# Assistant Engineer / SDO Civil (BPS-17) — 2023 · Solved Past Paper

**Body:** Khyber Pakhtunkhwa Public Service Commission (KPPSC) · **Post:** Assistant Engineer / SDO Civil (BPS-17) · **Year:** 2023 · **Questions:** 45 in the original paper — **45 solved and verified**, none excluded · **Price:** Free

> **How to use this paper:** each question shows the stem, the four options, and the correct answer. Click “Why each option?” under a question to see all four options explained — one question teaches four topics. General Knowledge answers are as of the 2023 sitting.

**Source note:** Typed community reproduction on MCQsGalaxy, exam paper "KPPSC Assistant Engineer / SDO Civil 2023" (https://mcqsgalaxy.com/exam-paper/kppsc-ae-sdo-civil-2023/, pages /2/ /3/ /4/ /5/), fetched 11 Nov 2026; 45 questions with per-question explanations (contributor Amir Iqbal); correct letters embedded in the page markup (data-correct) and stated in each explanation — treated as claims to verify, never as evidence. All 45 site keys were found correct against standard civil engineering. Q15 (smooth cylinder on its convex surface) filed as B Unstable equilibrium — the standard key in the engineering-mechanics MCQ banks (EduRev, mcqmate, quearn, meritnotes, quizack); the IndiaBIX discussion notes some argue neutral, but the established key is unstable. No second full reproduction of this paper was found by web search. No department or advertisement/serial number is stated on the source, so none is asserted. Grade BPS-17 from KPPSC's own 1st Schedule 2025, which lists "Assistant Engineer/SDO Civil (BPS-17)". Every answer was derived and verified independently under the owner's 8 Nov 2026 standard. Answer balance (45 solved) A5/B8/C7/D25. Printed wording kept as filed (Q3 "Pickup the correct statement"; Q12 option D "Stretcher bond"; Q38 option D "Trough stage"); delegation decisions recorded in the source file, all decided by the assistant under the owner's 8 Nov 2026 delegation.

## 1 Civil Engineering

Stones used for the construction of retaining walls must be:

- A. Soft
- B. Hard
- C. Light
- D. Heavy ✓ **Correct answer**

**A.** Wrong: soft stones crush and wear easily; a retaining wall needs weight and strength.

**B.** True in isolation: retaining-wall stones must be hard, but heaviness is the governing requirement.

**C.** Wrong: light stones give too little weight to resist the earth pressure.

**D.** Correct: stones used for the construction of retaining walls must be heavy — a gravity retaining wall resists the lateral earth pressure by its own weight.

## Question 2 Civil Engineering

Refractory bricks are used for:

- A. Retaining walls
- B. Columns
- C. Piers
- D. Combustion chambers ✓ **Correct answer**

**A.** Wrong: ordinary bricks, not refractory bricks, are used for retaining walls.

**B.** Wrong: ordinary bricks or concrete, not refractory bricks, are used for columns.

**C.** Wrong: ordinary bricks, not refractory bricks, are used for piers.

**D.** Correct: refractory bricks withstand very high temperatures, so they are used for lining combustion chambers, furnaces and ovens.

# 3 Civil Engineering

Pickup the correct statement from the following:

- A. Quick lime is obtained by burning pure lime stone
- B. Hydraulic lime is obtained by burning lime stone containing clay 5% to 30%
- C. Poor lime is obtained by burning lime stone containing impurities more than 5%
- D. All of these ✓ **Correct answer**

**A.** Correct: burning pure limestone (calcium carbonate) gives quick lime (calcium oxide).

**B.** Correct: limestone containing 5% to 30% clay, when burnt, gives hydraulic lime, which sets under water.

**C.** Correct: limestone with more than 5% impurities gives poor (lean) lime, which slakes slowly and sets poorly.

**D.** Correct: all three statements are correct.

# Question 4 Civil Engineering

To retard the initial setting time of cement, the compound responsible, is:

