spent Rs. 800 on installation and Rs. 150 on transportation. At what price should it be sold so that the profit earned would have been 15%, if no discount was offered?
 (a) Rs. 12938
 (b) Rs. 14030
 (c) Rs. 13450
 (d) Rs. 15467
 (e) None of these
- 29.** Mr A sold a goods, to Mr. B at 10% discounted value of printed rate. The discounted value is Rs. 1242. If 15% profit is earned on purchase rate by selling the goods at printed rate, what is the purchase rate?
 (a) Rs. 1242
 (b) Rs. 1380
 (c) Rs. 1280
 (d) Rs. 1200
 (e) None of these
- 30.** Rajesh purchased a mobile phone and a refrigerator for Rs. 12000 and Rs. 10000 respectively. She sold the refrigerator at a loss of 12 per cent and mobile phone at a profit of 8 per cent. What is her overall loss/profit?
 (a) Loss of Rs. 280
 (b) Profit of Rs. 2160
 (c) Loss of Rs. 240
 (d) Profit of Rs. 2060
 (e) None of these

Solutions

Basic MCQs

1. **(a);** CP = Rs. 27.50, SP = Rs. 28.60
 Then Gain = SP - CP = 28.60 - 27.50 = Rs. 1.10
 Since, Gain% = $\frac{\text{gain} \times 100}{\text{CP}}\%$
 $\Rightarrow \text{Gain\%} = \frac{1.10 \times 100}{27.50} = 4\%$
2. **(b);** CP = Rs. 490, SP = Rs. 465.50

$$\text{Loss} = \text{CP} - \text{SP} = 490 - 465.50 = \text{Rs. } 24.50$$

$$\text{Loss\%} = \frac{\text{loss} \times 100}{\text{CP}}\% = \frac{24.50 \times 100}{490} = 5\%$$

$$3. \quad \text{(b); } \text{SP} = \left[\frac{100 + \text{gain\%}}{100} \right] \times \text{CP}$$

$$\Rightarrow \text{SP} = \left[\frac{100 + 20}{100} \right] 56.25 = \text{Rs. } 67.50$$

4. (c); $SP = \left[\frac{100 - \text{loss}\%}{100} \right] \times CP$
 $\Rightarrow SP = \left[\frac{100 - 5}{100} \right] \times 80.40 = \text{Rs. } 76.38$

5. (a); $CP = \frac{100 \times SP}{100 + \text{gain}\%} \Rightarrow \text{Rs. } 35$

6. (e); Let $SP = \text{Rs. } 100$ then $CP = \text{Rs. } 96$
 $\text{Profit} = SP - CP = 100 - 96 = \text{Rs. } 4$
 $\text{Profit}\% = \frac{\text{profit}}{CP} \times 100\% = \frac{4}{96} \times 100 = 4.17\%$

7. (c); Here, True weight = 1000g.
 False weight = 960g.
 $\text{Error change} = (1000 - 960)\text{g.} = 40\text{g.}$
 $\Rightarrow \text{Gain}\% = \frac{\text{Error change}}{\text{True weight} - \text{Error}} \times 100\%$
 $= \frac{40}{1000 - 40} \times 100\% = \frac{25}{6}\%$

8. (d); Here, since both gain and loss percent is same, hence the resultant value would be loss percent only.

$$\Rightarrow \text{Loss}\% = \frac{a^2}{100} \quad [\text{where } a = 10\%]$$

$$= 1\%$$

9. (c); Using net discount formula

$$\Rightarrow \left[a + b - \frac{ab}{100} \right]\%$$

Here, $a = 40\%$, $b = 20\%$

Applying both values in above formula:

$$\Rightarrow \left[40 + 20 - \frac{40 \times 20}{100} \right]\% = 52\%$$

10. (b); Total SP given = $\text{Rs. } 1220$

Total CP of 13 chairs = $\text{Rs. } 13 \times 115 = \text{Rs. } 1495$

Hence, $CP > SP$
 $\Rightarrow \text{Loss} = CP - SP = \text{Rs. } 1495 - 1220 = \text{Rs. } 275$

11. (d); CP of 6 articles = $\text{Rs. } 5$, CP of 5 articles = $\text{Rs. } \frac{25}{6}$

$$\text{SP of 5 articles} = \text{Rs. } 6$$

$$\frac{6 - \frac{25}{6}}{25} \times 100 = \frac{11}{25} \times 100 = 44\%$$

12. (c); CP of 12 tables = SP of 16 tables

$$\frac{\text{CP of 1 table}}{\text{SP of 1 table}} = \frac{16}{12} = \frac{4}{3}$$

$$\% \text{Loss} = \frac{4 - 3}{4} \times 100 = 25\%$$

13. (b); Let CP for A be $\text{Rs. } 100$

A sells it to B at 20% profit

$\text{Rs. } [100 + 20\% \text{ of } 100] = \text{Rs. } 120$

Now B sells it to C at 25% profit

$\text{Rs. } [120 + 25\% \text{ of } 120] = \text{Rs. } 150$

If C buys at $\text{Rs. } 150$, A bought at $\text{Rs. } 100$

Hence, by unitary method,

$$\text{If C bought at } \text{Rs. } 1500, \text{ A paid} = \text{Rs. } \left[\frac{100}{150} \times 1500 \right]$$

$$= \text{Rs. } 1000$$

14. (e); Given $\text{Loss}\% = 10\%$

$$\Rightarrow 10\% = \left(\frac{\text{CP} - \text{SP}}{\text{CP}} \right) \times 100$$

$$\frac{10}{100} = \frac{390 - \text{SP}}{390}, \text{SP} = \text{Rs. } 351$$

15. (a); Here, $\text{Profit}\% = 10\%$

$$\frac{10}{100} = \frac{\text{SP} - \text{CP}}{\text{CP}} \Rightarrow \frac{1}{10} = \frac{924 - \text{CP}}{\text{CP}}$$

$$11\text{CP} = 9240 \Rightarrow \text{CP} = \text{Rs. } 840$$

Practice MCQs for Prelims Level-1 & Level-2



Level - 1

1. (c); Let cost price of book be '100x'

$$\text{So, Selling price of book} = 100x \times \left(1 + \frac{50}{300} \right) = \frac{350x}{3}$$

$$\text{Mark price of book} = \frac{350x}{3} \times \frac{100}{87.5} = \frac{400x}{3}$$

$$\therefore \text{Required Ratio} = \frac{100x}{400x} = \frac{3}{4}$$

2. (b); Required probability = $\frac{6}{11} \times \frac{5}{10} + \frac{5}{11} \times \frac{4}{10}$

$$= \frac{30+20}{110}$$

$$= \frac{50}{110}$$

$$= \frac{5}{11}$$

3. (b); Let the cost price and marked price be $\text{Rs. } 3x$ and $\text{Rs. } 5x$ respectively

And let the loss and discount be $\text{Rs. } y$ and $\text{Rs. } 4y$ respectively

ATQ

$$3x - y = 5x - 4y$$

$$3y = 2x$$

$$\text{Marked price} = \text{Rs. } \frac{15y}{2}$$

$$\text{Required discount \%} = \frac{4y}{\frac{15y}{2}} \times 100 = 53\frac{1}{3}\%$$

$$\begin{aligned} \text{Cost price} &\Rightarrow 80x - 7.5 & \dots(\text{ii}) \\ \text{Comparing (i) \& (ii)} \\ \frac{200x}{3} &= 80x - 7.5 \\ x &= \frac{9}{16} \\ \text{Cost price} &= \frac{200}{3} \times \frac{9}{16} = \text{Rs. } 37.5 \end{aligned}$$

- 40. (a):** Let mark price of each product and number of products are Rs.100y and 100x respectively.
Damaged product = 20x

$$\begin{aligned} \text{Undamaged product} &= 80x \\ \text{S.P. of damage product} &= \text{Rs. } 70y \\ \text{S.P. of good product} &= \text{Rs. } 90y \\ \text{ATQ,} \\ 80x \times 90y - 20x \times 70y &= 29000 \\ xy &= 5 \\ \text{Sum of mark price of all product} \\ &= 100x \times 100y \\ &= 10000xy \\ &= \text{Rs. } 50,000 \end{aligned}$$

Practice MCQs for Mains

- 1. (b):** Let the MP of a chair and a table be Rs.5x and Rs.8x respectively.
And, the number of chairs and tables bought be 6y and 5y respectively.
CP of a chair for Abhishek = $(100 - 20)\%$ of $5x$
= Rs.4x
CP of a table for Abhishek = $(100 - 25)\%$ of $8x$
= Rs.6x
Total CP for Abhishek = $4x \times 6y + 6x \times 5y$
= $24xy + 30xy = 54xy$
SP of a chair for Abhishek
= $(100 - 25)\%$ of $(100 + 50)\%$ of $4x = 4.5x$
SP of a table for Abhishek
= $(100 - 20)\%$ of $(100 + 50)\%$ of $6x = 7.2x$
Number of chairs sold in bunch of four by Abhishek
= $\frac{2}{3}$ rd of $6y = 4y$
So, number of table sold for free by Abhishek
= $\frac{1}{4}$ th of $4y = y$
Total SP for Abhishek = $4.5x \times 6y + 7.2x \times (5y - y)$
= $27xy + 28.8xy = 55.8xy$
Profit % = $\frac{55.8xy - 54xy}{54xy} \times 100 = \frac{1.8xy}{54xy} \times 100 = 3\frac{1}{3}\%$
- 2. (c):** According to the question,
MP of a table = $300 + \text{MP of a chair}$
 $\Rightarrow 8x = 300 + 5x \Rightarrow x = 100$
Total CP for Abhishek = 108000
 $\Rightarrow 54xy = 108000$
 $\Rightarrow 54 \times 100 \times y = 108000 \Rightarrow y = 20$
Number of chairs purchased by Abhishek = $6y$
= 120
- 3. (b):** Original company price = $1660 \times \frac{100}{83} = 2000$ Rs.
SP of garments, which Sameer fixed
= $2000 \times \frac{107}{100} = 2140$ Rs.
- 4. (c):** Ratio of profits = Ratio of (amount \times time)
Let, initial amounts of Raju, Rancho & Farhan be $5x$, $7x$ and $9x$ respectively
 $5x \times 3 + 5x \times 3 : 7x \times 3 + \frac{7x}{2} \times 6 + 7x \times 3 : 9x \times 3 + 27x \times 6 + \frac{27x}{9} \times 3$
 $= 10 : 21 : 66$
 $\frac{(21-10)}{97} \times 11737 = 11 \times 121 = 1331$ Rs
- 5. (e):** Ratio of their amounts at the end of 1st year
= 5 : 7 : 3
Profit Share of Rancho = $\frac{7}{15} \times 22500 = 7 \times 1500$
= Rs 10500
- 6. (a):** Ramu's discount:
8% on 8000 = 640
5% on 12000 = 600
3% on 16000 = 480
Total = 1720 on 36000
Final S.P. on Ramu sold shashi = 34280
Shyamu's Discount:
7% on 12000 = 840
6% on 8000 = 480
5% on 16000 = 800
Total = 2120 on 36000
Final SP on Shyamu sold to Rajesh = 33880
C.P. for both of them = $36000 \times \frac{100}{125} = 28800$
Ramu has greater Profit
Profit% for Ramu = $\frac{(34280-28800)}{28800} \times 100$
= 19% (approx.)
- 7. (a):** Ramu's Discount:
8% on 8000 = 640
4% on 12000 = 480
1% on 16000 = 160
Total = 1280 on 36000
Final SP for him = $36000 - 1280 = 34720$
Profit = $34720 - 28800 = 5920$
- 8. (a):** Given that Kailash car's average (in term of litres per kilometer is 20% higher than Shyam's car)
Let Kailash car takes x litres of petrol per kilometer
then, Shyam car will take $\frac{5}{6}x$ litres of diesel per kilometer
Also,
Cost price / litre of petrol = cost price / litre of diesel
+ 60% of cost price/litre of petrol.
 $\frac{\text{cost price}}{\text{L of petrol}} = \frac{5}{2}$
 $\frac{\text{cost price}}{\text{L of diesel}} = \frac{2}{5}$
Required ratio = $\frac{\text{cost/kilometre of kailash car}}{\text{cost/kilometre of shyam's car}}$
 $= \frac{\frac{x \times 5}{5}}{\frac{x \times 2}{6}} = 3 : 1$

9. (e): Shyam's car gives 20 km/litre means, it takes 0.05 litres of diesel per kilometer

$$\frac{5}{6}x \rightarrow 0.05$$

$$x \rightarrow .06 \text{ (litre/km for kailash car)}$$

cost price per litre of diesel = 12.5 Rs/L

$$\text{so, cost per litre of petrol} = \frac{12.5}{2} \times 5 = 31.25 \text{ Rs/L}$$

$$\text{Required difference} = 0.06 \times 31.25 - 0.05 \times 12.5 = 1.25$$

10. (c): Let Satish, Veer, Arun and Yogesh buy 'w', 'x', 'y' and 'z' bicycle respectively.

According to direction given

$$w + x = y \quad \dots(i)$$

$$x + y = z \quad \dots(ii)$$

$$y = 20 \quad \dots(iii)$$

$$z - w = 24 \quad \dots(iv)$$

By solve (i), (ii), (iii) and (iv) We get,

$$w = 8, x = 12, y = 20, z = 32$$

Let Satish, Veer, Arun and Yogesh get 'a%', 'b%', 'c%' and 'd%' discount by wholeseller on MP.

According to direction given,

$$b + c = a + d \quad \dots(i)$$

$$c = a + b \quad \dots(ii)$$

$$d = a + c \quad \dots(iii)$$

$$d - b = 10\% \quad \dots(iv)$$

By solving (i), (ii), (iii) and (iv)

We get

$$a = 5\%, b = 10\%, c = 15\%, d = 20\%$$

Let marked price of each bicycle = 100x

Satish buy 1 bicycle at = 95x

Arun buy 1 bicycle at = 85x

$$\text{Profit earn by Satish} = 800x - 8 \times 95x$$

$$= 800x - 760x = 40x$$

$$\text{Profit earn by Arun} = 800x - 8 \times 85x$$

$$= 800x - 680x = 120x$$

$$\text{Desired \%} = \frac{120x - 40x}{40x} \times 100 = \frac{80x}{40x} \times 100 = 200\%$$

11. (e): Total bicycle Yogesh bought = 32

Let M.P. = 100x

$$\text{C.P. of 32 bicycle} = 32 \times 80x = 2560x$$

$$\text{S.P. of 8 bicycle at 10\% discount} = 8 \times 90x = 720x$$

$$\text{S.P. of 18 bicycle at 30\% discount} = 18 \times 70x = 1260x$$

$$\text{S.P. of 6 bicycle on M.P.} = 6 \times 100x = 600x$$

$$\text{Total S.P.} = 720x + 1260x + 600x = 2580x$$

$$\text{Profit} = 2580x - 2560x = 20x$$

$$100x = 20,000$$

$$x = 200$$

$$\text{Total profit} = 20 \times 200 = 4000$$

12. (b): Let the marked price of a chair be = Rs 50

And the marked price of a table be = Rs 70

Also, no. of chairs bought be = 9x

And no. of tables bought be = 8x

$$\text{C.P. of chair for Raghav} = \frac{4}{5} \times 50 = 40$$

$$\text{C.P. of table for Raghav} = \frac{3}{4} \times 70 = 52.5$$

$$\begin{aligned} \text{Total C.P. for Raghav} &= 9x \times 40 + 8x \times 52.5 = 780x \\ \text{Total S.P. for Raghav} &= 7x \times 40 \times 1.5 \times 0.75 + 8x \times 52.5 \times 1.5 \times 0.8 \\ &= 315x + 504x = 819x \\ \text{Profit \%} &= \frac{819 - 780}{780} \times 100 = \frac{39}{780} \times 100 = 5\% \end{aligned}$$

13. (a): C.P. for Raghav = $90 \times 40 + 80 \times 52.5$

$$= 3600 + 4200 = 7800$$

$$\text{Required average price} = \frac{7800}{170} = \text{Rs } 45.88$$

14. (e): Let cost of pure rice per kg is 10 Rs.

So cost of impure rice per kg is 4 Rs.

Total cost for the shopkeeper

$$= 12 \times 10 + 4 \times (4 + 4) = 120 + 32 = 152 \text{ Rs.}$$

$$\text{Total selling price} = \frac{10}{100} \times 120 \times 16 = 192$$

$$\text{Required percentage} = \frac{40}{152} \times 100 = \frac{500}{19} \%$$

15. (d): Let 15 pens and 15 pencils are sold and cost of 1 pen is 10 Rs.

So, Cost of 3 pen is 30 Rs. which is equal to cost of 5 pencils.

Total cost price of 15 pens and 15 pencils

$$= 15 \times 10 + 6 \times 15$$

$$= 150 + 90 = 240 \text{ Rs.}$$

Total selling prices of 15 pens and 15 pencils

$$= 150 \times \frac{6}{5} + 90 \times \frac{4}{3} = 180 + 120 = 300$$

$$\text{Overall percentage profit} = \frac{300 - 240}{240} \times 100$$

$$= \frac{60}{240} \times 100 \Rightarrow 25\%$$

16. (b): If 100 articles are Manufactured then 12 will be rejected

$$\text{Total selling price of 88 articles} = 88 \times 7.5 = 660$$

$$\text{Total cost price of 100 article} = \frac{660 \times 100}{120} = 550$$

$$\text{Manufacturing cost of per article} = \frac{550}{100} = 5.50 \text{ Rs}$$

17. (a): C.P. of car = $\frac{90}{100} \times 4,50,000 = \text{Rs. } 4,05,000$

$$\text{C.P. of scooter} = \frac{1}{10} \times 4,05,000 = \text{Rs. } 40,500$$

$$\text{M.P. of scooter} = \text{Rs. } 50,625$$

$$\text{C.P. of car and scooter} = 4,05,000 + 40,500 = 4,45,500$$

$$\text{S.P. of car and scooter} = \frac{130}{100} \times 4,45,500$$

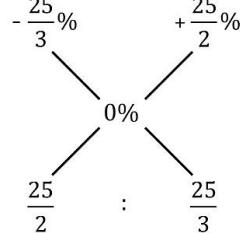
$$= \text{Rs. } 5,79,150$$

$$\text{S.P. of car} = 5,79,150 - \frac{110}{100} \times 40,500$$

$$= 5,79,150 - 44,550 = 5,34,600$$

$$\text{Required Ratio} = \frac{50,625}{5,34,600} = \frac{25}{264}$$

18. (a):



∴ Table : Chair = $\frac{1}{2} : \frac{1}{3}$
 $= 3 : 2$
 Let Table = $3x$
 Chair = $2x$
 ATQ-
 $3x \times \frac{25}{2} \times \frac{1}{100} - 2x \times \frac{25}{3} \times \frac{1}{100} = 25$
 $\frac{5x}{24} = 25$
 $x = 120$
 ∴ Table = 360 Rs.
 Chair = 240 Rs.

19. (c): Let dealer cost for 100 kg
 Shopkeeper buys goods worth : 1.2×100
 $= 120\text{kg}$
 shopkeeper sells to customer goods worth
 $= 100 \times \frac{80}{100} = 80\text{ kg}$
 profit = $120 - 80 = 40\text{kg}$
 Required % = $40 \times \frac{100}{80}$
 ∴ Profit % = 50%
20. (b): CP of 150 calculators = $150 \times 250 = \text{Rs. } 37500$
 Total CP = $37500 + 2500 = \text{Rs. } 40000$
 MP of 150 calculators = $150 \times 320 = \text{Rs. } 48000$.
 SP after discount = $48000 \times \frac{95}{100} = \text{Rs. } 45600$.
 ∴ Percentage profit = $\frac{45600 - 40000}{40000} \times 100 = 14\%$

21. (b): Let cost price = 100
 Then mark price = $100 \times 3/2 = 150$
 Let discount percent and profit percent = x
 ATQ,
 $\frac{100(100+x)}{100} = \frac{150(100-x)}{100}$
 $x = 20\%$

22. (b): Let the correct weight be 1 kg and C.P. be Rs 1/g
 Quantity purchased by the shopkeeper = 1250 g
 Quantity sold by the shopkeeper = 750 g
 We have
 S.P. of 750 g = C.P. of 1250 g
 \Rightarrow S.P. of 750 g = Rs 1000
 \Rightarrow C.P. of 750 g = $\frac{1000 \times 750}{1250} = 600$ Rs
 Therefore, profit by selling 750 g of item
 $= 1000 - 600 = \text{Rs. } 400$
 Profit percentage = $\frac{400}{600} \times 100 = 66.67\%$

23. (c): Let the cost price be Rs. 100
 Then marked price will be Rs. 150
 He gives 10% discount, so
 Selling price = $150 \times \frac{90}{100} = \text{Rs. } 135$
 As he cheats and gives 20% less in weight,
 Cost price becomes = $100 \times \frac{80}{100} = \text{Rs. } 80$
 ∴ Profit percentage = $\frac{135 - 80}{80} \times 100 \approx 68\%$

24. (c): Let, total expenditure on an item be Rs. 100
 Then S.P. of item = 125
 New expenditure on raw materials = $1.15 \times 40 = 46$
 New expenditure on labour = $1.2 \times 20 = 24$
 New expenditure on miscellaneous = $1.5 \times 20 = 30$
 Profit percentage = $\frac{125 - 120}{120} \times 100 = 4\frac{1}{6}\%$

25. (c): To get a profit of $13\frac{7}{11}\%$ at a selling price of Rs. 125,
 the C.P. of an item must be equal to $125 \times \frac{1100}{1250} = 110$
 We need to reduce C.P. (or expenditure) by 10, and
 this 10 has to be reduced from expenditure on raw
 materials.
 Required % = $\frac{10}{46} \times 100 = 21\frac{17}{23}\%$

Previous Years's Solutions for Prelims & Mains

1. (b): Let the profit earned on second article be x%
 Using allegation method,

$$\begin{array}{ccc} 12 & & x \\ & 15 & \\ (x-15) & 3 & \\ 1 & : & 1 \end{array} \quad (\text{ratio of cost price})$$

 $\Rightarrow x = 18\%$
 ATQ,
 $6\% = \text{Rs. } 90$
 So, cost price = 100% = Rs 1500

2. (b): Let cost price of Jeans = $100x$ Rs.
 Marked price of Jeans = $125x$ Rs.
 Selling price of jeans = $125x \times \frac{90}{100} \times \frac{95}{100}$
 $= 106.875x$ Rs.
 ATQ —
 $106.875x - 100x = 89.1$
 $x = 12.96$

Cost price of jeans = 1296 Rs.
 For 40% of profit
 Selling price = $1296 \times \frac{140}{100} = 1814.4$ Rs.

3. (c): let CP of book be Rs x
 SP = Rs $1.2x$
 New CP = Rs $0.9x$
 New SP = Rs $1.2x + 90$
 ATQ, $0.9x \times \frac{140}{100} = 1.2x + 90$
 $1.26x = 1.2x + 90$
 $x = \text{Rs. } 1500$

4. (b): Let C.P. of LED = $100x$ Rs.
 M.P. of LED = $160x$ Rs.
 First discount = $160x \times \frac{1}{8}$
 $= 20x$ Rs.
 Second and third discount
 $(160x - 20x) \times \frac{(100-d)}{100} \times \frac{(100-25)}{100} = 84x$

24. (d): Let the original price of watch be Rs. x

Now in earlier situation,

He gave discount of 15%

$$\text{So, selling price of watch} = \text{Rs. } x \left(\frac{100 - D\%}{100} \right)$$

$$= \text{Rs. } x \left(\frac{85}{100} \right)$$

Now if he would have given 20% discount,

$$\text{Selling price of watch} = \text{Rs. } x \left(\frac{80}{100} \right)$$

According to question

$$\Rightarrow x \left(\frac{85}{100} \right) - x \left(\frac{80}{100} \right) = 51$$

$$\Rightarrow x = \frac{51 \times 100}{85 - 80} = \text{Rs. } 1020$$

25. (a): CP of 245 pieces of article = Rs. (245×30)

$$= \text{Rs. } 7350$$

Total CP (including transport and packing)

$$= \text{Rs. } (7350 + 980 + 1470) = \text{Rs. } 9800$$

$$\text{Hence, CP of 1 piece} = \frac{9800}{245} = \text{Rs. } 40$$

$$\text{SP of 1 piece} = \text{Rs. } 50$$

$$\text{Gain\%} = \frac{10}{40} \times 100 = 25\%$$

26. (a): Let the original price of article be Rs. 100

$$\text{After 5\% discount, its SP} = \text{Rs. } [100 - 5\% \text{ of } 100] \\ = \text{Rs. } 95$$

= For original price = Rs. 100, SP = Rs. 95

Hence, for original price = Rs. 504 (given)

$$= \text{SP} = \frac{95}{100} \times 504 = \text{Rs. } 478.80$$

Given, Profit\% = 20\%

$$\frac{20}{100} = \frac{478.8 - \text{CP}}{\text{CP}} \Rightarrow \text{CP} = \text{Rs. } 399$$

27. (d): In this question, you don't need to solve in multiple steps to first find MP, then CP etc.

In such questions if we need to find profit \% if no discount is given, then formula is:

$$\text{Profit\%} = \frac{(\text{Discount\%}) + (\text{Profit\% earlier})}{(100 - \text{Discount\%})} \times 100$$

$$= \frac{20 + 30}{100 - 20} \times 100 = 62.5\%$$

28. (b): CP of TV for Suresh (including transportation and installation)

$$= \text{Rs. } [11250 + 150 + 800] = \text{Rs. } 12200$$

Req. Selling price (if no discount given)

$$\Rightarrow \text{Rs. } \left[12200 \times \frac{115}{100} \right] = \text{Rs. } 14030$$

29. (d): We can determine CP (cost price)/purchase rate by below formula:

$$\begin{aligned} \text{CP} &= \text{SP} \times \frac{100}{100 - \text{Discount\%}} \times \frac{100}{100 + \text{Profit\%}} \\ &= 1242 \times \frac{100}{90} \times \frac{100}{115} = \text{Rs. } 1200 \end{aligned}$$

30. (c): $(\text{Loss\% on refrigerator}) = \frac{12}{100} = \frac{10000 - \text{SP}}{10000}$

$$\text{SP of refrigerator} = \text{Rs. } 8800$$

$$(\text{Profit\% on phone}) = \frac{8}{100} = \frac{\text{SP} - 12000}{12000}$$

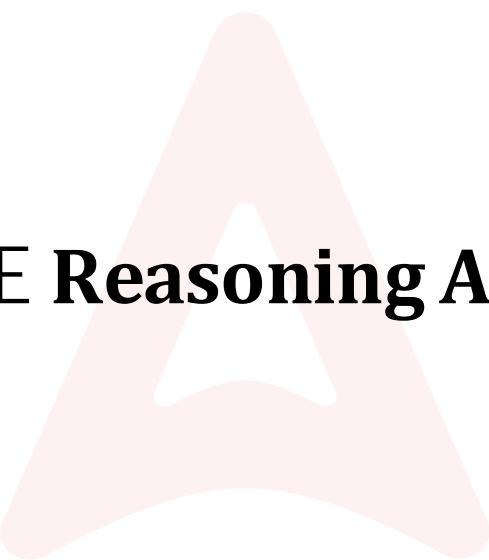
$$\text{SP of phone} = \text{Rs. } 12960$$

Hence, Profit/Loss = (Total SP) - (Total CP)

$$= 12960 + 8800 - 12000 - 10000$$

$$= \text{Rs.} - 240 \text{ (Loss of Rs. 240)}$$

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ACE Reasoning Ability



Alpha-Numeric-Symbol Series

Introduction: Alpha - Numeric - Symbol series is a combination of alphabets, Numbers, and symbols. This chapter is one of the important chapters because in every competitive exam around five questions come from this chapter.

○ Some important points you have to keep in your mind:

- (1) Vowels - A, E, I, O, U
- (2) Consonants - All letters except vowels
- (3) Numbers - 1, 2, 3, 4 etc ...
- (4) Symbols - ! @ # \$ % etc ...

