Question 1 (25 marks)

When Sean joined a sales company he was offered a choice of two different salary contracts.
The details of the contracts are outlined in the table below.

	Salary	End of year commission on total sales
Contract A	€35 000	2%
Contract B	€30 000	3%

(a) Find how much Sean would earn under each contract in a year where his total sales were €400 000.

Contract A	Contract B
= €35,000 + (0.02)(€400,000)	= €30,000 + (0.03)(€400,000)
= €35,000 + €8,000	= €30,000 + €12,000
= €43,000	= €42,000

(b) Another employee, Mary, earned €50 000 in a particular year. She is on Contract A. Find her total sales for that year.

$$€50,000 = €35,000 + (0.02)(x)$$
$$€50,000 - €35,000 = 0.02x$$
$$€15,000 = 0.02x$$

(c) Find the total sales for which a salesperson would earn the same amount of money under each contract.

$$€30,000 + (0.03)x = €35,000 + (0.02)(x)$$
$$€30,000 + 0.03x = €35,000 + 0.02x$$
$$0.03x - 0.02x = €35,000 - € 30,000$$
$$0.01x = €5,000$$
$$x = 500,000$$

Question 1 (25 marks)

(a) A new machine is bought for €30000. Its value depreciates by 15% each year for five years. Find the value of the machine at the end of the five years.

$$C = P(1 - r)^N$$ Simply substitute values into formula

$$= €30,000 (1 - 0.15)^5$$

$$= €30,000 (0.85)^5$$

$$= €30,000 (0.4437)$$

$$= €13,311.16$$

(b) A sum of money was invested for two years at 3% compound interest per year. At the end of the two years it amounted to €30000. Find the sum invested.

$$VALUE = PRINCIPAL (1 + \%)^{N \ (No. \ of \ Years)}$$ Simply substitute values into formula

$$€30,000 = P(1 + 0.03)^2$$

$$€30,000 = P(1.03)^2$$ Divide across by $(1.03)^2$

$$\frac{€30,000}{(1.03)^2} = P$$

$$P = €28,277.88$$

(c) A company invested €25000 for three years at a fixed rate of compound interest. At the end of the three years it amounted to €26530·20. Find the rate of interest.

$$VALUE = PRINCIPAL (1 + \%)^{N \ (No. \ of \ Years)}$$ Simply substitute values into formula

$$€26,530.20 = €25,000 (1 + i)^3$$ Divide across by 25,000

$$\frac{€26,530.20}{€25,000} = (1 + i)^3$$

$$1.061208 = (1 + i)^3$$

$$\sqrt[3]{1.061208} = 1 + i$$

$$1.02 = 1 + i$$ Rate of interest = 2%

$$1.02 - 1 = i$$

$$i = 0.02$$

Question 6 (25 marks)

(a) A salesman earns a basic salary of €150 per week. In addition, he gets commission of 20% on sales up to the value of €1000 in the week and 30% commission on any sales above this. Find his total income for a week when his total sales amount to €3000.

TOTAL INCOME = BASIC SALARY + 20% (1000 SALES) + 30% (ANY SALES ABOVE 1000)

= €150 + (0.2)(1000) + (0.3)(3000 - 1000)

= €150 + (0.2)(1000) + (0.3)(2000)

= €150 + 200 + 600 = €950

(b) On a different week his total income is €1160. Find his total sales for this week.

TOTAL INCOME = BASIC SALARY + 20% (1000 SALES) + 30% (ANY SALES ABOVE 1000)

WE DON'T KNOW THE AMOUNT OF SALES ABOVE 1000....LET THIS EQUAL X

€1,160 = €150 + (0.2)(1000) + (0.3)(x)

€1,160 = €150 + + 200 + 0.3x

0.3x = €1,160 - €150 - €200

0.3x = €810

$x = \dfrac{€810}{0.3}$

x = €2,700

TOTAL SALES WILL INCLUDE €1,000 + €2,700 = **€3,700**

Question 1 (25 marks)

Emma works part time after school at the local takeaway. She is paid a rate per hour and also receives €2 for each delivery she makes.

(a) One day, she works for 2 hours, makes 5 deliveries and is paid a total of €28. Find her hourly rate of pay.

$$2h + 5(2) = €28$$
$$2h + 10 = €28$$
$$2h = €28 - €10$$
$$2h = €18$$
$$h = €9$$

(b) One week, she works for h hours and makes d deliveries. Write a formula in h and d for the wage (w) she receives.

$$Wages = (Rate)(No. Hours) + (Rate)(No. Deliveries)$$
$$w = 9h + 2d$$

(c) Another week, she works for 6 hours and makes 12 deliveries. She also works 5 hours on a Sunday, at time and a half, and makes some deliveries. In total, she receives €161·50 for that week. Find how many deliveries she makes on the Sunday.

$$Sunday\ Income = 9(6) + 2(12) + 5(13.5) + 2(x)$$
$$€116.50 = €54 + 10 + 67.50 + (2)(x)$$
$$€116.50 = €145.50 + 2x$$
$$€145.50 - €116.50 = 2x$$
$$2x = 29$$
$$x = 29$$

Question 6 (25 marks)

Fiona earns a gross wage of €1550 every fortnight. She pays income tax, a Universal Social Charge (USC), and Pay Related Social Insurance (PRSI) on this wage.