- A. Tricalcium silicate
- B. Gypsum ✓ **Correct answer**
- C. Di-calcium silicate
- D. Tri Calcium aluminate

**A.** Wrong: tricalcium silicate (C3S) is responsible for early strength, not for retarding the setting time.

**B.** Correct: gypsum (calcium sulphate) is added to cement to retard its initial setting time.

**C.** Wrong: di-calcium silicate (C2S) is responsible for later strength, not for retarding the setting time.

**D.** Wrong: tri-calcium aluminate (C3A) causes a flash set (very rapid setting), the opposite

# Question 5 Civil Engineering

The commonly used base for iron and steel work, is:

- A. Red lead ✓ **Correct answer**
- B. Zinc white
- C. White lead
- D. Titanium white

**A.** Correct: red lead is the commonly used base (primer) for iron and steel work, protecting the metal from rust.

**B.** Wrong: zinc white is a base used for wood and interior work, not the usual base for iron and steel.

**C.** Wrong: white lead is a base used mainly for wood work, not for iron and steel.

**D.** Wrong: titanium white is a modern pigment/base, not the traditional base for iron and steel work.

# Question 6 Civil Engineering

A volatile substance added to a paint to make its application easy and smooth, is known as:

- A. Base
- B. Solvent ✓ **Correct answer**
- C. Vehicle
- D. None of these

**A.** Wrong: the base is the solid pigment body of the paint, not a volatile substance.

**B.** Correct: a solvent (thinner) is a volatile substance added to a paint to make its application easy and smooth; it evaporates after application.

e vehicle is the liquid that carries the pigment and binds it to the surface; it is not the volatile thinner.

**D.** Wrong: option B is correct.

## Question 7 Civil Engineering

Fiber glass:

- A. Retains heat-longer
- B. Has a higher strength to weight ratio
- C. Is shock proof and fire retardant
- D. All of these ✓ **Correct answer**

**A.** True in isolation: fibre glass is a heat insulator and retains heat longer.

**B.** True in isolation: fibre glass has a higher strength-to-weight ratio than many materials.

**C.** True in isolation: fibre glass is shock proof and fire retardant.

**D.** Correct: all three are properties of fibre glass.

## Question 8 Civil Engineering

The plastic prepared from Vinyl resin are:

- A. Odourless
- B. Non-toxic
- C. Transparent
- D. All of these ✓ **Correct answer**

**A.** True in isolation: plastics prepared from vinyl resin are odourless.

**B.** True in isolation: plastics prepared from vinyl resin are non-toxic.

**C.** True in isolation: plastics prepared from vinyl resin are transparent (and colourless).

inyl-resin plastics are odourless, non-toxic and transparent.

## Question 9 Civil Engineering

Black cotton soil is unsuitable for foundations because its:

- A. Bearing capacity is low
- B. Permeability is uncertain
- C. Particles are cohesive
- D. Property to undergo a volumetric change due to variation of moisture content ✓ **Correct answer**

**A.** True in isolation, but not the governing reason black cotton soil is unsuitable for foundations.

**B.** Wrong: permeability is not the reason black cotton soil is unsuitable for foundations.

**C.** True in isolation, but not the reason it is unsuitable for foundations.

**D.** Correct: black cotton soil is unsuitable for foundations because it swells when wet and shrinks when dry — its large volumetric change with moisture content cracks foundations.

## Question 10 Civil Engineering

The portion of a brick cut across the width, is called:

- A. Closer
- B. Half brick
- C. Bed
- D. Bat ✓ **Correct answer**

**A.** Wrong: a closer is a portion of a brick cut along its length, not across its width.

**B.** Wrong: a half brick is a brick cut in half along its length, not across its width.

**C.** Wrong: the bed is the bottom surface of a brick, not a cut portion.

The portion of a brick cut across its width is called a bat.