In whole chapter we will use these four points by applying some different conditions.

○ Some twisted terms, you must understand to solve the questions:

- (1) A precedes B means A will left to B (i.e., AB)
- (2) B is preceded by A (It also means that A will left to B). (i.e., AB)
- (3) B follows A means B will right to A (i.e., AB)
- (4) A is followed by B

It also means that B will right to A (i.e., AB)

○ Some common types of series are:

- **Alphabet series-** this can be of two types :
 - ☞ Where all the elements are alphabets.
Ex- E N D H A G S I H D L F
 - ☞ Where elements are in the form of words having 3 or 4 alphabets in each
Ex- RHU SNJ OKF INK ABH
- **Number series-** where all given elements are numerals.
Ex- 3 5 7 8 9 0 1 9 3 8 4 7
- **Alpha-numeric series-** where given elements are combination of alphabets and numbers.
Ex- A N D 9 7 2 M K 6 3 7 B R 0
- **Alpha-symbol series-** where given elements are combination of alphabets and symbols.
Ex- J * F A B \$ # N J * I %
- **Numeric-symbol series-** where given elements are combination of numbers and symbols.
Ex- 8 7 # % 9 8 % 4 3 & @
- **Alpha-numeric-symbol series-** combination of alphabets, numbers and symbols are given here and this is very common type of series found in exam.
Ex- * S D % 6 J \$ Q 5 ! O \$ P 7 ^ M @ X C 3 5 B

- **3-digit number series-** Here, all elements are numbers having three digits in each.

Ex- 571 095 387 204 184

○ Some important examples you have to keep in mind:

3-digit number series example is given-

634 563 086 456 678

- (a) Here, number is – 634 (complete term)
Digit is – 6, 3, 4 (single numeral)

- (b) When numbers are arranged in ascending/descending order, then only numbers are arranged and digits remain same on their position.

Ascending- 086 456 563 634 678

Descending- 678 634 563 456 086

- (c) When digits are operated in ascending/descending/reversed order, then only digits are arranged and numbers remain same on their position.

Ascending- 346 356 068 456 678

Descending- 643 653 860 654 876

Reversed- 436 365 680 654 876

- (d) When digits interchange their position, then numbers remain same on their position.

Ex- 2nd and 3rd digit interchange their position, so new arrangement is

643 536 068 465 687

○ Important tips:

Left + Left = (-) from Left

Right + Right = (-) from Right

Left + Right = (+) from Right

Right + Left = (+) from Left

EXAMPLE

Read the following character sequence carefully and then answer the questions given below it:

B C Z 4 X 6 Δ G \$ M P • 5 % R

- (1) Which character is 3rd to the right of 4th from the right?

Explanation: 3rd to the right of 4th from the right means (4 – 3) from right = 1st from right = R

- (2) Which character is 2nd to the left of 7th from left?

Explanation: 2nd to the left of 7th from left means (7 – 2) from left = 5th from left = X

- (3) Which character is 2nd to the left of 7th from right?
Explanation: 2nd to the left of 7th from right means (7 + 2) from right = 9th from right = Δ
- (4) Which character is 2nd to the right of 7th from left?
Explanation: 2nd to the right of 7th from left means (7 + 2) from left = 9th from left = \$

Points to Remember

- (1) Give proper attention to twisted terms like "Preceded" and "Followed/succeeded".
- (2) Follow the important tips which are mentioned in concept part to solve questions in less time.
- (3) Count characters from left or right in series properly because a silly mistake will make your answer wrong.

EXERCISE

Foundation

Directions (1-10): What should be come in place of question mark (?)

1. ABABCABCDABCD?

(a) A	(b) B	(c) C
(d) D	(e) E	
2. ZZYZYXZYXWZY?

(a) Z	(b) Y	(c) X
(d) W	(e) None of these	
3. ANZBOYCPXD?W

(a) Q	(b) R	(c) S
(d) T	(e) U	
4. ABDGKP?

(a) S	(b) T	(c) Q
(d) V	(e) None of these	
5. AY, BX, CW, DV, ?

(a) GH	(b) EF	(c) EU
(d) EV	(e) None of these	
6. A2Y, B4W, C6U ?

(a) C8S	(b) D8S	(c) E8T
(d) D75	(e) None of these	
7. AB, CF, EJ, ?, IR

(a) FM	(b) FL	(c) FJ
(d) GN	(e) None of these	
8. BY, DW, ?, HS, JQ

(a) FT	(b) FU	(c) GU
(d) EU	(e) None of these	
9. ZZYZYXZYXWZYXWVZYXWVUZYXWVU?

(a) T	(b) U	(c) W
(d) S	(e) None of these	
10. ZYXWVUTZYXWVUZYXWVZYXW?

(a) V	(b) Y	(c) Z
(d) U	(e) None of these	

Direction (11-15): Study the following alphanumeric series carefully and answer the questions given below:

S 5 D G H & M * 7 8 # B 9 K L @ 6 % U & * 2

11. How many alphabets in the above series are immediately preceded and followed by symbols?

(a) None	(b) Two	(c) One
(d) Three	(e) None of these	
12. Which element is 5th to the left of the element which is 7th from the right end?

(a) #	(b) &	(c) 8
(d) B	(e) 7	

13. How many vowels are between the 6th element from the left end and 4th element from the right end?

- | | | |
|-----------|-------------------|---------|
| (a) None | (b) One | (c) Two |
| (d) Three | (e) None of these | |

14. What would come at the question mark in the following sequence? **5DG &M* #B9 ?**

- | | | |
|---------|-------------------|---------|
| (a) @6% | (b) 6%U | (c) L@6 |
| (d) %U& | (e) None of these | |

15. How many numbers are there in the above series which are immediately followed by symbols and immediately preceded by alphabets?

- | | | |
|-----------|-------------------|---------|
| (a) None | (b) One | (c) Two |
| (d) Three | (e) None of these | |

Direction (16-20): Study the following alphanumeric series carefully and answer the questions given below:

D % G \$ & H J R 6 Y # I L 9 \$ 7 @ V 1 X A 8 %

16. How many numbers in the series are preceded as well as followed by alphabets?

- | | | |
|----------|---------------------|-----------|
| (a) None | (b) One | (c) Three |
| (d) Two | (e) More than three | |

17. If we eliminated all the numbers in this series then, which of the following element is 5th to the right of H?

- | | | |
|-------|-------------------|-------|
| (a) Y | (b) # | (c) I |
| (d) L | (e) None of these | |

18. How many numbers in the series are preceded as well as followed by symbols?

- | | | |
|-----------|---------------------|----------|
| (a) Three | (b) One | (c) None |
| (d) Two | (e) More than three | |

19. Which of the following element is 4th to the left of the element which is 5th from right end?

- | | | |
|-------|-------------------|--------|
| (a) L | (b) 9 | (c) \$ |
| (d) 7 | (e) None of these | |

20. If we eliminated all alphabets in this series then, which of the following element is 4th to the left of @?

- | | | |
|-------|-------------------|--------|
| (a) 6 | (b) # | (c) \$ |
| (d) 9 | (e) None of these | |

Directions (21-25): The following questions are based on the five three-digit numbers given below:

574 658 821 945 247

21. If one is added to the last digit of each of the numbers, in how many numbers thus formed will the last digit be a perfect square (1 is also be a perfect square)?

- | | | |
|----------|-------------------|-----------|
| (a) one | (b) two | (c) three |
| (d) four | (e) None of these | |

- 22.** If 1 is subtracted from the 1st digit of each number then how many numbers thus formed will be divisible by three?
 (a) none (b) one (c) two
 (d) three (e) four
- 23.** If in each number, all the three-digit are arranged in ascending order within the number which of the following will be the highest number?
 (a) 574 (b) 658 (c) 821
 (d) 945 (e) 247
- 24.** If in each number the first two digits are replaced by their sum then which number will be the largest?
 (a) 574 (b) 658 (c) 821
 (d) 945 (e) 247
- 25.** If in each number the position of 1st and the 2nd digit are interchanged which number will be the smallest?
 (a) 574 (b) 658 (c) 821
 (d) 945 (e) 247

Directions (26-30): These questions are based on following set of numbers.

937 483 765 572 684

- 26.** If in each number the first two digit are replaced by their sum which number will be the largest?
 (a) 937 (b) 684 (c) 765
 (d) 483 (e) 572
- 27.** If '1' is added to the second digit and then the first and second digits are interchanged. Which number will be third highest?
 (a) 684 (b) 483 (c) 572
 (d) 937 (e) 765
- 28.** If the order of first and last digit is reversed and then the numbers are arranged in descending order, which numbers will be second from right.
 (a) 937 (b) 483 (c) 765
 (d) 572 (e) 684
- 29.** If in each number the positions of first and second digits are interchanged, which number will be the smallest?
 (a) 684 (b) 572 (c) 765
 (d) 483 (e) 937
- 30.** If in each number '1' is added to the last digit and then the position of second and third digits are interchanged which number will be the largest.
 (a) 483 (b) 684 (c) 765
 (d) 937 (e) 572

Directions (31-35): The following questions are based on the five three digit numbers given below:

374 659 821 945 247

- 31.** If 1 is subtracted from the last digit of each numbers how many numbers thus formed is divisible by two?
 (a) None (b) one (c) two
 (d) three (e) four
- 32.** If in each number the first and second digits are interchanged, which of the following will be the third lowest number?
 (a) 374 (b) 247 (c) 659
 (d) 821 (e) 945

- 33.** If in each number 2 is added to the middle digit and then first two digit are interchanged then which of the number will be the largest?
 (a) 659 (b) 945 (c) 374
 (d) 247 (e) 821

- 34.** If 1 is subtracted from the last digit of each of the numbers then in how many numbers thus formed will be the last digit be perfect square (one is also a perfect square)
 (a) None (b) one (c) two
 (d) three (e) four

- 35.** If in each number, all the three digits are arranged in ascending order within the number which of the following will be the second highest number.
 (a) 247 (b) 374 (c) 659
 (d) 821 (e) 945

Direction (36-40): Following questions are based on the five three digit numbers given below:

328 642 836 697 954

- 36.** If all the numbers are arranged in descending order from left to right, which of the following will be the product of the first and the second digits of the number which is exactly in the middle of the new arrangement.
 (a) 6 (b) 63 (c) 24
 (d) 54 (e) 45

- 37.** One is subtracted from the first digit and two is subtracted from third digit of each of the numbers. What will be the difference between the first digit of the highest number and the third digit of the lowest number?

- (a) 1 (b) 2 (c) 3
 (d) 4 (e) 5

- 38.** What will be the resultant if the 1st digit of the second highest number is divided by the 3rd digit of the highest number.

- (a) 2 (b) 1 (c) 4
 (d) 6 (e) None of these

- 39.** If the position of the first and the third digits of each of the numbers are interchanged. What will be the sum of all the digit of the second highest number thus formed?

- (a) 12 (b) 13 (c) 17
 (d) 18 (e) 22

- 40.** If all the digits in each of the number are arranged in descending order within the number, which of the following will form the lowest number in the new arrangement of numbers.

- (a) 328 (b) 642 (c) 697
 (d) 836 (e) 954

Moderate

Directions (1-5): These questions are based on the following set of numbers.

538 687 239 764 848

- 1.** If in each number the first and the third digits are interchanged and then newly formed numbers are arranged in ascending order, which number will be the third?

- (a) 538 (b) 687 (c) 764
 (d) 848 (e) 239

2. If '1' is added to the first digit of each number and '1' is subtracted from the second digit, which number will be the largest?
 (a) 687 (b) 239 (c) 848
 (d) 538 (e) 764
3. If in each number the positions of the first and second digits are interchanged which number will be the smallest?
 (a) 538 (b) 239 (c) 687
 (d) 764 (e) 848
4. If '1' is subtracted from the last digit as well as the first digit and then the second and third digits are interchanged, which number will be the second if arranged in ascending order?
 (a) 538 (b) 239 (c) 764
 (d) 687 (e) 848
5. If all the second digits of the numbers are reduced by 2 and then increased by 1 and arranged in ascending order after that how many digits will appear 2 or more than 2 times in the whole series?
 (a) One (b) Two (c) Three
 (d) Four (e) five

Directions (6-10): The following questions are based on the five four digit number given below:

3475 2791 6458 1826 7583

6. If one is added to the last digit of each of the numbers in how many numbers thus formed will be the last digit be a perfect square (one is also perfect square).
 (a) none (b) one (c) two
 (d) three (e) four
7. If the first and third digit of each of the numbers are interchanged what will be the sum of the third digit of the lowest number and the third digit of the highest number.
 (a) 3 (b) 6 (c) 7
 (d) 4 (e) None of these
8. What will be the resultant if the second digit of the highest number is subtracted from the third digit of the second lowest number?
 (a) 2 (b) 3 (c) 4
 (d) 5 (e) None of these
9. If all the digit in each of the numbers are arranged in descending order from left to right within the number which of the following will be the sum of all the four digits of the number which is third highest in the new arrangement.
 (a) 19 (b) 32 (c) 17
 (d) 23 (e) None of these
10. If in each number the first and the last digits are interchanged. Which of the following will be the second lowest number?
 (a) 3475 (b) 2791 (c) 6458
 (d) 1826 (e) 7583

Directions (11-15): Study the following arrangement carefully to answer the questions given below:

7, 2, 6, 3, 7, 5, 6, 4, 2, 9, 6, 1, 3, 4, 1, 6, 3, 9, 1, 5, 6, 9, 2, 3, 1, 6, 5, 4, 3, 2, 1, 9, 6, 7, 1, 6, 3

11. How many 6s are there in the following numbers series, each of which is immediately preceded by 1 or 5 and immediately followed by 3 or 9?

- (a) None (b) One (c) Two
 (d) Three (e) None of these

12. How many 3s are there in the following number series each of which is preceded by its multiple and immediately followed by its multiple also.

- (a) One (b) Two (c) Three
 (d) More than three (e) None of these

13. Which is 7th digit to the right of 25th from right end?

- (a) 5 (b) 1 (c) 6
 (d) 7 (e) None of these

14. How many 1s are there which are followed as well as preceded by even number?

- (a) None (b) One (c) Two
 (d) Three (e) None of these

15. Which is 5th digit to the left of 20th from right end?

- (a) 3 (b) 9 (c) 2
 (d) 4 (e) None of these

Directions (16-20): Study the following arrangement carefully and answer the questions given below:

**7 6 1 7 9 2 4 1 5 6 4 9 2 3 4 1 2 5 8 5 8 4 8 3 1
2 7 5 2 6 7 2 9 5 3**

16. How many 2s are there in the above arrangement, each of which is immediately followed by a digit which have a numerical value of more than four?

- (a) None (b) One (c) Two
 (d) Three (e) More than three

17. How many such 1s are there in the above arrangement, each of which is immediately preceded by a perfect square?

- (a) None (b) One (c) Two
 (d) Three (e) More than three

18. How many such 5s are there in the above arrangement each of which is immediately preceded and followed by an odd digit?

- (a) None (b) One (c) Two
 (d) Three (e) More than three

19. Which of the following is third to the left of the eighteenth digit from the left end of the above arrangement?

- (a) 8 (b) 3 (c) 4
 (d) 5 (e) 1

20. If all the even digits are deleted from the above arrangement, which of the following will be ninth from the right end of arrangement?

- (a) 9
 (b) 3
 (c) 1
 (d) 5
 (e) 7

Directions (21-25): Study the following arrangements carefully and answer the question given below.

2 4 8 5 6 β 1 3 @ 6 4 5 2 # 9 7 1 3 ≤

21. Which of the following digit/symbol is second to the right of the 10th from the left end?

- (a) 6
 (b) 4
 (c) 5
 (d) 3
 (e) None of these

- 22.** How many pairs of numbers are there in the series highlighted in bold in the above arrangement each of which as many numbers between them (in both forward and backward directions) as they have between them in the numerical series?
 (a) one (b) two (c) three
 (d) four (e) None of these
- 23.** How many symbol are there in the above arrangement each of which is immediately followed by perfect square (one is a perfect square)
 (a) one (b) two (c) three
 (d) four (e) five
- 24.** How many perfect squares are there in the above arrangement, each of which is immediately preceded by an even number? (One is also a perfect square).
 (a) one (b) two (c) three
 (d) four (e) None of these
- 25.** If all the symbols are dropped from the above arrangement, which of the following will be the 12th from the right end of the above arrangement?
 (a) 5 (b) 3 (c) 6
 (d) 1 (e) None of these

Directions (26-30): Study the following arrangements carefully and answer the question given below.

3 4 2 6 8 7 © 5 4 * 3 2 9 \$ 1 6 5 3 7 # 9 8 6 @ 2 1 4 3 π 9 8 7 2
b 4 3

- 26.** How many 2's are there in the above arrangement, each of which is immediate followed by a perfect square? (1 is also a perfect square)
 (a) None (b) One (c) Two
 (d) Three (e) More than Three
- 27.** Which of the following is 5th to the right of 18th from the left end of the above arrangement?
 (a) \$ (b) 9 (c) 2
 (d) @ (e) 6
- 28.** How many symbols are there in the above arrangement each of which is immediately preceded as well as followed by an even number in the above arrangement
 (a) None (b) One (c) Two
 (d) Three (e) More than Three
- 29.** If all the digits that are perfect square are dropped from the above arrangement, which of the following will be 13th (digit/symbol) from the left end of the above arrangement.
 (a) \$ (b) 2 (c) #
 (d) 7 (e) 5
- 30.** How many pairs of digit are there in the number **highlighted in bold** in the above arrangement each of which has many digits between them (in both forward and backward directions) as they have between them in the numerical series?
 (a) One (b) Two (c) Three
 (d) Four (e) Five

Directions (31-35): Following questions are based on the five three-digit numbers given below.

452 869 125 345 854

- 31.** If all the digits in the number are arranged in the descending order within the number from left to right, then which among the following will be the lowest

- number after re arrangement?
 (a) 452 (b) 869 (c) 125
 (d) 345 (e) 854

- 32.** What is the product of 3rd digit of 2nd lowest number and 1st digit of 2nd highest number?
 (a) 36 (b) 38 (c) 40
 (d) 44 (e) None of these
- 33.** If 1 is subtracted from each number than how many numbers thus formed are odd numbers?
 (a) One (b) Two (c) Three
 (d) Four (e) None of these
- 34.** What is the product of the 1st digit of highest number and 2nd digit of the lowest number?
 (a) 6 (b) 8 (c) 15
 (d) 16 (e) None of these

- 35.** If all the numbers are added, then what will be the 3rd digit of the new number formed?
 (a) 2 (b) 3 (c) 6
 (d) 4 (e) None of these

Directions (36-40): These questions are based on the following five numbers:

451 685 254 723 132

- 36.** If we arranged all numbers in descending order from left then, the position of how many numbers are remain unchanged?
 (a) One (b) None (c) Three
 (d) Two (e) More than three
- 37.** If we interchanged 1st and 3rd digit of each number then, how many numbers become even?
 (a) None (b) Three (c) Two
 (d) One (e) More than three
- 38.** If we interchanged 1st and 2nd digit of each number then, which of the following number becomes 3rd highest number?
 (a) 451 (b) 685 (c) 254
 (d) 723 (e) 132
- 39.** If we interchanged 2nd and 3rd digit of each number, then how many numbers become odd?
 (a) One (b) None (c) Two
 (d) Three (e) More than three

- 40.** What is the total sum of 3rd digit of 2nd number from left and 2nd digit of 3rd number from right?
 (a) 10 (b) 8 (c) 9
 (d) 11 (e) None of these

Directions (41-45): Following questions are based on the five words given below, Study the following words and answer the following question:

SAND CARE RUIN MOON NICE

- 41.** If the letters are arranged in alphabetical order within the words then how many words will start with a vowel?
 (a) One (b) Three (c) Two
 (d) Four (e) Five
- 42.** If the given words are arranged in the order as they appear in a dictionary from left to right, then which of the following word will be second from the right end?
 (a) RUIN (b) MOON (c) SAND
 (d) NICE (e) CARE

- 43.** How many letters are there between the first letter of the first word from the left end and the second letter of the third word from the right end?
 (a) Two (b) Three (c) Four
 (d) One (e) More than four

- 44.** If in each of the given words, every consonant is changed to its previous letter and every vowel is changed to its next letter according to the English alphabetical series, then in how many words, thus formed, at least one vowel will appear?
 (a) One (b) Two (c) Three
 (d) More than three (e) None

- 45.** If the given words are arranged in the order as they appear in a dictionary from right to left, which of the following will be second from the left end?
 (a) RUIN (b) MOON (c) NICE
 (d) SAND (e) CARE

Direction (46-49): Study the following alphabetic series carefully and answer the questions given below:

C V B N H G M K J N X Z A E S Q W E R P X I U T R L O A

- 46.** How many letters are there in the series which is preceded by vowel and succeeded by consonant?
 (a) None (b) One (c) Two
 (d) Three (e) More than three

- 47.** Which of the following letter is 9th from left of 'U'?
 (a) A (b) E (c) S
 (d) Q (e) None of these

- 48.** If all vowels are eliminated from the series then, which of the following letter is 11th from right end?
 (a) N (b) Z (c) X
 (d) S (e) None of these

- 49.** How many letters are there in the series which is preceded by vowel and succeeded by the letter which comes before K in English alphabetical series?
 (a) None (b) One (c) Two
 (d) Three (e) More than Three.

Difficult

Directions (1-5): In each of the questions given below, a group of letters is given followed by four combinations of symbols/numbers (a), (b), (c) and (d). You have to find out which of the four combinations correctly represents the group of letters based on the symbol/number codes and the conditions given below. If none of the four combinations represents the group of digits correctly, give (e) 'None of these' as the answer.

K	Z	M	Q	A	B	S	E	D	P	I	L	X	O	C	U
2	3	@	7	%	#	1	6	0	8	5	!	4	+	^	9

Steps:

- (a) If the first and fourth letter of the word are vowel, then both are coded as first letter.
- (b) If the first letter is vowel and last letter is consonant, then both are coded as last letter.
- (c) If the both first and last letter of the word are vowel, then the codes for both letter will be interchanged.
- (d) If the both first and last letter of the word are consonant, then both are coded as &.

- | | | | |
|-----------------|--------------|-------------------|-------------|
| 1. ALXBC | (a) ^!4# ^ | (b) %!4# ^ | (c) ^! #4 ^ |
| | (d) ^ 4 #! ^ | (e) None of these | |
| 2. SMZPQ | (a) 1@387 | (b) &3@8& | (c) 7@381 |
| | (d) &83@& | (e) None of these | |
| 3. OPDCM | (a) @08%3 | (b) @08 ^ 3 | (c) @80 ^ @ |
| | (d) 3%80+ | (e) None of these | |
| 4. BELXU | (a) #4!69 | (b) #6!49 | (c) 6#!46 |
| | (d) #6!94 | (e) None of these | |
| 5. IBXCU | (a) 5#4 ^ 9 | (b) 94# ^ 5 | (c) 59#4 ^ |
| | (d) 9#4 ^ 5 | (e) None of these | |

Directions (6-10): In each of the following below is given a group of letters followed by four combinations of digits/symbols numbered (a), (b), (c) and (d). You have to find out which of the combinations correctly represents the group of letters based on the following coding system and mark the number of that combination as the answer. If none of the four combinations correctly represents the group of letters, mark (e), i.e. 'None of these', as the answer. Note: More than one condition may apply.

Letter	R	G	F	A	P	Q	U	N	E	I	K	J	S	O	H
Digit/Symbol	#	2	7	μ	%	3	&	9	1	@	5	©	6	8	\$

Conditions:

- (i) If first letter is vowel and last letter is consonant then both are coded with the code of the consonant.
- (ii) If both the 2nd letter and the last letter is vowel, then their codes are to be interchanged.
- (iii) If the second letter is a consonant and the 2nd last letter is a vowel, then both are to be coded as the code for the vowel.
- (iv) If both 1st and fifth letter is consonant then both are coded as the code of third letter.
- (v) If only one condition is applied among the above given, then the code of first letter is interchanged with code of second letter and third letter code interchanged with 4th letter and so on after that applied condition.

- | | | | |
|-------------------|---------------|-------------------|---------------|
| 6. ANSHIKA | (a) μ96\$5@μ | (b) μ96\$5@\$ | (c) μ9@6\$5μ |
| | (d) μ96@\$5μ | (e) None of these | |
| 7. RFKOSH | (a) 7558\$5 | (b) 758\$55 | (c) 57585\$ |
| | (d) 7585\$5 | (e) None of these | |
| 8. NIHONE | (a) \$@\$8\$@ | (b) \$1@8\$@ | (c) \$1\$8\$@ |
| | (d) \$1\$7\$@ | (e) None of these | |
| 9. HSJEQP | (a) 6©1@%© | (b) 6©1©\$© | (c) 6©1©%6 |
| | (d) 6©1©%© | (e) None of these | |
| 10. AROHIS | (a) 6@8\$@6 | (b) 6#8\$#6 | (c) 6@6\$#6 |
| | (d) 6@8\$#6 | (e) None of these | |

Directions (11-15): Study the following alphanumeric series carefully and answer the questions given below:

L E 8 Y O & H G 9 J 9 @ % S 4 I O 9 U * K # 3 \$ 1 T 3 @ 9

STEP 1: The letters which are immediately followed and immediately preceded by a number are arranged in the end of the series in the alphabetical order.

STEP 2: The numbers which are immediately preceded by the number and immediately followed by the symbols are arranged in the starting of the series in the ascending order. (They are arranged just before L)

STEP 3: The symbols which are immediately followed by number are interchanged its position with respect to the element just after it.

NOTE: STEP-2 is applied after STEP-1 and STEP-3 is applied after STEP-2.

11. How many letters are arranged before letter (K) of the series in the step-1?

- (a) Twenty (b) Nineteen (c) Seventeen
 (d) Ten (e) None of these

12. How many vowels are immediately followed by letter in step-3?

- (a) Five (b) Three (c) One
 (d) Six (e) None of these

13. Which among the following are the elements which are 4th position from the left end in the step-2 and 7th position from the right end in step-1?

- (a) Y3 (b) E3 (c) P#
 (d) E\$ (e) None of these

14. How many symbols are immediately preceded by number in step-2?

- (a) Five (b) Three (c) One
 (d) Two (e) None of these

15. Which among the following element is exactly between the element, which is 5th from the left end and the element, which is 7th from the right end in step-3?

- (a) % (b) 4 (c) S
 (d) I (e) None of these

Directions (16-20): Study the following information and answer the given questions: Arrange the following string, as per the steps given below-

Z 7 U @ 6 D £ 5 ¥ G 8 \$ K # 3 E 2 R & % 1 P 9 B μ ^ A 4 H

STEP 1: The Numbers which is immediately preceded by the symbol and immediately followed by an Alphabet are written from the right end in ascending order.

STEP 2: Interchanging the even number with the previous element in the series to form the step- 2

STEP 3: Alphabet which is immediately preceded by a symbol are written between seventh and eighth element from the left end in alphabetical order.

STEP 4: The first fourteen element from the left end is written after the last element in series in the reverse order (It means fourteenth element from the left end is written immediately after the last element and so on..)

NOTE: (STEP II is applied after STEP I and STEP III is applied after STEP II and STEP IV is applied after STEP III)

16. Which of the following element is sixth to the right of the element which is ninth from the left end in step 3?

- (a) \$ (b) K (c) #
 (d) G (e) None of these

17. If the alphabet which is immediately followed by a consonant is changed to next letter in alphabet series in step 2, then how many vowels are present in the newly formed series?

- (a) Two (b) None (c) Three
 (d) One (e) More than three

18. If all the symbols are removed from the step 1, then which of the following element will be in the middle of the series?

- (a) 2 (b) P (c) R
 (d) Both (a) and (c)
 (e) Both (a) and (b)

19. How many alphabets are immediately followed and immediately preceded by number in step 4?

- (a) One (b) Two (c) None
 (d) Three (e) More than three

20. What will be the product of the number which is sixth from the right end in step 1 and the number which is fifth from the left end in step 4?

