

**GAUTENG DEPARTMENT OF EDUCATION  
SENIOR CERTIFICATE EXAMINATION**

**COMMERCIAL MATHEMATICS SG**

**POSSIBLE ANSWERS OCT / NOV 2006**

---

**QUESTION 1  
RATIO AND PROPORTIONS, MENSURATION AND STATISTICS**

1.1 1.1.1 Total:  $25\ 000 + 65\ 000 + 25\ 000 + 5\ 000 + 700\ 000 + 1\ 170\ 000 = 2\ 520\ 000$  ü  
 Mean:  $2\ 520\ 000 \div 6 = 420\ 000$  ü (2)

1.1.2 Mode: 25 000 üü (2)

1.1.3 Median (Ascending order): 5 000 25 000 25 000 65 000  
 700 000 1 700 000

Median:  $\frac{25\ 000 + 65\ 000}{2}$  ü

=  $\frac{90\ 000}{2}$  ü

= 45 000 ü (3)

1.2  $\frac{1}{2} : \frac{1}{3} : \frac{1}{4} = \frac{6:4:3}{12}$  ü

Total no of parts 13

A's share :  $\frac{6}{13} \times \frac{7800}{1} = 3600$  ü

B's share :  $\frac{4}{13} \times \frac{7800}{1} = 2400$  ü

C's share :  $\frac{3}{13} \times \frac{7800}{1} = 1800$  ü (5)

1.3  $\frac{5}{6} \div \frac{1}{3} \times (0,2)^2$

=  $\frac{5}{6} \times \frac{3}{1} \times 0,04$  ü

=  $\frac{5}{2} \times 0,04$

= 0,10 ü (4)

- 1.4 5kg cost:  $R5 \times 14 = R70 \text{ ¤}$   
 8kg cost:  $R8 \times 27 = R216 \text{ ¤}$   
 Total Cost:  $R70 + R216 = R286 \text{ ¤}$   
 Cost of 1kg mixture:  $\frac{R286}{13}$   
 $= R22 \text{ ¤}$

(4)  
**[20]**

### QUESTION 2 INSOLVENCY

- 2.1 Value of claim :  $\frac{R161\,520}{60} \text{ ¤¸}$   
 $= R2692 \text{ ¤}$

(4)

- 2.2 Realisation of assets:  $4620 + 75\,000 + 2\,880$   
 $= 82\,500 \text{ ¸¸}$

Less preferent claims  $75\,000 + 2\,100 = 77\,100 \text{ ¸¸}$   
 Amt available to Creditors:  $82\,500 - 77\,100 = R5\,400 \text{ ¸¸}$   
 Total creditors claims  $4\,000 + 5\,000 = R9\,000 \text{ ¸¸}$

- 2.2.1 Final dividend paid out:  $\frac{5\,400}{9\,000} \times \frac{100}{1} \text{ ¸¸}$   
 $= 60\text{c in the rand ¸}$

(12)

- 2.2.2 Sum paid to mortgage:  $75\,000 + (.6 \times 5000) \text{ ¸}$   
 $= 75\,000 + 3\,000 \text{ ¸¸}$   
 $= 78\,000 \text{ ¸}$

(4)  
**[20]**

### QUESTION 3 PARTNERSHIP

- | 3.1                 | 12 mths | 09 mths | TOTAL       |
|---------------------|---------|---------|-------------|
|                     | Leena   | Doris   |             |
| Salary              | 72 000  | 54 000  | 126 000 ¸¸¸ |
| Interest on Capital | 4 000   | 2 250   | 6 250 ¸¸¸   |
| Totals              | 76 000  | 56 250  | 132 250 ¸¸  |

Remaining profit:  $188\,250 - 132\,250 \text{ ¸}$   
 $= 56\,000 \text{ ¸¸}$

Doris's Share in remaining profit:  $\frac{3}{7} \times 56\,000 \text{ ¸¸} = 24\,000$   
 $\therefore \text{ ¸}$   
 $R56\,250 + 24\,000 \text{ ¸¸}$   
 $= R80\,250 \text{ ¸}$

(17)

3.2 Nompho invested 25 000 FOR 3 mths : 75 000 for 1 mth ü  
 + (25 000 – 10 000) 15 000 for 9 mths : 135 000 for 1 mth ü  
 total : 210 000 for 1 mth ü

