

MARKING SCHEME & MODEL ANSWERS

Class: 9th | Subject: Construction (NSQF)

Academic Session: 2026-27

Max Marks: 60

Time Allowed: 2.30 Hours

Code: A

Medium: English

Total Questions: 30

SECTION - A : LONG ANSWER TYPE QUESTIONS (3 × 5 = 15 MARKS)

Q.1. Describe the characteristics of good building stones.

5 Marks

Answer / Key Points: A good building stone must possess the following essential characteristics:

- **Crushing Strength:** Should be high (compressive strength > 100 N/mm²) to withstand heavy structural loads.
- **Durability:** Highly resistant to atmospheric actions like rain, frost, temperature variations, and chemical action.
- **Hardness & Toughness:** Resistant to wear and tear due to friction/abrasion; able to withstand impact and vibration.
- **Low Water Absorption:** Percentage absorption should not exceed 5% by weight after 24 hours of immersion.
- **Good Dressability & Workability:** Easy to shape, dress, cut, and carve without excessive labor or fracturing.
- **Specific Gravity:** Should generally be high (greater than 2.7) for heavy structural stability like retaining walls.

--- OR ---

Q.1 (OR). What are the different types of stones used in construction? Explain brief details of their uses.

- **Granite:** Igneous rock; extremely hard and durable. *Uses:* Bridge piers, sea walls, foundations, steps, and kitchen countertops.
- **Marble:** Metamorphic rock; takes good polish. *Uses:* Ornamental work, flooring, wall cladding, and decorative carvings.
- **Sandstone:** Sedimentary rock; easy to work. *Uses:* Ashlar masonry, ornamental buildings, and flagstone paving.
- **Limestone:** Sedimentary rock. *Uses:* Flooring, wall masonry, manufacturing of lime and cement.
- **Slate:** Metamorphic rock; breaks into thin sheets. *Uses:* Roofing, damp-proof courses (DPC), and flooring.

Q.2. Why are geometric constructions important in making engineering drawings?

5 Marks

Answer / Key Points:

- **Accuracy & Precision:** Form the foundation for producing exact shapes, dimensions, and curves in engineering blueprints.
- **Standardization:** Ensures drawings follow universally accepted graphic rules understood across industries globally.
- **Component Design:** Critical for designing mechanical parts, structural profiles, arches, and polyhedral layouts.
- **Problem Solving:** Helps solve complex geometric intersections, tangents, and angles without needing complex manual calculations.
- **Quality Control:** Reduces layout errors on construction sites and manufacturing shop floors.

--- OR ---

Q.2 (OR). List the step-by-step procedure for constructing a regular polygon having 10 equal sides (Decagon).

- **Step 1:** Calculate the interior angle $\theta = (10 - 2) \times 180^\circ / 10 = 144^\circ$ or exterior angle $360^\circ / 10 = 36^\circ$.
- **Step 2:** Draw a circle of radius equal to the given circumscribing circle radius with center O.
- **Step 3:** Draw a base line (side AB) of the required given length.
- **Step 4:** Using a protractor/compass, set an angle of 36° at center O or 144° internal angle at vertex.
- **Step 5:** Step off the side length AB around the circumference of the circle 10 times using a compass.
- **Step 6:** Join all 10 vertices sequentially with straight line segments to complete the regular decagon.

Q.3. Explain in brief Shallow Foundation and Deep Foundation with neat sketches.

5 Marks

Answer / Key Points:

- **Shallow Foundation:** Defined as a foundation where depth (D) is equal to or less than its width (B), i.e., $D \leq B$. It transfers structural loads to upper soil layers. *Examples:* Spread footing, strip footing, mat/raft foundation.
- **Deep Foundation:** Defined as a foundation where depth (D) is significantly greater than its width (B), i.e., $D > B$. Used when surface soil is weak; transfers loads to deeper firm strata. *Examples:* Pile foundation, pier foundation, well/caisson foundation.
- **Neat Sketches:** Line diagrams showing ground level (GL), depth, width, and load transfer direction for both types.

--- OR ---

Q.3 (OR). Explain in detail the procedure and safety precautions involved in the excavation of a soil trench.

