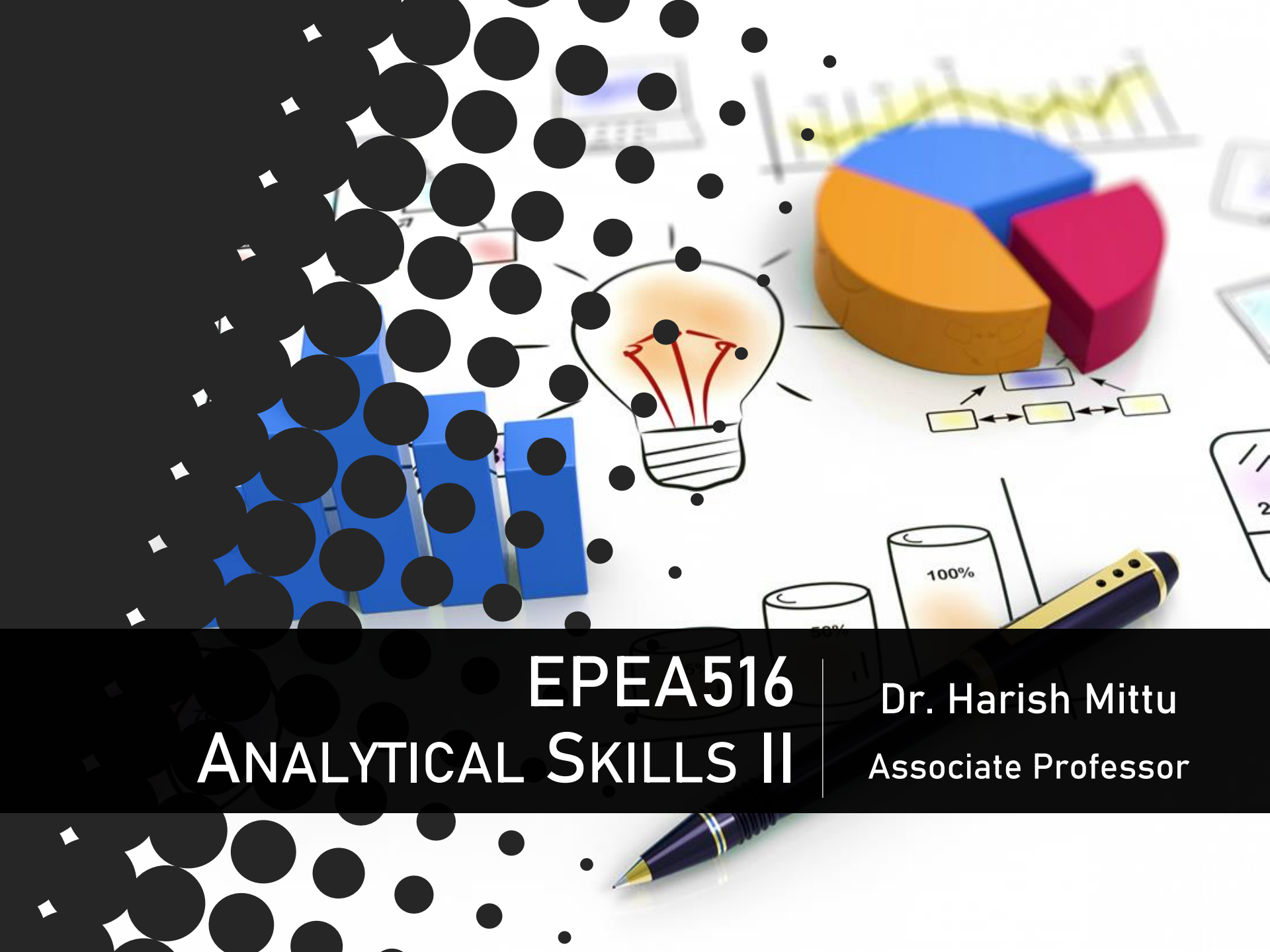

EPEA516
Analytical Skills II

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Learning Outcomes

After this lecture, you will be able to

- solve problems based on time and amount computation.

Problem 1

- In what time Rs.20000 will earn an interest of Rs.2000 at 8% p.a.?
- P = Rs. 20000
- S.I. = Rs. 2000
- R = 8% p.a.
- T = ?
- $T = \frac{S.I. \times 100}{P \times R}$

Problem 1

- $T = \frac{S.I. \times 100}{P \times R}$
- $T = \frac{2000 \times 100^{10}}{20000 \times 8_{4}}$ (10 over 100, 5 over 10)
- $T = 1\frac{1}{4}$ years
- T = 1.25 years
- T = 1 year and 3 months

Problem 2

- In what time a sum of money will four times itself at a rate of simple interest of 12% p.a.?
- n = 4
- R = 12 % p.a.
- T = ?
- $T = \frac{(n-1) \times 100}{R}$
- $T = \frac{(4-1) \times 100}{12}$

Problem 2

- $T = \frac{(4-1) \times 100}{12}$
- $T = \frac{(3) \times 100}{12}$ → $\frac{25}{4}$
- T = 25 years