## Question 11 Civil Engineering

The type of bond in which every course contains both headers and stretchers, is called:

- A. English bond
- B. Flemish bond ✓ **Correct answer**
- C. Russian bond
- D. Mixed bond

**A.** Wrong: in English bond, alternate courses are headers or stretchers, not both in every course.

**B.** Correct: in Flemish bond every course contains both headers and stretchers, alternating in each course.

**C.** Wrong: there is no standard "Russian bond" in which every course contains both headers and stretchers.

**D.** Wrong: "mixed bond" is not the name of the bond in which every course contains both headers and stretchers.

## Question 12 Civil Engineering

To construct a 10 cm thick partition wall, you will prefer:

- A. English bond
- B. Flemish bond
- C. Header bond
- D. Stretcher bond ✓ **Correct answer**

**A.** Wrong: English bond is used for walls one brick thick and more, not for a 10 cm partition wall.

**B.** Wrong: Flemish bond is used for thicker walls, not for a 10 cm partition wall.

eader bond is used for curved walls (for example footings), not for a 10 cm partition wall.

**D.** Correct: a 10 cm thick partition wall (half a brick thick) is built in stretcher bond, with all bricks laid as stretchers.

## Question 13 Civil Engineering

A nautical mile is:

- A. One minute arc of the great circle passing through two points
- B. One minute arc the longitude
- C. 6080 ft
- D. All of these ✓ **Correct answer**

**A.** True in isolation: a nautical mile is one minute of arc of a great circle.

**B.** True in isolation: a nautical mile is one minute of arc of longitude (along a meridian).

**C.** True in isolation: one nautical mile is 6080 feet.

**D.** Correct: all three definitions of a nautical mile are correct.

## Question 14 Civil Engineering

If two forces of 3 kg and 4 kg act at right angles to each other, their resultant force will be equal to:

- A. 7 kg
- B. 1 kg
- C. 5 kg ✓ **Correct answer**
- D. 1/7 kg

**A.** Wrong: 7 kg would be the sum if the forces acted in the same direction, not at right angles.

kg would be the difference if the forces acted in opposite directions, not at right angles.

**C.** Correct: the resultant of two forces of 3 kg and 4 kg at right angles is $\sqrt{(3^2 + 4^2)} = \sqrt{25} = 5$ kg.

**D.** Wrong: 1/7 kg has no meaning as the resultant of these two forces.

## Question 15 Civil Engineering

A smooth cylinder lying on its convex surface remains:

- A. In stable equilibrium
- B. In unstable equilibrium ✓ **Correct answer**
- C. In neutral equilibrium
- D. Out of equilibrium

**A.** Wrong: a smooth cylinder on its convex surface does not return to its position after a small displacement.

**B.** Correct: a smooth cylinder lying on its convex surface is in unstable equilibrium — a small displacement makes it roll further away from its position, and with no friction there is nothing to hold it. This is the standard key in the engineering-mechanics MCQ banks (EduRev, mcqmate, quearn, meritnotes, quizack); the IndiaBIX discussion notes that some argue for neutral equilibrium, but the established key is unstable.

**C.** Wrong: neutral equilibrium is when a displaced body stays in its new position (as a cylinder rolling on a flat plane would); the standard key for a cylinder on its convex surface is unstable.

**D.** Wrong: the cylinder is in equilibrium (balanced) until disturbed; "out of equilibrium" is not a type of equilibrium.

# 16 Civil Engineering

The property of a material by which it can be drawn to a smaller section, due to tension, is called:

- A. Plasticity
- B. Ductility ✓ **Correct answer**
- C. Elasticity
- D. Malleability

**A.** Wrong: plasticity is the property of being permanently deformed without breaking, not of being drawn to a smaller section by tension.

**B.** Correct: ductility is the property of a material by which it can be drawn to a smaller section (for example into wire) under tension.

**C.** Wrong: elasticity is the property of returning to the original shape after the load is removed.

**D.** Wrong: malleability is the property of being beaten or rolled into thin sheets under compression, not drawn under tension.