- **Procedure:**
 - Mark layout lines (center line/outlines) using chalk, lime, and pegs.
 - Excavate top layer up to required depth step-by-step; maintain side slopes (angle of repose).
 - Deposit excavated earth at least 1.5 meters away from trench edges.
- **Safety Precautions:**
 - Use timbering/shoring for deep trenches ($> 1.5\text{m}$) to prevent side collapse.
 - Provide personal protective equipment (PPE) like helmets, boots, gloves to workers.
 - Place warning barricades and red lights around open trenches at night.
 - Keep excavated soil at safe distance to prevent rolling back.

SECTION - B : SHORT ANSWER TYPE QUESTIONS (6 × 3 = 18 MARKS)

Q.4. Explain the main uses of stones in building construction works.

3 Marks

Answer: Main uses of stones in civil works are:

- Building load-bearing wall masonry and foundation structures.
- Crushed stone aggregate for making concrete and road pavements.
- Decorative facing/cladding, flooring tiles, and roofing slates.

Q.5. Write down the standard units of measurement used for the following items of civil work:

3 Marks

Answer:

1. **Earthwork in excavation:** Cubic Metre (m^3 or cu.m)
2. **Brickwork in superstructure:** Cubic Metre (m^3 or cu.m) [Note: Half-brick walls measured in m^2]

Q.6. What are the general precautions to be taken for handling and maintaining construction tools?

3 Marks

Answer: Precautions include:

- Clean tools immediately after use to remove dirt, mortar, and moisture.
- Apply oil or grease on metal surfaces to prevent rusting.
- Store tools systematically in dry toolboxes/racks and replace wooden handles when cracked.

Q.7. Write down the step-by-step procedure for marking line-out for foundation on the ground.

3 Marks

Answer:

- **Step 1:** Clear the site and establish baseline and corners using wooden pegs and surveyor's instruments.
- **Step 2:** Erect masonry wooden profiles/paddles outside excavation limits and stretch masonry cords.
- **Step 3:** Verify corners using 3-4-5 right angle rule and sprinkle lime powder along taut strings to mark wall outline.

Q.8. Write the geometric steps to divide a straight line into seven equal parts.

3 Marks

Answer:

- **Step 1:** Draw the given straight line AB. Draw an acute ray AC at any convenient angle from point A.
- **Step 2:** With compass set to convenient radius, mark 7 equal arcs on line AC starting from A (points 1, 2, 3, 4, 5, 6, 7).
- **Step 3:** Join point 7 to end point B. Draw parallel lines through points 1 to 6 parallel to 7-B; these divide AB into 7 equal parts.

--- OR ---

Q.8 (OR). Explain the method of drawing tangents from a given point lying on the circumference of a circle to the circle.

- **Step 1:** Locate center O of the circle and given point P on the circumference. Draw radial line OP.
- **Step 2:** Extend line OP outward past point P.
- **Step 3:** At point P, construct a perpendicular line to radius OP using compass/set square. This perpendicular line is the required tangent.

Q.9. Why are engineering drawings important in manufacturing and assembly processes?

3 Marks

Answer:

- Acts as the universal graphical language between designers, engineers, and workers on site.
- Provides precise technical specifications, exact dimensions, materials, and tolerances required for fabrication.
- Prevents misinterpretation, reduces material waste, and ensures accurate fitment during assembly.

--- OR ---

Q.9 (OR). Which key points are to be noted and verified in a building plan, elevation, and section drawing?

- **Plan:** Room dimensions, door/window positions, wall thicknesses, and room layout orientation.
- **Elevation:** Total height, architectural appearance, roof level, and outer finishes.
- **Section:** Foundation depth, floor-to-ceiling heights, lintel levels, wall thickness, slab details.

SECTION - C : VERY SHORT ANSWER TYPE QUESTIONS (6 × 2 = 12 MARKS)

Q.10. Write down the units of measurement used for the following items of work:

2 Marks

Answer:

1. **Railing CI Pipes:** Running Metre (m or R.M.)
2. **Flooring:** Square Metre (m² or sq.m)

Q.11. Write a short note on different types of Masonry Tools used in civil construction.

2 Marks

Answer: Masonry tools are specialized hand tools used for laying bricks, stones, and applying mortar. Common tools include:

- **Trowel:** For spreading and leveling mortar joints.
- **Plumb Bob:** For checking vertical alignment of walls.
- **Spirit Level:** For checking horizontal alignment.