- (a) 48 (b) 42 (c) 54
 (d) 24 (e) 12

Directions (21-24): Study the following alphanumeric series carefully and answer the questions given below:

A S 2 ! D F @ 9 G H 7 # 8 J K 3 \$ % L Z * 5 ^ X C 4 V & B 6 N 1

STEP 1: The letters which are immediately preceded by symbol and immediately followed by a consonant are arranged just after 2 in the series in the alphabetical order.

STEP 2: The numbers which are immediately preceded by the Symbol and immediately followed by the letter are arranged between 6 and N in the decreasing order.

STEP 3: The letters which are immediately preceded by the symbol and immediately followed by the number are arranged in the beginning of the series in the alphabetical order.

NOTE: (STEP 2 is applied after STEP 1 and STEP 3 is applied after STEP 2)

21. How many numbers are between 4th element from left and 7th element from right in the last step?

- (a) Two (b) Three (c) Four
 (d) Six (e) None of these

22. Which of the following element is 3rd to the left of 5th element from the right end in Step 2?

- (a) C (b) 4 (c) &
 (d) B (e) V

23. How many symbols are immediately followed by numbers in Step 3?

- (a) One (b) Three (c) Four
 (d) Five (e) Two

24. Which of the following element is 7th to the left of “8” in the Step 2?

- (a) C (b) ^ (c) 4
 (d) V (e) %

- 36.** (d) the number which will be in the middle be 697, so product of 1st and 2nd digit is $6 \times 9 = 54$
- 37.** (b) After doing this process 226,540,734,595,852
Highest no. = 852 = first digit = 8
Lowest no. = 226 = third digit = 6
Difference = $8 - 6 = 2$
- 38.** (a) third digit of highest no (954) = 4
1st digit of second highest no (836) = 2
Result = $8 \div 4 = 2$
- 39.** (e) After doing this process we get numbers are = 823,246,638,796,459
Second highest no = 796 = $7 + 9 + 6 = 22$
- 40.** (b) after doing this process we get numbers are as follow: 832, 642, 863, 976, 954 so lowest numbers 642 come from 642.

Moderate

Directions (1-5):

- 1.** (a) New numbers – 835 786 932 467 848
Ascending order – $467 < 786 < 835 < 848 < 932$
Ans. 538
- 2.** (c) New numbers after applying operations – 628, 777, 329, 854, 938
largest number is 848
- 3.** (b) New numbers after interchanging operation – 358, 867, 329, 674, 488
Ans. 239
- 4.** (a) $538 \rightarrow 437 \rightarrow 473$
 $687 \rightarrow 586 \rightarrow 568$
 $239 \rightarrow 138 \rightarrow 183$
 $764 \rightarrow 663 \rightarrow 636$
 $848 \rightarrow 747 \rightarrow 774$
Ascending order – $183 < 473 < 568 < 636 < 774$
Ans. 538
- 5.** (d) New numbers – 528, 677, 219, 754, 838
Ascending order – $219 < 528 < 677 < 754 < 838$
Ans. 2, 5, 8, 7

Directions (6-10):

- 6.** (c) 6,2,9,7,4 perfect square is 9 and 4
- 7.** (a) after processing the series will be 7435, 9721, 5468, 2816, 8573 and desired result will be $1+2 = 3$
- 8.** (c) $9 - 5 = 4$
- 9.** (d) after this process numbers are
7543, 9721, 8654, 8621, 8753
 $8654 = 8 + 6 + 5 + 4 = 23$
- 10.** (e) 7583

Directions (11-15):

- 11.** (d) three = 163, 569, 163
- 12.** (a) one = 639
- 13.** (a) 18th digit from right = 5
- 14.** (b) one = 416
- 15.** (a) 25th digit from right end = 3

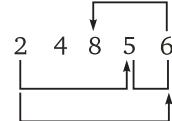
Directions (16-20):

- 16.** (e) four = 25, 27, 26, 29

- 17.** (c) two = 41, 41
18. (b) one = 953
19. (c) 15th from left = 4
20. (d) 5

Directions (21-25):

- 21.** (c) 12th from left = 5
22. (d)



- 23.** (b) two = β1, #9

- 24.** (b) two = 24, 64

- 25.** (a) 5

Directions (26-30):

- 26.** (c) two = 29, 21
27. (e) 23rd from left end = 6
28. (c) two = 6@2, 2@4
29. (e) 5
30. (d) 4 = 3 4 2 6 8 7



Directions (31-35):

- 31.** (c) **32.** (c) **33.** (b) **34.** (d) **35.** (d)

Directions (36-40):

- 36.** (d) 451 685 254 723 132
723 685 451 254 132
37. (b) **38.** (c) **39.** (d) **40.** (a)

Directions (41-45):

- 41.** (b) SAND CARE RUIN MOON NICE
ADNS ACER INRU MNOO CEIN
42. (a) Arrangement according to dictionary from left to right: CARE, MOON, NICE, RUIN, SAND
43. (d) Number of letters between S and U is one.
44. (e) SAND CARE RUIN MOON NICE
RBMC BBQF QVJM LPPM MJBF
45. (a) Arrangement according to dictionary from right to left: SAND, RUN, NICE, MOON, CARE

Directions (46-49):

- 46.** (e) AES, ESQ, ERP, IUT, UTR
47. (b) **48.** (c) **49.** (a)

Difficult

Directions (1-5):

- 1.** (a) **2.** (e) **3.** (c) **4.** (b)
5. (d)

Directions (6-10):

- 6.** (e) No condition applies.
7. (d) Condition (iv) and (v) is applied.
8. (c) Condition (ii) and (iv) is applied.
9. (d) Condition (iv) and (v) is applied.
10. (a) Condition (i) and (iii) is applied.

32. (b) In row-1

Even number is followed by an odd number so
 $= 26 * 5 = 130$

Even number is followed by another even number so
 $= 130 + 12 = 142$

In row-2

Odd number is followed by an even number so
 $= 23 + 6 = 29$

If sum of resultant of both row is 177, therefore resultant of 2nd row is 35

Odd number is followed by an even number so
 $= 29 + 6 = 35$

So value of X will be 6.

33. (e) In row-1

Odd number is followed by an odd number so
 $= 33/3 = 11$

Odd number is followed by an even number so
 $= 11+2 = 13$

In row-2

Odd number is followed by an even number so
 $= 11+4 = 15$

Odd number is followed by an odd number so
 $= 15/3 = 5$

So, multiplication of resultant of two rows is 65.

Directions (34-38):

34. (e) For row-1:

An even number is followed by another even number
 $= 10/2 = 5$

An odd number is followed by another odd number (but not a perfect square) $= 5 + 3 = 8$

For row-2:

An odd number is followed by an even number (but not a perfect square) $= 13 \times 8 = 104$

An even number is followed by an odd number
 $= 104 + 9 = 113$

The sum is $= 113 + 8 = 121$.

35. (c): For row -1:

An odd number is followed by a perfect square
 $= 11 - 4 = 7$

An odd number is followed by a perfect square
 $= 9 - 7 = 2$

For row-2:

An even number is followed by another even number
 $= 30/6 = 5$

The resultant of row-2 is $= 52 - 2 = 50$

Then value of X must be = 10.

36. (d) For row - 1:

An odd number is followed by another odd number (but not a perfect square) $= 15 + 5 = 20$

An even number is followed by an odd number
 $= 20 + 9 = 29$

For row - 2:

An even number is followed by an odd number
 $= 6 + 13 = 19$

An odd number is followed by an even number (but not a perfect square) $= 19 \times 14 = 266$

The difference of row-1 and row-2 $= 266 - 29 = 237$

37. (d) For row - 1:

An odd number is followed by another odd number (but not a perfect square) $= 27 + 23 = 50$

An even number is followed by another even number
 $= 50/10 = 5$

For row - 2:

An even number is followed by an odd number
 $= 18 + 15 = 33$

An odd number is followed by another odd number (but not a perfect square) $= 33 + 11 = 44$

The multiplication of row-1 and row-2 $= 5 \times 44 = 220$

38. (b) For row - 1:

An odd number is followed by an even number (but not a perfect square) $= 3 \times 10 = 30$

An even number is followed by an odd number
 $= 30 + 5 = 35$

For row - 2:

An odd number is followed by a perfect square
 $= 7 - 4 = 3$

An odd number is followed by a perfect square
 $= 9 - 3 = 6$

The multiplication of row-1 and row-2 $= 35 + 6 = 41$

39. (c) VS = I©, U#

40. (b) 9DF

Previous Year (Memory Based)

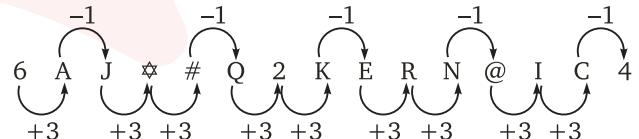
Directions (1-5):

1. (b) 10th from the right end, i.e., N.

2. (d) Fifth to the left of the 18th from the left end $= 18 - 5 = 13$ th from the left, i.e., 2.

3. (a)

4. (c)



5. (b) 6HJ, 2ME, 4CT

Directions (6-10):

6. (b) U9

7. (c) Sixth to the right of the 19th from the right end, that is $(19 - 6 =)$ 13th from the right, i.e., 4.

8. (c) #RN, ©WP

9. (d) D F # R N A @ Y M © W P H U K E

10. (e) Fifth letter \rightarrow R Sixth letter \rightarrow N

Eighth letter \rightarrow A Twelfth letter \rightarrow M

Twentieth letter \rightarrow I Twenty-third letter \rightarrow E

The meaningful words that can be formed are MARINE and REMAIN.

Hence, either I or A will be fourth letter from the left.

Directions (11-15):

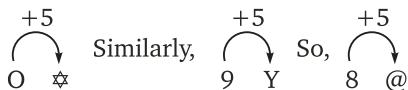
11. (b) New arrangement



Hence the eighth from the left end is 9.

12. (c) E 9, U 4

13. (c) XZ, LH



14. (b)

15. (a) Sixth to the right of thirteenth from the right end is $(13 - 6) = 7$ th from the right end, i.e., @.

Directions (16-20):

16. (a) New arrangement

K 2 8 P B 3 H G T I A Y E 4 9 L U 7 C N

Hence, 10th from right end is A.

17. (e) K, 3H, GT, AY, 9L, 7C, and CN

18. (b) K2 and B3

19. (d)

20. (a) New arrangement:

A 2 8% B # C 3 E \$ G H I K L N £ 4 9 P T @ 7 U Y

Hence, sixteenth from the left is N.

Directions (21-25):

21. (c) New arrangement:

A D F K E 8 J Q 1 V T U 2 W 6 B G I L 7 3 H.

Hence, eleventh from right end is U.

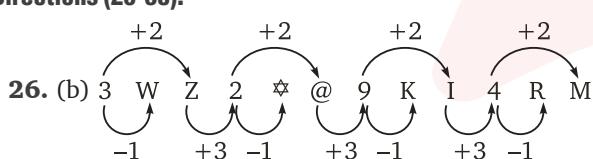
22. (e) E8, Q1, U2, L7. Hence there are four such letters.

23. (b) G @ I

24. (b) FKE, VTU

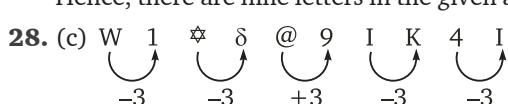
25. (e)

Directions (26-30):



27. (e) 8Q, 2J, 9P, 7T, 6F, QW, UK, ME, PI

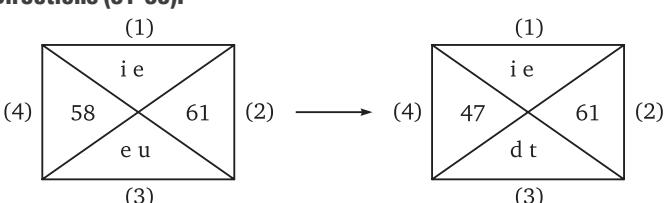
Hence, there are nine letters in the given arrangement.



29. (a) Fifth to the right of fifteenth from the right end $= (15 - 5) = 10$ th from the right, i.e., 4.

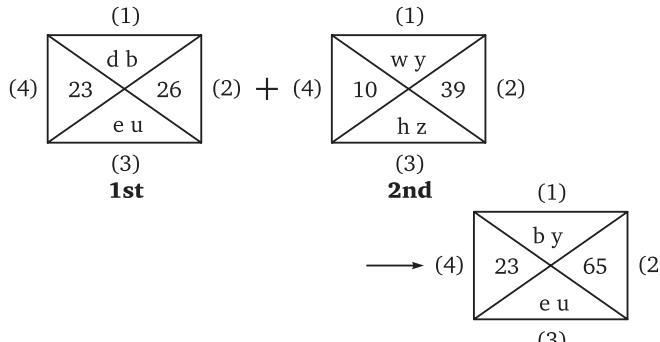
30. (c) W3*, Z5\$, R4\$

Directions (31-35):



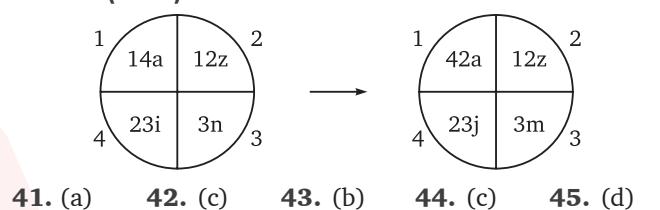
31. (c) 32. (b) 33. (c) 34. (d) 35. (e)

Directions (36-40):



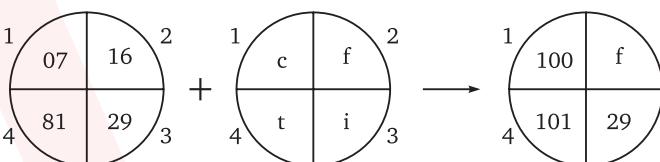
36. (b) 37. (a) 38. (e) 39. (a) 40. (b)

Directions (41-45):



41. (a) 42. (c) 43. (b) 44. (c) 45. (d)

Directions (46-50):



46. (b) 47. (b) 48. (b) 49. (c) 50. (d)

Directions (51-55):

$$(1) \frac{stu}{2} \longrightarrow 900 \quad (2) \frac{mja}{3} \longrightarrow 512$$

$$(3) \frac{hck}{4} \longrightarrow 4 \quad (4) \frac{niy}{5} \longrightarrow 27$$

51. (a) 52. (c) 53. (d) 54. (c) 55. (b)

Directions (56-60):

$$(1) \frac{ter}{4} + \frac{yan}{2} \longrightarrow 32 \quad (2) \frac{ick}{5} + \frac{aly}{3} \longrightarrow 5$$

$$(3) \frac{ken}{6} + \frac{kha}{8} \longrightarrow k \quad (4) \frac{hat}{7} + \frac{urf}{9} \longrightarrow 16$$

56. (a) 57. (b) 58. (c) 59. (d) 60. (b)

Directions (61-64):

61. (b) "7 2"
62. (c) "2"
63. (b) "5"
64. (b) "1 4"

Directions (65-69):

65. (a) 66. (e) 67. (c) 68. (c) 69. (a)

Directions (70-74):

70. (b) 71. (c) 72. (d) 73. (a) 74. (d)

03

Coding-Decoding

Definition : In this type of test secret messages or words have to be deciphered or decoded. They are coded according to a definite pattern or rule which should be identified first. Then the same rule be applied to decipher another coded word or message.

Types of Coding-Decoding

1. Letter coding
2. Coding by Analogy
3. Coding in Fictitious Languages
4. Coding by substitution
5. Coding by shifting words
6. Coding based on conditions
7. Mathematical operation Based coding

1. LETTER CODING

(i) Coding by shifting letters

Example: In a certain code language the word METAL is coded as LDSZK. How will the word ZINC be written in that language?

Solution :

M	E	T	A	L
-1↓	-1↓	-1↓	-1↓	-1↓
L	D	S	Z	K

Similarly,

Z	I	N	C
-1↓	-1↓	-1↓	-1↓
Y	H	M	B

Note: For coding concepts, you must know about numerical order of alphabet, which is A to Z.

Example :

A	B	C	D	E	F	G	H	I	J
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
1	2	3	4	5	6	7	8	9	10
K	L	M	N	O	P				
↓	↓	↓	↓	↓	↓				
11	12	13	14	15	16				
Q	R	S	T	U	V	W	X	Y	Z
↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
17	18	19	20	21	22	23	24	25	26

(ii) Coding by re-arranging letters

Example: In a certain code language the word NUMERICAL is written as LMUIREACN. How will be the word PUBLISHED be written in that language?

Solution :

N	U	M	E	R	I	C	A	L
1	2	3	4	5	6	7	8	9
⇒	L	M	U	I	R	E	A	C
9	3	2	6	5	4	8	7	1

Therefore,

$$\begin{array}{ccccccccc} \text{P} & \text{U} & \text{B} & \text{L} & \text{I} & \text{S} & \text{H} & \text{E} & \text{D} \\ 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \end{array} \Rightarrow \begin{array}{ccccccccc} \text{D} & \text{B} & \text{U} & \text{S} & \text{I} & \text{L} & \text{E} & \text{H} & \text{P} \\ 9 & 3 & 2 & 6 & 5 & 4 & 8 & 7 & 1 \end{array}$$

2. CODING BY ANALOGY

(i) Coding by shifting letters

Example: In a certain code language PEAR is written as RCCP and AUNT is written as CSPR. How is LAND written in that code?

Solution :

P	E	A	R
+2↓	-2↓	+2↓	-2↓
R	C	C	P

Similarly,

L	A	N	D
+2↓	-2↓	+2↓	-2↓
N	Y	P	B

(ii) Digit-coding

Example : In a certain code ROAM is written as 5913 and DONE is written as 4962. How is MEAN written in that code?

Solution :

Letter	A	D	E	M	N	O	R
Code	1	4	2	3	6	9	5

Similarly,

M	E	A	N
↓	↓	↓	↓
3	2	1	6

(iii) Symbol Coding

Example : In a certain code BROTHER is written as \$%53#4% and DREAM is written as 9%47*. How is THREAD written in that code?

Solution :

Letter	A	B	D	E	H	M	O	R	T
Code	7	\$	9	4	#	*	5	%	3

Similarly,

T	H	R	E	A	D
↓	↓	↓	↓	↓	↓
3	#	%	4	7	9

3. CODING IN FICTITIOUS LANGUAGE

Example : In a certain code 'nik ma de' means 'he has come', 'de lit pa' means 'come here fast' and 'ma la se' means 'she has gone'. What is the code for 'he' ?

Solution : We have,

nik ma de ⇒ he has come

... (i)

de lit pa \Rightarrow come here fast

... (ii)

ma la se \Rightarrow she has gone

... (iii)

Word

Code

He

nik

Has

ma

Come

de

Here

lit/pa

Fast

lit/pa

She

la/ se

Gone

la/se

'He' code is 'nik'

4. CODING BY SUBSTITUTION

Example : White means black, black means red, red means blue, blue means yellow and yellow means grey, then which of the following represents the colour of clear sky?

Solution: Clearly, we know that, the actual colour of sky is blue, and as given blue means yellow. Hence, the colour of sky is yellow.

5. CODING BY SHIFTING WORDS

Example: If the sentence 'layman can practice successful psychotherapy without great training' is written as 'practice without successful layman training psychotherapy can great' in a certain code, then how will I would have to think all the time' be written in that code?

Solution :

Layman	can	practice	successful	psychotherapy
1	2	3	4	5
without	great	training		
6	7	8		

Then after coding

3	6	4	1	8		
practice	without	successful	layman	training		
5	2	7				
psychotherapy	can	great				

Similarly,

I	Would	have	to	think	all	the	time
1	2	3	4	5	6	7	8

Then after coding

3	6	4	1	8	5	2	7
Have	all	to	I	time	think	would	the

6. CODING BASED ON CONDITIONS

Example:

Directions (1-3): Digits in the number given in each of the following questions are to be coded based on the codes and the condition given below:

Digit	2	9	4	6	3	8	1	7	5	0
Code	P	M	R	K	T	V	B	W	F	D

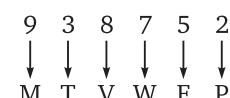
Conditions :

- (i) If both the first and the last digits of a number are odd numbers, they should be coded as 'Z'.
- (ii) If both the first and the last digits of a number are even numbers, they should be coded as 'A'

Questions and Solutions:

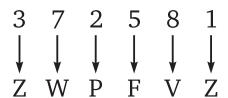
Q.(1) 9 3 8 7 5 2

No conditions are applied



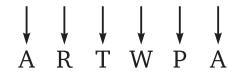
Q.(2) 3 7 2 5 8 1

Condition (i) Applies



Q.(3) 8 4 3 7 2 6

Condition (ii) Applies



7. MATHEMATICAL OPERATION BASED CODING

Example : If the alphabets are assigned values such as A = 3, D = 6, G = 8, I = 2, L = 4, and T = 5 then what is the sum of values of all the alphabets in the word DIGITAL?

Solutions :

A	D	G	I	L	T
3	6	8	2	4	5

$$6 + 2 + 8 + 2 + 5 + 3 + 4 = 30$$

(i) Alphabets and their numerical/place values play an important role in most of the part of reasoning like in coding decoding, machine input, alphabet series etc.

(ii) You should have these values on your tips to solve the problems faster and smarter.

TIPS AND TRICKS: In order to solve such questions quickly you need to memorize the following table of the reverse and the numerical values the ranks of the alphabets:

Numerical Value	Alphabets	Reverse	Numerical Value
1	A	Z	26
2	B	Y	25
3	C	X	2
4	D	W	23
5	E	V	22
6	F	U	21
7	G	T	20
8	H	S	19
9	I	R	18
10	J	Q	17
11	K	P	16
12	L	O	15
13	M	N	14

(iii) There are some pair of words which help to learn you these values more easily.

E	J	O	T	Y
5	10	15	20	25
C	F	I	L	O
3	6	9	12	15

- (iv) When 26 alphabets are broken into two series i.e., first 13 and last 13 alphabets and placed parallel to each other then, they make an ‘opposite letter series’. This series also has an important role in multiple topics and mainly in coding decoding. The opposite letter series is given below:

A – Z = **AZad**
 H – S = **High School, Harbhajan Singh**
 B – Y = **BoY**
 I – R = **Indian Railway**
 C – X = **CraX**
 J – Q = **Jungle Queen, Jack Queen**
 D – W = **DraW, DeW**
 K – P = **Kevin Pietersen**
 E – V = **EVen, EVening**
 L – O = **LOve**

F – U = **FUel**

M – N = **MaN**

G – T = **GaTe, Game of Thrones**

[Note: some combination of words is given to memorise these pairs easily.]

Points to Remember

- (1) Coding and Decoding questions are designed to judge the candidate’s ability to decipher the rule that given code follows.
- (2) While approaching a question, firstly decide the type of question asked, and then examine common Pattern in them.
- (3) After decoding every code, arrange all code in tabular form so, that you can easily find the answer to every questions.
- (4) Remember that it is scoring chapter, but a single mistake can make your every answer wrong.

EXERCISE

Foundation

1. If in a certain code, LUTE is written as MUTE and FATE is written as GATE, then how will BLUE be written in that code?
 (a) CLUE (b) GLUE (c) FLUE
 (d) SLUE (e) None of these
2. If in a certain language, MADRAS is coded as NBESBT, how BOMBAY coded in that language?
 (a) CPNCBX (b) CPNCBZ (c) CPOCBZ
 (d) CQOCBZ (e) None of these
3. If FISH is written as EHRG in a certain code, how would JUNGLE be written in that code?
 (a) ITMFKD (b) ITNFKD (c) KVOHMF
 (d) TIMFKD (e) None of these
4. In a certain code, TWINKLE is written as SVHOJKD then how would FILTERS be written in that code?
 (a) EHKSDQR (b) EHKUDQR (c) EGHUDQR
 (d) GJMSFST (e) None of these
5. In a certain code, ROAD is written as URDG. How is SWAN written in that code?
 (a) VXDQ (b) VZDQ (c) VZCP
 (d) UXDQ (e) None of these
6. If in a certain code, CHILDREN is written as BGHKESFO. How is GEOMETRY written in that code?
 (a) FDNMFUSX (b) FDNLFUSZ (c) HDNMFUTY
 (d) HDMNFUTZ (e) None of these
7. In a certain code, FAVOUR is written as EBUPTS. How is DANGER written in that code?
 (a) CBFFDS (b) CBMHDS (c) EBFHDS
 (d) EBHHFS (e) None of these
8. In a certain code, Productions is written as QQPCVEUHPMT. How is ORIENTATION written in that code?
 (a) PQJDVBSJNO (b) PQJDOUBUJPO
 (c) PSJFOVBSJNO (d) NSHFMVBSJNO
 (e) None of these

9. If in a code, MIND becomes KGLB and ARGUE becomes YPESC, then what will DIAGRAM be in that code?
 (a) BGYEPYK (b) BGYPYEK (c) GLPEYKB
 (d) LKBGYPK (e) None of these
10. In a certain code, BASIC is written as DDULE. How is LEADER written in that code?
 (a) NGCFGTE (b) NHCGGU (c) OGFDFHT
 (d) OHGDGHU (e) None of these
11. In a certain code “UNDER” is written as “6152@” and “DEAF” is written as “52#7”. How “FRAUD” is written in that code
 (a) 7@6#5 (b) 72#65 (c) 7@#65
 (d) 6@7#5 (e) None of these
12. In a certain code language, ‘coll tip mot’ means ‘singing is appreciable’, ‘mot baj min’ means ‘dancing is good’ and ‘tip nop baj’ mean ‘singing and dancing’, which of the following means ‘good’ in that code language?
 (a) Not (b) min (c) baj
 (d) Cannot be determined (e) None of these
13. In a certain code language, ‘mink yang pe’ means ‘fruits are ripe’, ‘pe lao may mink’ means ‘oranges are not ripe’ and ‘may pe nue mink’ means ‘mangoes are not ripe’. Which word in that language means ‘mangoes’?
 (a) May (b) pe (c) nue
 (d) mink (e) None of these
14. In a certain code language, ‘tom kun sud’ means ‘dogs are barking’, ‘kun jo mop’ means ‘dogs and horses’ and ‘mut tom ko, means ‘donkeys are mad’. Which word in that language means ‘barking’?
 (a) Sud (b) kun (c) jo
 (d) tom (e) ko
15. In a code language, ‘mok dan sil’ means ‘nice big house’, ‘fit kon dan’ means “house is good” and ‘warm tir fit’ means ‘cost is high’. Which word stands for ‘good’ in that language?
 (a) Mok (b) dan (c) fit
 (d) kon (e) None of these

Directions (35-39): Study the following information carefully and answer the questions given below:

In a certain code language

- 'in a certain code language
'exams good for growth' is coded as 'jam, dam, mam, ram'
'bank exams are difficult' is coded as 'pam, jam, vam, bam'
'bank growth not easy' is coded as 'pam, ram, lam, tam'
'easy for difficult preferred' is coded as 'tam, mam, ham, sa'

35. What is the code for the word 'exams' in the given code language?

- (a) jam (b) tam (c) lam
- (d) ram (e) None of these

36. 'ram' is the code for which of the following words?

- (a) bank (b) exams (c) easy
- (d) difficult (e) None of these

37. What is the code for the word 'preferred' in the given code language?

- (a) vam (b) ram (c) sam
- (d) jam (e) None of these

38. If 'busy not good' is coded as 'fam, lam, dam' then what could be the possible code for 'busy schedule'?

- (a) lam,bam (b) fam, pam (c) fam, cam
- (d) dam,cam (e) lam, cam

39. 'tam-bam' is the code for which of the following words?

- (a) growth-easy (b) not easy (c) preferred for
- (d) easy difficult (e) None of these

Directions (40-41): In a language 'truck is train', 'train is tractor', 'tractor is ship', 'ship is aero plane', 'aero plane is bulldozer', 'bulldozer is scooter' then in that language.

