

Question 1 [3 marks]

Gross income: £29 800 Personal allowance: £12 570

(a) Taxable income

$$29\,800 - 12\,570 = 17\,230$$

Answer: £17 230 (1 mark)

(b) Income tax at 20% on taxable income

$$0.20 \times 17\,230 = 3\,446$$

Answer: £3 446 (2 marks)

Question 2 [5 marks] — there is an error in the question

Gross income: £104 000 Personal allowance: £12 570 Allowance is reduced by **£1 for every £2** above £100 000.

Amount above £100 000:

$$104\,000 - 100\,000 = 4\,000$$

Reduction in allowance:

$$4\,000 \div 2 = 2\,000$$

Correct reduced personal allowance:

$$12\,570 - 2\,000 = 10\,570$$

□ The question says “Show that his personal allowance is reduced to £10 285”. This is **inconsistent** with the taper rule and the given income. The **correct** reduced allowance is **£10 570**, not £10 285.

(a) Method:

- Find income above £100 000
- Halve it
- Subtract from £12 570

Award full marks for a correct method leading to £10 570. (2 marks)

(b) Taxable income Using the correct allowance:

$$104\,000 - 10\,570 = 93\,430$$

Answer: £93 430 (1 mark)

(c) Income tax

- 20% on first £37 700

$$0.20 \times 37\,700 = 7\,540$$

- Remaining taxable income:

$$93\,430 - 37\,700 = 55\,730$$

- 40% on £55 730

$$0.40 \times 55\,730 = 22\,292$$

Total tax:

$$7\,540 + 22\,292 = 29\,832$$

Answer: £29 832 (2 marks)

Question 3 [4 marks]

Bella's gross income: £132 000

(a) Why is her personal allowance zero? Personal allowance is tapered away completely once income exceeds £125 140. Bella's income (£132 000) is above this, so her allowance is reduced to zero. **(2 marks)**

(b) Extra tax at 45% above £125 140 Amount above £125 140:

$$132\,000 - 125\,140 = 6\,860$$

Extra tax at 45%:

$$0.45 \times 6\,860 = 3\,087$$

Answer: £3 087 (2 marks)

Question 4 [4 marks]

NI bands:

- 0% up to £12 570
- 8% from £12 570 to £50 270
- 2% above £50 270

Lena's income: £39 000

(a) Income on which she pays 8% NI

$$39\,000 - 12\,570 = 26\,430$$

Answer: £26 430 (1 mark)

(b) NI at 8%

$$0.08 \times 26\,430 = 2\,114.40$$

Answer: £2 114.40 (3 marks)

Question 5 [5 marks]

Noah's income: £62 000

(a) Show he pays 8% NI on £37 700 Upper limit of 8% band: £50 270 Lower limit: £12 570

$$50\,270 - 12\,570 = 37\,700$$

(2 marks)

(b) Total NI

- 8% on £37 700

$$0.08 \times 37\,700 = 3\,016$$

- 2% on income above £50 270:

$$62\,000 - 50\,270 = 11\,730$$

$$0.02 \times 11\,730 = 234.60$$

Total NI:

$$3\,016 + 234.60 = 3\,250.60$$

Answer: £3 250.60 (3 marks)

Question 6 [4 marks]

Rate: 975 items/hour Shift: 8 hours

(a) Items in 8 hours

$$975 \times 8 = 7\,800$$

Answer: 7 800 items (2 marks)

(b) Target: 8 000 items $7\,800 < 8\,000$, so one 8-hour shift is **not enough**; they are 200 items short. (2 marks)

Question 7 [6 marks]

Large items: 3000 needed Rate between 350 and 520 items/hour

(a) Minimum time at 520/hour

$$3\,000/520 \approx 5.77 \text{ hours}$$

≈ 5.8 hours (about 5 h 46 min) (2 marks)

(b) Maximum time at 350/hour

$$3\,000/350 \approx 8.57 \text{ hours}$$

≈ 8.6 hours (about 8 h 34 min) (2 marks)

(c) 7 hours available

- At best rate: about 5.8 hours $\rightarrow$ possible
- At worst rate: about 8.6 hours $\rightarrow$ not possible

So it is **only realistic if the production rate is near the maximum**; otherwise, 7 hours is not enough. A good comment: “Not guaranteed; at lower rates they cannot finish in one day.” (2 marks)

Question 8 [5 marks]

Plan 2 loan, while studying: interest = RPI + 3% RPI = 4.3%

(a) Interest rate while studying

$$4.3\% + 3\% = 7.3\%$$

Answer: 7.3% (1 mark)

(b) Interest on £18 000 in one year

$$0.073 \times 18\,000 = 1\,314$$

Answer: £1 314 (2 marks)

(c) Why might total owed after graduation be more than £18 000 + one year's interest?
Examples (any one, clearly explained):

- Interest is added every year while studying, not just one year.
- RPI may change, affecting the rate.
- They may borrow more in later years.

