CPCCBC4006B
SELECT, PROCURE AND STORE CONSTRUCTION MATERIALS FOR LOW RISE PROJECTS

THEORY EXAM INSTRUCTIONS

- This exam will occur under standard assessment conditions.
  - An oral examination may be allowed under certain circumstances. Answers will be documented and FT003 (Oral examination declaration form) must be completed.
- Participants must provide enough detail in their responses to demonstrate their knowledge and skills.
- Please fill in the details below, providing your name, signature and date of assessment.
  - Your signature acknowledges that this is your own work.
- If a participant initially answers a question incorrectly but modifies their response, they must follow the instructions below:
  - If a participant changes their response in writing, they must put their initials next to the written change.
  - If a participant changes their response verbally, this must be noted on the exam paper by the assessor.

Participant name: Massimiliano Carante

Participant signature: 

Assessor name:

Assessor signature:

Date: 16/07/2019

Number of questions	Number of questions answered correctly	Satisfactory?	
		Yes	No
44		☐	☐

ASSESSOR COMMENTS

Q1. **Which of the following documents and/or people would you refer to when selecting materials for a building project? Tick all that apply.**

Answer

Choice	Possible Answers
☑	Australian Standards
☑	Contract
☑	Drawings
☑	Manufacturer
☑	National Construction Code
☑	Specifications
☑	Tolerances

☐

Q2. **Identify the Volume and Parts of the NCC that relate to suitability of materials for Classes 1 and 10, and Classes 2 to 9.**

Answer

Classes 1 and 10	Classes 2 to 9
Volume 2 part A5.0	Volume 1 part A5.0

☐

Q3. **Identify the assessment methods used to verify a performance solution.**

Answer

- Evidence of suitability
- A verification method
- Expert judgement
- Comparison with the Deemed-to-Satisfy provisions

☐

Q4. **Which of the following solutions for material selection often references the Australian Standards? Tick your response.**

Answer

Choice	Possible Answers
☑	Deemed-to-Satisfy solution
☐	Performance solution

☐

Q5. **Identify five (5) materials commonly used for *low rise buildings* in your region. For each material, identify the following:**

- **Its name**
- **Properties of the material**

Answer

#	Material name	Properties
1	Glass	Glass allows light through to provide additional lighting and visibility. Can be opened to facilitate extra ventilation. Glass is brittle and fragile
2	Brick and Block	Created from natural materials in a commercial process. Bricks and blocks have a high degree of flame resistance and good thermal properties. Strong compression strength.
3	Rock	Natural material and readily available. Difficult to handle at times due to weight and shape. Very dense which aids protection. Strong compression strength.
4	Wood	Natural material. Can be used in different climates and provides good strength. Various choices available for different applications. Can be susceptible to rot and requires maintenance
5	Concrete	Composite material and readily available. Low tensile strength which can be addressed using reinforcing bars. Prone to durability issues if incorrectly constructed. Good construction allows for long service life with minimal maintenance. Good thermal properties.

		Very strong in compression

Q6. **For each of the materials in Q5. identify the following:**

- **Quality of the material (i.e. durability, serviceability, cost effectiveness)**
- **Compatibility and non-compatibility of the material (i.e. what it would/would not be suitable for)**

Answer

#	Quality	Compatibility
1	Good durability and serviceability. Can be cost effective but dependent on requirements due to many different types of glass available	Suitable for allowing lighting and visibility into rooms and to exterior of buildings. Not suitable as a load bearing material. Brittle and low strength
2	Good durability and serviceability. Low cost but varies on type of block/brick.	Suitable for most applications such as housing, retaining walls etc. Load bearing applications require design
3	Very good durability and serviceability. Can be costly due to weight (for transportation) and size. Dependent on type of rock.	Suitable for many applications such as housing walls, retaining walls etc
4	Good durability and serviceability provided material is maintained and correct type used. Relatively cheap	Suitable for many applications including load bearing. I.e. walls, beams, frames.
5	Good durability and serviceability. Dependent upon construction quality	Suitable for many different applications. Labour intensive if cast in-situ. Suitable for load bearing applications.