Problem 3

- In how many years will a sum of money double itself at $13\frac{1}{2}\%$ p.a.?
- n = 2
- $R = 13\frac{1}{2} = \frac{27}{2}\%$
- T = ?
- $T = \frac{(n-1) \times 100}{R}$

Problem 3

- $T = \frac{(n-1) \times 100}{R}$
- $T = \frac{(2-1) \times 100}{\frac{27}{2}}$
- $T = \frac{(1) \times 100 \times 2}{27}$
- $T = \frac{200}{27}$
- $T = 7\ \frac{11}{27}$ years

Problem 4

- A sum of money put out on simple interest doubles itself in 10 years. In how many years would it five times itself?
- n = 2
- m = 5
- T = 10 years
- Required Time (T') $= \frac{(m-1) \times T}{(n-1)}$

Problem 4

- n = 2, m = 5, and T = 10 years

- Required Time (T′) $= \frac{(m-1) \times T}{(n-1)}$

$= \frac{(5-1) \times 10}{(2-1)}$

$= \frac{(4) \times 10}{(1)}$

$= 40$ years

Problem 5

- A certain sum of money becomes three times of itself in 20years at simple interest. In how many years does it become double of itself at the same rate of simple interest?
- n = 3
- m = 2
- T = 20 years
- Required Time (T') = $\frac{(m-1) \times T}{(n-1)}$

Problem 5

- n = 3, m = 2, and T = 20 years

- Required Time (T′)

$$= \frac{(m-1) \times T}{(n-1)}$$

$$= \frac{(2-1) \times 20}{(3-1)}$$

$$= \frac{(1) \times \cancel{20}\ 10}{\cancel{(2)}}$$

$$= 10 \text{ years}$$

Problem 6

- Calculate the time if a sum amounts to Rs. 500 at 8% p.a. and amounts to Rs. 400 at 4% p.a.
- $A_1 = 500$ and $A_2 = 400$
- $R_1 = 8\%$ p.a. and $R_2 = 4\%$ p.a.
- T = ?
- $$T = \frac{[A_1 - A_2]}{[A_2R_1 - A_1R_2]}$$

$$= \frac{[500 - 400]}{[400 \times 8 - 500 \times 4]}$$

Problem 6

- A_1 = 500, A_2 = 400, R_1 = 8% p.a., and R_2 = 4% p.a., and T = ?
- $$T = \frac{[A_1 - A_2]}{[A_2R_1 - A_1R_2]}$$

$$= \frac{[500 - 400]}{[400 \times 8 - 500 \times 4]}$$

$$= \frac{[100]}{[3200 - 2000]}$$

$$= \frac{\cancel{[100]}\ 1}{\cancel{[1200]}\ 12}$$

$$= \frac{1}{12} \text{ years}$$

$$= 1 \text{ month}$$

Problem 7

- If the interest rate is 3% p.a., then a sum of Rs. 2000 amount to how much in 4 years ?
- P = Rs. 2000
- R = 3% p.a.
- T = 4 years
- A = ?
- $S.I. = \frac{P \times R \times T}{100}$

Problem 7

- P = Rs. 2000, R = 3% p.a., T = 4 years, and A = ?
- $S.I. = \frac{P \times R \times T}{100}$
- $S.I. = \frac{\overset{20}{\cancel{2000}} \times 3 \times 4}{\cancel{100}}$
- S.I. = Rs. 240
- A = P + S.I.
- A = Rs. (2000 + 240) = Rs. 2240

Problem 8

- A person borrowed Rs. 7000 from his friend at 5% p.a. for 2years. Find the money returned by that person to his friend.
- P = Rs. 7000
- R = 5% p.a.
- T = 2 years
- A = ?
- $A = P\left(1 + \frac{R \times T}{100}\right)$

Problem 8

- P = Rs. 7000, R = 5%, T = 2 years, and A = ?
- $A = P\left(1 + \frac{R \times T}{100}\right)$
- $A = 7000\left(1 + \frac{\cancel{5} \times \cancel{2}}{\cancel{100}_{\cancel{50}}_{10}}\right)$
- $A = 7000\left(1 + \frac{1}{10}\right)$
- $A = 7000\left(\frac{10 + 1}{10}\right)$

Problem 8

- $A = 7000 \left(\frac{10 + 1}{10}\right)$

- $A = \overset{700}{\cancel{7000}} \left(\frac{11}{\cancel{10}}\right)$

- A = Rs. 7700

Conclusion

- $T = \frac{S.I. \times 100}{P \times R}$

- If a certain sum of money becomes n times itself at R% p.a. simple interest in T years, then

$$T = \frac{(n-1) \times 100}{R}$$

Conclusion

- If a certain sum of money becomes n times itself in T years at a simple interest, then the time (T') in which it will become m times itself is given by

$$\text{Required Time } (T') = \frac{(m-1) \times T}{(n-1)}$$

Conclusion

- If a certain sum of money P lent out for a certain time T amounts to A_1 at R_1% p.a. and to A_2 at R_2% p.a., then

$$T = \frac{[A_1 - A_2]}{[A_2R_1 - A_1R_2]}$$

Conclusion

- $A = P + S.I.$

- $A = P \left(1 + \frac{R \times T}{100}\right)$

Summary

- Computation of
  - Time
  - Amount

That’s all for now…