40. Which of the following can fly

- (a) aero plane (b) ship (c) bulldozer
- (d) train (e) truck

41. Which of the following can travel in water

- (a) aero plane (b) ship (c) bulldozer
- (d) trian (e) truck

Directions (42-44): In a certain language black is called white, white is called red, red is called green, green is called yellow, yellow is called pink, pink is called brown and brown is called saffron then

42. What is color of milk

- (a) black (b) red (c) green
- (d) yellow (e) None of these

43. What is color of human blood

- (a) black (b) red (c) green
- (d) yellow (e) None of these

44. What is color of leaf

- (a) black (b) red (c) green
- (d) yellow (e) None of these

45. If white is called blue, blue is called red, red is called green and green is called saffron. What is the color of Indian flag's first (top).

- (a) white (b) blue (c) Red
- (d) green (e) Cannot be determined

46. If white is called 'blue', blue is called 'red', red is called 'yellow', yellow is called 'green', green is called 'black', black is called 'violet' and violet is called 'orange', what would be the color of human blood?

- (a) Red (b) Green (c) Yellow
- (d) Violet (e) Orange

47. If orange is called 'butter', butter is called 'soap', soap is called 'ink', ink is called 'honey' and honey is called 'orange' which of the following is used for washing clothes?

- (a) Honey (b) Butter (c) Orange
- (d) Soap (e) Ink

48. If blue means 'green', green means 'white', white means 'yellow', yellow means 'black', 'black means 'red', red means 'brown', then what is the color of milk?

- (a) Black (b) Brown (c) Blue
- (d) Yellow (e) Green

49. If black means red, red means green, green means yellow, yellow means blue blue means pink, pink means violet. then what is color of human blood.

- (a) red (b) blue (c) green
- (d) white (e) None of these

Moderate

Directions (1-5): In a certain code 'ge ji zo' means 'had horrible dream', lit zo pit' means 'realise your dream' and 'ge ze pat ze' means 'very very horrible experience'.

1. Which of the following is the code of 'your'?

- (a) lit (b) zo (c) pit
- (d) Cannot be determined (e) None of these

2. 'ji ze pit lit' may represent:

- (a) very horrible you realize
- (b) you had realize your
- (c) had realize your very
- (d) your very realize dream
- (e) your very very had

3. 'dream had horrible experience', can be coded as $\frac{3}{4}$

- (a) zo ge ji ze (b) pat ge zo ji (c) zo jig e pit
- (d) Cannot be determined (e) None of these

4. Which of the following is the code of 'very'?

- (a) ge (b) pat (c) ze
- (d) Cannot be determined (e) None of these

5. Which of the following is the code of 'had'?

- (a) ge (b) ji (c) zo
- (d) Cannot be determined (e) None of these

Directions (6-10): In a certain code language, 'hop to see you' is coded as 're so na di', 'please come to see the party' is coded as 'fi ge na di ke zo', 'hope to come' is coded as 'di so ge' and 'see you the party' is coded as 're fi zo na'.

6. How is 'please' coded in the given code language?

- (a) Di (b) ke (c) fi
- (d) na (e) None of these

7. What does the code 'so' stand for in the given code language?

- (a) hope (b) come (c) see
- (d) to (e) None of these

8. How is 'party' coded in the given code language?

- (a) either 're' or 'fi' (b) Either 'zo' or 'na'
- (c) Either 'zo' or 'fi' (d) Either 'zo' or 'ge'
- (e) either 'ke' or 'fi'

9. How will 'please see you' be coded in the given code language?

- (a) Re na ke (b) so re na (b) zo re na
- (d) na di ke (e) ke re ge

10. Which one of the following will be coded as 'so di re' in the given code language?

- (a) you see hope (b) hope you please
- (c) hope you come (d) the hope to
- (e) you hope to

Directions (11-15): Study the information and answer the following questions:

In a certain code language

“honest try to study” is coded as “BR20 GO8 LO20 BT19”

“work hard win sit” is coded as “WA8 PO23 MI23 GI19”

“mind way pen work” is coded as “WI13 ME16 BA23 PO23”

and “star john sky blue” is coded as “IT19 VL2 BK19 MO10”

11. What is the code for “final way”?

- (a) OI9, BA23
- (b) BA23, OI6
- (c) BA23, RA9
- (d) OU9, BA23
- (e) OS9, BR20

12. What is the code for “honest speak”?

- (a) GO10, PR19
- (b) GO9, PP19
- (c) GO8, PP19
- (d) GO12, PP12
- (e) GO8, PQ19

13. Which may be the possible code for “Result”?

- (a) TE21
- (b) GE18
- (c) GH18
- (d) TE20
- (e) GH21

14. What is the code for ‘violet’?

- (a) GI22
- (b) GO20
- (c) GO21
- (d) GI20
- (e) GH20

15. What is the code for “try to honest desire”?

- (a) BR20, VR4, GO8, LO20
- (b) VE4, GO8, LO20, BR20
- (c) VC4, LO20, BR20, GO8
- (d) VE8, BR20, GO8, LO20
- (e) EV10, BR20, LO20, GO8

Directions (16-20): Study the information and answer the following questions:

In a certain code language

“air quality control system” is coded as “Q1Z L19H X17J K3X”

“water clean may good” is coded as “Q23D C7T M3X X13N”

“white and black cow” is coded as “D23D V3X C1Z J2Y”

“school is open now” is coded as “K19H R9R M15L V14M”

16. What is the code for ‘student’ in the given code language?

- (a) H19T
- (b) T19S
- (c) H19S
- (d) S19H
- (e) None of these

17. What is the code for ‘University’ in the given code language?

- (a) X20F
- (b) F21X
- (c) X21F
- (d) X21G
- (e) None of these

18. If the code for “white dog” is “D23D F4W” then what is the code for “dog bark”?

- (a) J3Y C4W
- (b) C4W J11Y
- (c) J1Y C4W
- (d) F4W J2Y
- (e) None of these

19. What may be the possible code for ‘manifesto’ in the given code language?

- (a) M13M
- (b) N13N
- (c) N14M
- (d) M13N
- (e) None of these

20. What is the code for ‘Accident’ in the given code language?

- (a) S1Z
- (b) S26Z
- (c) S1A
- (d) T1Z
- (e) None of these

HINTS & SOLUTIONS

Foundation

1. (a) The first letter of the word is moved one step forward to obtain the first letter of the code, while the other letters remain unaltered.
2. (b) Each letter in the word is moved one step forward to obtain the corresponding letter of the code.
3. (a) Each letter in the word is moved one step backward to obtain the corresponding letter of the code.
4. (b) Each letter in the word, except the middle letter, is moved one step backward while the middle letter is moved one step forward to obtain the corresponding letter of the code.
5. (b) Each letter in the word is moved three steps forward to obtain the corresponding letter of the code.
6. (b) Each of the first four letters in the word is moved one step backward, while each of the last four letters is moved one step forward to obtain the corresponding letter of the code.
7. (b) Each first, third and fifth letters are each moved one step backward, while the second, fourth and sixth letters are each moved one step forward to obtain the corresponding letter of the code.
8. (a) The first, third, fifth, seventh, ninth and eleventh letters in the word are each moved one step forward; the second, fourth, eighth and tenth letters are each moved one step backward, while the middle (i.e. sixth) letter is

moved two steps forward to obtain the corresponding letters of the code.

9. (a) Each letter in the word is moved two steps backward to obtain the corresponding letter of the code.

10. (b) The letters at the odd-numbered positions in the word are each moved two steps forward while those at the even-numbered positions are each moved three steps forward to obtain the corresponding letters of the code.

11. (c) Compare UNDER and DEAF you see that DE is common and in code “52” is common in same pattern you find that code as follows:

U → 6	D → 5	F → 7
N → 1	E → 2	R → @
D → 5	A → #	A → #
E → 2	F → 7	V → 6
R → @		D → 5

12. (b) col tip mot → singing is appreciable ... (i)
- Mot baj min → dancing is good ... (ii)
- Tip nop baj → singing and dancing ... (iii)

Code of good is in equation (2) there are two other words dancing and is from (1) and (2) together we see that “mot” and “is” common in both cases means not is code of is. Similarly from (2) and (3) we see that “baj” and “dancing” are common means code of baj should be dancing. So we found after this process code for good be min.

13. (c) nue **14.** (a) sud **15.** (d) kon

16. (c) tri

17. (a) vog

18. (d) cus

19. (a) lon

20. (d) dom pul ta → bring not food

Pil tri sop → food is good

Tak da sop → good bright boy

For finding code of hot we first have to find out code of bring and food from equation (2) we can find out code of food but we can't find code of bring.

- | | | |
|-------------------|------------------|-------------------|
| 21. (a) ja | 22. (c) * | 23. (c) 7 |
| 24. (b) 5 | 25. (a) 3 | 26. (a) 2 |
| 27. (c) 7 | 28. (d) 8 | 29. (c) 8b |
| 30. (c) 7 | 31. (b) 6 | |

Directions (32-34): The following are the codes of the words:

Words	Codes
is/game	rash/tash
football	jash
important	mash
life of	lash/cash
part	dash
interesting	nash
player	bash
truth	wash

32. (d)

33. (e)

house	vash
is	rash

Directions (35-39): The codes for the words are as follows:

Words	Codes
Exams	jam
Growth	ram
For	mam
Good	Dam
Bank	Pam
Difficult	Bam
Are	Vam
Easy	tam
Not	Lam
Preferred	Sam

35. (a)

36. (e) **37.** (c)

38. (c)

39. (d)

Directions (40-41)

40. (c) bull dozer **41.** (a) aero plane

Directions (42-44)

42. (b) red

43. (c) green **44.** (d) yellow

45. (e)

46. (c) The color of the human blood is 'red' and as given, 'red' is called 'yellow'. So, the color of human blood is 'yellow'.

47. (e) Clearly, 'soap' is used for washing the clothers. But, 'soap' is called 'ink'. So, 'ink' is used for washing the clothers.

48. (d) The color of milk is 'white'. But, as given, 'white' means 'yellow'. So, the color of milk is 'yellow'.

49. (c) green

Moderate

Directions (1-5):

Zo = dream, ge = horrible, jl = had, ze = very, pat = experience, lit/pit = relies/your

- | | |
|----------------------------|-------------------------------------|
| 1. (d) | 2. (c) had realize your very |
| 3. (b) pat ge zo ji | 4. (c) ze |
| 5. (b) jl | |

Directions (6-10):

See = na, to = di, hope = so, you = re, come = ge, the/party = fi/zo, please = ke

- | | |
|-----------------------------------|----------------------------|
| 6. (b) ke | 7. (a) hope |
| 8. (c) Either 'zo' or 'fi' | |
| 9. (a) re na ke | 10. (e) you hope to |

Directions (11-15):

Look = me, at = cac, this = non, is = se, beautiful = qa, things = dha, place = le, time = dho, going = wh

- | | |
|--|--------------------------|
| 11. (c) dha | 12. (c) dho qa se |
| 13. (b) place | 14. (b) going |
| 15. (e) going things this place | |

Directions (16-20):

Market = pi, in = to, more = zo, money = ab, share = vo, loss = je, now = su, making = ka, the/gains = do/yo

- | | | |
|----------------------------|-------------------|-------------------------|
| 16. (c) share | 17. (a) ka | 18. (e) yo or do |
| 19. (b) vo wi zo do | 20. (e) | |

Directions (21-25):

It = le, fine = ga, rush = sa, hour = mi, traffic/is = ru/do, to = be, one = fi, go = pa, school = no

- | | | |
|---------------------|-------------------|----------------------------|
| 21. (e) | 22. (a) ga | 23. (d) it one hour |
| 24. (a) rush | 25. (c) | |

Directions (26-30):

Kaju → pi	Favourite → xi
Arti → si	Sweets → li
Iron → chi	Man → ti
Saurabh → hi	Dangerous → ni

- | | | |
|----------------|----------------|----------------|
| 26. (b) | 27. (a) | 28. (c) |
| 29. (d) | 30. (a) | |

Directions (31-35): The codes for the words are as follows:

Words	Codes
offer/season	#15X/@19W
festive	@6Z
for	@6Y
best/winter	@23X/@2Y
discounts	@4X
online/shopping	#15Z/@19X

31. (a)

32. (e)

33. (d)

34. (e) Codes for the words are as follows:

best	@ 2Y
For	@ 6Y
celebrating	@ 3Z

35. (b)

Directions (36-40): The following are the codes of the words:

Words	Codes
Payment	opp
Necessary	qrr
Is	stt
Digital	uvv
application	wxx
cash/not	yzz/abb
encouraged	cdd
through/mobile	eff/ghh
downloaded	ijj

36. (d)

37. (b)

38. (e)

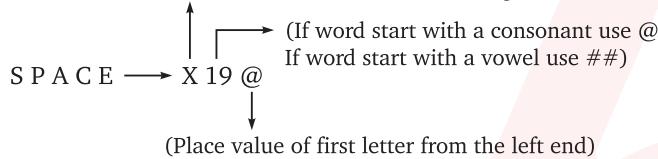
39. (e)

40. (a)

Direction (41-45):

Logic :

(Reverse of second letter from the right end)



41. (c)

42. (b)

43. (d)

44. (b)

45. (a)

Direction (46-50):

Words	Codes
New	Wo
type	Np
of	Cz
series	Rd
What/does	md/sc
do	Sg
not	Dr
watch	Dh
your	Kf

46. (a)

47. (e)

48. (d)

49. (e)

50. (d)

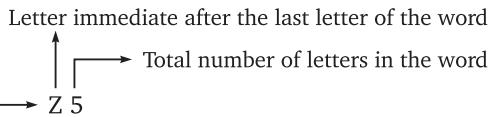
Directions (51-52):

Jar	A
Cloth	D
Table	C
Jam	B
Month/butter	E/F
Knife	G
Pen/money	I/H
Eraser/week	J/K

51. (a)

52. (e)

Direction (53-56):



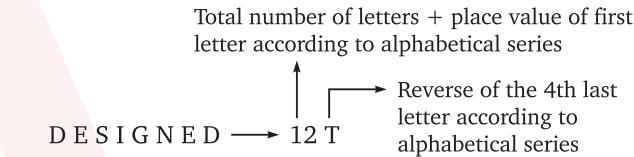
53. (d)

56. (c)

54. (d)

55. (e)

Directions (57-60):



57. (c)

60. (d)

58. (b)

59. (c)

Direction (61-65): Let us understand the logic behind the given coding decoding

Case-1: If the first letter of the code is consonant-

Second preceding letter of the opposite letter of second last letter of the word



Place value of 2nd letter of word

Case-2: If the first letter of the code is vowel-

Opposite of second letter of the word



Place value of 2nd letter of the word

Next letter of second last letter of the word

61. (a)

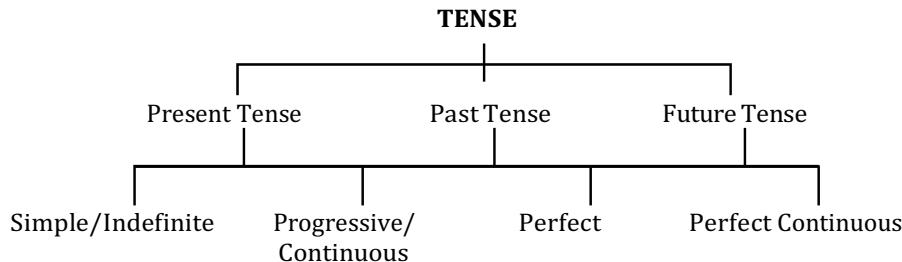
62. (e)

63. (b)

64. (e)

65. (e)





On the basis of time of an action performed, we can divide sentences into the following three tenses:

- (i) Present Tense (ii) Past Tense (iii) Future Tense

On the basis of the state of an action performed, we can further classify each tense into the following four parts:

- (i) Simple Indefinite Tense
 (ii) Progressive/ Continuous Tense
 (iii) Perfect Tense
 (iv) Perfect Continuous Tense

Present Tense

This tense expresses an action that is currently going on or habitually performed or a state that currently or generally exists. We can classify present tense into the following four parts:

- (i) Present Indefinite (Simple Present)
 (ii) Present Continuous (Present Progressive)
 (iii) Present Perfect
 (iv) Present Perfect Continuous

(i) Present Indefinite Tense

This tense is called the present ‘indefinite’ tense because in this tense, the action is simply mentioned and nothing can be said about its completeness. This tense is used to express an action which occurs on regular basis.

STRUCTURE

For Singular:

- **Sub + V₁ + s/es + Obj. (Affirmative)**
For e.g. - She writes a letter
- **Sub + does not + V₁ + Obj. (Negative)**
For e.g. - She does not write a letter.
- **Does + Sub + V₁ + Obj. + '?' (Interrogative)**
For e.g. - Does she write a letter?
- **Does + Sub + not + V₁ + Obj + '?' (Interrogative - Negative)**
For e.g. - Does she not write a letter?

For Plural:

- **Sub + V₁ + Obj (Affirmative)**
For e.g. - They play cricket.
- **Sub + do not + V₁ + Obj (Negative)**
For e.g. - They do not play cricket.
- **Do + Sub + V₁ + Obj + '?' (Interrogative)**
For e.g. - Do they play cricket?
- **Do + Sub + not + V₁ + obj + '?' (Interrogative - Negative)**
For e.g. - Do they not play cricket?

Note: 'I' is treated as plural in Present Tense. For eg - I eat dinner at 8 o'clock daily.

Uses:

1. **To show Habitual Actions**
For e.g. - (a) He goes out for a walk every day.
(b) My father visits temple thrice a week.
2. **To show General truth/Universal truth/ permanent truth etc.**
For e.g. - (a) The sun rises in the east.
(b) Water boils at 100°C.
3. **To show imperative sentences.**
For eg - (a) Always obey your parents.
(b) Do not play on the road.
4. **In exclamatory sentences which start with 'Here' and 'There'.**
For eg - (a) Here comes the train!
(b) There rings the bell!
5. **In newspaper headlines and commentary of sports.**
For e.g. - (a) India launches a satellite.
(b) Sachin hits a boundary.
6. **To describe the events that occurred in past in a dramatic way.**
For e.g. - (a) India uproots the British Empire.
(b) Alexander defeats Paurus.
7. **This Tense is also used to express professional activities.**
For e.g. - (a) A barber cuts hair.
(b) A confectioner sells sweets.

(ii) Present Continuous Tense

This Tense is used to express action that is currently in progress.

STRUCTURE

For Singular:

- **Sub + is + V₁ ing + Obj (Affirmative)**
For e.g. - She is singing a song.
- **Sub + is not + V₁ ing + Obj (Negative)**
For e.g. - She is not singing a song
- **Is + Sub + V₁ ing + Obj + '?' (Interrogative)**
For e.g. - Is she singing a song?
- **Is + Sub + not + V₁ ing + Obj + (Interrogative – Negative)**
For e.g. - Is she not singing a song?

For Plural:

- **Sub + are + V₁ ing + Obj. (Affirmative)**
For eg - They are playing cricket.
- **Sub + are not + V₁ ing + Obj. (Negative)**
For e.g. - They are not playing cricket.
- **Are + Sub + V₁ ing + Obj + '?' (Interrogative)**
For eg - Are they playing cricket?
- **Are + Sub + not + V₁ ing + Obj + '?' (Interrogative – Negative)**
For e.g. - Are they not playing cricket?
Note: 'Am' is used as helping verb with I.
For eg - I am reading a novel.

Uses:

1. **To show a continuous action.**
For e.g. - (a) She is playing chess.
(b) They are not driving a car.
2. To show those actions which have following words
"Now, these days, now-a-days, still, at this time, at this moment, at present."
For e.g. - (a) Is she still reading?
(b) My mother is reading the Mahabharata now.
3. **To denote a change of present state/situation into another.**
For e.g. - (a) Cars are becoming costlier day by day.
(b) She is getting more and more complicated.

4. To show those events/ actions that will take place in near future.

- For e.g. - (a) I am going on vacations tomorrow.
 (b) She is getting married next week.

(iii) Present perfect Tense

This Tense is used to express those actions that have been finished recently.

STRUCTURE

For singular:

- **Sub + has + V₃ + Obj (Affirmative)**
 For e.g. - She has bought a house.
- **Sub + has not + V₃ + Obj (Negative)**
 For e.g. - She has not bought a house.
- **Has + Sub + V₃ + Obj + '?' (Interrogative)**
 For e.g. - Has she bought a house?
- **Has + Sub + not + V₃ + Obj + ? (Interrogative – Negative)**
 For e.g. - Has she not bought a house?

For Plural:

- **Sub + have + V₃ + Obj (Affirmative)**
 For e.g. - They have completed their work.
- **Sub + have not + V₃ + Obj (Negative)**
 For e.g. - They have not completed their work.
- **Have + Sub + V₃ + Obj +? (Interrogative)**
 For e.g. - Have they completed their work?
- **Have + Sub + not + V₃ + Obj +? (Interrogative – Negative)**
 For e.g. - Have they not completed their work?

Note: 'T' is used as plural in this type of Tense

For eg - I have submitted my assignment

Uses:

1. **To show the action that has just ended**
 For e.g. - (a) I have written a letter
 (b) Ishan has gone to Mumbai.
2. **In sentences which consist the following:**
 "This/That/It is the first/second/third/best/worst".
 For e.g. - (a) This is the worst novel, I have ever read.
 (b) It is the best book, I have ever read.
3. **To show those sentences which have the following words.**
 "Already, so far, as yet, yet, upto now, just, just now, recently, ever, lately"
 For e.g. - (a) I have already taken my lunch.
 (b) Have you ever been to London?

Note: Generally, Present Perfect Tense does not take an adverb of Past time.

For e.g. - 'I have seen Amit yesterday' is wrong.

❖ Simple past is used when an adverb of past is mentioned.

Therefore, the correct usage of sentence given above should be as follows: 'I saw Amit yesterday.'

(iv) Present perfect Continuous

This type of Tense is used to express those actions that had begun in the past and are still in progress.

Structure:

For Singular:

- **Sub + has been + V₁ ing + Obj. + since/for + Time being. (Affirmative)**
 For e.g. - (a) Ram has been living here since 1993
 (b) Ram has been living here for last ten years.
- **Sub + has not been + V₁ ing + Obj. + since/for + Time being. (Negative)**
 For e.g. - (a) Ram has not been living here since 1993.
 (b) Ram has not been living here for last ten years.

- **Has + Sub + been + V₁ ing + Obj + since/for + Time being + '?' (Interrogative)**
For e.g. - (a) Has Ram been living here since 1993?
(b) Has Ram been living here for last ten years.
- **Has + Sub + not + been + V₁ ing + Obj + since/for + Time being + '?' (Interrogative -Negative)**
For e.g. - (a) Has Ram not been living here since 1993?
(b) Has Ram not been living here for last ten years.

For Plural:

- **Sub + have been + V₁ ing + Obj. + since/for + Time being. (Affirmative)**
For e.g. - (a) They have been singing since morning.
(b) They have been singing for two hours.
- **Sub + have not been + V₁ ing + Obj. + since/for + Time being. (Negative)**
For e.g. - (a) They have not been singing since morning.
(b) They have not been singing for two hours.
- **Have + Sub + been + V₁ ing + Obj. + since/for + Time being + '?' (Interrogative)**
For e.g. - (a) Have they been singing since morning?
(b) Have they been singing for two hours?

Uses:

- **Have + Sub + not + been + V₁ ing + Obj. + since/for + Time being + '?' (Interrogative -Negative)**
For e.g. - Have they not been singing for two hours?
Note: 'I' is used as plural in this tense
For e.g. - I have been cleaning the room since morning.
Note: (a) 'since' is used to represent 'Point of time'
(b) 'for' is used to represent 'Period of time'
- 1. **To show those actions that had begun in the past and are still in progress.**
For e.g. - The baby has been sleeping since morning.
- 2. **It can be used with time phrases like "for, since, long, how long, all the time, all week, etc."**
For e.g. - (a) For how long have you been eating?
(b) She has been crying all the time.

Past Tense

This Tense expresses an action that has happened or a state that previously existed, like present tense, past tense can also be classified into following four parts:

- (a) Past Indefinite (Simple Past)
- (b) Past Continuous (Past Progressive)
- (c) Past Perfect
- (d) Past Perfect continuous

(i) Past Indefinite Tense

This Tense is used to express an action that happened or finished in the past.

Structure:

The structure of sentence with singular/plural subject remains same in Past Indefinite Tense.

For Singular:

For e.g. - She wrote a book.

- **Sub + Did not + V₁ + Obj (Negative)**
For e.g. - She did not write a book.
- **Did + Sub + V₁ + Obj + '?' (Interrogative)**
For e.g. - Did she write a book?
- **Did + Sub + not + V₁ + Obj + '?' (Interrogative - Negative)**
For e.g. - Did she not write a book?

Uses:

1. To show a past action.

- For e.g.** - (a) I wrote a letter yesterday.
(b) She came last week.

Note: Following words are used in Past Indefinite Tense.

"Yesterday, ago, last, the other day, the day before, etc."

2. To show a past habit.

For e.g. - (a) I played cricket in my childhood.
 (b) She always prayed to God.

3. This Tense is used in conditional sentences to indicate a condition which is unlikely to occur.

For e.g. - (a) I wish I knew singing.
 (b) If Ravi came we would congratulate him.

4. With the phrase

"It is time, It is high time, It is about time"

For e.g. - (a) It is time you repaired the A/C.
 (b) It is about time you got a haircut.

(ii) Past Continuous Tense

This Tense is used to express an action which was in progress for some time in the past.

Structure:

For singular:

- Sub + was + V₁ ing + Obj (Affirmative)

For e.g. - She was calling me.

- Sub + was not + V₁ ing + Obj (Negative)

For e.g. - She was not calling me.

- Was + Sub + V₁ ing + Obj + '?' (Interrogative)

For e.g. - Was she calling me?

- Was + Sub + not + V₁ ing + Obj + '?' (Interrogative - Negative)

For e.g. - Was she not calling me?

For Plural:

- Sub + were + V₁ ing + Obj (Affirmative)

For e.g. - They were watching a movie.

- Sub + were not + V₁ ing + Obj (Negative)

For e.g. - They were not watching a movie.

- Were + Sub + V₁ ing + Obj + '?' (Interrogative)

For e.g. - Were they watching a movie?

- Were + Sub + not + V₁ ing + '?' (Interrogative - Negative)

For e.g. - Were they not watching a movie?

Note: 'I' is used as singular Subject in this Tense.

For e.g. - I was writing a letter.

Uses:

1. This Tense is used when two actions were simultaneously in progress in the past.

For e.g. - (a) While she was preparing lunch, I was taking shower.
 (b) While I was reading, my wife was watching T.V.

2. This Tense is also used in combination with Simple past

For e.g. - (a) While I was walking in the fields, I found a mobile phone.
 (b) When I was going to school, a dog bit me.

(iii) Past Perfect Tense

This Tense expresses an action which has been completed (a long time ago) in the Past.

Structure:

The structure of sentences with singular/Plural Subject remains same in Past Perfect Tense.

- Sub + had not + V₃ + Obj. (Negative)

For e.g. - He had not left for USA.

- Had + Sub + V₃ + Obj. + '?' (Interrogative)

For e.g. - Had he left for USA?

- Had + Sub + not + V₃ + Obj + '?' (Interrogative - Negative)

For e.g. - Had he not left for USA?

Uses:

- When two actions occur in the past, one after the other, then, the first action is expressed in Pastperfect Tense and the second action is expressed in Simple Past Tense.

For e.g. - (a) The patient had died before the doctor came.
 (b) He came after she had gone.

- To express some unfulfilled wish in the Past.

For e.g. - (a) I had hoped that he would pass.
 (b) She had expected his arrival, but he did not come.

(iv) Past perfect Continuous Tense

This Tense is used to express an action that started in past, continued for a period of time and thenfinished in Past.

Structure:

The structure of sentences with singular/Plural subject remains same in Past PerfectContinuous Tense.

For Singular } Sub + had been + V₁ing + obj + Since/for + time being. (Affirmative)
 For Plural }

For e.g. - (a) She had been watching T.V. for two hours.
 (b) She had been watching T.V. since 2 p.m.