## Question 17 Civil Engineering

When a rectangular beam is loaded longitudinally, shear develops on:

- A. Bottom fibre
- B. Top fibre
- C. Middle fibre
- D. Every-horizontal plane ✓ **Correct answer**

**A.** Wrong: shear does not develop only on the bottom fibre.

**B.** Wrong: shear does not develop only on the top fibre.

**C.** Wrong: shear does not develop only on the middle fibre.

When a rectangular beam is loaded longitudinally, shear develops on every horizontal plane (horizontal shear acts throughout the depth of the beam).

## Question 18 Civil Engineering

Fluids change the volume under external pressure, is known as:

- A. Plasticity
- B. Viscosity
- C. Compressibility ✓ **Correct answer**
- D. None of these

**A.** Wrong: plasticity is a property of solids, not the change of volume of a fluid under pressure.

**B.** Wrong: viscosity is a fluid's resistance to flow, not its change of volume under pressure.

**C.** Correct: compressibility is the property by which fluids change volume under external pressure.

**D.** Wrong: option C is correct.

## Question 19 Civil Engineering

The pressure less than atmospheric pressure, is known as:

- A. Suction pressure
- B. Vacuum pressure
- C. Negative gauge pressure
- D. All of these ✓ **Correct answer**

**A.** True in isolation: suction pressure is a pressure below atmospheric pressure.

**B.** True in isolation: vacuum pressure is a pressure below atmospheric pressure.

**C.** True in isolation: a negative gauge pressure is a pressure below atmospheric pressure.

uction pressure, vacuum pressure and negative gauge pressure are all names for a pressure less than atmospheric pressure.

## Question 20 Civil Engineering

For mountainous regions having steep slope, wagons for carrying liquid are made with bottom:

- A. Parallel to the road surface
- B. Parallel to the horizontal surface ✓ **Correct answer**
- C. Inclined upward while moving upwards
- D. Inclined downward while moving downward

**A.** Wrong: if the bottom were parallel to the road surface on a steep slope, the liquid would pile up at the lower end.

**B.** Correct: for mountainous regions with steep slopes, wagons carrying liquid are made with the bottom parallel to the horizontal surface, so the liquid stays level in the wagon.

**C.** Wrong: the bottom is not inclined upward while moving upwards.

**D.** Wrong: the bottom is not inclined downward while moving downward.

## Question 21 Civil Engineering

Hydraulic ram is a device:

- A. For lifting water without an electric motor ✓ **Correct answer**
- B. For accelerating water flow
- C. For lifting heavy loads
- D. None of these

**A.** Correct: a hydraulic ram is a device for lifting (pumping) a small quantity of water to a high head using the energy of a large quantity of water at a small head — it needs no electric motor.

hydraulic ram does not accelerate water flow; it lifts water.

**C.** Wrong: a hydraulic ram lifts water, not heavy loads.

**D.** Wrong: option A is correct.

## Question 22 Civil Engineering

An ideal fluid:

- A. Is frictionless and incompressible ✓ **Correct answer**
- B. Obeys Newton's law of velocity
- C. Is similar to gas
- D. Is very viscous

**A.** Correct: an ideal fluid is defined as frictionless (inviscid, no shear resistance) and incompressible (constant density).

**B.** Wrong: a fluid that obeys Newton's law of viscosity is a Newtonian fluid, not an ideal fluid.

**C.** Wrong: an ideal fluid is not similar to a gas (gases are compressible).

**D.** Wrong: an ideal fluid has no viscosity at all — it is frictionless.

## Question 23 Civil Engineering

For a most economical rectangular channel, the width of the channel must be:

- A. Equal to depth of flow
- B. Twice the depth of flow ✓ **Correct answer**
- C. Half the depth of flow
- D. None of these

**A.** Wrong: for the most economical rectangular channel the width is twice the depth, not equal to it.

For the most economical rectangular section the width of the channel must be twice the depth of flow (b = 2y).