Q7. **Identify five (5) physical characteristics that may be considered when evaluating potential building materials.**

Answer

Density and specific gravity
Strength
Electrical conductivity
Thermal conductivity and capacity
Moisture absorption

Q8. **Match the terms and definitions below by writing the appropriate letter next to each number in the centre column.**

Answer

Term		Answers	Definition	
1	Carbon footprint	1 - B	A	The amount of energy required to manufacture a product
2	CO2e	2 - E	B	Total GHD emissions produced during manufacture construction and use
3	Embodied energy	3 - A	C	Greenhouse gas emissions
4	Embodied water	4 - D	D	The amount of water required to manufacture a product
5	GHG	5 - C	E	CO2equivalent tonnes emitted into the atmosphere

Q9. **Which of the following materials would be considered as 'low energy content'? Tick all that apply.**

Answer

Choice	Possible Answers
☐	Bricks
☑	By-products of other industrial processes
☐	Cement
☐	Glass
☐	Metals
☐	Plastics
☑	Sand
☑	Stone
☑	Timber

Q10. **Refer to the table below and identify the wall material type that has the smallest embodied energy and emission impact.**

COMPONENT	kWh/ m2 indoor floor area	Kg CO2e/ m2 indoor floor area
Floor suspended slab 114 - 117 mm	208	68
Floor suspended timber on stumps	76	26
ROOF		
Roof steel frame colorbond steel or tile	209	72
Roof timber frame colorbond steel or tile	143	47
WALLS		
Walls double brick; s/b interior	312	103
Walls brick veneer timber frame	204	67
Walls timber frame fibro clad	61	20
Walls steel frame fibro clad	90	30
Walls Timber frame timber clad	68	23
Walls pre-cast concrete	264	88
Walls concrete block	160	53
OTHER , APPLICABLE TO ALL HOMES REGARDLESS OF TYPE		
Construction, admin, transport, other materials such as copper pipes, glass, aluminium	406	144
Floor coverings assume approx. 50% ceramic tile 50% polypropylene carpet	61	20
Fittings, fixed appliances built in $ bathroom, kitchen, w/robes	96	43
ADDITIONS	**kWh/ m2 area or m length**	**Kg CO2e/ m2 area or m length**
Roofed open areas - alfresco / porch / verandah / carport	352	117
Garage single brick or cavity walls, concrete slab, steel or tile roof	675	219
Open Carport	352	117
Fence brick or metal (per metre length, assuming 1.5 m height)	186	61
Paving (brick or concrete)	96	32
Pool (concrete below ground)	534	198

Answer Walls timber frame fibro clad ☐

Q11. **Identify the Volume and Parts of the NCC that relate to energy efficiency of materials for Classes 1 and 10, and Classes 2 to 9.**

Answer

Classes 1 and 10	Classes 2 to 9
Volume 2, Part 3.12	Volume 1, Part J

Q12. **Identify the relevant section of the Standards and Tolerances Guide and the associated Australian Standard that addresses residential slabs and footings.**

Answer

Standards and Tolerances Guide	Australian Standard
The QBCC guide refers to this in section 2.0	AS 2870

Q13. **Identify the relevant section of the Standards and Tolerances Guide and the associated Australian Standard that addresses roof tiles.**

Answer

Standards and Tolerances Guide	Australian Standard
The QBCC Guide refers to this in Section 6.0	AS 2049

Q14. **Identify the Volume and Parts of the NCC that relate to safety barriers for swimming pools for Classes 1 and 10, and Classes 2 to 9.**

Answer

Classes 1 and 10	Classes 2 to 9
Volume 2, Part 3 10.1.0	Volume 1 Part G1.1 – G1.3

Q15. **In some states, barriers and fences for swimming pools are not entirely regulated by the NCC, as noted in the Ancillary Provisions and State and Territory Variations. Identify the applicable Act and Regulation that regulate safety barriers for swimming pools in your jurisdiction.**