- Sub + had not been + V₁ ing +Obj + Since/for + Time being (Negative)

For e.g. - (a) She had not been watching T.V. for Two hours.
 (b) She had not been watching T.V. since 2.00 PM.

Uses:

- Had + Sub + been + V₁ ing + since/for + Time being + '?' (Interrogative)

For e.g. - (a) Had she been watching T.V. for two hours?
 (b) Had she been watching T.V. since 2:00 PM?

- Had + Sub + not + been + V₁ ing + Obj + Since/for + Time being + '?' (Interrogative -Negative)

For e.g. - (a) Had she not been watching TV for two hours?
 (b) Had she not been watching T.V. since 2:00 PM.

- It is used to express a repeated action in the past.

For e.g. - (a) I had been trying to contact you.
 (b) He had been trying to get a good job.

- It is used to express an action that had happened in the past and its effects were still visible inthe past.

For e.g. - (a) She had been playing tennis when the news of her selection came in.
 (b) I had been reading novel for 2 hours, when she asked me about its plot.

Future Tense

This Tense expresses an action that has not yet happened or a state that does not exist but is expected totake place after some time from now.

Future Tense can be classified into following four Tenses

- Future Indefinite (Simple Future)
- Future Continuous (Future Progressive)
- Future Perfect
- Future Perfect Continuous.

(i) Future Indefinite Tense

This Tense expresses an action that is expected to be finished in near future.

Structure:

Note: The structure of sentences with singular/plural subject remains same in future Indefinite Tense.

→ For Singular } Sub + will + V₁ + obj. (Affirmative)
 For Plural }

For eg - (a) She will call you.
 (b) They will call you.

- Sub + will not + V₁ + Obj. (Negative)

For e.g. - She will not call you.

- **Will + Sub + V₁ + Obj + '?' (Interrogative)**
For e.g. – Will she call you?
- **Will + Sub + V₁ + Obj + '?' (Interrogative – Negative)**
For e.g. – Will she not call you?

Note: Now a days, only 'will' is used as helping verb in future Tense because the usage of 'Shall' has gone out of style in modern English. Though 'Shall' is still used sometimes.

Note: Use of Shall/will is explained in modals.

Uses:

To show conditional actions that have adverb clause, Present Indefinite Tense along with 'unless,until, when, if'

For e.g. – (a) Unless she works hard, she will not pass.
(b) If you run fast, you will win the race.

(ii) Future Continuous Tense

This Tense used to express an action that will be in progression in Future.

Structure:

The structure of sentences with singular/Plural subject remains same in future continuousTense.

- **Sub + will be + V₁ ing + Obj. (Affirmative)**
For e.g. – She will be cooking food at this time tomorrow.
- **Sub + will not be + v₁ ing + Obj. (Negative)**
For e.g. – She will not be cooking food at this time tomorrow.
- **Will + Sub + be + V₁ ing + '?' (Interrogative)**
For e.g. – Will she be cooking food at this time tomorrow?
- **Will + Sub + not + be + V₁ ing + Obj + '?' (Interrogative – Negative)** For e.g. – Will she not be cooking food at this time tomorrow?

(iii) Future Perfect Tense

This Tense expresses those actions that will certainly be finished at a point in future.

Structure:

- **Sub + will have + V₃ + Obj (Affirmative)**
For e.g. – She will have submitted her project by Monday.
- **Sub + will not have + V₃ + Obj (Negative)**
For e.g. – She will not have submitted her project by Monday.
- **Will + Sub + have V₃ + Obj + '?' (Interrogative)**
For e.g. – Will she have submitted her project by Monday?
- **Will + Sub + not + have + V₃ + Obj + '?' (Interrogative – Negative)**
For e.g. – Will she not have submitted her project by Monday?

Note: In future perfect Tense, when an action is expected to be completed in near future, till/byare used before the adverb of future.

For e.g. – "by tomorrow, till next week, by Monday"

Uses:

To show an action in which 'when' or 'before' is followed by present Tense.

For e.g. – (a) I will have completed this task before she comes.
(b) He will have reached school before the bell rings.

(iv) Future Perfect Continuous Tense:

This Tense is used to express an action that continues upto some point of time in future.

Structure:

- **Sub + will have been + V₁ ing + Obj. + Since/for + Time being (Affirmative)**
For e.g. – She will have been washing clothes for 3 hours.
- **Sub + will not have been + V₁ ing + Obj + since/for + Time being (Negative)**
- **For e.g. –** Will not have been washing clothes for 3 hrs.
- **Will + Sub + have been + V₁ ing + Obj + Since/for + time being + '?' (Interrogative)**
For e.g. – Will she have been washing clothes for 3 hours?
- **Will + Sub + not + have been + V₁ ing + Obj + since/for + time being + '?' (Interrogative – Negative)**
For e.g. – Will she not have been washing clothes for 3 hrs?

Note: Future perfect progressive denotes continuous action while future perfect denotes completedaction.

For e.g. - (a) By the end of this month, I will have been travelling for 6 months (Continuation)
 (b) By the end of this month, I will have travelled for 6 months (Completed Action)

Exercise

Direction (1 – 25): Find out the error in each of the following sentences, if there is no error, answer is (e). Avoid punctuation mistakes (if any).

1. (a) An anarchist is / (b) a person who / (c) is believing in or / (d) tries to bring about anarchy. / (e) No error
2. (a) We discuss / (b) this issue / (c) when / (d) she comes / (e) No error.
3. (a) It is high time / (b) you bought / (c) this book / (d) from the market / (e) No error
4. (a) Whenever / (b) he is coming here / (c) he brings a lot of / (d) gifts for us / (e) No error.
5. (a) Shweta behaves / (b) as if she never / (c) tells a lie / (d) in her life. / (e) No error.
6. (a) I wish / (b) I was the / (c) president of a / (d) powerful country / (e) No error
7. (a) Shreya uses to watch / (b) TV till eleven o'clock at night / (c) and then goes / (d) to bed / (e) No error
8. (a) I wish / (b) I met you when / (c) you were / (d) living in India / (e) No error
9. (a) "Here came / (b) my friend!" / (c) said Ashish when / (d) he saw Udit / (e) No error
10. (a) If we had / (b) Rahul in our team / (c) we would have / (d) won the match / (e) No error
11. (a) A drop in the mercury column / (b) of a barometer / (c) indicates the change / (d) in atmospheric pressure / (e) No error
12. (a) New king / (b) Porus leads / (c) his army / (d) and attacked the enemy / (e) No error
13. (a) Juhi has / (b) saved money for months / (c) and will buy / (d) a new car next week / (e) No error
14. (a) Rama hopes / (b) to become an IAS officer / (c) after she completes / (d) her graduation. / (e) No error
15. (a) Rahul, along with his friends, / (b) is going to have / (c) a party at his apartment / (d) after the match. / (e) No error
16. (a) Harit had not taken / (b) any decision / (c) until he had / (d) studied the case / (e) No error.
17. (a) I tried to tell Shivam / (b) what has happened / (c) but my words / (d) were not audible / (e) No error.
18. (a) The teacher taught / (b) the students since / (c) Morning, therefore, she / (d) was exhausted / (e) No error.
19. (a) I have been / (b) studying in / (c) my room / (d) for last evening / (e) No error.

20. Whenever an expectation will fail, (a) / the agent interacts with users, (b) / presenting its rationale (c) / for its expectation. / (d) / no error (e)

21. It is appearing that (a) / by the 4th century (b) / the land was already (c) / starting to deteriorate. / (d) / no error (e)

22. A misogynist is a person (a) / who is hating women or (b) / believes that men are (c) / much better than women. / (d) / no error (e)

23. He is neglecting (a) / his research (b) / these days without any (c) / derived conclusions. / (d) / no error (e)

24. The drug (a) / will give you (b) / temporary relief (c) / from the pain. / (d) / no error (e)

25. They bought the house (a) / in 2006 and they did (b) / a lot of work (c) / on it since then. / (d) / no error (e)

Direction (26 – 45): Fill in the blanks with the right option:

26. My husband and I will _____ the banquet.

- (a) attend (b) has attended (c) attended
 (d) is attending (e) None of these

27. Tom always _____ coffee in the morning.

- (a) drinks (b) drank (c) drunk
 (d) has drink (e) None of these

28. I _____ already left by the time you called.

- (a) has (b) have (c) had
 (d) am (e) None of these

29. The team _____ in two hours.

- (a) has arrived (b) will arriving (c) is arriving
 (d) arrive (e) None of these

30. She _____ television for the past two hours.

- (a) has watched (b) has been watching
 (c) will watch (d) will be watching
 (e) None of these

31. Our English teacher _____ always on time.

- (a) is (b) had been (c) were
 (d) has been (e) None of these

32. Martha _____ three miles a day before she broke her leg.

- (a) has walked
 (b) will walk
 (c) will have walked
 (d) had been walking
 (e) None of these

33. A letter of apology _____ to him.

- (a) sent (b) has send (c) has been sent
 (d) has sent (e) None of these

- 7. (a);** 'Watches' should be used in place of 'uses to watch' since present habits are expressed in 'Simple Present Tense'
For eg :- He goes for a walk every day, before having his tea in the morning.
- 8. (b);** 'Had met' should be used in place of 'met' because in 'unfulfilled wish, condition or desire' of past, I wish/as If/If etc. take 'past perfect Tense'
For eg :- I wish I had met nelson Mandela.
- 9. (a);** 'Here comes' should be used in place of 'Here come'. Since 'Simple present Tense' is used in exclamatory sentences starting with 'Here' and 'there'
For eg :- There goes the ball!
- 10. (e);** No error
- 11. (e);** No error
- 12. (b);** 'led' should be used in place of 'leads' since this a past event and past events (histonic ones) are expressed in simple past tense
- 13. (c);** 'is going to buy' should be used in place of 'will buy' because when a future plan of action is expected to take place, we use 'going to'.
For eg :- She has invited all her friends as she is going to celebrate her wedding anniversary tomorrow.
- 14. (c);** 'She has completed' should be used in place of 'she completes' because Rama would have completed her graduation before becoming an IAS officer. Hence Present Perfect Tense would be used.
For eg :- O can't decide until I've got all the information about this
- 15. (e);** No Error
- 16. (a);** 'Did not take' should be used in place of 'had not taken' because whenever two past actions are stated, past perfect is used to express former action whereas the latter one is expressed in 'Simple Past Tense'.
For eg :- when we reached the station, the train had already departed.
- 17. (b);** 'What had happened' should be used in place of 'what has happened' because what T tried to tell Shivam is a past action. Hence past perfect tense should be used here to denote 'past of the past'. **For eg :-** He informed his father about the car accident that had occurred last week.
- 18. (a);** 'Had been teaching' should be used in place of 'Taught'. Because, teacher had started teaching in past, continued to teach in past and finished teaching in past. Hence, past perfect continuous must be used.
For eg :- She had been driving for six hours before she met with an accident.
- 19. (d);** 'Since last evening' should be used in place of 'for last evening' because 'since' is used to denote 'point of time' whereas 'for' is used to denote 'period of time'.
For eg :- They have been waiting since 4 o' clock.
 Point of time
 They have been waiting for four hours.
 Period of time
- 20. (a);** "Whenever an expectation will fail," should be replaced by "Whenever an expectation fails" as we use simple present to denote actions of habitual nature.
- 21. (a);** "it is appearing" should be replaced by "it appears that". Note that while using "appears" in the sense of "seems", we always use simple tense, instead of continuous tense.
- 22. (b);** "who is hating" should be replaced by "who hates" as to express general truths, we always use simple present tense.
- 23. (e);** No error.
- 24. (e);** No error.
- 25. (b);** "they did" should be replaced by "they have done" as when the main verb in a sentence with a since clause or a since phrase (since then) refers to a period of time including the present, a present perfect tense or present perfect continuous tense is necessary.
- 26. (a);** 'attend' will be used as the structure of simple future tense is subject + will/Shall + 1st form of verb + Object.
- 27. (a);** 'Drinks' will be used. To denote an action of habitual nature, we use simple present tense.
- 28. (c);** The usage of the word 'already' shows that the action has been completed. Hence, perfect tense should be used.
- 29. (c);** For future plans which are expected to be executed in near future, we use present progressive tense. Hence, option (c) is the correct answer choice.
- 30. (b);** In this sentence, the action had started in past and was in action for a period of time, hence present perfect continuous tense is used. Therefore, (e) is the correct choice.
- 31. (a);** To denote an action of habitual nature, we use simple present tense. Hence, option (a) is the correct answer choice.
- 32. (d);** "had been walking" is the correct phrase to fill the blank as in the given sentence the action had started in the past and was in action till the point in the past. Hence, past perfect continuous tense should be used here. Therefore, option (d) is the correct choice.
- 33. (c);** The given statement is in passive voice, hence the structure "has+been+V3" should be used. Hence, option (a) is the correct choice.
- 34. (b);** "had" is the correct phrase to fill the blank. The usage of the word "already" indicates that the action in the given sentence has been completed. Hence, perfect tense should be used.
- 35. (d);** "is growing" should be used to fill the blank as the usage of the phrase "nowadays" indicates that the sentence is in present continuous tense. Hence, option (d) is the correct answer choice,

Noun is the name of a person, place, thing, animal, or idea. Like Ram, happiness, chain, etc. Noun can be classified into four groups which are as follows:

- (i) Proper Noun
- (ii) Common Noun
- (iii) Collective Noun
- (iv) Material Noun

(i) Proper Noun: Proper Noun denotes a particular person, place or thing.

For Ex - India, Calcutta, Ramesh, The Ganga, etc.

(ii) Common Noun: Common Noun is the name given in common to every person or thing of the same class or kind.

For Ex - Table, Glass, Town, King etc.

(iii) Collective Noun: Collective Noun denotes a group or collection of similar individuals considered as one complete whole.

Some of the collective nouns are given below:-

Examples of Collective Noun.

1. A **band** of musicians.
2. A **board** of directors, etc.
3. A **bevy** of girls, women, officers etc.
4. A **bunch** of grapes, keys, etc.
5. A **bundle** of sticks and hay.
6. A **caravan** of merchants, pilgrims, travellers.
7. A **chain/range** of mountains or hills.
8. A **choir** of singers.
9. A **class** of students.
10. A **retinue** of servants/ attendants.
11. A **clump/ grove** of trees.
12. A **code** of laws.
13. A **cluster/ constellation/ galaxy** of stars.
14. A **company/ regiment/ army** of soldiers.
15. A **convoy** of ships, cars etc. moving under an escort.
16. A **course or series** of lectures.
17. A **crew** of sailors.
18. A **crowd/ mob** of people.
19. A **curriculum** of studies.
20. A **flight** of steps, stairs.
21. A **fleet** of ships or motorcars.
22. A **flock** of geese, sheep and birds.
23. A **gang** of robbers, labourers.
24. A **garland/bunch/ bouquet** of flowers.
25. A **heap** of ruins, sand, stones.
26. A **herd** of cattle.
27. A **litter** of puppies.
28. A **pack** of hounds, cards.
29. A **pair** of shoes, scissors, compasses, trousers.
30. A **series** of events.
31. A **sheaf** of corn, arrows.
32. A **swarm** of ants, bees or flies.
33. A **train** of carriages, followers etc.
34. A **troop** of horses (cavalry)
35. A **volley** of shots, bullets.
36. A **forum** of people (discussing issues)
37. A **congregation** of people (discussing religious issues)

(iv) Material Noun: Material Noun denotes matter or substance of which a thing is made.

For Ex - Iron, Silver, Gold, Milk, etc.

(v) Abstract Noun: An Abstract Noun is usually the name of a quality, action, or state considered apart from the object to which it belongs.

For Ex -

Quality	Action	State
Goodness	Laughter	Childhood
kindness	Theft	Boyhood
Whiteness	Movement	Youth
Darkness	Judgement	Slavery
Hardness	Hatred	Sleep
Brightness	Heroism	Sickness

Abstract Nouns are generally formed from verbs, adjectives and common Nouns.

(a) From Verbs:

live	life
know	knowledge
see	sight
advise	advice
laugh	laughter
please	pleasure
grow	growth
govern	government
serve	service
obey	obedience
practise	practice
think	thought

(b) From Adjectives

brave	bravery
great	greatness
poor	poverty
young	youth
wise	wisdom
long	length
deep	depth
grand	grandeur
good	goodness
honest	honesty
just	justice
true	truth
broad	Breadth
wide	Width
sole	Solitude
kind	Kindness

(c) From Common Nouns:

boy	boyhood
infant	infancy
thief	theft
slave	slavery
friend	friendship
judge	judgement
girl	girlhood
agent	agency
hero	heroism
bond	bondage
leader	leadership
coward	cowardice

The Noun- Number (Singular/Plural)

On the basis of number, there are two types of noun.

- (a) Singular Noun
- (b) Plural Noun

Singular Noun: A noun that is used to denote a single (one) person or thing is called singular Noun.

For Ex - Boy, girl, man, bird, tree, etc.

Plural Noun: A noun that is used to denote more than one person or thing is called plural Noun

For Ex - Boys, girls, men birds, trees, etc.

There are some rules which must be followed to ensure grammatical accuracy.

Rule 1: Hyphenated noun does not have plural form.

Ex - (a) He gave me two **hundred-rupees** notes. (change 'rupees' into 'rupee')

(b) He stays in **five-stars** hotels. (change 'stars' into 'star')

Rule 2: Certain nouns/words are used in colloquial English in India which is wrong as the word is literally translated from English to Hindi.

Ex -

Wrong

1. Cousin brother / Cousin sister
2. Pick pocketer
3. Good name
4. Big blunder
5. Strong breeze
6. Bad dream
7. Proudly
8. According to me

Correct

1. Cousin
2. Pick pocket
3. Name
4. Blunder (means a big mistake)
5. Strong wind (Breeze is always light and gentle)
6. Nightmare
7. Proud
8. In my opinion

We generally get confused while using the following nouns:-

(a) **Floor** (the flat surface of a room)

(a) **Ground** (surface of the earth)

(b) **Skill** (we acquire it by learning)

(b) **Talent** (A natural ability)

(c) **Envy** (a wish to possess that the other person has.)

(c) **Jealousy** (a feeling that arises out of fear of losing that you have.)

How Plural is formed

Generally, the Plurals of nouns are formed by adding 's' to the singular form.

For Ex -

boy — boys	Girl — girls
Bird — birds	Cow — cows
Ship — ships	Desk — desks
Pencil — pencils	Book — Books
Cassette — cassettes	Film — films

But, there are some rules of changing singular nouns into plural ones.

Rule 1: If —s, —ss, —sh, —ch, —x and —z are the last letters of noun, put —es to the end to make them plural.

Singular	Class	kiss	Miss	Brush	Bush	Bench	Branch	Box
Plural	Classes	kisses	misses	Brushes	Bushes	Benches	Branches	Boxes

But, in case of Stomach (Pronounced as Stomak), Monarch (Pronounced as Monark) only s is needed at their end to make them plural.

Patriarch Patriarchs

Monarch Monarchs

Rule 2: If there is —o in the end of a noun, put —es to the end for plural.

Singular	Hero	Volcano	Mosquito	Potato	Negro	Bingo
Plural	Heroes	Volcanoes	Mosquitoes	Potatoes	Negroes	Bingoes

There are some exceptions where only —s is needed for a plural one in —o ending nouns.

Singular	Plural	Singular	Plural
Radio	Radios	Ratio	Ratios
Studio	Studios	Portfolio	Portfolios
Cuckoo	Cuckoos	Bamboo	Bamboos

Rule 3: If there are double vowels to the end of noun, put only —s to the end of that noun for plural.

Singular	Plural	Singular	Plural
Radio	Radios	Ratio	Ratios
Studio	Studios	Portfolio	Portfolios
Cuckoo	Cuckoos	Bamboo	Bamboos

NOUN

Rule 4: If —y is the last letter of a noun and that —y is preceded by a consonant, then change y into ies for the plural forms.

Singular	Plural	Singular	Plural
Spy	Spies	Baby	Babies
History	Histories	Lady	Ladies
Fly	Flies	Sky	Skies
Story	Stories	City	Cities
Army	Armies	Pony	Ponies

Rule 5: If —y is the last letter of a noun and that —y is preceded by a vowel, put only —s to the end of that noun for plural.

Singular	Plural	Singular	Plural
Lay	Lays	Bay	Bay
Ray	Rays	Prey	Preys
Key	Keys	Storey	Storeys
Tray	Trays	Day	Days
Clay	Clays	Play	Plays

Rule 6 : If —f or —fe are the last letters of a noun, then change —f or —fe into 'ves'.

Singular	Plural	Singular	Plural
Knife	Knives	Life	Lives
Wife	Wives	Thief	Thieves
Leaf	Leaves	Loaf	Loaves

Rule 10: There are some nouns which are only used in the plural. They take plural verb with them.

(a) Names of instruments which have two parts forming a kind of pair.

For Ex - Ballows, spectacles, scissors, tongs, pincers etc.

Singular	Plural	Singular	Plural
Calf	Calves	Handkerchief	Handkerchieves
Wolf	Wolves	Shelf	Shelves
Self	Selves		

Yet, there are some exceptions to this rule, such as:

Singular	Plural	Singular	Plural
Proof	Proofs	Roof	Roofs
Chief	Chiefs	Reef	Reefs
Gulf	Gulfs	Belief	Beliefs
Grief	Griefts	Brief	Briefs
Serf	Serfs	Dwarf	Dwarfs
Hoof	Hoofs	Strife	Strifes

Rule 7: It is found that a few nouns form their plural by changing the inside vowel of the singular form.

Singular	Plural	Singular	Plural
Man	Men	Woman	Women
Tooth	Teeth	Goose	Geese
Mouse	Mice	Foot	Feet
	Feet	Louse	Lice

Noun

Rule 8: There are a few nouns that form their plural by adding en to the singular.

Singular	Plural	Singular	Plural
Ox	Oxen	Child	Children

Rule 9: There are some nouns which have their singular and plural forms alike.

Singular	Plural	Singular	Plural
Swine	Swine	Sheep	Sheep
Deer	Deer	Trout	Trout
Salmon	Salmon	Pair	Pair
Dozen	Dozen	Score	Score
Gross	Gross	Stone (unit)	Stone

Rule 10: There are some nouns which are only used in the plural. They take plural verb with them.

(a) Names of instruments which have two parts forming a kind of pair.

For Ex - Ballows, spectacles, scissors, tongs, pincers etc.

- (b) Names of certain articles of dress.
For Ex - Trousers, breeches, drawers etc.
- (c) Certain other nouns.
For Ex - Annals, thanks, proceeds (of a sale), tidings, environs, nuptials, obsequies, assets, chattels, odds, amends, seals, shambles, vegetables, troops, particulars, aborigines, alms, ashes, arrears, dregs, eaves, earnings, sweepings, etc.

Rule 11: There are some plural forms of nouns which are actually singular. They take singular verb with them.

For Ex - Innings, mathematics, news, civics, politics, physics, ethics, economics, mechanics, summons, measles, mumps, rickets, singles, billiards, athletics etc.

For Ex - Mathematics is an easy subject. (Mathematics is singular number)

If plural looking subjects are particularised or possessed, they becomes as plural nouns.

(a) **My Mathematics** are strong.

↓
Possessed

↓
Plural Number

(b) **The politics** of our state are dirty.

↓
Particularised

↓
plural number

(c) The **summons** was issued by the magistrate

↓
singular number

Rule 12: The following nouns are always used in singular number.

For Ex - Scenery, machinery, poetry, stationery, sultry, jewellery, crockery, luggage, baggage, breakage, halilage, percentage, knowledge, postage, wastage, furniture, information, traffic, coffee, dust etc.

Rule 13: Certain Collective Nouns, though singular in form, are always used as plurals.

For Ex - Poultry, cattle, vermin, people, gentry, police and peasantry etc.

Rule 14: In Compound Nouns, we make their plural forms only by adding 's' to the main word.

Singular:	Plural:
Father-in-law	Fathers-in-law
Daughter-in-law	Daughters-in-law
Mother-in-law	Mothers-in-law
Commander-in-chief	Commanders-in-chief
Step-daughter	Step-daughters
Maid-servant	Maid-servants
Looker-on	Lookers-on
Passer-by	Passers-by
Man-of-war	Men-of-war
Coat-of-mill	Coats-of-mill

Now, look at these examples:

Singular:	Plural:
Man killer	Man killers
Chief Minister	Chief Ministers
Woman hater	Woman haters
Cupful	Cupfuls
Handful	Handfuls
Draw back	Draw backs

Rule 15: Noun borrowed from other languages in English have their special rules to change them into plural.

Singular:	Plural:	Singular:	Plural:
Datum	Data	Ditum	Dita
Erratum	Errata	Bacterium	Bacteria
Referendum	Referenda	Memorandum	Memoranda
Agendum	Agenda	Medium	Media
Sanatorium	Sanatoria	Criterion	Criteria

Singular:	Plural:	Singular:	Plural:
Phenomenon	Phenomena	Oasis	Oases
Thesis	These	Hypothesis	Hypotheses
Analysis	Analyses	Crisis	Crises
Index	Indice/Indices		

Rule 16: Some—um ending Latin nouns take only —s in plural form.

Singular	Plural
Harmonium	Harmoniums
Forum	Forums
Pendulum	Pendulums
Stadium	Stadiums
Premium	Premiums
Quorum	Quorums

Rule 17: Noun + Proposition + the same noun remains always singular in use.

For Ex -

Village after village	—	correct
Match after match	—	correct
Row upon row	—	correct
Word for word.	—	correct
But,		
Villages after villages	—	wrong
Matches after matches	—	wrong
Rows upon rows	—	wrong
words for words	—	wrong

Rule 18: The digits, some words and abbreviations take their plural form in the following ways:

Singular	Plural
70	70s
21	21s
if	ifs
M.A.	M.As (not M.A.'s)
B.A.	B.As (not B.A.'s)
M.L.A.	M.L.As (not M.L.A.'s)
M.P.	M.Ps

Rule 19: Some nouns have two meanings in the singular but only one in plural.

	Singular	Plural
Light	1. radiance 2. a lamp	Lights : Lamps
Practice	1. habit 2. exercise of a profession	Practices : habits
Powder	1. dust 2. a dose of medicine in fine grains like dust	Powders : doses of medicine
People	1. nation 2. Men and women	Peoples : nations

Rule 20: Some nouns have two forms for the plural, each with a somewhat different meaning.

Singular	Plural
Brother	Brothers : Sons of the same parent Brethren : members of a society of a community.
Cloth	Cloths : kinds or pieces of cloth. Clothes : garments.

Singular	Plural
Die	Dies : stamps for coining. Dice : small cubes used in games.
Fish	Fishes : taken separately. Fish : collectively
Genius	Geniuses : persons of great talent Genii : spirits
Index	Indexes : tables of contents in books Indices : signs used in algebra
Penny	Pennies : number of coins. Pence : amount in value

Rule 21: Some nouns have one meaning in the singular and more than one in the plural.

Singular	Plural	
Colour : hue	Colours :	1. Hues
		2. the flag of a
		Regiment
Custom : habit	Customs :	1. habits.
		2. Duties levied on
		imports.
Effect : result	Effects :	1. Results
		2. Property
Manner : method	Manners :	1. Methods
		2. correct behaviour
Moral : a moral lesson	Morals :	1. moral lessons
		2. Conduct
Number : quantity	Numbers :	1. Quantities
		2. Verses
Pain : Suffering	Pains :	1. Sufferings
		2. care, exertion
Premise : proposition	Premises :	1. propositions
		2. buildings.
Quarter : fourth part	Quarters :	1. Fourth part.
		2. Lodgings
Spectacle : a sight	Spectacles :	1. sights.
		2. Eye-glasses
Letter : letter of the Alphabet	Letters :	1. letters of the alphabet
		2. Epistles
		3. Literature
Ground : earth	Grounds :	1. enclosed land
		2. attached to house
		3. reasons dregs

Rule 22: Some nouns change their meaning when we make them plural.