Cindy invested 30 000 for 6 mths : 180 000 for 1 mth ü  
 + (30 000 + 5 000) 35 000 for 6 mths : 210 000 for 1 mth ü  
 total : 390 000 for 1 mth ü

Ratio A : B = 210 000 : 390 000  
 21 : 39 ü  
 7 : 13 ü

(8)  
 [25]

**QUESTION 4  
 PROFIT AND LOSS**

4.1	4.1.1	SP	CP	PROFIT
		125	100	25
		560	X	

Cost Price of the dealer:  $\frac{R560 \times 100}{125}$  üüüü  
 = R448 üüü

(7)

4.1.2 The CP of the dealer is the SP of the Wholesaler

SP	CP	Profit
100	88	12
448	x	

CP of the Wholesaler  $\frac{R448 \times 88}{100}$  üüüü  
 = R394,24 üüü

(7)

4.2 CP of article  $\frac{R544 \times 75}{100}$  üüü

= R408 ü

Profit: R544 – 408 üü

= R136 ü

Profit %:  $\frac{136}{408} \times \frac{100}{1}$  % üü

= 33  $\frac{1}{3}$  % ü

(8)

4.3 4.3.1 Let the CP be R100  
 Original MP is  $R100 + 60\% \text{ of } R100 \left[ \frac{60}{100} \times \frac{160}{1} \right]$   
 =  $R100 + R60$   
 =  $R160$   
 Reduced MP:  $R160 - 12,5\% \text{ of } R160 \left[ \frac{12,5}{100} \times \frac{160}{1} \right]$   
 =  $R160 - R20$   
 =  $R140$   
 SP =  $R140 - 5\% \text{ of } R140 \left[ \frac{5}{100} \times \frac{140}{1} \right]$   
 =  $R140 - R7$   
 =  $R133$

SP CP  
 133 100  
 5989 x

CP of the article:  $\frac{5985}{1} \times \frac{100}{133}$   
 = R4 500

or

Before discount:  $\frac{5985}{1} \times \frac{100}{95} = 6\ 300 \text{ [} 5985 - 95\% \text{]}$   
 Before disc. Add reduced MP  $\frac{6300}{1} \times \frac{100}{87,5} = 7200 \text{ [} 6300 - 87,5 \text{]}$   
 Cost price of article:  $\frac{7200}{1} \times \frac{100}{160} \text{ [} 7200 - 160\% \text{]}$   
 = 4500 (10)

4.3.2 Original MP of article  $\frac{4\ 500}{1} \times \frac{160}{100}$  CP MP  
 100 160  
 4500 X  
 = R7 200 (4)

4.3.3 % profit on CP:  $\frac{5\ 985 - 4\ 500}{4\ 500(\text{CP})} \times \frac{100}{1} \%$   
 =  $\frac{1485}{45} \left[ \frac{1485}{4500} \times \frac{100}{1} \right]$   
 = 33% (4)  
**[40]**

**QUESTION 5  
 STOCKS AND SHARES**

5.1 Amt received from sale of stock:

$R80 \times 110 = R8\ 800$  üüüü

No of shares bought:

$\frac{8\ 800}{2,75} = 3\ 200$  üüüü (8)

$$5.2 \quad 5.2.1 \quad \% \text{ income} \quad : \quad \frac{6}{36} \times \frac{100}{1} = 16 \frac{2}{3} \% \text{ üüüü} \quad (5)$$

$$5.2.2 \quad \text{Dividend} \quad : \quad 15\% \text{ of } 75 = 11,25 \text{ cents üü}$$

$$\begin{aligned} \text{Income} \quad : \quad & \frac{11,25}{90} \times \frac{100}{1} \% \text{ üü} \\ & = 12,5\% \text{ üü} \end{aligned} \quad (6)$$

$$5.2.3 \quad \text{Dividend} \quad : \quad \begin{aligned} & 15\% \text{ of R3 üü} \\ & = 45 \text{ cents ü} \end{aligned}$$

$$\begin{aligned} \% \text{ income} \quad : \quad & \frac{45}{2,25} \times \frac{100}{1} \% \text{ üüü} \\ & = 20\% \text{ ü} \end{aligned}$$

Investment 5.2.3 is most profitable ü (8)