Answer In NSW: Swimming Pool Act 1992 and Swimming Pool Regulation 2008

Q16. **Identify the Australian Standard that relates to safety barriers for swimming pools.**

Answer AS 1926 ☐

Q17. **True or False (Tick your response): According to the Standard in Q16. all gates must be fitted with a self-closing device that will return the gate to a closed position from any position without the use of manual force.**

Answer

☑	True
☐	False

☐

Q18. **Identify the Volume and Parts of the NCC that relate to fire-resistance of building elements for Classes 1 and 10, and Classes 2 to 9.**

Answer

Classes 1 and 10	Classes 2 to 9
Volume 2, Schedul 5	Volume 1, Schedule 5

☐

Q19. **Identify the Australian Standard that relates to fire-resistance tests for elements of construction.**

Answer AS 1530 ☐

Q20. **For all NCC Classes, where the ground or subfloor space is excessively damp or subject to frequent flooding, which durability class must the subfloor framing must be used where above ground?**

Answer Class 1 or 2 timbers or H3 preservative treated timbers ☐

Q21. **Identify the Australian Standards that must be observed when meeting the requirements for Q20.**

Answer AS 1684.2, AS 1684.3 or AS 1684.4 ☐

Q22. **True or False (Tick your response): Where materials are not used as intended (or without considering NCC requirements), this can make a significant difference to the life or serviceability of the structure.**

Answer

☑	True
☐	False

☐

Q23. **Explain why durability and serviceability impact on the cost effectiveness of chosen materials.**

Answer Materials that are cheap, but not durable or have high serviceable costs, do not end up being cheaper in the long run. However, spending a little more money on materials that are durable and require minimal maintenance will cost less in the long run – as they do not need to be replaced as frequently and have low ongoing costs ☐

Q24. **Provide an example of short term degradation of materials and describe its effects on a building on structure.**

Answer Timber is often prone to short term degradation. When exposed to the weather it may suffer from weathering, causing splitting and crumbling or if it is unprotected and remains damp for long periods, it will rot. ☐

Q25. **Provide an example of long term degradation of materials and describe its effects on a building on structure.**

Answer

Stone usually forms a surface skin when exposed to the atmosphere. This can act to protect the stone or in some cases it may cause failure. The failure is usually associated with acid rain, a result of sulphur dioxide pollution in the atmosphere.

Q26. **You have spoken to a supplier who has indicated that some of the client's desired materials are unavailable. When considering alternative building materials what must be taken into consideration (i.e. other than the client's requirements)?**

Answer

When selecting building materials you need to be aware of a number of considerations, such as:
Client requirements
Material availability or lack of availability
Environmental issues
Life Cycle Assessment methodology

An alternative material or building practice should only be considered if it is performance tested, efficient, environmentally sustainable or more cost-effective.

Q27. **Identify two (2) things that you should look for when receiving a delivery of materials.**

Answer

Confirm the correct quantity
Confirm the condition of the delivery

Q28. **If you encounter issues with delivery, what two (2) options do you have?**

Answer

Accept the shipment with 'conditions' or
Reject the entire shipment

☐

Q29. **Which of the following should be assessed before shifting materials? Tick all that apply.**

Answer

Choice	Possible Answers
☑	What needs to be relocated (e.g. size, weight)
☑	The relocation area, site layout and obstacles
☑	Distance and time to relocate load
☑	Whether a team is available and/or appropriate
☑	Whether PPE must be worn (e.g. for hazardous materials)

☐

Q30. **What document should you refer to for guidance on how to handle and store hazardous chemicals?**

Answer

The use of a Safety Data Sheet will give the best advice on correct handling and if special PPE is required