Singular	Plural
Air: atmosphere	Airs: affected manners
Alphabet: letter	Alphabets: languages
Advice: counsel	Advices: information
Abuse: bad language	Abuses: Evil
Compass: extent, range	Compasses: an instrument for - drawing circles

Singular	Plural
Force: strength	Forces: military forces
Good: benefit, well-being	Goods: merchandise
Physic: medicine	Physics: natural science
Practice: habit	Practices: traditions
Iron: a kind of metal	Irons: fetters
Light: radiant	Lights: lamps
Respect: regard	Respects: compliments
Work: duty	Works: creations

Rule 23: (a) Abstract Nouns have no plural.

For Ex – Hope, charity, love, kindness, happiness, hatred etc.

When such words do appear in the plural, they are used as common nouns.

For Ex – Kindness = acts of kindness. Provocations = instances or cases of provocation.

(b) There are also some names of substances or materials which are never used in plurals. They are called **Material Nouns**.

For Ex – Copper, iron, tin, wood etc.

But, when these words are used in the plural, they become Common nouns and also, their meanings are changed.

For Ex – Coppers-Copper coins. Irons —fetters.

Tins —cans made of tin. Woods —forests.

The Noun – Gender

In grammar, gender is the sexual classification of noun. Gender can be divided into four categories, which are as follows:

- (i) **Masculine Gender** (which denotes male sex)
- (ii) **Feminine Gender** (Which denotes female sex)
- (iii) **Common Gender** (which denotes both male and female)
- (iv) **Neuter Gender** (which denotes no sex and is used for non-living things)

Rules for changing masculine nouns into feminine nouns:

(1) By using a different word.

For Ex –

Masculine	Feminine	Masculine	Feminine
Father	Mother	Brother	Sister
Husband	Wife	Boy	Girl
Uncle	Aunt	Doe	Buck
Nephew	Niece	Man	Woman
King	Queen	Gentleman	Lady
Sir	Madam	Son	Daughter
Cock	Hen	Boar	Sow
Stag	Hind	Swan	Nymph
Widower	Widow	Fox	Vixen
Beau	Bettle	Gander	Goose
Bachelor	Maid, Spinster	Drone	Bee
Horse (or Stallion)	Mare	Bullock	Heifer
Hart	Roe	Buck	Doe
Wizard	Witch	Bull (or Ox)	Cow
Earl	Countess	Groom	Bride
Drake	Duck	Monk	Nun
Colt	Filly	Lad	Lass
Dog (or hound)	Bitch		

(2) By adding a syllable (—ess, —ine, —trix, —a, etc.)

For Ex -

Masculine	Feminine	Masculine	Feminine
Lion	Lioness	Heir	Heiress
Host	Hostess	Poet	Poetess
Priest	Priestess	Mayor	Mayoress
Patron	Patroness	Peer	Peeress
Benefactor	Benefactress	Conductor	Conductress
Negro	Negress	Enchanter	Enchantress
Instructor	Instructress	Founder	Foundress
Waiter	Waitress	Traitor	Traitress
Seamster	Seamstress	Tempter	Tempress
Songster	Songstress	Preceptor	Preceptress
Murderer	Murderess	Sorcerer	Sorceress

(3) By substituting a feminine word for a masculine in compound words.

For Ex -

Masculine	Feminine	Masculine	Feminine
Peacock	Peahen	Grandfather	Grandmother
Billy-goat	Nanny-goat	Cock-sparrow	Hen-sparrow
Foster-father	Foster-mother	Czar	Czarina
Jack-ass	Jenny-ass	Testator	Testatrix
Viceroy	Vicerene	Prophet	Prophetess
Executor	Executrix	Steward	Stewardess
Shepherd	Shepherdess	Manager	Manageress
Viscount	Viscountess	Baron	Barones
Jew	Jewess	Signor	Signora
Author	Authoress	Giant	Giantess
Count	Countess	Hero	Heroine
Don	Donna	Sultan	Sultana
Administrator	Administratorin	Signor	Signora

Again, —ess is added after dropping the vowel of the masculine ending.

For Ex -

Masculine	Feminine	Masculine	Feminine
Abbot	Abbess	Duke	Duchess
Emperor	Empress	Actor	Actress
Hunter	Huntress	Master	Mistress
Marquis	Marchioness	Prince	Princess
Tiger	Tigress	Votary	Votaress
he-ass	She-ass	Land-lord	Land-lady
Man-servant	Maid-servant	Milk-man	Milk-maid
School-master	School-mistress	Man-kind	Woman-kind
Washer-man	Washer-woman	Bull-calf	Cow-calf
Step-son	Step-daughter	He-bear	She-bear
Buck-rabbit	Doe-rabbit	Great-uncle	Great-aunt

Note: 1. Some Masculine Nouns are used in the Common Gender.

For Ex – Actor, Advocate, Author, Chairman, Doctor, Hound, Lawyer, Man, Painter, Poet, Teacher, Tutor, Hunter, etc.

2. Some Feminine Nouns are used in the Common Gender.

For Ex – Cow, Duck, Bee, etc.

3. Some Feminine Nouns have no corresponding Masculine forms.

For Ex – House-wife (mistress of the house)

Virgin (an unmarried woman)

Flirt (woman pretending to make love)

Virago (a turbulent woman)

Dowager (widow with late husband's property)

Siren (an enticing woman)

Brunette (a dark-complexioned woman)

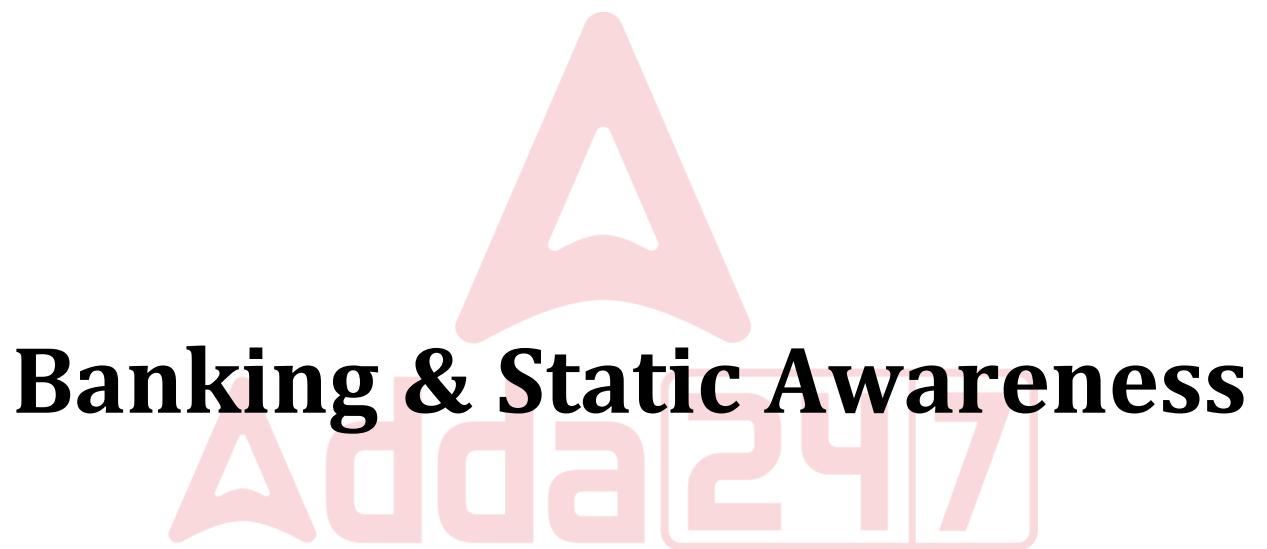
Prude (a woman of an affected modesty)

4. Some Masculines have no corresponding Feminies.

For Ex – Captain, Judge, Knight, Squire, Parson

- 26. (a):** 'India's' should be used in place of 'India'. When two nouns are joined with 'and' and denote two different possessions, then 'apostrophe' is used with each of them.
- 27. (b):** 'Public demand' should be used in place of 'Public's demand'. For explanation, refer to question -17.
- 28. (e):** No error.
- 29. (a):** 'Breeze' is gentle flow of air. So 'strong wind' will be used here.
- 30. (b):** Change 'hairs' to 'hair' because hair is an uncountable noun and it can be made singular/plural by adding certain words before the uncountable nouns. Also remember that hair takes singular verb ('dyes' in the given sentence)
- 31. (e):** Hair is singular when it refers to an entire head of hair (e.g., brown hair, blonde hair, curly hair). The word hair is usually used when it refers to all the hairs on one's head in general. When describing individual strands of hair, the plural is hairs. In the given sentence hairs are detached from the body so it can be considered countable hence the plural hairs is correct here.
- 32. (b):** Remove 'final'. 'Conclusion' is always final.
- 33. (a):** Change 'indicates' to 'indicate' because data is plural and it will qualify with plural verb. Singular form of 'data' is 'datum'.
- 34. (c):** 'Summons' is singular in form. Plural form of 'summons' is 'summonses'.
- 35. (c):** 'Mob' means 'angry group of people'. Hence 'Angry mob' is superfluous, so remove angry.
- 36. (b):** Replace 'peacockess' with 'peahen' because it is the correct feminine of peacock.
- 37. (c):** 'testatrix' comes in place of 'testatoress' because 'testatrix' is the correct feminine form of the testator.
- 38. (c):** Change 'equipments' to 'equipment' because equipment is an uncountable noun. Refer rule 12.
- 39. (a):** 'check-ups' is the correct plural form of 'check-up'. So change 'checks-up' to 'check-ups'.
- 40. (b):** 'floor' will be used instead of 'ground' because floor is the bottom or lower part of any room; the supporting surface of a room while ground is the surface of the earth, as opposed to the sky or water or underground.
- 41. (a):** Replace 'sheepess' with 'ewe' because 'ewe' is the correct feminine word.
- 42. (c):** 'a stone's throw' is the correct idiomatic usage.
- 43. (c):** 'poetry' should be used in place of 'poeticies' because poetry has no plural form and it is always used as a singular number. See rule 12.
- 44. (c):** 'cousin' should be used in place of 'cousin brother'. We don't use "sister" or "brother" with "cousin".
- 45. (c):** 'radii' (not radiuses) is plural of 'radius'.
- 46. (d):** 'seniors' should be used in place of 'senior's since, we put an Apostrophe comma at the end of plurals formed by adding 's' at the end like enemies', friends', boys' etc.
- 47. (a):** 'Commander-in-chief's' should come in place of 'Commander's-in-chief' because apostrophe is added only at the end of compound words.
- 48. (a):** 'One can love one's' should be used here.
- 49. (d):** 'percentage' should be used in place of 'percentages' because percentage has no plural form and it is always used as a singular number. See rule 12.
- 50. (b):** Change 'air conditioner's fan belt' to 'fan belt of air conditioner'. Apostrophe is not used with non-living things.

...ఎంబెచ్ రిపర్ట్...
...ఎంబెచ్ రిపర్ట్...



Banking & Static Awareness

- Banking can be defined as the activity of accepting deposits from the general public & the entities, and then lending that money to earn profits.
- But now banking not only includes deposits and loans but also includes providing services like issuance of debit and credit cards, providing safe custody of valuable items, lockers, ATM services and online transfer of funds across the country / world.
- Bank is a financial institution that performs the banking activity ie.it accepts deposits and lending of funds to earn profits.
- Any company, which transacts the business of banking defined above is termed as Banking company

Introduction

- As per the Reserve Bank of India (RBI), India's banking sector is sufficiently capitalised and well-regulated.
- The Indian banking industry has recently witnessed the roll out of innovative banking models like payments and small finance banks. RBI's new measures may go a long way in helping the restructuring of the domestic banking industry.
- The digital payments system in India has evolved the most among 54 countries with India's Immediate Payment Service (IMPS) being the only system at level 5 in the Faster Payments Innovation Index (FPII).

Market Size

- Public-sector banks control more than 70 percent of the banking system assets, thereby leaving a comparatively smaller share for its private peers. Banks are also encouraging their customers to manage their finances using mobile phones.
- As the Reserve Bank of India (RBI) allows more features such as unlimited fund transfers between wallets and bank accounts, mobile wallets are expected to become strong players in the financial ecosystem.

History of Banking Sector in India

- The first bank of a joint stock variety was Bank of Bombay, established in 1720 in Bombay. This was followed by the Bank of Hindustan in Calcutta, which was established in 1770 by an agency house.
- The General Bank of Bengal and Bihar, which came into existence in 1773, after a proposal by Governor (later Governor General) Warren Hastings, proved to be a short-lived experiment.
- The first 'Presidency bank' was the Bank of Bengal established in Calcutta on June 2, 1806 with a capital of Rs.50 lakh. The bank was given powers to issue notes in 1823.

- Bank of Bombay was the second Presidency bank set up in 1840 with a capital of Rs.52 lakh, and the Bank of Madras the third Presidency bank established in July 1843 with a capital of Rs.30 lakh.
- With the collapse of the Bank of Bombay, the New Bank of Bombay was established in January 1868.
- The Presidency Bank Act, which came into existence in 1876, brought the three Presidency banks under a common statute and imposed some restrictions on their business.
- The first Indian owned bank was the Allahabad Bank set up in Allahabad in 1865, the second, Punjab National Bank was set up in 1895 in Lahore, and the third, Bank of India was set up in 1906 in Mumbai. All these banks were founded under private ownership.
- The Swadeshi Movement of 1906 provided a great impetus to joint stock banks of Indian ownership and many more Indian commercial banks such as the Central Bank of India, Bank of Baroda, Canara Bank, Indian Bank, and Bank of Mysore were established between 1906 and 1913.
- The late Shri Vithal L Kavthekar pioneered the urban co-operative credit movement in the year 1889 in the then princely State of Baroda.
- The first registered urban co-operative credit society was the Conjeevaram Urban Co-operative Bank, organised in Conjeevaram, in the then Madras Presidency in October 1904.

Note: They were known as Presidency banks as they were set up in the three Presidencies that were the units of administrative jurisdiction in the country for the East India Company. The Presidency banks were governed by Royal Charters. The Presidency banks issued currency notes until the enactment of the Paper Currency Act, 1861, when this right to issue currency notes by the Presidency banks was abolished and that function was entrusted to the Government.

- The presidency banks were amalgamated into a single bank, the Imperial Bank of India, in 1921. It also functioned as a central bank prior to the establishment of the RBI. The Imperial Bank of India performed three sets of functions, viz., commercial banking, central banking and the banker to the government.
- By 1930, the number of commercial banks increased to 107 with the Imperial Bank of India still dominating the Indian banking sector.
- Indian Central Banking Enquiry Committee was set up in 1929 to survey extensively the problems of Indian banking, and observed that a central bank be established for the country.
- Reserve Bank of India Act 1934 was enacted paving the way for the setting up of the Reserve Bank of India. The issue of bank failures and the need for catering to the requirements of agriculture were the two prime reasons

- for the establishment of the Reserve Bank. The banking sector came under the purview of the Reserve Bank in 1935.
- The Government, therefore, first implemented the exercise of nationalisation of the Imperial Bank of India with the

objective of “extension of banking facilities on a large scale, more particularly in the rural and semi-urban areas, and for diverse other public purposes”. The Imperial Bank of India was converted into the State Bank of India in 1955 with the enactment of the State Bank of India Act, 1955.

Exercise

- Public-sector banks control more than ____ per cent of the banking system assets.
 (a) 70 per cent (b) 100 per cent (c) 80 per cent
 (d) 60 per cent (e) 50 per cent
- Name of the first bank of a joint stock variety was Bank of Bombay, The bank was established in which year?
 (a) 1840 in Surat
 (b) 1733 in Madras
 (c) 1720 in Bombay
 (d) 1725 in Calcutta
 (e) 1798 in Allahabad
- Bank of Hindustan was established in which city?
 (a) Surat (b) Bombay (c) Delhi
 (d) madras (e) Calcutta
- Bank of Bengal (Bank of Calcutta) was established in which year?
 (a) 1806 (b) 1935 (c) 1845
 (d) 1877 (e) 1884
- Bank of Hindustan was established in which year?
 (a) 1907 (b) 1919 (c) 1772
 (d) 1775 (e) 1770
- Which was the first presidency bank of India?
 (a) United Western Bank
 (b) Bank of Bengal
 (c) Bank of Rajasthan
 (d) Bank of India
 (e) None of these
- Bank of Bengal was established with a capital of
 (a) Rs. 50 lakhs (b) Rs. 100 lakhs (c) Rs. 25 lakhs
 (d) Rs. 30 lakhs (e) RS. 45 lakhs
- Name the second Presidency bank of India?
 (a) Punjab & Sind Bank
 (b) Bank of India
 (c) Bank of Bombay
 (d) Bank of Maharashtra
 (e) Bank of Madras
- Bank of Bombay was the second Presidency bank set up in which year with a capital of Rs.52 lakh?
 (a) 1840 (b) 1845 (c) 1835
 (d) 1919 (e) 1935
- Which was the third presidency bank of India?
 (a) Bank of Madras
 (b) Bank of Bombay
 (c) United Western Bank
 (d) Bank of Bengal
 (e) United Bank of India
- Bank of Madras was established in which year with a capital of Rs.30 lakh.
 (a) 1840 (b) 1843 (c) 1885
 (d) 1777 (e) 1770
- The Presidency Bank Act came into existence in which year that brought the three Presidency banks under a common statute and imposed some restrictions on their business?
 (a) 1885 (b) 1777 (c) 1880
 (d) 1770 (e) 1876
- The first Indian owned bank was the Allahabad Bank set up in Allahabad in which year?
 (a) 1865 (b) 1777 (c) 1843
 (d) 1876 (e) 1720
- Punjab National Bank was the second Indian owned bank set up in which year?
 (a) 1895 in Lahore
 (b) 1865 in Surat
 (c) 1777 in Madras
 (d) 1770 in calcutta
 (e) 1885 Amritsar
- Bank of India was the third Indian owned bank set up in 1906 in which city?
 (a) Calcutta (b) Madras (c) Allahabad
 (d) Lucknow (e) Mumbai
- All three presidency banks were amalgamated into a single bank, the Imperial Bank of India, in which year?
 (a) 1945 (b) 1921 (c) 1919
 (d) 1935 (e) 1950
- The Imperial Bank of India was converted into the State Bank of India in which year?
 (a) 1982 (b) 1962 (c) 1956
 (d) 1990 (e) 1955
- In which year the Indian Central Banking Enquiry Committee was set up?
 (a) 1930 (b) 1935 (c) 1929
 (d) 1777 (e) 1876
- Which was the first registered urban co-operative credit society of India ?
 (a) Anyonya Sahakari Mandali
 (b) Conjeevam Urban Co-operative
 (c) Pioneer Urban
 (d) Kanakavli-Math Co-operative Credit Society
 (e) Bombay Urban Co-operative Credit Society
- The general Bank of Bengal and Bihar came into existence in which year?
 (a) 1773 (b) 1874 (c) 1934
 (d) 1770 (e) 1772

Solutions

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|--|--|--|
| 1. (a): Public sector banks control more than 70 percent of the banking system assets thereby the private sector's share is very low as compared to public sector banks. | 6. (b): The first presidency bank was the Bank of Bengal established in calcutta on June 2, 1806 with a capital of RS. 50 Lakh. | India. Its headquarter is in New Delhi, India. The bank was founded in 1894 and was established in Lahore. |
| 2. (c): The western variety of joint stock banking was brought to India by the English Agency houses of Calcutta and Bombay (now Kolkata and Mumbai). The first bank of a joint stock variety was Bank of Bombay, established in 1720 in Bombay | 7. (a): The Bank of Bengal established in calcutta on June 2, 1806 with a capital of RS. 50 Lakh. | 15. (e): Bank of India was founded on 7th September, 1906 by a group of eminent businessmen from Mumbai. |
| 3. (e): The first bank of India is Bank of Hindustan established in 1770. This bank was established at Calcutta under European management. It was liquidated in 1830-32. | 8. (c): The bank of Bombay was the second presidency bank of India established In the year 1840 with capital Rs. 52 lakhs | 16. (b): The Imperial Bank is owned by the shareholders of these three merged presidency banks.This bank represents a merger of the presidency banks of Bengal, Bombay, and Madras |
| 4. (a): The Bank of Calcutta was launched on 2nd June, 1806 as a Regional Bank. Among its founders were East India Company, Some European Merchants and a few wealthy Indians. | 9. (a): The bank of Bombay was the second presidency bank of India established In the year 1840 | 17. (e): On 1 July 1955, the Imperial Bank of India became the State Bank of India. |
| 5. (e): Modern banking in India originated in the last decade of the 18th century. Among the first banks were the Bank of Hindustan, which was established in 1770 and liquidated in 1829-32; and the General Bank of India, established in 1786 but failed in 1791. | 10. (a): The Bank of madras was the third presidency bank of India established in the year July 1843 with a capital of Rs. 30 lakhs | 18. (c): Indian Central Banking Enquiry Committee was set up in 1929 to survey extensively the problems of Indian banking, and observed that a central bank be established for the country. |
| | 11. (b): The Bank of madras was the third presidency bank of India established in the year July 1843 | 19. (b): The first urban cooperative credit society was registered in Canjeevaram (Kanjivaram) in the erstwhile Madras province in October, 1904. Amongst the prominent credit societies were the Pioneer Urban in Bombay (November 11, 1905), |
| | 12. (e): The presidency bank Act, came into existence in 1876, brought three Presidency banks under a common statute and imposed some restrictions on their business | 20. (a): The bank came into existence in the year 1773. |
| | 13. (a): The bank was founded in Allahabad in 1865. | |
| | 14. (a): Punjab National Bank is a Banking and Financial service bank owned by Government of | |

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All about the Formation of RBI

- RBI is the central bank of India. It is also known as the banker's Bank.
- The origins of RBI can be traced to 1926, when the Royal Commission on Indian Currency and Finance – also known as the Hilton-Young Commission – recommended the creation of a central bank for India to separate the control of currency and credit from the Government and to augment banking facilities throughout the country.
- RBI Act of 1934 established the Reserve Bank and it started its operations in 1935.
- The Central Office of the Reserve Bank was initially established in Calcutta but was permanently moved to Mumbai in 1937.
- Starting as a private shareholders' bank, the Reserve Bank was nationalised in 1949. It aimed at achieving coordination between the policies of the government and those of the central bank.

Origins of the Reserve Bank of India

- **1926:** The Royal Commission on Indian Currency and Finance recommended creation of a central bank for India.
- **1927:** A bill to give effect to the above recommendation was introduced in the Legislative Assembly, but was later withdrawn due to lack of agreement among various sections of people.
- **1933:** The White Paper on Indian Constitutional Reforms recommended the creation of a Reserve Bank. A fresh bill was introduced in the Legislative Assembly.
- **1934:** The Bill was passed and received the Governor General's assent
- **1935:** The Reserve Bank commenced operations as India's central bank on April 1 as a private shareholders' bank with a paid-up capital of rupees five crore (rupees fifty million).
- **1942:** The Reserve Bank ceased to be the currency issuing authority of Burma (now Myanmar).
- **1947:** The Reserve Bank stopped acting as banker to the Government of Burma.
- **1948:** The Reserve Bank stopped rendering central banking services to Pakistan.
- **1949:** The Government of India nationalised the Reserve Bank under the Reserve Bank (Transfer of Public Ownership) Act, 1948.

RBI as on Organisation

- The Central Board of Directors is at the top of the Reserve Bank's organisational structure. These are appointed by the Government under the provisions of the Reserve Bank of India Act, 1934.

- The Governor is the Reserve Bank's chief executive. It supervises and directs the affairs and business of the RBI. The management team also includes Deputy Governors and Executive Directors.
- The Central Government nominates fourteen Directors on the Central Board, including one Director each from the four Local Boards. The other ten Directors represent different sectors of the economy.
- All these appointments are made for a period of four years.
- Govt. also nominates one Government official as a Director representing the Government, who is usually the Finance Secretary to the Government of India and remains on the Board 'during the pleasure of the Central Government'.
- The Reserve Bank Governor and a maximum of four Deputy Governors are also ex officio Directors on the Central Board.

Subsidiaries of the RBI

The fully owned subsidiaries of RBI are as follows:

- **Deposit Insurance and Credit Guarantee Corporation of India (DICGC)**
- **Bharatiya Reserve Bank Note Mudran Private Limited (BRBNMPL)**

A Brief on Deposit Insurance and Credit Guarantee Corporation of India (DICGC)

- With a view to integrating the functions of deposit insurance and credit guarantee, the Deposit Insurance Corporation and Credit Guarantee Corporation of India were merged and the present Deposit Insurance and Credit Guarantee Corporation (DICGC) came into existence on July 15, 1978.
- It was established under the DICGC Act 1961.
- It insures all deposits (such as savings, fixed, current, and recurring deposits) with eligible banks except some deposits that we will study in the chapter related to DICGC.

Bharatiya Reserve Bank Note Mudran Private Limited (BRBNMPL)

- RBI established BRBNMPL in February 1995 as a wholly-owned subsidiary to augment the production of bank notes in India and to enable bridging of the gap between supply and demand for banknotes in the country.
- It has been registered as a Public Limited Company under the Companies Act, 1956 with its Registered and Corporate Office situated at Bengaluru.

The Current Office Holders

Shri Shaktikanta Das | Governor

Shri T. Rabi Sankar | Deputy Governor

Shri M. Rajeshwar Rao | Deputy Governor

Functions of the RBI

Monetary Authority

- Formulates, implements and monitors the monetary policy.
 - Objective: maintaining price stability while keeping in mind the objective of growth.

Regulator and supervisor of the financial system:

- Prescribes broad parameters of banking operations within which the country's banking and financial system functions.
 - Objective: maintain public confidence in the system, protect depositors' interest and provide cost-effective banking services to the public.

Manager of Foreign Exchange

- Manages the Foreign Exchange Management Act, 1999.
 - Objective: to facilitate external trade and payment and promote orderly development and maintenance of foreign exchange market in India.

Issuer of currency

- Issues and exchanges or destroys currency and coins not fit for circulation.
 - Objective: to give the public adequate quantity of supplies of currency notes and coins and in good quality.

Other Functions of RBI

- **Also, RBI** performs a wide range of promotional functions to support national objectives.
 - **Banker to the Government:** performs merchant banking function for the central and the state governments; also acts as their banker.
 - **Banker to banks:** maintains banking accounts of all scheduled banks.

What is Financial Supervision by RBI with the help of BFS?

RBI performs the function of Financial supervision under the guidance of the Board for Financial Supervision (BFS).

This was constituted in November 1994 as a committee of the Central Board of Directors of the Reserve Bank of India. The objective is to undertake consolidated supervision of the financial sector comprising commercial banks, financial institutions and non-banking finance companies.

The Board is constituted by co-opting four Directors from the Central Board as members for a term of two years and is chaired by the Governor.

Other important points related to RBI

- It has 27 regional offices, most of them in state capitals and 04 Sub-offices.
 - It has five training establishments
 - (a) Two, namely, College of Agricultural Banking and Reserve Bank of India Staff College are part of the Reserve Bank.
 - (b) Others are autonomous, such as, National Institute for Bank Management, Indira Gandhi Institute for Development Research (IGIDR), Institute for Development and Research in Banking Technology (IDRBT) etc.

