

# **Exponential Growth & Decay** (inc Compound Interest)

## Question Paper 1

Level	IGCSE C
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Number
Sub-Topic	Exponential Growth & Decay (inc Compound
	interest)
Booklet	Question Paper 1

Time Allowed: 69 minutes

Score: \(\sigma \)/57

Percentage: /100

#### **Grade Boundaries:**

A*	А	В	С	D	Е	U
>85%	75%	60%	45%	35%	25%	<25%

1		s estimated that the world's population is growing at a rate of 1.14% p n January 1st 2014 the population was 7.23 billion.	per year.
	(a	Find the expected population on January 1st 2020.	
			billion [2]
	(b	Find the year when the population is expected to reach 10 billion.	
			[2]
		start of an experiment there are 20 000 bacteria. number of bacteria increases at a rate of 30% per hour.	
(2	a)	Work out the number of bacteria after 4 hours.	
			[2]
(l		After how many <b>whole</b> hours, from the start of the experiment, will than one million?	
			hours [2]

2

3	(a)	(i)	Eduardo invests \$640 at a rate of 2% per year compound i	interest
_	(**/	\ <del>-</del> /	Educated in rests 40 to at a rate of 270 per year compound	micor obc.

Show that, at the end of 6 years, Eduardo has \$721, correct to the nearest dollar.

Answer(a)(i)

[2]

### Manuela also invests \$640.

At the end of 4 years, Manuela has \$721.

Find the yearly compound interest rate.

*Answer(a)*(ii) ...... % [4]

#### **(b)** Carlos buys a motor scooter for \$1200.

Each year the value of the scooter decreases by 10% of its value at the beginning of that year.

Find the value of the scooter after 3 years.

4	The population of Olton is decreasing at a rate of 3% per year. In 2013, the population was 50 000.
	Calculate the population after 4 years. Give your answer correct to the nearest hundred.
	<i>Answer</i>
5	Alex invests \$200 for 2 years at a rate of 2% per year simple interest.  Chris invests \$200 for 2 years at a rate of 2% per year compound interest.
	Calculate how much more interest Chris has than Alex.
	<i>Answer</i> \$[4]

6	Maryah borrows \$12 000 to start a business.  The loan is for 3 years at a rate of 5% per year compound interest.  The loan has to be paid back at the end of the 3 years.
	Calculate the total amount to be paid back.
	Answer \$ [3]
	7 Bruce invested \$420 at a rate of 4% per year compound interest.
	Calculate the <b>total</b> amount Bruce has after 2 years.
	Give your answer correct to 2 decimal places.

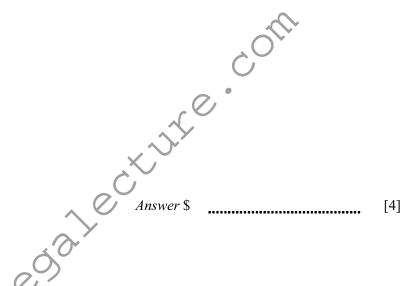
*Answer* \$......[3]

8	Carol invests \$6250 at a rate of 2% per year compound interest.
	Calculate the <b>total</b> amount Carol has after 3 years.
	<i>Answer</i> \$ [3
9	Acri invested \$500 for 3 years at a rate of 2.8% per year compound interest.
	Calculate the final amount he has after 3 years.
	Answer\$ [3]

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10	Rorie invecte	\$280 for 2 years	at a rate of 3% per	vear compound interest.
10	Don's invests	5200 for 2 years	at a rate of 5% per	vear combound interest.

Calculate the interest Boris receives at the end of the 2 years. Give your answer correct to 2 decimal places.



Pedro invested \$800 at a rate of 5% per year **compound** interest.

Calculate the **total** amount he has after 2 years.

*Answer* \$ \_\_\_\_\_[2]

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		correct to 2 decimal					
				Δ r	15wor \$		[3]
10 I		S					[~]
		for 3 years at 4% pomount he had after t		i <b>pound</b> inte	rest.		

14	Nikhil invests \$200 for 2 years at 4% per year compound interest
	Calculate the <b>exact</b> amount Nikhil has after 2 years.

[2] Answer \$

Answer's ..... 15 Zainab borrows \$198 from a bank to pay for a new bed. The bank charges compound interest at 1.9% per month. Calculate how much **interest** she owes at the end of 3 months. Give your answer correct to 2 decimal places.

[3]

16

NORTH EASTERN BANK

SAVINGS ACCOUNT

Per Year

Simple Interest

SOUTH WESTERN BANK

SAVINGS ACCOUNT

4.9%

Per Year

Compound Interest

Kalid and his brother have \$2000 each to invest for 3 years.

(a) North Eastern Bank advertises savings with **simple** interest at 5% per year. Kalid invests his money in this bank.

How much money will he have at the end of 3 years?

[2] Answer(a)\$

**(b)** South Western Bank advertises savings with **compound** interest at 4.9% per year. Kalid's brother invests his money in this bank.

At the end of 3 years, how much **more** money will he have than Kalid?

Answer(b)\$ [3]