(2 marks)

Question 9 [7 marks]

RPI = 4.3% Interest = RPI + between 0% and 3% depending on income. Threshold: £28 470
Top of band: £51 245

Graduate earns £39 858.

(a) Explain why added percentage $\approx 1.5\%$

Income above threshold:

$$39\,858 - 28\,470 = 11\,388$$

Width of band:

$$51\,245 - 28\,470 = 22\,775$$

Proportion through band:

$$11\,388 / 22\,775 \approx 0.5$$

Added percentage = 0.5 of 3% $\approx 1.5\%$. **(3 marks)**

(b) Total interest rate

$$4.3\% + 1.5\% = 5.8\%$$

Answer: 5.8% **(1 mark)**

(c) Interest on £32 000 at 5.8%

$$0.058 \times 32\,000 = 1\,856$$

Answer: £1 856 **(3 marks)**

Question 10 [6 marks]

Threshold: £28 470 Income: £36 000 Interest rate: 7.3% Loan at start: £40 000

(a) Income above threshold

$$36\,000 - 28\,470 = 7\,530$$

Answer: £7 530 **(1 mark)**

(b) Annual repayment

$$0.09 \times 7\,530 = 677.7 \approx 678$$

Answer: £678 (to nearest pound) (2 marks)

(c) Amount owed at end of year

Interest added:

$$0.073 \times 40\,000 = 2\,920$$

Balance after interest:

$$40\,000 + 2\,920 = 42\,920$$

After repayment:

$$42\,920 - 678 = 42\,242$$

Answer: £42 242 (3 marks)

Question 11 [5 marks]

RPI table:

- 2020–21: 2.1%
- 2021–22: 2.9%
- 2022–23: 13.8%
- 2023–24: 11.6%
- 2024–25: 4.3%

(a) Largest increase between consecutive periods

Differences:

- 2.1 → 2.9: +0.8
- 2.9 → 13.8: +10.9
- 13.8 → 11.6: -2.2
- 11.6 → 4.3: -7.3

Largest increase is between **Sept 2021–Aug 2022** and **Sept 2022–Aug 2023**. (2 marks)

(b) Student from Sept 2021 to Aug 2024

Periods:

- Sept 2021–Aug 2022: 2.9%
- Sept 2022–Aug 2023: 13.8%
- Sept 2023–Aug 2024: 11.6%

Interest above 10% for **2 academic years** (2022–23 and 2023–24). **Answer: 2 years (3 marks)**

Question 15 [5 marks]

Income: £45 000 Threshold: £28 470 Interest rate: 7.3% Loan at start: £27 500

(a) Annual repayment

Income above threshold:

$$45\,000 - 28\,470 = 16\,530$$

Repayment:

$$0.09 \times 16\,530 = 1\,487.7 \approx 1\,488$$

Answer: £1 488 (2 marks)

(b) Interest added

$$0.073 \times 27\,500 = 2\,007.5$$

Answer: £2 007.50 (2 marks)

(c) Amount owed at end of year

After interest:

$$27\,500 + 2\,007.5 = 29\,507.5$$

After repayment:

$$29\,507.5 - 1\,487.7 = 28\,019.8 \approx 28\,020$$

Answer: £28 020 (to nearest pound) (1 mark)

Question 16 [5 marks] — The Party Factory

Rate: 980 items/hour Time: 6 hours Order: 6 000 items

(a) Items in 6 hours

$$980 \times 6 = 5\,880$$

Answer: 5 880 items (2 marks)

(b) Can they complete 6 000 items in one 6-hour shift?

$5\,880 < 6\,000 \rightarrow$ they are 120 items short. So **no**, one 6-hour shift is not enough. **(2 marks)**

(c) Why might actual number be less than 5 880?

Examples:

- Machine downtime/breakdowns
- Changeover/setup time
- Staff breaks
- Defective items rejected

(1 mark)

Question 17 [7 marks] — The Party Factory

Small items: 950–1000 per hour Large items: 350–520 per hour

Order:

- 4 200 small items
- 2 100 large items

(a) Minimum time for 4 200 small items

Use maximum rate: 1 000/hour

$4\,200 / 1\,000 = 4.2$ hours

Answer: 4.2 hours (2 marks)

(b) Maximum time for 2 100 large items

Use minimum rate: 350/hour

$2\,100 / 350 = 6$ hours

Answer: 6 hours (2 marks)

(c) Can both orders be completed in one 8-hour day?

- Small items: 4.2 hours (best case)
- Large items:
 - o Best case:

$2\,100 / 520 \approx 4.04$ hours

Total best-case time:

$4.2 + 4.04 \approx 8.24$ hours > 8

Even at **maximum** rates, total time is slightly more than 8 hours. So it is **not possible** to complete both orders in one 8-hour day. **(3 marks)**