PART II: BUSINESS MATHEMATICS (SOLUTIONS)

1. Salary = 32 000
   Deduction = 8000
   % = $\frac{8\,000}{32\,000} \times 100$
   ⇨ 25% **answer A**
2. Let cost =C
   The C+15%C = 138,000
   ⇨ C+15%C = 138 000
   ⇨ $\frac{115C}{100} = 138\,000frs$
   ⇨ $C = 120\,000frs$
   Answer B
3. No of routes = 8!
   ⇨ $8\times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$
   ⇨ n= 40,320 ways
4. F.V = P.V $(1+i)^n$
   FV= 200, PV = 800 , i=5%
   ➢ N=?
   ⇨ $\frac{FV}{PV} = (1+i)^n$
   ⇨ $\ln(\frac{FV}{PV})=\ln(1+i)^n$
   ⇨ $\ln(\frac{FV}{PV})=n\ln(1+i)$
   ⇨ $n=\frac{\ln(\frac{FV}{PV})}{\ln(1+i)}$
   ⇨ $n==\frac{\ln(\frac{2000}{800})}{\ln(1+0.05)}$
   ⇨ n=18.78 years
5. B =$\begin{pmatrix}3 & 3\\5 & 1\end{pmatrix}$=$5\times B$

⇨ $5\times\begin{pmatrix}3 & 3\\5 & 1\end{pmatrix}$

⇨ $\begin{pmatrix}15 & 15\\25 & 5\end{pmatrix}$

6. Cost percent = 100%

   Selling percent = 100% + 125

   ⇨ =112%

   ⇨ S.P = 112% ×C.P

   ⇨ $\frac{112}{100}\times 15$ = 16.8 frs

   ⇨ $S.P = 16.8frs$

7.

Year	1	2	3	4
Inflow	60000	80000	50000	20000
CCF	60000	140000	190000	21000
Recovery	40000	0		

   If 12 months = 80 000

   ?months = 40 000

   ⇨ $\frac{12\times 40\ 000}{80000}$ = 1.6 months

   ⇨ $answer = 1.6months$

8. Demond fun: P = 2-x

   Revenue fun: f(x) = Px

   = (2-x) x

   ⇨ Rev fun: $2x-x^2$

9. Coefficient of strewness when mode = mean = median is = 0

10. Let the first sum be $\sum_0 10$ and the next be $\sum_{11} 25$

⇨ $\frac{\sum_0 10}{10}$ = 16 and $\frac{\sum_{11} 25}{15}$ = 6

⇨ $\sum_0 10$ = 160 and $\sum_{11} 25$ = 90

$now \sum_0 10 + \sum_{11} 25$ = 160 + 90 = 250

=> total mean = $\frac{\sum_0 10 + \sum_{11} 25}{25} = \frac{\sum_0 25}{25}$

=> $\frac{250}{25} = 10$

⇨ $\frac{\sum_0 25}{25}$ = 10

11. Data = 6,3,2,1,4,2,

4 point moving total

First total = 6+3+2+1 =12

Second total = 3+2+1+4 = 10

Third total = 2+1+4+2 = 9

Therefore, 4P(m-t) = 12, 10 , 9

16. 40% → wife

20 % of (40%) → son

30% of (20% of (40%)0 → clabs

⇨ % of original

⇨ $\frac{30}{100} \times \frac{20}{100} \times \frac{40}{100}$

⇨ $\frac{24}{1000}$ = 0.024× 100

⇨ 2.4% ≅ 3% closest answer

19. data: 2, 3, 18, 14, 5, 2

Ordered data: 2,2,3,5,14,18

=>median =$\frac{3+5}{2}$ = 4

20. ratio = 1/5 a= 1,250

$T_n = ar^{n-1}$

⇨ $T_{15} = ar^{15-1} = ar^{14}$

⇨ $1{,}250(1/5)^{14}$

⇨ $S_n = \frac{a(1-r^n)}{1-r} = \frac{1250(1-(\frac{1}{5})^{14}}{1-1/5}$

⇨ 1562.5

21. $T_2 = 9r^{2-1} = 9r$

$T_5 = 9r^{5-1} = 9r^4$

$T_2 = 8$

⇨ ar = 8

⇨ $T_5 = 27$----------(1).

⇨ $ar^4 = 27$ ----------(2).

⇨ (2)/(1)

⇨ $\frac{9r^4}{9r} = \frac{27}{8}$

⇨ r=3/2

23. amount = x

Inversely proportional to 3, 2, and 4

Inverse: 1/3, ½, and ¼

Let share be a, b and c

⇨ a+b+c

⇨ $\frac{a}{1/3} = \frac{b}{1/2} = \frac{c}{1/4}$

⇨ $\frac{a+b+c}{\frac{1}{3}+\frac{1}{2}+\frac{1}{4}} = \frac{x}{13/12} = k$

⇨ $k = \frac{12x}{13}$

$$sharing$$

$$\frac{a}{1/3} = k => a = \frac{1}{3} = \frac{12x}{13} => a = \frac{4x}{13}$$

$$\frac{b}{1/2} = k => b = \frac{1}{2} = \frac{12x}{13} => b = \frac{6x}{13}$$

$$\frac{c}{1/4} = k => c = \frac{1}{4} = \frac{12x}{13} => c = \frac{3x}{13}$$

If the third worker received 60 000

Therefore, $\frac{3x}{13}$ = 60 000 = 60 000×13 = 3x

⇨ 3x = 60 000×13

⇨ 13x = 780 000

⇨ $\frac{13x}{13} = \frac{780\ 000}{3}$

Answer = 260 000

25. cash discount = 50%

Therefore, ratio = 5%:25%

= 1:5