

**MAH-CET 2024 FOR
BCA BBA BBM BMS**



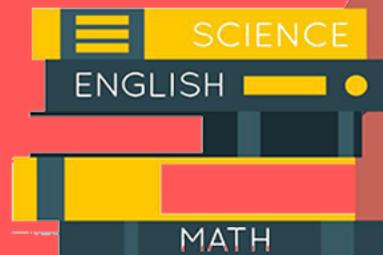
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COURSE**

DAY - 15

MATHS



SIMPLE & COMPLEX
INTERESTS





TOTAL
QUESTIONS
TODAY:

10

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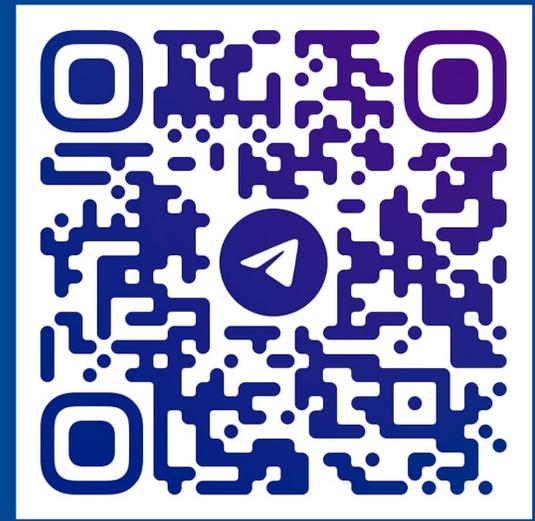


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Simple Interest

Interest

$$I = \frac{P \times N \times R}{100}$$

Principal Amount

No. of Years

Rate of Interest / yearly

$$A = P + I$$



Compound Interest

P, N, R

(i) $A = P \left(1 + \frac{R}{100} \right)^N$

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

(ii) $CI = A - P$



Compound Interest

On a principal amount P , Rate of interest for 1st year is $R1\%$, for 2nd year is $R2\%$, 3rd year is $R3\%$

$$A = P \left(1 + \frac{R1}{100} \right) \left(1 + \frac{R2}{100} \right) \left(1 + \frac{R3}{100} \right)$$

$$CI = A - P$$



1. In how many years does a sum of money becomes 4 times at the simple interest rate of 10% pa?

- A. 30
- B. 45
- C. 60
- D. 90

A

$$I = \frac{P N R}{100}$$

$$3P = \frac{P \times N \times 10}{100}$$

$$3 \times 10 = N \Rightarrow N = 30 \text{ yrs}$$

$$P = P$$

$$A = 4P$$

$$R = 10\%$$

$$N = ?$$

$$A = P + I$$

$$4P = P + I$$

$$4P - P = I$$

$$I = 3P$$



CI 1 _____ 9 P → R
 2. The compound interest on Rs. 30,000 at 7% per annum is Rs. 4347. The period (in years) is: N = ?

- A. 2
- B. 3
- C. 4
- D. 7

(A)

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

$$A = P + CI$$

$$30000 + 4347$$

$$A = 34347$$

$$11449$$

(3)

(7)

(14)

$$10^2 = 100$$

$$11^2 = 121$$

(7)

(107)

$$34347 = 30000 \times \left(1 + \frac{7}{100}\right)^N$$

$$\frac{11449}{30000} = \left(\frac{107}{100}\right)^N$$

$$\frac{11449}{30000} = \left(\frac{107}{100}\right)^N$$

$$\frac{11449}{10000} = \left(\frac{107}{100}\right)^N$$

$$\left(\frac{107 \times 107}{100 \times 100}\right) = N = 2$$



3. After what time will the sum of Rs.10000 become Rs.12000 at 5% per annum simple interest?

- A. 3 years
- B. 2 years
- C. 5 years
- D. 4 years

$\text{\textcircled{D}}$

$$I = \frac{PNR}{100}$$

$$2000 = \frac{10000 \times N \times 5}{100}$$

$$N = \frac{4000}{100 \times 5}$$

$$\boxed{N = 4}$$

P

$$P = 10000$$

A

$$A = 12000$$

$$A = P + SI$$

$$12000 = 10000 + SI$$

$$\boxed{SI = 2000}$$



4. A person borrowed Rs.18500 at a certain rate of interest and Rs.15000 for 1% higher rate of interest. If the interest paid for both at the end of 4 years is Rs.2000, the former rate of interest is?