5.3 5.3.1 Proceeds from sale of ABC Stock

$$= R3\,600/1 \times 80/100 \text{ üüü}$$

$$= R2880 \text{ ü} \quad (4)$$

5.3.2 Nominal Value of XYZ Stock

$$= R2880 \times 100/125 \text{ üüü}$$

$$= R2304 \text{ ü} \quad (4)$$

[35]

### QUESTION 6 MENSURATION

$$6.1 \quad \text{Area of circle:} \quad ?r^2 = 154\text{m}^2 \text{ ü}$$

$$\begin{aligned} r^2 &= 154 \div \frac{22}{7} \text{ üü} \\ &= 49 \text{ ü} \\ r &= 7 \text{ ü} \end{aligned}$$

$$\begin{aligned} \text{Circum of circle:} \quad & ? \times 2 \times 7 \\ &= \frac{22}{7} \times 2/1 \times 7/1 = 44\text{m üüüü} \end{aligned}$$

$$\text{Circum of wheel:} \quad \frac{44}{20} = 2,2\text{m üüü} \quad (10)$$

6.2 Volume of pipe material (V)

$$V = \pi R^2 h - \pi r^2 h$$

$$\pi r^2 h = \pi R^2 h - V$$

$$r^2 = \frac{\pi R^2 h - V}{\pi h}$$

$$= \frac{22}{7} \cdot \frac{4}{1} \times \frac{4}{1} \cdot \frac{140 - 3080}{1}$$

$$\frac{22}{7} \cdot \frac{140}{1}$$

$$= \frac{7040 - 3080}{440}$$

$$= \frac{3960}{440}$$

$$= 9 \text{ cm}$$

$$\therefore \text{Internal radius} = \sqrt{9} = 3 \text{ cm} \quad (10)$$

$$\begin{aligned} 6.3 \quad s &= \frac{1}{2} (A + B + C) \\ &= \frac{1}{2} (8,7 + 6,3 + 6,0) \\ &= \frac{1}{2} (21,0) \\ &= 10,5 \text{ m} \end{aligned}$$

$$\begin{aligned} \text{Area} &= 10,5(10,5 - 8,7)(10,5 - 6,3)(10,5 - 6,0) \\ &= 10,5(1,8)(4,2)(4,5) \\ &= 18,90 \text{ m}^2 \end{aligned}$$

(9)

6.4 Area of circular floor:

$$\pi r^2 = 154 \text{ m}^2$$

$$r^2 = \frac{154}{\pi} \times \frac{7}{22}$$

$$= 49$$

$$\text{therefore } r = 7$$

Volume of Dam:  $\pi r^2 h$ 

$$= \frac{22}{7} \cdot 700^2 \times 400 \text{ cm}^3$$

$$= 616000000 \text{ cm}^3$$

$$\text{or } \frac{22}{7} \times 7^2 \times 4 = 616 \text{ m}^3$$

No of litres:  $616000000 \div 1000 = 616000$  litres

Therefore 616 kilolitres is the capacity of the dam.

(1000 l = 1 kilolitre)

alternative

$$\begin{aligned} v &= \text{Base area} \times \text{height} \\ &= 154 \times 4\text{m}^3 \\ &= 616\text{m}^3 \end{aligned}$$

Capacity of Dam: 616 000 l or 616 kl  
( $1\text{m}^3 = 1000\text{l}$  or 1 kl)

(10)

$$6.5 \quad 4r^2 = 616 \text{ cm}^2$$

$$r^2 = \frac{616}{4} \text{ üü}$$

$$= 49 \text{ üü}$$

$$r = 49 = 7 \text{ üü}$$

(6)  
[45]

