Resources to support the National 5 Computing Science course

This document maps past paper questions against the course content listed in the course specification.

You can find these in the 'Past Papers and Marking Instructions' dropdown on the National 5 subject page.

Software design and development

Phase	Skills, knowledge and understanding	Past paper questions
Development methodologies	Describe and implement the phases of an iterative development process: analysis, design, implementation, testing, documentation, and evaluation, within general programming problem-solving.	2024 Q3 SQP Q5 2022 Q9(a)(ii)
Analysis	Identify the purpose and functional requirements of a problem that relates to the design and implementation at this level, in terms of: ♦ inputs ♦ processes ♦ outputs	2024 Q9(a) SQP Q11(a) 2023 Q9(a) 2023 Q11(a) 2022 Q8(a) 2019 Q13(a) 2018 Q19(a)

Phase	Skills, knowledge and understanding	Past paper questions
Design	Identify the data types and structures required for a problem that relates to the implementation at this level, as listed below.	2023 Q11(b)(i)
Design	Describe, identify, and be able to read and understand: ♦ structure diagrams ♦ flowcharts ♦ pseudocode	2024 Q10(a)(b) SQP Q10(b)(c) SQP Q12(a) 2023 Q5 2022 Q4(a) 2022 Q9(a)(i) 2019 Q5 2019 Q16(a)(b)
Design	Exemplify and implement **one** of the above design techniques to design efficient solutions to a problem.	2024 Q4 2024 Q10(d)(i) 2024 Q11(a)(i) SQP Q7(a) 2023 Q10(b) 2023 Q11(b)(ii) 2022 Q4(b) 2022 Q8(b) 2022 Q9(b)(i) 2019 Q16(c) 2019 Q19(b)(ii) 2018 Q19(d) 2018 Q21(a)
Design	Describe, exemplify, and implement user-interface design, in terms of input and output, using a wireframe.	SQP Q10(a) 2023 Q9(b) 2022 Q10(a) 2019 Q3 2018 Q19(b)
Implementation (data types and structures)	Describe, exemplify, and implement appropriately the following data types and structures: ♦ character ♦ string ♦ numeric (integer and real) ♦ Boolean ♦ 1D arrays	2024 Q1 2024 Q5(a) 2024 Q7(b) SQP Q1 SQP Q11(b)(i) SQP Q12(b) 2023 Q9(d) 2022 Q2 2022 Q3 2022 Q8(c)(i) 2019 Q13(c) 2019 Q19(c)(ii) 2018 Q17(a)(i)

Phase	Skills, knowledge and understanding	Past paper questions
Implementation (computational constructs)	Describe, exemplify, and implement the appropriate constructs in a high-level (textual) language: ♦ expressions to assign values ♦ expressions to return values using arithmetic operations (addition, subtraction, multiplication, division, and exponentiation) ♦ expressions to concatenate strings ♦ selection constructs using simple conditional statements with <, >, ≤, ≥, =, ≠ operators ♦ selection constructs using complex conditional statements ♦ logical operators (AND, OR, NOT) ♦ iteration and repetition using fixed and conditional loops ♦ predefined functions (with parameters): — random — round — length Read and explain code that makes use of the above constructs.	2024 Q5(b) 2024 Q7(a) 2024 Q9(b) 2024 Q11(b)(c)(ii)(e) SQP Q4 SQP Q11(c)(i)(ii) SQP Q13(a)(b)(c) 2023 Q6(b) 2023 Q8(a)(b) 2023 Q9(c) 2023 Q10(c)(d)(i) 2023 Q11(d) 2022 Q6(a)(b) 2022 Q8(c)(ii) 2019 Q13(f) 2019 Q19(a) 2019 Q19(c)(iii) 2018 Q4(a) 2018 Q7 2018 Q11 2018 Q14(c) 2018 Q15 2018 Q19(c)(i)(ii) 2018 Q21(b)(i)
Implementation (algorithm specification)	Describe, exemplify, and implement standard algorithms: ♦ input validation ♦ running total within loop ♦ traversing a 1D array	2024 Q9(d) SQP Q12(c) 2023 Q8(a) 2022 Q8(c)(ii) 2022 Q10(c) 2019 Q7(b) 2019 Q13(e) 2019 Q19(c)(i) 2018 Q17(a)(ii) 2018 Q21(b)(ii)