(a) Each fortnight, Fiona pays income tax at the rate of 20% on the first €1300 she earns and 40% on the remainder. She has tax credits of €126 per fortnight. Find how much income tax she pays per fortnight.

$$\text{TOTAL INCOME} = 20\% \,(1300) + 40\% \,(\text{ANY INCOME ABOVE } 1300) - \text{TAX CREDITS}$$

$$= €150 + (0.2)(1300) + (0.4)(1550 - 1300) - 126$$

$$= €150 + (0.2)(1300) + (0.4)(250) - 126$$

$$= €150 + 200 + 600$$

$$= €950$$

(b) Each fortnight, Fiona also pays USC on her gross wage. The rates are: 1% on the first €462 she earns, 3% on the next €214, and 5.5% on the balance. Find the total amount of USC she pays each fortnight.

Question 1 (25 marks)

Padraic works in America and travels between Ireland and America.

(a) In Ireland, he exchanged €2000 for US dollars when the exchange rate was €1 = $1·29. Find how many US dollars he received.

(b) Padraic returned to Ireland and exchanged $21 000 for euro. He received €15 000. Write the exchange rate for this transaction in the form €1 = $1.29

(c) Padraic wants to exchange some dollars for sterling. On a day when the euro to dollar exchange rate is €1 = $1·24 and the euro to sterling exchange rate is €1 = £0·83, find the dollar to sterling exchange rate. Write your answer in the form $1 = £ 1.29.

Question 2 (25 marks)

(a) John, Mary and Eileen bought a ticket in a draw. The ticket cost €50. John paid €25, Mary paid €15 and Eileen paid €10. The ticket won a prize of €20 000. The prize is divided in proportion to how much each paid. How much prize money does each person receive?

(b) Assuming that the Earth is a sphere of radius 6378 km:

(i)   Find the length of the equator, correct to the nearest km.
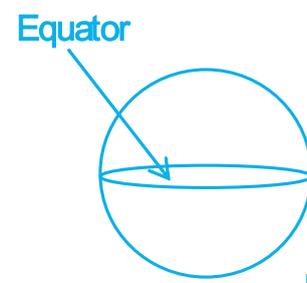
(ii)   Find the volume of the Earth in the form $a \times 10^{n}$, where $1 \leq a < 10$ and
          Give the value of a correct to three decimal places.

(c)   The mass of the Earth is $5{\cdot}97 \times 10^{24}$ kg . The mass of the Sun is

Question 1 (25 marks)

A shopkeeper bought 25 school blazers at €30 each and 25 trousers at €20 each.

(a) Find the total cost to the shopkeeper.

$$= \text{PRINCIPAL} \left(1 + \% \right)^{N \, (No. \, of \, Years)}$$

25 x 30 = 750

25 x 30 = 750

25 x 20 = 500

500 +750 =€1250

(b) The shopkeeper sells a blazer and a trousers as a set for €89·95. Find her profit on this transaction.

€30 + €25 = €50

€89·95 – €50 = €39·95

(c) The shopkeeper sells 22 blazer and trouser sets at €89·95 each. She sells the remaining 3 sets at a discount of 20% on the selling price. Find her mark up (profit as a percentage of cost price) on the total transaction.

22 x 89·95 = €1978·90

89·95 x 0·8 = €71·96

3 x 71·96 = €215·88

1978·90 + 215·88 = €2194·78

2194·78 - 1250 = €944·78 (Profit)

$$\frac{944·78}{1250} \times 100 = 75·58\%$$

(a)   Mary bought a new car for €20 000 on the 1ˢᵗ July 2010. The value of the car depreciated at a compound rate of 15% each year. ind the value of the car, correct to the nearest euro, on the 1ˢᵗ July 2014.

$C = P (1 - r)^N$ *Simply substitute values into formula*

$= €30{,}000 (1 - 0.15)^5$

$= €30{,}000 (0.85)^5$

$= €30{,}000 (0.4437)$

$= €13{,}311.16$

(b)   Mary wishes to buy a new car, which costs €24 000, on the 1ˢᵗ July 2014.

(i)   *Buy Right Car Sales* offers Mary €10 500 for her old car. She can borrow the balance for one year at a rate of 11·5%. How much would she repay on 1ˢᵗ July 2015?

$24\,000 - 10\,500 = €13\,500$ *to borrow*

$13\,500 \times 1·115 = €15\,052·50$ *to repay on 1ˢᵗ July 2015*

(ii) *Bargain Deals Car Sales* offers Mary €10 000 for her old car and an interest free loan of the balance for six months. At the end of the six months Mary would make a payment of €4000 and would be charged interest at a compound rate of 1·5% per month for the next six months. How much would Mary repay on 1st July 2015?

24 000 −10 000 =€14 000 Loan

14 000 −4000 =10 000 To repay after 6 months

10 000 x(1·015)^6 =€10 934·43 to repay on 1st July 2015

(iii) Which of the above options should Mary choose if she wishes to pay the least amount? Justify your answer by calculation.

10 934·43 +4000 =€14 934·43

[Difference €118·07]

She would pay less overall if she bought the car from Bargain Deals (option (ii))