Q.12. Which tools are used for line-out for foundation plan? Explain any two with simple sketches.

2 Marks

Answer: Tools used: Wooden Pegs, Mason's Nylon Line/String, Steel Tape, Plumb Bob, Line Duster (Lime powder).

- **1. Wooden Pegs:** Driven into ground to fix reference centerlines and corners.
- **2. Mason Thread / String:** Stretched tightly between pegs to mark straight wall lines.

Q.13. Write short notes on tools required for constructing brick footings.

2 Marks

Answer: Essential tools for brick footing construction:

- **Brick Hammer:** Used for cutting/trimming bricks to exact footing step sizes.
- **Trowel & Spirit Level:** Used for laying mortar beds and ensuring each stepped course is perfectly horizontal.

Q.14. Write the four steps of entrepreneurship development. Give one suitable example.

2 Marks

Answer:

- **Four Steps:** 1. Idea Generation (Opportunity Spotting) → 2. Business Planning → 3. Resource Mobilization → 4. Execution / Business Management.
- **Example:** Identifying demand for eco-friendly fly-ash bricks, preparing project plan, acquiring brick making machine, and starting local production.

--- OR ---

Q.14 (OR). "My customers are not buying my food product because they do not like the flavour of it." What step of business development should I follow next?

- **Answer / Action Step:** Product Modification / Customer Feedback Integration & R&D.
- **Explanation:** Collect specific customer feedback regarding taste preferences, reformulate the recipe/flavor profile, conduct market testing with small samples, and relaunch improved product.

Q.15. What are green skills? Why are they important in modern construction?

2 Marks

Answer:

- **Green Skills:** Knowledge, abilities, and values needed to live, develop, and support a sustainable, resource-efficient society.
- **Importance in Construction:** Reduces environmental impact, minimizes material waste, promotes energy efficiency, and enables sustainable green building practices.

--- OR ---

Q.15 (OR). Describe any three effective methods of water conservation.

- **Rainwater Harvesting:** Collecting and storing rainwater from rooftops for reuse or groundwater recharge.
- **Drip / Micro Irrigation:** Applying water directly to root zones of plants to prevent evaporation losses.
- **Greywater Recycling:** Reusing domestic wastewater (from sink/bath) for flushing, cleaning, and gardening.

SECTION - D : OBJECTIVE TYPE QUESTIONS (15 × 1 = 15 MARKS)

Note: Full 1 mark is awarded for each correct option / answer. No negative marking.

Q. No.	Correct Answer / Solution	Option / Key	Marks
Q.16	Construction of roof is to protect the structure from rain.	(c) roof	1 Mark
Q.17	The function of a wall is to provide privacy and partition .	(d) Both (a) and (b)	1 Mark
Q.18	The rate of an item of work depends upon specification of work, materials, and mortar proportion .	(d) All of these	1 Mark
Q.19	The standard size of A1 drawing sheet is 594 × 841 mm .	(b) 594 × 841	1 Mark
Q.20	When we communicate verbally, we should use simple words .	(b) simple words	1 Mark
Q.21	Why do we send emails? To share documents and files .	(b) To share documents...	1 Mark

Q. No.	Correct Answer / Solution	Option / Key	Marks
Q.22	Dressing and grooming help us to look smart .	(a) smart	1 Mark
Q.23	Collared button-down shirt with formal trousers is an example of formal shirt/wear .	(b) formal	1 Mark
Q.24	To get info from WWW, we need Computer, Browser, and Internet Connection .	(d) All of the above	1 Mark
Q.25	Which of the following is a web browser? Chrome .	(b) Chrome	1 Mark
Q.26	"Bisecting a line means dividing the line into two equal parts."	True	1 Mark
Q.27	Tools used for line-out for foundation plan (Any two):	Mason's line (string), Wooden pegs / Plumb bob	1 Mark
Q.28	A spirit level is used to check the _____ of the floor, roof, door frame, etc.	level / flatness / horizontal alignment	1 Mark
Q.29	_____ is a natural building material obtained directly from rock.	Stone / Rock	1 Mark
Q.30	Stones are used in the form of _____ in construction of building walls and foundations.	blocks / masonry stones / ballast / aggregates	1 Mark