Phase	Skills, knowledge and understanding	Past paper questions
Testing	Describe, identify, exemplify, and implement normal, extreme, and exceptional test data for a specific problem, using a test table.	2024 Q10(c)(i)(ii) 2024 Q11(a)(ii) SQP Q7(b) 2023 Q4 2022 Q9(b)(ii) 2019 Q7(a) 2018 Q19(e)
Testing	Describe and identify syntax, execution, and logic errors.	2024 Q11(c)(i) SQP Q2 2023 Q7(a) 2023 Q10(d)(ii) 2022 Q9(c)(iv) 2019 Q11(2) 2019 Q19(b)(i) 2018 Q14(a) 2018 Q14(b)
Evaluation	Describe, identify, and exemplify the evaluation of a solution in terms of: ♦ fitness for purpose ♦ efficient use of coding constructs ♦ robustness ♦ readability: — internal commentary — meaningful identifiers — indentation — white space	2022 Q8(c)(iii) 2022 Q9(c)(i)(ii)

Computer systems

Phase	Skills, knowledge and understanding	Past paper questions
Data representation	Describe and exemplify the use of binary to represent positive integers.	
Data representation	Describe floating point representation of positive real numbers using the terms mantissa and exponent.	2024 Q6(a) 2023 Q10(a) 2022 Q5 2019 Q13(d) 2018 Q4(b)
Data representation	Convert from binary to denary and vice-versa.	2024 Q2 SQP Q3 2023 Q8(c) 2022 Q1 2019 Q1 2018 Q22(a)(i)
Data representation	Describe extended ASCII code (8-bit) used to represent characters.	2024 Q8 SQP Q11(d) 2023 Q6(a)(i) 2022 Q9(c)(iii) 2019 Q13(b)(ii) 2018 Q22(a)(ii)
Data representation	Describe the vector graphics method of graphic representation for common objects: ♦ rectangle ♦ ellipse ♦ line ♦ polygon with attributes: ♦ co-ordinates ♦ fill colour ♦ line colour	2024 Q10(d)(ii) SQP Q9(a)(b) 2023 Q1(a)(b) 2022 Q7 2019 Q12 2018 Q22(b)
Data representation	Describe the bit-mapped method of graphics representation.	2024 Q9(e) SQP Q12(d) 2023 Q9(e) 2022 Q10(d)(i) 2019 Q13(b)(i)

Phase	Skills, knowledge and understanding	Past paper questions
Computer structure	Describe the purpose of the basic computer architecture components and how they are linked together: ♦ processor (registers, ALU, control unit) ♦ memory locations with unique addresses ♦ buses (data and address)	2024 Q10(e) SQP Q11(b)(ii)(iii) 2023 Q6(a)(ii) 2023 Q7(b) 2022 Q10(b)(i)(ii) 2019 Q10(b) 2019 Q16(d)(i)(ii) 2018 Q21(b)(iii)(iv)
Computer structure	Explain the need for interpreters and compilers to translate high-level program code to binary (machine code instructions).	2024 Q11(d) 2023 Q11(c) 2022 Q9(d) 2019 Q16(e) 2018 Q17(b)
Environmental impact	Describe the energy use of computer systems, the implications on the environment and how these could be reduced through: ♦ settings on monitors ♦ power-down settings ♦ leaving computers on stand-by	2024 Q6(b) SQP Q8 2023 Q3 2022 Q10(d)(ii) 2018 Q22(c)
Security precautions	Describe the role of firewalls.	2019 Q15(d) 2016 Q20(a)
Security precautions	Describe the use made of encryption in electronic communications.	2024 Q9(c) 2023 Q2 SQP Q6 2022 Q8(d) 2019 Q15(d) 2018 Q6