☐

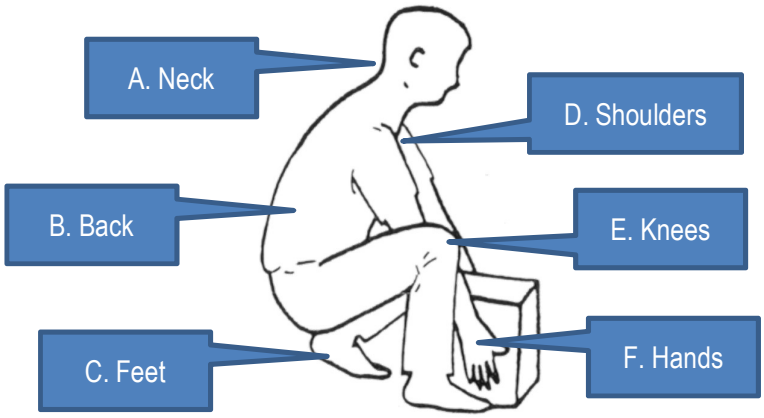
Q31. **Name three (3) ways you can reduce the risk of injury if a load is too heavy for one person to carry, push or pull.**

Answer

Lighten the load
Team lift
Mechanical lift

☐

Q32. **In the diagram below a person is lifting a tool box.**
Filling in the table, indicate how each body part should be used/placed.



Answer

Area of body (Letter)	How it should be placed
D	Level
A	Upright
F	Good grip
B	Natural curve
E	Bent
C	Flat, facing load

Q33. **How should construction materials and components be handled?**
Tick all that apply.

Answer

Choice	Possible Answers
☑	Sorted to suit material type and size, separating hazardous material
☑	Stacked or stockpiled for ease of identification and retrieval
☐	Stored in access ways for ease of retrieval
☑	Stored clear of access ways
☑	Handled and positioned ready for installation

Q34. **Identify the Australian Standard that relates to the storage and handling of LP gas.**

Answer AS/NZS 1596

Q35. **List one (1) testing method for each of the building materials listed below.**

Answer

Material name	Properties
Concrete	Concrete cylinders or cubes are normally tested in a hydraulic press
Metals	The strength of metals is reduced if they are repeatedly loaded alternately in tension and compression. This test is called 'repeated loading' if the load is applied several hundred or thousands of times, and fatigue loading if the load is applied millions of times
Timber	A stress grading machine tests every individual piece of timber using a very fast and economical method. The test is based on the relationship between the strength and the deflection of timber. Each piece of timber is deflected at several points along its length, and the deflection category marked by means of a spot of dye. The timber is then classified visually by its colour markings.

Q36. **What Code gives detailed tables which state the required grade of timber for specific sizes and uses?**

Answer The Australian Timber Framing Code

Q37. **Name two (2) ways that defects may be seen in timber.**

Answer knots, gum veins

Q38. **Identify two (2) tests that may be performed to determine the durability of stone.**

Answer

Acid immersion test
Water absorption test: test of the porosity and the saturation coefficients of the stone

☐

Q39. **Name two (2) ways that defects may be seen in stone.**

Answer

Defects in stone are usually apparent as cracks and fissures in the rock surface

☐

Q40. **True or False (Tick your response): Under a contract, builders and other specialist tradespersons are the ones most likely to rectify or remedy problems that arise from incorrect installation, application or placement of materials.**

Answer

☑	True
☐	False

☐

Q41. **Name two (2) established methods that may be used to preserve timber.**

Answer

Paint.
Soil poisoning

☐

Q42. **Identify two (2) established methods that may be used to protect ferrous metals.**

Answer

Painting metal
Galvanisation

☐

Q43. **Explain why the corrosion resistance of non-ferrous metals is superior to that of ordinary steel.**

Answer

Is a result of the production of a ceramic coating of oxide or salt on the metal which protects it from further corrosion.

☐

Q44. **When should aluminium be coated with bituminous paint? Tick all that apply.**

Answer

Choice	Possible Answers
☐	At all times
☑	When it is buried in soil
☑	When it comes in contact with chemical materials
☑	When it is immersed in water
☐	When it is used on bitumen

☐