### QUESTION 7 INTEREST, DEPRECIATION, INSURANCE

$$\begin{aligned} 7.1 \quad A &= P + \frac{PRT}{100} && \text{Mar } 31 \\ & && \text{Apr } 30 \\ & && \text{May } \underline{12} \\ P &= \frac{A}{1 + r/100} && \frac{73 \sqrt{}}{365} = 1/5 \\ &= \frac{100 \times A}{100 + rt} \\ &= \frac{100 \times 2000 \text{ üü}}{100 + 15 \times 1/5 \text{ üüü}} \\ &= \frac{100 \times 2000}{103 \text{ üü}} = \text{R}1941,75\text{üü} \end{aligned} \quad (10)$$

$$7.2 \quad \text{Residual value after 5 yrs} = CP (1 - r/100)^n$$

$$= 60\,000 (1 - 25/100)^5 \text{ üüüüü}$$

$$= 60\,000 (0,75)^5 \text{ ü}$$

$$= 60\,000 \times (0,75)^5$$

$$= \text{R}14\,238,28 \text{ üü}$$

(8)

$$\begin{aligned}
 7.3 \quad \text{Option A} \quad : \quad A &= P(1 + r/200)2^n \\
 &= 20\,000 (1 + 6/200)^6 \text{ üüüü} \\
 &= 20\,000 (1,03)^6 \text{ ü} \\
 &= R23\,881,05 \text{ üü}
 \end{aligned}$$

$$\begin{aligned}
 \text{Option B} \quad : \quad A &= P(1 + r/100)^n \\
 &= 20\,000 (1 + 8/100)^3 \text{ üüüü} \\
 &= 20\,000 (1,08)^3 \text{ ü} \\
 &= R25\,194,24 \text{ üü} \tag{14}
 \end{aligned}$$

Option B is the better investment.

$$\begin{aligned}
 7.4 \quad \text{Premium (p)} &= \frac{55}{100} \times \frac{300\,000}{100} \text{ üüü} \\
 &= 1650 \text{ üü} \tag{5}
 \end{aligned}$$

Premium payable to also cover premium

$$\begin{aligned}
 &= \frac{Vp}{v-p} \\
 &= \frac{300\,000 \times 1650}{300\,000 - 1650} \\
 &= \frac{300\,000 \times 1650}{298350} \\
 &= R1659,13 \tag{8}
 \end{aligned}$$

**[40]**

### QUESTION 8 ANNUITIES

8.1 Annual Instalment

$$\begin{aligned}
 &= \text{Amt to redeem} \\
 &\quad A_{15} \text{ at } 5\% \\
 &= \frac{518\,985 \text{ ü}}{10,3797 \text{ üü}} \\
 &= R500\,00 \text{ ü} \tag{4}
 \end{aligned}$$

$$\begin{aligned}
 8.2 \quad \text{Principal} &= \frac{A}{S_{19} \text{ at } 6\%} \\
 &= \frac{168\,800 \text{ ü}}{33,76 \text{ üü}} \\
 &= 5\,000 \text{ ü} \tag{4}
 \end{aligned}$$



8.3 Amt due at the end of 8 yrs

$$\begin{aligned}
 &= P(S_9 - 1) \text{ at } 4\% \\
 &= 4\,000 (10,5828 - 1) \text{ üüü} \\
 &= 4\,000 \times 9,5828 \text{ ü} \\
 &= R38331,20 \text{ üü}
 \end{aligned}
 \tag{6}$$

8.4 Present value of R1 p.a. for 5 years at  $4\frac{1}{2}\%$  p.a. = 4,39 ü

$$\begin{aligned}
 \text{PV of R1 p.a. of an annuity due of R1 p.a. for 6 years} &= 4,39 + 1 \text{ ü} \\
 &= 5,39 \text{ ü}
 \end{aligned}$$

$$\text{R16 170 obtained an annuity of} = \frac{16\,170 \text{ ü}}{5,39 \text{ ü}}$$

$$= 3\,000 \text{ ü} \tag{6}$$

[20]

### QUESTION 9 RATES OF EXCHANGE, TAXES

9.1 No of US Dollars:  $\$ \frac{19501,50 \text{ ü}}{6,5005 \text{ ü}} = \$3000 \text{ üü}$

(4)

9.2 Cost of USA computer:  $250 \times 6,5005 = R1625,13 \text{ üüüü}$

$$\text{Cost of Japan computer: } \frac{28000 \times 6,5005 \text{ üü}}{109,27 \text{ ü}}$$

$$= R1665,73 \text{ üü}$$

Import computers from USA. ü

(10)