Database design and development

Phase	Skills, knowledge and understanding	Past paper questions
Analysis	Identify the end-user and functional requirements of a database problem that relates to the implementation at this level.	SQP Q16(a) 2019 Q14(a)
Design	Describe and identify the implications for individuals and businesses of the General Data Protection Regulation (UK GDPR) that data must be: ♦ processed lawfully, fairly and in a transparent manner in relation to individuals ♦ used for the declared purpose only ♦ limited to the data need for the declared purpose ♦ accurate ♦ not kept for longer than necessary ♦ held securely	2024 Q13 2022 Q14(b) 2019 Q14(d)
Design	Describe and exemplify entity-relationship diagrams with two entities indicating: ♦ entity name ♦ attributes ♦ relationship (one to many)	2024 Q15(a)(i) SQP Q16(b)(c) 2023 Q14(a) 2022 Q13(a) 2022 Q14(a)(i)(ii) 2019 Q10(a) 2019 Q14(b) 2018 Q23(a)

Phase	Skills, knowledge and understanding	Past paper questions
Design	Describe and exemplify a data dictionary: ♦ entity name ♦ attribute name ♦ primary and foreign key ♦ attribute type: — text — number — date — time — Boolean ♦ attribute size ♦ validation: — presence check — restricted choice — field length — range	2024 Q12 2024 Q15(a)(ii) SQP Q15 2023 Q12(a)(b) 2022 Q11 2019 Q8(a) 2019 Q14(c) 2019 Q17(a) 2018 Q5 2018 Q20(a)(b) 2018 Q23(b)
Design	Exemplify a design of a solution to the query: ♦ multiple tables ♦ fields ♦ search criteria ♦ sort order	2024 Q16(b) SQP Q17(a) 2023 Q15(a) 2022 Q13(b)(i) 2019 Q17(b) 2018 Q20(c)
Implementation	Implement relational databases with two linked tables, to match the design with referential integrity.	2024 Q16(a)(d) SQP Q16(d) 2018 Q20(e)

Phase	Skills, knowledge and understanding	Past paper questions
Implementation	Describe, exemplify and implement SQL operations for pre-populated relational databases, with a maximum of two linked tables: ♦ select: — from — where: o AND, OR, <, >, = o order by with a maximum of two fields ♦ insert ♦ update ♦ delete ♦ equi-join between tables Read and explain code that makes use of the above SQL.	2024 Q14(a)(b) 2024 Q15(c) 2024 Q16(c)(i) SQP Q14(a)(b) SQP Q17(b) 2023 Q13 2023 Q14(b) 2023 Q15(b) 2023 Q15(c)(ii) 2022 Q12(a) 2022 Q13(b)(ii) 2022 Q14(c)(d) 2019 Q4 2019 Q17(c)(ii)(d)(i) 2018 Q10(a)(b) 2018 Q16
Testing	Describe and exemplify testing: ♦ SQL operations work correctly at this level	2024 Q16(c)(ii) 2022 Q12(b) 2019 Q8(b) 2019 Q17(d)(ii) 2018 Q20(d)(i)
Evaluation	Evaluate solution in terms of: ♦ fitness for purpose ♦ accuracy of output	2024 Q15(b) SQP Q17(c) 2023 Q14(c) 2023 Q15(c)(i) 2019 Q17(c)(i) 2018 Q20(d)(ii)