The acts administered by Reserve Bank of India

- Reserve Bank of India Act, 1934
 - Public Debt Act, 1944/Government Securities Act, 2006
 - Government Securities Regulations, 2007
 - Banking Regulation Act, 1949
 - Foreign Exchange Management Act, 1999
 - Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (Chapter II)
 - Credit Information Companies (Regulation) Act, 2005
 - Payment and Settlement Systems Act, 2007
 - Payment and Settlement Systems Regulations, 2008 and Amended up to 2011 and BPSS Regulations, 2008
 - The Payment and Settlement Systems (Amendment) Act, 2015 - No. 18 of 2015
 - Factoring Regulation Act, 2011

Exercise

- The RBI is established on the recommendations of which commission?
(a) YV Reddy Committee
(b) Hilton Young Commission
(c) Rangarajan Committee
(d) J Reddy Committee
(e) None of these
 - The RBI established under which act?
(a) RBI Act of 1935 (b) RBI Act of 1934
(c) RBI Act of 1949 (d) RBI Act of 1926
(e) None of these
 - The Central Office of the Reserve Bank was initially established in?
(a) Calcutta (b) Mumbai (c) Delhi
(d) Chennai (e) Bengaluru
 - The Head office of the Reserve Bank of India currently situated in?
(a) Jaipur (b) Kolkata (c) Chennai
(d) Delhi (e) Mumbai
 - The Reserve Bank was nationalised in which year?
(a) 1947 (b) 1935 (c) 1949
(d) 1945 (e) 1942
 - The Reserve Bank started its operations in?
(a) 1938 (b) 1932 (c) 1935
(d) 1945 (e) 1949
 - The Reserve Bank stopped acting as banker to the Government of Burma from?
(a) 1947 (b) 1945 (c) 1944
(d) 1949 (e) 1938

- 8.** The Central Board of Directors of the Reserve Bank are appointed by?
(a) President (b) The Central Government
(c) Supreme Court (d) Finance minister
(e) None of these

9. How many Deputy Governors currently in the Reserve Bank of India?
(a) 5 (b) 4 (c) 7
(d) 3 (e) 6

10. The Central Government nominates ____ Directors on the Central Board for a period of four years.
(a) 14 (b) 12 (c) 15
(d) 17 (e) 10

11. DICGC is one of the fully owned subsidiaries of RBI, the full form of DICGC is?
(a) Deposit Insurance and Cash Guarantee Corporation of India
(b) Demandable Insurance and Credit Guarantee Corporation of India
(c) Deposit Insurance and Credit Guarantee Corporation of India
(d) Deposit Insurance and Credit Guarantee Company of India
(e) None of these

12. What is the full form of BRBNMPL?

13. Bharatiya Reserve Bank Note Mudran Private Limited
(a) Bharatiya Reserve Bank Note Monetary Private Limited
(b) Bharatiya Reserve Bank Note Money Private Limited
(c) Bharatiya Reserve Bank Note Micro Private Limited
(d) Bharatiya Reserve Bank Note Money Private Limited
(e) None of these

14. National Housing Bank (NHB) was set up on?
(a) 1982 (b) 1975 (c) 1998
(d) 1988 (e) 1992

15. RBI performs the function of Financial supervision under the guidance of?
(a) Board for Financial Supervision
(b) Central Board Directors
(c) RBI Governor
(d) Board for Payment and Settlement Systems
(e) None of these

16. The number of regional offices of RBI?
(a) 27 (b) 25 (c) 31
(d) 29 (e) 35

17. RBI Manages the Foreign Exchange under the act?
(a) Foreign Exchange Management Act, 1995
(b) Foreign Exchange Management Act, 1993
(c) Foreign Exchange Management Act, 1989
(d) Foreign Exchange Management Act, 1999
(e) Foreign Exchange Management Act, 1998

Solutions

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| 1. (b): Royal Commission on Indian Currency (Hilton Young Commission) recommends the establishment of a central bank to be called the 'Reserve Bank of India'. | Bank stopped acting as banker to the Government of Burma. | Nominated by Government: ten Directors from various fields and two government Official Others: four Directors - one each from four local boards |
| 2. (b): Reserve Bank of India Act, 1934, (II of 1934) constitutes the statutory basis on which the Bank is established. | 8. (b): The Central Board is appointed by the Central Government under the provisions of the Reserve Bank of India Act, 1934. | 11. (c): Deposit Insurance and Credit Guarantee Corporation is a wholly-owned subsidiary of Reserve Bank of India. It was established on 15 July 1978 under the Deposit Insurance and Credit Guarantee Corporation Act, 1961 to provide insurance of deposits and guarantee of credit facilities. |
| 3. (a): The original headquarter of RBI was in Calcutta. | 9. (b): The bank is headed by the governor, currently Shaktikanta Das. There are four deputy governor. | 12. (a): Bharatiya Reserve Bank Note Mudran Private Limited (BRBNMPL) was established by Reserve Bank of India (RBI) as its wholly owned subsidiary on 3rd February 1995 with a view to augmenting the production of banknotes in India to enable the RBI to bridge the gap between the supply and |
| 4. (e): RBI headquarter is in Mumbai. | 10. (a): The Reserve Bank's affairs are governed by a central board of directors. The board is appointed by the Government of India in keeping with the Reserve Bank of India Act. | |
| 5. (c): The Reserve Bank of India was nationalised with effect from 1st January, 1949 based on the Reserve Bank of India (Transfer to Public Ownership) Act, 1948. | Appointed/nominated for a period of four years
Constitution: Official Directors Full-time : Governor and not more than four Deputy Governors | |
| 6. (c): RBI began operations on April 01, 1935. | | |
| 7. (a): The Reserve Bank ceased to be the currency-issuing authority of Burma (now Myanmar) in 1942. In 1947, the Reserve | Non-Official Directors | |

Different Stages of Development of Indian Banking

- The Indian Banking System starts with **the Indigenous Banking System** which was mainly carried by the businessmen called Sharoffs, Seths, Sahukars, Mahajans, Chettis, etc. It couldn't be developed because they were not able to obtain deposits from the public.
- Modern banking** in India originated in the last decades of the 18th century. The first banks were The **General Bank of India which started in 1786, and the Bank of Hindustan**.
- Thereafter, **three presidency banks namely the Bank of Bengal** (this bank was originally started in the year 1806 as Bank of Calcutta and then in the year 1809 became the Bank of Bengal), the Bank of Bombay and the Bank of Madras, were set up. These three banks were merged in 1925 to form the Imperial Bank of India.
- The Allahabad Bank**, established in 1865, is the oldest survived Joint Stock bank in India.
- Punjab National Bank**, established in Lahore in 1895, which is now one of the largest banks in India.
- A major landmark in Indian banking history took place in **1934 when a decision was taken to establish 'Reserve Bank of India'** which started functioning in 1935. Since then, RBI, as a central bank of the country, has been regulating banking system.
- In 1949, to have close integration between policies of the Reserve Bank and those of the Government, it was decided to **nationalize the Reserve Bank immediately after the independence of the country**.
- To streamline the functioning of commercial banks, the **Government of India enacted the Banking Companies Act, 1949 which was later changed as the Banking Regulation Act 1949**. RBI acts as a regulator of banks, banker to the Government and banker's bank.
- To serve the economy in general and the rural sector in particular, the **All India Rural Credit Survey Committee recommended the creation of a state-partnered and state-sponsored bank by taking over the Imperial Bank of India, and integrating with it, the former state-owned or state-associate banks. An act was accordingly passed in Parliament in May 1955 and the State Bank of India was constituted on 1 July 1955**. Later, the State Bank of India (Subsidiary Banks) Act was passed in 1959, enabling the State Bank of India to take over eight former State-associated banks as its subsidiaries (later named Associates).
- Indian Banking System witnessed a major revolution in the year **1969 when 14 major commercial banks in the private sector were nationalized on 19th July, 1969**. Most of these banks having deposits of above Rs. 50 crores.
- In **1980, another six more commercial banks with deposits of above Rs. 200 crores were nationalized**.

Regional Rural Banks

- In 1975, a new set of banks **called the Regional Rural Banks, were setup based on the recommendations of a working group headed by Shri Narasimham**, to serve the rural population in addition to the banking services offered by the co-operative banks and commercial banks in rural areas.

New Private Sector Banks

- In 1991, the Narasimham committee recommended that banks should increase operational efficiency, strengthen the supervisory control over banks and the new players should be allowed to create a competitive environment. Based on the recommendations, **new private banks were allowed to start functioning**.

History of Banking Sector in India

- The first bank of a joint stock variety was Bank of Bombay, established in 1720 in Bombay. This was followed by Bank of Hindustan in Calcutta, which was established in 1770 by an agency house.
- The General Bank of Bengal and Bihar, which came into existence in 1773, after a proposal by Governor (later Governor General) Warren Hastings, proved to be a short-lived experiment.
- The first 'Presidency bank' was the Bank of Bengal established in Calcutta on June 2, 1806 with a capital of Rs.50 lakh. The bank was given powers to issue notes in 1823.
- Bank of Bombay was the second Presidency bank set up in 1840 with a capital of Rs.52 lakh, and the Bank of Madras the third Presidency bank established in July 1843 with a capital of Rs.30 lakh.
- With the collapse of the Bank of Bombay, the New Bank of Bombay was established in January 1868.
- The Presidency Bank Act, which came into existence in 1876, brought the three Presidency banks under a common statute and imposed some restrictions on their business.
- The first Indian owned bank was the Allahabad Bank set up in Allahabad in 1865, the second, Punjab National Bank was set up in 1895 in Lahore, and the third, Bank of India was set up in 1906 in Mumbai. All these banks were founded under private ownership.
- Swadeshi Movement of 1906 provided a great impetus to joint stock banks of Indian ownership and many more Indian commercial banks such as Central Bank of India, Bank of Baroda, Canara Bank, Indian Bank, and Bank of Mysore were established between 1906 and 1913.

- The late Shri Vithal L Kavthekar pioneered the urban co-operative credit movement in the year 1889 in the then princely State of Baroda.
- The first registered urban co-operative credit society was the Conjeevaram Urban Co-operative Bank, organised in Conjeevaram, in the then Madras Presidency.

Note:

- They were known as Presidency banks as they were set up in the three Presidencies that were the units of administrative jurisdiction in the country for the East India Company. The Presidency banks were governed by Royal Charters. The Presidency banks issued currency notes until the enactment of the Paper Currency Act, 1861, when this right to issue currency notes by the Presidency banks was abolished and that function was entrusted to the Government.
- The presidency banks were amalgamated into a single bank, the Imperial Bank of India, in 1921. It also functioned as a central bank prior to the establishment RBI. The Imperial Bank of India performed three set of functions, viz., commercial banking, central banking and the banker to the government.
- By 1930, the number of commercial banks increased to 107 with the Imperial Bank of India still dominating the Indian banking sector.
- Indian Central Banking Enquiry Committee was set up in 1929 to survey extensively the problems of Indian banking, observed that a central bank be established for the country.
- Reserve Bank of India Act 1934 was enacted paving the way for the setting up of the Reserve Bank of India. The issue of bank failures and the need for catering to the requirements of agriculture were the two prime reasons for the establishment of the Reserve Bank. The banking sector came under the purview of the Reserve Bank in 1935.
- The Government, therefore, first implemented the exercise of nationalisation of the Imperial Bank of India with the objective of "extension of banking facilities on a large scale, more particularly in the rural and semi-urban areas, and for diverse other public purposes". The Imperial Bank of India was converted into the State Bank of India in 1955 with the enactment of the State Bank of India Act, 1955.

Major Controls/Schemes introduced in Banking Sector from 1968

Year	Reform Introduced
1962	In order to ensure the safety of deposits of small depositors in banks in India, Deposit Insurance Corporation Act, 1961 was enacted. Deposit Insurance Corporation of India was established in January 1962.
1963	Agricultural Refinance Corporation (ARC) was set up by the Act of July 1, 1963. Its objective was to

	refinance central land mortgage banks, State cooperative banks and scheduled commercial banks.
1965	Credit Authorisation Scheme (CAS) was introduced, under which the commercial banks were required to obtain prior permission of RBI for sanctioning any fresh working capital limits above the prescribed norm which was revised from time to time.
1968	National Credit Council (NCC) set up in Feb. 1968 to assist RBI & Govt. to allocate credit according to plan priorities.
1969	Fourteen banks with deposits of over Rs.50 crores were nationalised.
1969	Lead Bank Scheme was introduced to mobilise deposits on a massive scale throughout the country and also for stepping up lending to the weaker sections.
1972	Concept of Priority Sector was formalised. Specific targets were set out in Nov 1974 for public sector banks & in Nov. 1978 for private sector banks.
1972	Differential Rate of Interest (DRI) Scheme was instituted to cater to the needs of the weaker sections of the society and for their upliftment.
1980	Six Banks with demand and time liabilities greater than Rs.200 crore as on March 14, 1980, were nationalised on April 15, 1980.
1994	Board for Financial Supervision (BFS) was set up within RBI to attend exclusively to supervisory functions & provide effective supervision in an integrated manner over the banking system, financial institutions, NBFCs & other para-banking financial institutions.
1995	Banking Ombudsman Scheme was introduced under the provisions of the BR Act, 1949.
2006	Banking Codes and Standards Board of India (BCSBI) was set up by Reserve Bank in order to provide for voluntary registration of banks committing to provide customer services as per the agreed standards and codes.
	The roadmap for the presence of foreign banks in India was drawn up in February 2005.
	Banks were advised to introduce a facility of 'no frills' account with nil or low minimum balances in November 2005.
	Recovery of Debts Due to Banks and Financial Institutions Act was enacted in 1993, which provided for the establishment of tribunals for expeditious adjudication and recovery of non-performing loans.
	Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002 was enacted in March, 2002.

- Before 1949, all the commercial banks in India were exclusively owned, controlled and managed by private entrepreneurs. The process of **nationalization of banks began** with the nationalization of RBI on 1st Jan 1949, with the passing of Reserve Bank (Transfer of Public Ownership) Act, 1948.
- RBI was nationalized to ensure greater coordination of monetary, economic and fiscal policies in independent India.

Nationalization of SBI

- The first step towards the nationalisation of commercial banks started with the **nationalisation of the Imperial Bank of India as the State Bank of India on 1 July 1955**.
- After this the 7 State-associated banks were nationalised as subsidiaries of the State Bank of India in 1959.
- The 7 associate banks were – the State Bank of Hyderabad, the State Bank of Jaipur and Bikaner, the State Bank of Travancore, the State Bank of Mysore, the State Bank of Patiala, the State Bank of Indore, and the State Bank of Saurashtra.

Nationalization of Banks in 1969

On 19th July 1969, 14 major commercial banks with deposits exceeding Rs. 50 crores were nationalized.

- Allahabad Bank
- Bank of Baroda
- Bank of India
- Bank of Maharashtra
- Canara Bank
- Central Bank of India
- Dena Bank
- Indian Bank
- Indian Overseas Bank
- Punjab National Bank
- Syndicate Bank
- Union Bank of India
- United Bank of India
- United Commercial Bank (now known as UCO bank)

Nationalization of Banks in 1980

On 15th April 1980, 6 more commercial banks were nationalized which were having the deposits above Rs.200 crores. The banks were:

- | | |
|------------------------------|-------------------------|
| 1. Andhra Bank | 2. Corporation Bank |
| 3. New Bank of India | 4. Punjab and Sind Bank |
| 5. Oriental Bank of Commerce | 6. Vijaya Bank |

Note: New Bank of India was merged with Punjab National Bank in 1993.

An Important Point

- Because of the nationalization, the major segment of the banking sector came under the control of the Government.

- The nationalization of banks imparted major impetus to branch expansion in unbanked, rural and semi-urban areas, which in turn resulted in huge deposit mobilization, thereby giving boost to the overall savings rate of the economy.
- It also resulted in scaling up of lending to agriculture and its allied sectors.

What were the possible OBJECTIVES of Nationalization?

- The Banking Companies (Acquisition and Transfer of Undertakings) Act, 1970 under which 14 banks were nationalised with effect from 19 July 1969** spelt the main objective as “to serve better the needs of development of the economy in conformity with national policy and objectives and for matters connected therewith or incidental thereto”.
- These objectives included:
- To mobilise the savings of the people to the largest possible extent and to utilise them for productive purposes.
- To ensure the operations of the banking system for a larger social purpose and to subject them to close public regulation.
- To meet the legitimate credit needs of private sector industry and trade, big or small.
- To meet in an increasing manner the needs of productive sectors of the economy and in particular those of farmers, small scale industrialists and self-employed professional groups.
- To actively foster the growth of the new and progressive entrepreneurs and credit fresh opportunities for hitherto neglected and backward areas in different parts of the country.
- To curb the use of bank credit for speculative and other unproductive purposes.
- To provide adequate training and reasonable terms of service to bank staff.
- To considerably expand the branch network of bank in all parts of the country, and
- To reduce regional and sectoral imbalance in banking and through that in economic development.

SBI Merger with its Associates

- Five associates & the Bharatiya Mahila Bank became part of the State Bank of India (SBI) on 1st April 2017, catapulting the country's largest lender to among the top 50 banks in the world.
- State Bank of Bikaner and Jaipur (SBBJ), State Bank of Hyderabad (SBH), State Bank of Mysore (SBM), State Bank of Patiala (SBP) and State Bank of Travancore (SBT),

- Financial System in a country comprises of various intermediaries who play crucial roles in sourcing out the funds from the surplus segment & deploying such funds to needy segments.
- The intermediaries are banks, financial institutions, mutual funds, etc.

Money Market

- Money market is a market for short-term financial assets that are close substitutes of money.
- The most important feature of a money market instrument is that it is liquid and can be turned into money quickly at low cost.
- The call/notice/Term money market forms an important segment of the Indian Money Market.
- **Under call money market**, funds are transacted on an overnight basis and **under notice money market**, funds are transacted for a period between 2 days and 14 days & **under the Term Money Market**, funds are transacted for a period between 15 days and 365 days.
- Scheduled commercial banks (excluding RRBs), cooperative banks (other than Land Development Banks) and Primary Dealers (PDs), **are permitted to participate in the call/notice money market both as borrowers and lenders.**

What are the Money Market Instruments?

- Commercial Paper
- Commercial Paper (CP) is an unsecured money market instrument issued in the form of a promissory note.
- CP, as a privately placed instrument, was introduced in India in 1990 with a view to enable highly rated corporate borrowers to diversify their sources of short-term borrowings and to provide an additional instrument to investors.
- Primary Dealers (PDs) and all-India financial institutions (FIs) were also permitted to issue CP to enable them to meet their short-term funding requirements.

Who can issue CP?

- Companies, PDs and FIs are permitted to raise short term resources through CP.
- A company would be eligible to issue CP provided:
 - (a) The tangible net worth of the company, as per the latest audited balance sheet, is not less than Rs.4 crore;
 - (b) The company has been sanctioned working capital limit by bank/s or FIs; and
 - (c) The borrowing account of the company is classified as a Standard Asset by the financing bank/institution.

Important Key Points related to CP

- CP shall be issued in the form of a promissory note.

- CP shall be issued in denominations of Rs. 5 lakh and multiples thereof.
- CP shall be issued at a discount to face value as may be determined by the issuer.
- CP shall be issued for maturities between a minimum of 7 days and a maximum of up to one year from the date of issue.

Certificates of Deposit

- Certificate of Deposit (CD) is a negotiable money market instrument and issued in dematerialised form or as a Usance Promissory Note against funds deposited at a bank or other eligible financial institution for a specified time period.

Who can issue CDs?

- CDs can be issued by
 - (a) scheduled commercial banks {excluding Regional Rural Banks and Local Area Banks}
 - (b) select All-India Financial Institutions (FIs) that have been permitted by RBI to raise short-term resources within the umbrella limit fixed by RBI.

Important Key Points related to CDs

- Minimum amount of a CD should be Rs.1 lakh, and in multiples of Rs. 1 lakh thereafter.
- Maturity period of CDs issued by banks should not be less than 7 days and not more than one year, from the date of issue.
- FIs can issue CDs for a period not less than 1 year and not exceeding 3 years from the date of issue.
- CDs may be issued at a discount on face value.
- Banks / FIs should issue CDs only in dematerialised form.

Non-Convertible Debentures (NCDs) of original or initial maturity up to one year

- Non-Convertible Debenture (NCD) means a debt instrument issued by a corporate (including NBFCs) with original or initial maturity up to one year and issued by way of private placement.
- "Corporate" means a company as defined in the Companies Act, 2013 (including NBFCs) and a corporation established by an act of any Legislature.

Eligibility to issue NCDs

A corporate shall be eligible to issue NCDs if it fulfills the following criteria, namely,

- The corporate has a tangible net worth of not less than Rs.4 crore, as per the latest audited balance sheet;
- The corporate has been sanctioned working capital limit or term loan by bank/s or all-India financial institution/s; and



- **PM SVANidhi** stands for Prime Minister Street Vendor's Atma Nirbhar Nidhi. It is a central sector scheme launched in June 2020. It aims to provide micro-credit facilities to street vendors affected due to COVID-19 pandemic. The scheme intends to facilitate collateral-free working capital loans of up to **INR10,000/- of one-year tenure.**
- Minister of Railways, Commerce and Industry, Consumer Affairs, and Food and Public Distribution **Piyush Goyal** launched the **Startup India Seed Fund Scheme (SISFS)** on **19 April 2021**. The fund aims to provide financial assistance to startups for proof of concept, prototype development, product trials, market entry, and commercialization.
- **The Pradhan Mantri Kisan Samman Nidhi Yojana (PM-Kisan Yojana)** was launched in **February 2019**. Under the scheme, the Centre transfers an amount of **Rs 6,000 per year, in three equal instalments**, directly into the bank accounts of all landholding farmers irrespective of the size of their land holdings. It is a Central Sector Scheme with 100% funding from the Government of India and being implemented by the **Ministry of Agriculture and Farmers Welfare**.
- **Pradhan Mantri Matsya Sampada Yojana (PMMSY)** launched by PM Narendra Modi on 10 September 2020. The Pradhan Mantri Matsya Sampada Yojana (PMMSY) aims to focus on the focused and sustainable development of the fisheries sector in the country. The scheme will be implemented at an estimated cost of Rs. 20,050 crores within a period of 5 years from the fiscal year 2020-21 to the fiscal year 2024-25 in all states and union territories. The scheme was announced as a part of the centre's AatmaNirbhar Bharat Package.
- **Pradhan Mantri Jan-Dhan Yojana (P.M.J.D.Y)** is India's National Mission for Financial Inclusion to ensure access to financial services, namely Banking Savings & Deposit Accounts, Remittance, Credit, Insurance, Pension in an affordable manner. This financial inclusion campaign was launched by the Prime Minister of India Narendra Modi on 28 August 2014.
- **Sukanya Samridhhi Account** is a Government of India backed saving scheme targeted at the parents of girl children. The scheme encourages parents to build a fund for the future education and marriage expenses for their female child. The scheme was launched by Prime Minister Narendra modi on 22 January 2015 as a part of the Beti Bachao, Beti Padhao campaign.
- **Pradhan Mantri MUDRA Yojana (PMMY)** is a scheme launched by the Hon'ble Prime Minister on April 8, 2015 for providing loans upto 10 lakh to the non-corporate, non-farm small/micro enterprises. These loans are classified as MUDRA loans under PMMY. These loans are given by Commercial Banks, RRBs, Small Finance Banks, Cooperative Banks, MFIs and NBFCs. Under the aegis of Pradhan Mantri MUDRA Yojana, MUDRA has created three products i.e. 'Shishu', 'Kishore' and 'Tarun' as per the stage of growth and funding needs of the beneficiary micro unit.
 - **Shishu:** covering loans up to Rs. 50,000
 - **Kishore:** covering loans above Rs. 50,000 and up to Rs.5,00,000
 - **Tarun:** covering loans above Rs.5,00,000 and up to Rs.10,00,000
- **Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY)** is a government-backed Life insurance scheme in India. It was originally mentioned in the 2015 Budget speech by Finance Minister Arun Jaitley in February 2015. It was formally launched by Prime Minister Narendra Modi on 9 May 2015 in Kolkata.
- **Pradhan Mantri Suraksha Bima Yojana (PMSBY)** is a government-backed accident insurance scheme in India. It was formally launched by Prime Minister Narendra Modi on 9 May 2015 in Kolkata. Pradhan Mantri Suraksha Bima Yojana is available to people between 18 and 70 years of age with bank accounts. It has an annual premium of Rs12.
- **Atal Pension Yojana** is a government-backed pension scheme in India targeted at the unorganized sector. It is administered by the PFRDA (Pension Fund Regulatory and Development Authority) under the National Pension System (NPS). The scheme was launched to encourage individuals from the weaker section to opt for pension, which would immensely benefit them during their old age. It was launched by Prime Minister Narendra Modi on 9 May 2015 in Kolkata. The minimum age of joining APY is 18 years and maximum age is 40 years.
- **Kisan Vikas Patra** is a saving certificate scheme which was first launched in 1988 by India Post. It was successful in the early months but afterwards the Government of India set up a committee under supervision of Shayamla Gopinath which gave its recommendation to the Government that KVP could be misused. Hence the Government of India decided to close this scheme and KVP was closed in 2011 and the new government relaunched it in 2014.
- **Pradhan Mantri Krishi Sinchayee Yojana (PMKSY)** has been formulated with the vision of extending the coverage of irrigation 'Har Khet ko pani' and improving water use efficiency 'More crop per drop' in a focused manner with end to end solution on source creation, distribution, management, field application and extension activities. The Cabinet Committee on Economic

Andaman And Nicobar

- **The Aerial Bay Islands** are a group of islands in Aerial Bay in the Andaman Islands. This group belongs to the North and Middle Andaman administrative district, part of the Indian union territory of Andaman and Nicobar Islands.
- **Barren Island Wildlife Sanctuary** is situated in the Andaman Sea, towards the east of the Andaman Islands. The wildlife sanctuary was established in the year 1977 to preserve the wildlife and the eco-system of the region.
- **Bluff island** and the surrounding waters are a wildlife sanctuary of India, initiated in 1987 as a nature preserve with an area of 0.21 km² and located in Andaman island.
- **Cinque Island Wildlife Sanctuary**, situated in Andaman archipelago, is a place endowed with spectacular natural beauty.
- **Cuthbert Bay Wildlife Sanctuary** is situated at the coast of the Middle Andaman Islands of the Indian union territory Andaman and Nicobar Islands comprising about 8 kilometers of the sandy beach.
- **The Lohabarrack Salt Water Crocodile Sanctuary** is named after the village adjacent to the sanctuary and was established in 1983 with a view to conserve the salt water crocodile and other biodiversity found in this area. The Sanctuary is located in Andaman and Nicobar Islands.
- **The Landfall Island Wildlife Sanctuary** was established by 'Andaman and Nicobar Administration' in the year 1987. The Landfall Island in which the wildlife sanctuary is located is the northernmost island of Andaman archipelago.

Andhra Pradesh

- **Coringa Wildlife Sanctuary** is a wildlife sanctuary and estuary situated in Andhra Pradesh, India.
- **The Kambalakonda Wildlife Sanctuary** is a forest located near Visakhapatnam. It is under the control of Andhra Pradesh Forest Department since March 10, 1970.
- **Koundinya Wildlife Sanctuary** is a wildlife sanctuary and an elephant reserve situated in Andhra Pradesh, India.
- **Kolleru Bird Sanctuary** is a sanctuary in Andhra Pradesh, India.
- **Krishna Wildlife Sanctuary** is a wildlife sanctuary and estuary located in Andhra Pradesh, India. It was established in November 1999, under the Wildlife Protection Act of 1972.
- **Nagarjunsagar-Srisailam** Tiger Reserve is the largest tiger reserve in India. The reserve spreads over five districts, Kurnool, Prakasam, Guntur, Nalgonda and Mahbubnagar district and located in Andhra Pradesh, Telangana, India.
- **Nellapattu Bird Sanctuary** is a bird sanctuary in Nellore district, Andhra Pradesh, India.

- **Pulicat Lake Bird Sanctuary** is one of the most famous Bird Sanctuaries in India. This Sanctuary is a haven for bird lovers and Ornithologists. Stretching across 481 km² located in Nellore district of Andhra Pradesh. Pulicat Lake is the second largest brackish-water eco-system in India after Chilka lake in Orissa.
- **Rollapadu Wildlife Sanctuary** is a wildlife sanctuary in the Kurnool district of Andhra Pradesh, India.
- **Sri Lankamalleswara Wildlife Sanctuary** is a wildlife sanctuary headquartered in Kadapa, Andhra Pradesh, India.
- **Sri Penusila Narasimha Wildlife Sanctuary** is a famous 1030.85 km² Protected area in Nellore District of Andhra Pradesh state in South India.
- **Sri Venkateshwara National Park** is a national park and biosphere reserve in Andhra Pradesh, India.
- **Gundla Brahmeswaram Wildlife** is located about 30 km from Nandyal, spread across over 1,194 sq. km. It is one of the last surviving tracts of pristine forests of Nallamala Hills, with varied habitat and Gundlakamma river flowing through it.