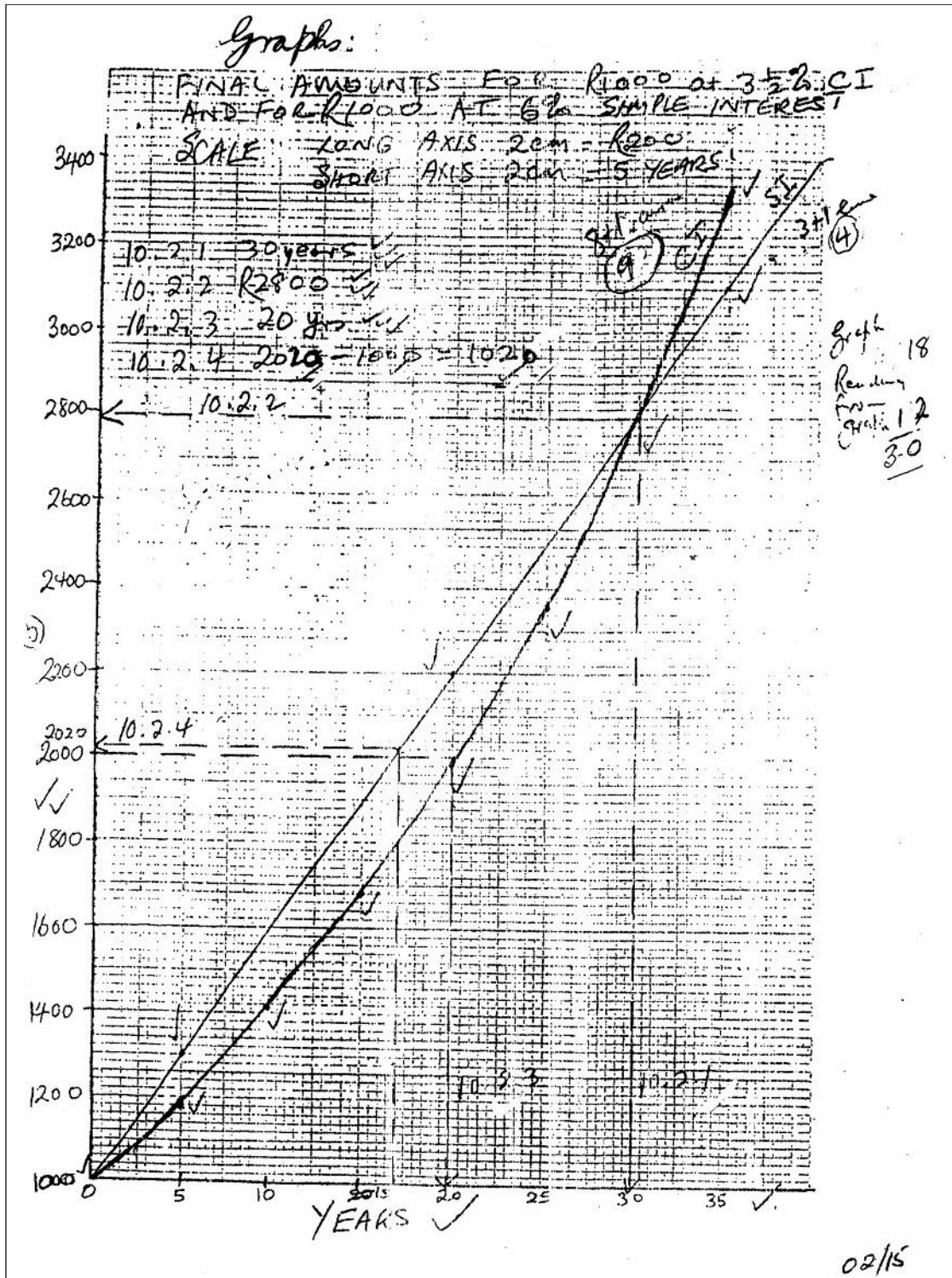
9.3 Cost of electricity:  $938\text{kw} \times 43,67/100 = R409,62 \text{ üüü}$   
 Cost of water (45kl = 6+4+10+20+5)

6kl	Freeü
4 x 3,60 kl	R 14,40ü
5 x 4,80 per kl	R 24,00ü
5 x 6,00 per kl	R 30,00ü
20 x 7,19	R143,80ü
5 x 8,50	R 42,50ü
	<u>R254,70ü</u>

$$\text{Total cost to consumer } R409,63 + R253,90 = R664,32 \text{ ü}$$

(11)  
[25]

QUESTION 10



(40)

TOTAL: 300