Web design and development

Phase	Skills, knowledge and understanding	Past paper questions
Analysis	Identify the end-user and functional requirements of a website problem that relates to the design and implementation at this level.	2024 Q19(d) 2023 Q19(a) 2022 Q19(e) 2019 Q15(a)
Design	Describe and exemplify the website structure with a home page, a maximum of four linked multimedia pages, and any necessary external links.	2024 Q17 SQP Q19 2023 Q20(b) 2019 Q18(a) 2018 Q18(a)
Design	Describe, exemplify and implement, taking into account end-user requirements, effective user-interface design (visual layout and readability) using wire-framing: ♦ navigational links ♦ consistency across multiple pages ♦ relative vertical positioning of the media displayed ♦ file formats of the media (text, graphics, video, and audio)	2024 Q18 SQP Q18(b) 2022 Q17
Design	Describe and identify the implications for individuals and businesses of the Copyright, Designs and Patents Act 1988 relating to: ♦ web content (text, graphics, video, and audio)	2024 Q20(d) SQP Q20(a)(ii) 2023 Q17(b) 2022 Q19(d) 2019 Q15(b)(i) 2018 Q13
Design	Compare a range of standard file formats: ♦ audio standard file formats WAV and MP3 in terms of compression, quality, and file size ♦ bit-mapped graphic standard file formats JPEG, GIF, and PNG in terms of compression, animation, transparency, and colour depth	2024 Q19(a) SQP Q20(a)(i) 2023 Q17(a) 2022 Q18(d)(i) 2019 Q15(b)(ii) 2019 Q18(d)(i) 2018 Q1 2018 Q3 2018 Q18(c)
Design	Describe the factors affecting file size and quality, relating to resolution, colour depth, and sampling rate.	SQP Q21(d)(ii) 2023 Q19(b)(ii) 2022 Q18(d)(ii)

Phase	Skills, knowledge and understanding	Past paper questions
Design	Describe the need for compression.	SQP Q21(d)(i)
Design	Describe, exemplify and implement prototyping (low-fidelity) from wireframe design at this level.	SQP Q18(a) 2023 Q20(a) 2022 Q18(a)(i)(ii) 2018 Q12
Implementation (CSS)	Describe, exemplify and implement internal and external Cascading Style Sheets (CSS): ♦ selectors, classes and IDs ♦ properties — text: ○ font (family, size) ○ color ○ alignment — background colour Read and explain code that makes use of the above CSS.	2024 Q19(b)(i) 2024 Q20(a) SQP Q21(a) SQP Q21(b)(i) 2023 Q18 2023 Q19(d) 2023 Q20(c) 2022 Q15 2022 Q18(b)(i)(ii) 2022 Q19(a) 2019 Q15(c)(iii) 2019 Q18(b) 2018 Q18(d)(d)
Implementation (HTML)	Describe, exemplify and implement HTML code: ♦ HTML ♦ head ♦ title ♦ body ♦ heading ♦ paragraph ♦ DIV ♦ link ♦ anchor ♦ IMG ♦ audio ♦ video ♦ lists — ol, ul and li Read and explain code that makes use of the above HTML.	2024 Q19(c) 2024 Q20(b) SQP Q20(b) SQP Q21(a) 2023 Q19(b)(i) 2023 Q19(d) 2023 Q20(c) 2022 Q18(c) 2022 Q19(a) 2019 Q2 2019 Q9 2019 Q15(c)(ii) 2019 Q18(d)(ii) 2018 Q18(b) 2018 Q23(c)(i)(ii)

Phase	Skills, knowledge and understanding	Past paper questions
Implementation (HTML) (continued)	Describe and implement hyperlinks (internal and external), relative and absolute addressing.	2024 Q19(b((ii) SQP Q21(b)(ii) 2023 Q16(b) 2022 Q16 2022 Q19(b) 2018 Q18(f)(i)(ii)
Implementation (JavaScript)	Describe and identify JavaScript coding related to mouse events: ♦ onmouseover ♦ onmouseout	2024 Q20(c)(i)(ii) SQP Q21(c)(i)(ii) 2023 Q19(c) 2022 Q19(c) 2019 Q15(c)(i) 2018 Q9
Testing	Describe and exemplify testing: ♦ matches user-interface design ♦ links and navigation work correctly ♦ media (such as text, graphics, and video) display correctly ♦ consistency	2024 Q20(e) SQP Q20(c)(i)(ii) 2018 Q8 2018 Q18(g)
Evaluation	Evaluate solution in terms of: ♦ fitness for purpose	2023 Q16(a) 2019 Q6 2019 Q18(c) 2018 Q2