Telangana

- **Kinnerasani Wildlife Sanctuary** is located in Bhadravati Kothagudem district, Telangana state of India.
- **Eturnagaram Wildlife Sanctuary** is a wildlife sanctuary located in Eturnagaram village in Jayashankar district in Telangana, India.
- **Kawal Tiger Reserve** is located at Jannaram mandal of Mancherial District (Old Adilabad district) in Telangana state of India.
- **Manjeera wildlife sanctuary** is a wildlife sanctuary and reservoir located in Sangareddy district of Telangana State, India.
- **Pocharam Wildlife Sanctuary** is a forest and wildlife sanctuary located 15 km from Medak and 115 km from Hyderabad, Telangana, India.
- **Pranahita wildlife sanctuary** is a protected area located in Mancherial district (Old Adilabad District) of Telangana State, India.
- **Pakhal Wildlife Sanctuary** is located in Warangal district of Telangana, its spread over an area of 860 square kilometers.

Bihar

- **Bhimbandh Wildlife Sanctuary** is a wildlife sanctuary in Bihar in the south west of Munger district.
- **Gautam Budha Wildlife Sanctuary** is a wildlife sanctuary located in Gaya district of Bihar state and Koderma district of Jharkhand state in east-central India.

- **ADB:** **The Asian Development Bank** is a regional development bank established on 19 December 1966, which is headquartered in the Ortigas Center located in the city of Mandaluyong, Metro Manila, Philippines.
- **ADR:** **American depositary receipt** is a negotiable security that represents securities of a non-U.S. company that trades in the U.S. financial markets.
- **AIDWA:** **The All India Democratic Women's Association** is an independent left oriented women's organization committed to achieving democracy, equality and women's emancipation.
- **AITUC:** **The All India Trade Union Congress** is the oldest trade union federations in India. It is not Politically affiliated to any political party including the Communist Party of India.
- **AMFI:** **Association of Mutual Funds in India** is a nodal association of mutual funds across India. AMFI provides useful knowledge and insights regarding mutual funds and investments.
- **APEC:** **Asia-Pacific Economic Cooperation** is a forum for 21 Pacific Rim member economies that promotes free trade throughout the Asia-Pacific region. It was established in 1989 and headquarters in Singapore
- **APL:** **Above Poverty Line** in India, a measure of persons who live above its nationally designated poverty threshold. People in urban areas must meet higher monthly income minimums to be considered above the poverty line.
- **APM:** **Administered pricing mechanism** came into existence on 1977. APM was administered by oil coordination committee(occ), under the ministry of petroleum and natural gas.
- **ARC:** **Asset Reconstruction Company** is a specialized financial institution that buys the NPAs or bad assets from banks and financial institutions so that the latter can clean up their balance.
- **ASBA:** **Applications Supported by Blocked Amount** is a process developed by the India's Stock Market Regulator SEBI for applying to IPO.
- **ASEAN:** **The Association of Southeast Asian Nations** was formed in 1967 by Indonesia, Malaysia, the Philippines, Singapore, and Thailand to promote political and economic cooperation and regional stability.
- **ASEM:** **The Asia-Europe Meeting (ASEM)** was established in 1996 as a forum for dialogue and cooperation between Europe and Asia. It aims to strengthen the relationship between the two continents. ASEM brings together 53 partners, including: the European Union, 30 European countries (28 EU member states, Norway, Switzerland), 21 Asian countries, the ASEAN Secretariat
- **ASSOCHAM:** **Associated Chambers of Commerce and Industry** initiated its endeavor of value creation for Indian industry in 1920. Having in its fold more than 400 Chambers and Trade Associations, and serving more than 4,50,000 members from all over India.
- **ATM:** **Automatic Teller Machine** is an electronic telecommunications device that enables customers of financial institutions to perform financial transactions, such as cash withdrawals, deposits, transfer funds, or obtaining account information, at any time and without the need for direct interaction with bank staff.
- **BCBS:** **The Basel Committee on Banking Supervision** is a committee of banking supervisory authorities that was established by the central bank governors of the Group of Ten countries in 1974.
- **BCSBI:** **The Banking Codes and Standards Board** of India is an independent banking industry watchdog that protects consumers of banking services in India.
- **BIS:** **The Bank for International Settlements** is an international financial institution owned by central banks which "fosters international monetary and financial cooperation and serves as a bank for central banks".
- **BOB:** **Bank of Baroda** is an Indian state-owned International banking and financial services company headquartered in Vadodara in Gujarat. It has a corporate office in Mumbai.
- **BOE:** **A bill of exchange** is a written order used primarily in international trade that binds one party to pay a fixed sum of money to another party on demand or at a predetermined date.
- **BOI:** **Bank of India** is commercial bank with headquarters at Bandra Kurla complex, Mumbai. Founded in 1906, it has been government-owned since nationalization in 1969.
- **BOP:** **The balance of payments** is a statement of all transactions made between entities in one country and the rest of the world over a defined period of time, such as a quarter or a year.
- **BOT:** **Build-operate-transfer** is a form of project financing, wherein a private entity receives a concession from the private or public sector to finance, design, construct, own, and operate a facility stated in the concession contract.
- **BR Act:** **The Banking Regulation Act, 1949** is a legislation in India that regulates all banking firms in India.
- **BCBS:** **The Basel Committee on Banking Supervision** is a committee of banking supervisory authorities that was established by the central bank governors of the Group of Ten countries in 1974.
- **BSE:** **The Bombay Stock Exchange** is an Indian stock exchange located at Dalal Street, Mumbai. Established in 1875, the BSE is Asia's first stock exchange.

- **BSR: 'Basic Statistical Returns** of Scheduled Commercial Banks in India' provides data on different dimensions of deposits and credit of the banking sector.
- **CA: Chartered Accountants** were the first accountants to form a professional accounting body, initially established in Scotland in 1854. Chartered accountants work in all fields of business and finance, including audit, taxation, financial and general management.
- **CAD: Current account deficit** is a measurement of a country's trade where the value of the goods and services it imports exceeds the value of the goods and services it exports.
- **CAG: The Comptroller and Auditor General (CAG)** of India is an authority, established by Article 148 of the Constitution of India, which audits all receipts and expenditure of the Government of India and the state governments, including those of bodies and authorities substantially financed by the government.
- **CAR: The capital adequacy ratio** is a measure of a bank's capital. It is expressed as a percentage of a bank's risk weighted credit exposures. It is used to protect depositors and promote the stability and efficiency of financial systems around the world.
- **CARE: Credit Analysis & Research Limited** was established in the year 1993. The company has 14 shareholders. It deals with advisory services, information and credit rating. It was registered by SEBI as per Securities & Exchange Board of India Regulations 1999.
- **CASA: Current Account Savings Account** operates like a normal bank account in which funds may be utilized at any time. Because of this flexibility, CASA has a lower interest.
- **CBLO: Collateralized borrowing and lending obligation** is a money market instrument that represents an obligation between a borrower and a lender as to the terms and conditions of a loan.
- **CBS: Core Banking Solutions** is a banking service provided by a group of networked bank branches where customers may access their bank account and perform basic transactions from any of the member branch offices.
- **CCIL: The Clearing Corporation of India Limited** was set up in April, 2001 to provide guaranteed clearing and settlement functions for transactions in Money, G-Secs, Foreign Exchange and Derivative markets.
- **CCL: Cash Credit Limit** is a short-term cash loan to a company. A bank provides this type of funding, but only after the required security is given to secure the loan.
- **CBD: The Caribbean Development Bank** is a financial institution that helps Caribbean nations finance social and economic programs in its member countries.
- **CDBS: Committee of Direction on Banking Statistics** in RBI was constituted in to have overall charge of the Basic Statistical Returns, with officials of different departments of RBI and of various banks as its members.
- **CDS: A credit default swap** is a particular type of swap designed to transfer the credit exposure of fixed income products between two or more parties.
- **CEPA: The Comprehensive Economic Partnership Agreement** is a free trade agreement between India and South Korea. The agreement was signed on August 7, 2009.
- **CGRA: Currency and Gold Revaluation Account** is the unrealized gain/loss in the value of gold and foreign exchange RBI holds based on movements in their value which is not considered in the income account but taken as a balance-sheet item.
- **CIBIL: Credit Information Bureau (India) Limited**, is a credit information company operating in India. It maintains credit files on 600 million individuals and 32 million businesses. TransUnion is one of four credit bureaus operating in India and is part of TransUnion, an American multinational group.
- **CNP: A card not present transaction** is a payment card transaction made where the cardholder does not or cannot physically present the card for a merchant's visual examination at the time that an order is given and payment effected.
- **(CPI): A consumer price index** measures changes in the price level of market basket of consumer goods and services purchased by households.
- **CRAR: Capital to Risk (Weighted) Assets Ratio**, is the ratio of a bank's capital to its risk. National regulators track a bank's CAR to ensure that it can absorb a reasonable amount of loss and complies with statutory Capital requirements.
- **CRILC: Reserve Bank of India (RBI) set up a Central Repository of Information on Large Credits** to collect, store, and disseminate credit data to lenders.
- **CRISIL: Credit Rating Information Services of India Limited** is a global analytical company providing ratings, research, and risk and policy advisory services.
- **CRMD: The credit risk management department of each bank** is responsible for planning and administering credit risk management and conducting credit risk measuring and monitoring, and such department regularly presents reports regarding its risk management situation to MHFG.
- **CRR: Cash Reserve Ratio** is a specified minimum fraction of the total deposits of customers, which commercial banks have to hold as reserves either in cash or as deposits with the central bank.
- **CSR: Corporate social responsibility** is a corporation's initiatives to assess and take responsibility for the company's effects on environmental and social wellbeing. The term generally applies to efforts that go beyond what may be required by regulators or environmental protection groups.
- **CTI: Country Threat Index** examines the volume of terrorist and rebel alerts, messaging traffic, videos, photos, incidents and the number killed and injured in a country over the past 30 days and runs it through an algorithm to assign the country its CTI.
- **DPG: Deferred Payment Guarantee** is issued by the bank at request of customer when he purchases goods or machineries from a creditor on the terms of payment after a specified time in lump sum or in instalments.
- **DPN: Demand promissory note** is a legal instrument in which one party promises in writing to pay a determinate sum of money to the other, either at a fixed or

Andhra Pradesh

- **Kuchipudi** is one of the eight major Indian classical dances. It originated in a village named Kuchipudi in the Indian state of Andhra Pradesh.
- **Vilasini Natyam** or Chinna Melam is an Indian classical dance form originating in Andhra Pradesh.
- **Andhra Natyam** is a classical dance form originating from the Indian state of Andhra Pradesh. This traditional dance form, having a history of 2000 years, was lost in the Mughal and British era.
- **Burrakatha** also spelled Burrakatha, is an oral storytelling technique in the Katha tradition, performed in villages of Andhra Pradesh and Telangana.
- **Veeranatyam** or Dance of the brave is an ancient form of dance from the state of Andhra Pradesh, with associated religious significance. Veeranatyam started as a ritual that was performed in Shiva temples in honour of Lord Shiva.
- **Butta bommalu** is one of the most famous and popular dance forms of Andhra Pradesh. It is a mask dance that originated in Tanaku in the West Godavari district of the state.
- **Tholu Bommalata** is the shadow puppet theatre tradition of the state of Andhra Pradesh in India.
- **Dappu Dance** is actually a complementary to the Dandora Dance in North India. In the coastal area of Andhra Pradesh this dance is also known as Tapetta.
- **Tappeta Gullu** is a kind of Folk Dance that derives its origin from the folk cultures in India.
- **The Lambadi** is performed by the banjaras, a semi-nomadic tribe seen all over Andhra Pradesh. This dance a colourful exposition of joy which is the highlight of many a festive occasion.
- **Kolatam** or the stick dance, is one of the most popular dance narratives in Andhra Pradesh. It is also called as Kolannalu or Kolkolannalu.

Assam

- **Bihu dance** is a group dance in which males and females dance together. The dance is performed to traditional Bihu music.
- **Bagurumba** is a folk dance in Assam which is performed by the Bodos tribe.
- **Bhortal Dance** is one of the most popular dances in the state of Assam this dance is performed in a group. Six or seven dancers generally present the Bhortal dance together.
- **Jhumur dance** is a traditional dance of tea tribe communities of Assam. The dance is usually performed during Autumn season in Assam. This dance is also found in few parts of West Bengal.

Arunachal Pradesh

- **Bardo Chham** is a folk dance of Sherdukpens, a small community of West Kameng District of Arunachal Pradesh, Bardo Chham depicts the victory of good over evil.

Bihar

- **Jhijhian dance** is a folk dance practiced in the Bihar state of India. It is a ritualistic dance which is performed during the times when there is absolutely no rain and the land is sun parched. It is performed in a group.
- **Jat-Jatin Dance** is the most popular folk dance of North Bihar, especially in Mithila and Koshi region. It is performed by a pair of man and woman. Jat-Jatin is a folk dance of the same emigrant husband accompanied by his spouse.
- **Jhumeri Dance** of Bihar is similar to "Garva of Gujarat". Specialized to the married women, it is a folk dance of Mithilanchal of Bihar.
- **Sohar-Khilouna Dance**- The foremost event in one's life is his birth. The birth of a child is celebrated all over the country with different traditional rituals. In Bihar, ladies always sing Sohar on the occasion of birth ceremony of a child.
- **Sama Chakeva** is one of the important festivals of the young brothers and sisters in the northern part of India. It is mainly celebrated in Mithila region.

Chhattisgarh

- **Raut Nacha** is a traditional folk dance usually done by Yadavs as symbol of worship to Krishna.
- **Panthi Dance**- This Indian folk dance is prominent ritual of the Satnami community of Chhattisgarh. The community celebrates the anniversary of the birth of Guru Ghasidas on Maghi Purnima.

Gujarat

- **Garba** is customarily performed by women, the dance involves circular patterns of movement and rhythmic clapping. It is popularly performed during Navratri. The word comes from "garbha deep" which is translated as either light in the inner sanctum of the temple or lamp inside a perforated earthen pot (which is often used in the dance).
- **Dandiya Raas** is an energetic, vibrant dance originating in the state of Gujarat. Often called the "stick dance" because it uses polished sticks or dandiya, it represents a mock-fight between Durga and Mahishasura, the mighty demon-king.
- **Tippani Dance** is a form of folk dance originated from the Chorwad region of Saurashtra in Gujarat, India.
- **The Padhar dance** is a folk dance of Gujarat, India. It is performed by Padhar, a fishermen community living along

banks Nal Sarovar of Bhal region. The dancer holds small sticks in his hands while dancing.

Haryana

- **Phag Dance** this is a seasonal dance, through which agricultural people express their joy and vigour. During the month of February -March, they have a little leisure between sowing and harvesting.
- **Daph dance** is one of the popular folk dances of Haryana. Performed to show joy and happiness regarding a good harvest, this dance is popular in various regions of Haryana. The dance is majorly performed by Ahir Community.
- **The Dhamal dance** is famous in the Gurgaon area, which is inhabited by Ahirs. Men perform this dance outdoors only on moonlit nights of Phalgun month. It is said that the people perform this dance whenever their crop is ready for the purpose of the harvest.
- **Loor dance** Girls perform the Loor during the month of 'Phalguna' (pring). This dance is named so because the word 'Loor' means girl in the Bhangra area of Haryana. It is specially performed during the Holi festival.
- **Jhumar** is a folk dance widely performed by married women of Haryana. The dance is named after the ornament called 'Jhumar,' worn on the forehead by young married women. Ladies dressed in colorful costumes, move in a circle to the beats of dholak and thali.

Himachal Pradesh

- **Nati** refers to the traditional dance of Kullu district of Himachal Pradesh. The dance is listed in the Guinness Book of World Records as largest folk dance. It is quite popular in whole Himachal Pradesh.
- **Kinnauri Nati** refers to the traditional dance of Kullu district of Himachal Pradesh. The dance is listed in the Guinness Book of World Records as largest folk dance. It is quite popular in whole Himachal Pradesh. Dance is also popular in Chandigarh where Himachali youth perform this on cultural programmes
- **Namgen dance** is performed in Himachal Pradesh. The Namagen dance is performed in the month of September to celebrate the autumn. They wear costumes which are largely woolen and studded with silver ornaments. Mostly men and women dance together.
- **Jhali** is a common dance form in the region little heard of outside the boundaries of Himachal Pradesh. Jhali is a dance of gaiety and gratefulness for the harvests.
- **Mahasu** folk dance is performed in praise of God. The dance is an important part of the Mahasu Devta fair held every August.
- **Dangi Nritya** originated in the Dangs. It is a tribal dance full of energy, skill and enthusiasm. Men and women interlock hands at the waist to form a chain and dance in sync while maintaining a serpentine movement.

Jammu & Kashmir

- **The Rauf** is a folk dance form which is mainly practiced by the women folk of the Kashmir valley. There are several

folk dance forms which have particularly originated and flourished in the state of Jammu and Kashmir.

- **The Hikat dance** is a very old form of folk dance which is being performed by the young girls in the marriage ceremonies in the valley of Kashmir.
- **Dhamali** is a dance performed by the people to pay respect and honor the dignified saint. This dance is performed by the disciples of Baba and his Sufi teachings.

Jharkhand

- **Karma dance** which is also popularly known as Karma Naachis performed by the tribes of Jharkhand, Chhattisgarh, Madhya Pradesh, Bihar, Orissa and other regions of the country. This tribal dance is performed during the autumnal festival of Karma Puja.

Karnataka

- **Yakshagana** is a traditional theatre form that combines dance, music, dialogue, costume, make-up, and stage techniques with a unique style and form. This theatre style is mainly found in Tulunadu and some parts of Malenadu regions of Karnataka
- **Suggi Kunitha** is a festival dance in Karnataka. It is performed by Halakki Vokkaligas, a community of Karnataka.
- **Karaga** is a folk dance of Karnataka which originated as a ritual dedicated to Draupadi as known in these parts as Droupthamma. The ritual is performed on a full moon day.

Kerala

- **Kathakali** is one of the major forms of classical Indian dance. It is a "story play" genre of art, but one distinguished by the elaborately colorful make-up, costumes and facemasks that the traditionally male actor-dancers wear.
- **Ottan Thullal** is a dance and poetic performance form of Kerala, India. It was introduced in the 18th century by Kunchan Nambiar.
- **Mohiniyattam** also referred to as Mohini-attam, is derived from "Mohini" – a famous female avatar of the Hindu god Vishnu in Indian mythology.
- **Kaikottikali** is an extremely popular folk dance performed by the maidens of Kerala. It is a group dance and is mainly performed on the occasion of Onam and Thiruvathira.

Lakshadweep

- **Lava Dance** a folk dance mainly performed by the males in Lakshadweep, is a renowned traditional dance form performed on festive occasions. The word 'Lava' means beautiful dance, song and rhythmic movement.

Madhya Pradesh

- **Tertali** is a folk dance performed by the Kamar tribes of Madhya Pradesh. It is an elaborate ritual with many elements of dance. This majestic dance is usually performed by two or three women, who sit on the ground.
- **Jawara**, a harvest dance, is usually performed in the Bundelkhand area of Madhya Pradesh. It reflects the gaiety

and pleasure of the peasants who have attained a good harvest.

- **Matki Dance** is mostly performed in the Malwa region of Madhya Pradesh, India. It is a solo dance performed by ladies on special occasions like weddings, birthdays.
- **Phulpati Dance** is performed in Malwa region of India. This dance is performed by unmarried girls. It is performed on the occasion of Holi.
- **Grida Dance** is performed in the villages of Madhya Pradesh. This dance celebrates the flourishing of the 'rabi' crops (winter crops). It is performed by groups belonging to different villages, who gather together for this occasion.
- **Maanch** is a form of operatic ballet that is very popular in Malwa. It is a lyrical folk drama of Malwa region of the State Madhya Pradesh. The language of the Maanch is traditionally Malwi.

Mizoram

- **Cheraw dance** is a ritual dance performed in Mizoram, India, consisting of four people holding two crossed pairs of bamboo staves.

Manipur

- **Dhol Cholom**, a drum dance is one of the dances performed during Holi in Manipur.

Maharashtra

- **Lavani** is a genre of music popular in Maharashtra. Lavani is a combination of traditional song and dance, which particularly performed to the beats of Dholki.
- **Koli Dance** is a popular dance form of the fishermen community of Kolis residing in the coastal areas of Maharashtra.
- **Lezim** is a folk-dance form Maharashtra. This dance is named after a wooden idiophone to which thin metal discs are fitted which produce a jingling sound and the dancers use this while dancing.
- **Pavri Nach** (also Tarpha Nach) is a renowned dance form of Maharashtra. It is an exclusive preserve of the Kokna tribes. The tarpha or pavri, a wind instrument made of dried gourd, is the chief instrument used in this dance. Hence the dance is known as Tarpha Nach or Pavri Nach.

Odisha

- **Odissi** also referred to as Orissi in older literature, is a major ancient Indian classical dance that originated in the Hindu temples of Odisha.
- **Chhau dance** is a semi classical Indian dance with martial, tribal and folk origins in the eastern Indian states of Odisha, Jharkhand and West Bengal.
- **Ghumara Dance** is one of the most sought and leading folk dance form in Orissa. Ghumura dance is depicted in Sun Temple of Konark confirming this dance form is since the medieval period.
- **Gotipua** is a traditional dance form in the state of Odisha, India, and the precursor of Odissi classical dance. It has been performed in Orissa for centuries by young boys, who dress as women to praise Jagannath and Krishna.

- **Sambalpuri folk dance** is mainly originated from the Sambalpur District, Odisha.

Puducherry

- **Garadi** is the most popular folk dance of Puducherry. The origin of this dance leads us to the Hindu epic Ramayana.

West Bengal

- **Gambhira Dance** One of the folk dances of West Bengal, it is a traditional and devotional form of dance. This dance is performed by the devout devotees of Goddess Shakthi.
- **Kathi dance** is a folk dance performed in the West Bengal state of India. This dance is noted for its beautiful hand and leg coordination.
- **The Baul dance** of West Bengal is a very famous folk dance that explains the joys and sadness of life through a beautiful song and dance form.
- **Domni** is performed in Malda district. A Domni performance starts with a Vandana dedicated to God. Then the 'Mool Gayen' and 'Chhokras' offer devotional prayers.
- **Dhunachi** is a dance performed in Bengal for the Durga Pooja at the time of Dussehra. Women and Men wear traditional Bengali dresses and dance with a mud pot filled with burnt coconut shavings. This is known as a tribute to Maa Durga.

Punjab

- **Bhangra** refers to several forms of folk dance and music that originate in the Punjab region of India. The dance is generally performed during the Vaisakhi festival that celebrates the harvest.
- **Giddha** is a popular folk dance of women in Punjab region of India and Pakistan. The dance is often considered derived from the ancient dance known as the ring dance.
- **Karthi** is a folk dance performed in Punjab. It is one of few dances in Punjab, which involves both men and women.
- **Kikkli** also spelled as Kikli, is one of the folk dances of Punjabi females performed by two girls holding hands and twirling each other in circle and balancing their positions in circular motions.
- **Sammi** is a traditional dance form originating from the tribal communities of Punjab. It is the dance of Punjabi women.

Rajasthan

- **Ghoomar** is a traditional folk dance of Bhil tribe performed to worship Goddess Sarasvati which was later embraced by other Rajasthani communities.
- **Chakri dance** of Rajasthan is a local folk dance mainly of Kanjar tribe from Baran and Kota districts. While women dancers spin away to a certain rhythm, the unique background music is contributed by the local menfolk showing their skill with the musical instrument 'dholak'.
- **Gangaur** is colourful and one of the most important festivals of people of Rajasthan.
- **Kalbelia** is performed by Naachato Rajasthan the women's group of the Kalbelia community of Rajasthan.
- **Tera Tali** is famous folk dance of Rajasthan. Performed by the 'Kamar' tribe.

Andhra Pradesh

- **The Srisailam Dam** is constructed across the Krishna River in Kurnool district, Andhra Pradesh near Srisailam temple town and is the 2nd largest capacity working hydroelectric station in the country.
- **The Somasila Dam** (Opening date 1989) is a dam constructed across the **Penna River** near Somasila, Nellore district, Andhra Pradesh.
- **Prakasam Barrage** across the **Krishna River** connecting Krishna and Guntur districts Andhra Pradesh.
- **Tatipudi Reservoir** is a water reservoir on **River Gosthani** located in Tatipudi, Vizianagaram in Andhra Pradesh.
- **Gandipalem Reservoir** is built on the **River Penner** in Andhra Pradesh.
- **The Ramagundam dam** is located in Karimnagar, Andhra Pradesh.
- **Dummaguden Dam** on the river **Godavari** in Andhra Pradesh.

Telangana

- **Nagarjuna Sagar Dam** (Opening date 1967) was built across the **Krishna river** at Nagarjuna Sagar Nalgonda, Telangana.
- **Sri Ram Sagar** (Opening date 1977) is a reservoir across the **River Godavari** in Telangana.
- **Nizam Sagar Dam** (Opening date 1923) constructed across the Manjira River, a tributary of the Godavari River in Telangana.
- **Dindi Reservoir** is a medium water reservoir across Dindi tributary of **River Krishna** located near Dindi, Mahabubnagar town in Telangana.
- **The Lower Manair Dam** was constructed across the **Manair River** in the state of Telangana.
- **Singur Dam** is an irrigation, hydroelectric and drinking water project located in Telangana. The Dam is built on the **river Manjira**.

Bihar

- **Nagi Dam** is located in Jamui District, Bihar.

Chhattisgarh

- **Hasdeo Bango Dam** is a dam constructed across the **Hasdeo river** in Chhattisgarh.

Gujarat

- **The Sardar Sarovar Dam** is a gravity dam on the **Narmada river** near Navagam, Gujarat.
- **The Ukai Dam** constructed across the **Tapti River**, is the second largest reservoir in Gujarat after the Sardar

Sarovar. It is also known as Vallabh Sagar. Constructed in 1972, the dam is meant for irrigation, power generation and flood control.

- **Kadana Dam** is situated in Panchmahal district of Gujarat. It was built on **Mahi River** with the purpose of controlling, irrigation and hydropower facilities.
- **The Karjan Reservoir** is situated on **Karjan river** in Gujarat.

Himachal Pradesh

- **Bakra Dam**(Opening date 1963) is a concrete gravity dam on the **Sutlej River** in Bilaspur, Himachal Pradesh in northern India. The dam forms the Gobind Sagar reservoir.
- **The Pong Dam**, also known as the Beas Dam, is an earthfill embankment dam on the **Beas River** in the state of Himachal Pradesh.
- **The Chamera Dam** impounds the **River Ravi** and supports the hydroelectricity project in the region. It is located near the town of Dalhousie, in the Chamba district in the state of Himachal Pradesh.

Jammu & Kashmir

- **Salal Dam** is a run-of-the-river power project on the **Chenab River** in the Reasi district of the Indian state of Jammu and Kashmir.
- **Baglihar Dam** is a run-of-the-river power project on the **Chenab River** in the southern Doda district of the Indian state of Jammu and Kashmir.

Jharkhand

- **The Maithon Dam** is constructed on the **Barakar River** located at Dhanbad, in the state of Jharkhand.
- **Panchet Dam**(opened in 1959) was constructed across the **Damodar River** at Panchet in Dhanbad, Jharkhand.
- **Tenughat Dam** is an earthfill dam with composite masonry cum concrete spillway across the **Damodar River** at Bokaro district in the Indian state of Jharkhand.

Karnataka

- **Krishna Raja Sagara** is the name of both a lake and the dam that creates it. It is located close to the settlement of Krishnarajasagara in the Indian State of Karnataka.
- **The Tungabhadra Dam** (opened in 1953) is constructed across the **Tungabhadra River**, a tributary of the Tungabhadra River. The dam is near the town of Hospet in Karnataka.
- **The Bhadra Dam** which has created the Bhadra Reservoir, is located on the Bhadra River a tributary of Tungabhadra River in the western part of Karnataka.