'x'

Let $R = x$ $N = 4$

$$SI = \frac{PNR}{100} = \frac{18500 \times 4 \times x}{100}$$

B

- A. $2 \frac{2}{63} \%$
- ✓ B. $1 \frac{3}{67} \%$
- C. $1 \frac{3}{14} \%$
- D. None

$$SI_2 = 600x + 600$$

$$SI_1 = 740x \quad \text{--- (1)}$$

$$x = \frac{1450}{1340} = \frac{70}{67}$$

$$\begin{array}{r} 3 \\ 1 \overline{) 67} \end{array}$$

$$2000 = 740x + 600x + 600$$

$$2000 - 600 = 1340x$$

$$1400 = 1340x$$



5. A certain money placed at compound interest amount Rs.4200 in 1 year and Rs.4410 in 2 years. The rate of interest is?

- A. 5%
- B. 10%
- C. 15%
- D. 20%

A



Rs. 210

$$\frac{210}{4200} \times 100 = 5\%$$



6. The difference between compound interest and simple interest for Rs.3000 at 10% pa for 2 years is?

- A. 10
- B. 20
- C. 30
- D. None

$$P = 3000 \quad R = 10 \quad N = 2$$

$$SI = \frac{3000 \times 10 \times 2}{100} = 600$$

C

$$A = 3000 \left(1 + \frac{10}{100}\right)^2 = 3000 \times \frac{11 \times 11}{10 \times 10} = 30 \times 121$$
$$A = 3630$$

$$CI = 630$$

600

$$CI = A - P = 3630 - 3000$$



108 → 10000 + 64 + 1600

7. Mr. Sayyad kept Rs. 40,000 in a bank at 8% compound interest for 2 years. Mr. Fernandes invested Rs. 1,20,000 in a mutual fund for 2 years. After 2 years, Mr. Fernandes got Rs. 1,92,000. Whose investment turned out to be more profitable ?

- A. Mr. Sayyad
- B. Mr. Fernandes
- C. Both are equal
- D. Data insufficient

Profit (F) = 72000

P% (F) = ~~72000~~ / ~~120000~~ × 100 = 60%

$A = P \left(1 + \frac{R}{100}\right)^N = 40000 \left(1 + \frac{8}{100}\right)^2$

1664 / 6656 × 100 / 40000

100

16.64%

$= 40000 \left(\frac{108}{100} \times \frac{108}{100}\right)$

11664 × 4 = 46656



8. Find the compound interest on **Rs.8000** for **4 years** at **6% pa**?

- A. 3578.5
- B. 2099.8
- C. ~~1678.7~~
- D. ~~1234.5~~

B

$$CI = A - P$$

$$= 9956 - 8000$$

$$\rightarrow 1956 \dots$$

$$111 \times 111$$

$$12321 \times 0.8$$

$$\underline{9856.8}$$

$$A = P \left(1 + \frac{R}{100}\right)^N = 8000 \left(1 + \frac{6}{100}\right)^4$$

$$A = 8000 \times \frac{106}{100} \times \frac{106}{100} \times \frac{106}{100} \times \frac{106}{100}$$

$$= 8 \times 53 \times 53 \times 53 \times 53$$

$$\frac{50 \times 50 \times 50 \times 50}{25 \times 25} = 1111$$

$$\frac{4 \times 2809 \times 2809}{28 \times 28 \times 1} = 1111$$



P

R

9. In what time Rs.10000 invested at 10% pa will yield Rs.3310 as Compound Interest?

- A. 1 yr
- B. 2
- C. 3
- D. 4

$$A = P + CI = 10000 + 3310$$

$$A = 13310$$

C

$$13310 = 10000 \left(1 + \frac{10}{100} \right)^N$$

$$\left(\frac{11}{10} \right)^3 = \frac{13310}{10000} = \left(\frac{11}{10} \right)^N$$

$$\frac{11^3 = 1331}{10^3 = 1000}$$



10. If the simple interest on a sum of money for 2 years at 5% per annum is Rs. 50, what is the compound interest on the same at the same rate and for the same time?

$R = 5$

$50 = I$

$N = 2$

A

A. Rs. 51.25

B. Rs. 52

C. Rs. 54.25

D. Rs. 60

$$I = \frac{PNR}{100}$$

$$50 = \frac{P \times 2 \times 5}{100}$$

$$P = \frac{50 \times 100}{2 \times 5} = 500$$

$P = 500$ $R = 5$ $N = 2$

551.25

~~2205~~

4

$$105 \times 21$$

4

51.25

$$551.25 - 500$$

A

$$A = 500 \left(1 + \frac{5}{100} \right)^2$$

$$= 500 \times \frac{105}{100} \times \frac{105}{100}$$

$$= 551.25$$

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DAY - 16

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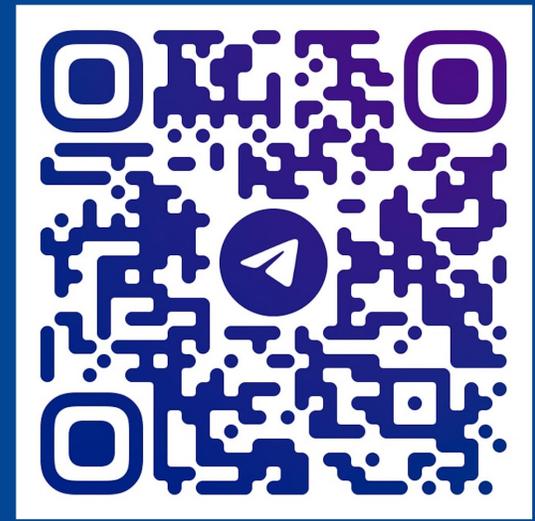
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