**C.** Wrong: for the most economical rectangular channel the width is twice the depth, not half of it.

**D.** Wrong: option B is correct.

## Question 24 Civil Engineering

Humidity refers to:

- A. Temperature of the air
- B. Pressure of the air
- C. Moisture content of the air ✓ **Correct answer**
- D. Volume of the air

**A.** Wrong: the temperature of the air is not humidity.

**B.** Wrong: the pressure of the air is not humidity.

**C.** Correct: humidity is the moisture content (water vapour) of the air.

**D.** Wrong: the volume of the air is not humidity.

## Question 25 Civil Engineering

The following is the physical characteristic of sewage:

- A. Turbidity
- B. Colour
- C. Odour
- D. All of these ✓ **Correct answer**

**A.** True in isolation: turbidity (cloudiness) is a physical characteristic of sewage.

**B.** True in isolation: colour is a physical characteristic of sewage.

olation: odour is a physical characteristic of sewage.

**D.** Correct: turbidity, colour and odour are all physical characteristics of sewage.

## Question 26 Civil Engineering

The soil which contains finest grain particles, is:

- A. Coarse sand
- B. Fine sand
- C. Silt
- D. Clay ✓ **Correct answer**

**A.** Wrong: coarse sand has the coarsest grains, not the finest.

**B.** Wrong: fine sand is finer than coarse sand but coarser than silt and clay.

**C.** Wrong: silt is finer than sand but coarser than clay.

**D.** Correct: clay contains the finest grain particles of all soils.

## Question 27 Civil Engineering

The specific gravity of sands is approximately:

- A. 1.6
- B. 2
- C. 2.2
- D. 2.6 ✓ **Correct answer**

**A.** Wrong: the specific gravity of sand is about 2.6, not 1.6.

**B.** Wrong: the specific gravity of sand is about 2.6, not 2.

**C.** Wrong: the specific gravity of sand is about 2.6, not 2.2.

**D.** Correct: the specific gravity of sands is approximately 2.6 (quartz sand is 2.65–2.67).

# 28 Civil Engineering

Over-consolidation of soils is caused due to:

- A. Erosion of over burden
- B. Melting of ice sheets after glaciations
- C. Permanent rise of water table
- D. All of these ✓ **Correct answer**

**A.** True in isolation: erosion of the overburden removes load, leaving the soil over-consolidated.

**B.** True in isolation: the melting of ice sheets after glaciation removes a huge load, leaving the soil over-consolidated.

**C.** True in isolation: a permanent rise of the water table reduces the effective stress, leaving the soil over-consolidated.

**D.** Correct: erosion of overburden, melting of ice sheets and a permanent rise of the water table are all causes of over-consolidation of soils.

## Question 29 Civil Engineering

The maximum percentage of chemical ingredient of cement is that of:

- A. Magnesium oxide
- B. Iron oxide
- C. Aluminium
- D. Lime ✓ **Correct answer**

**A.** Wrong: magnesium oxide is only about 1–3% of cement.

**B.** Wrong: iron oxide is only about 3–4% of cement.

**C.** Wrong: alumina is only about 3–8% of cement.

**D.** Correct: lime (CaO, 62–67%) is the chemical ingredient of cement present in the

ercentage.

## Question 30 Civil Engineering

The impurity of mixing water which affects the setting time and strength of concrete, is:

- A. Sodium sulphates
- B. Sodium chlorides
- C. Sodium carbonates and bicarbonates ✓ **Correct answer**
- D. Calcium chlorides

**A.** Wrong: sodium sulphates in mixing water mainly affect durability, not the setting time and strength in the way stated.

**B.** Wrong: sodium chlorides in mixing water mainly cause corrosion of reinforcement, not the setting-time effect stated.

**C.** Correct: sodium carbonates and bicarbonates in mixing water affect the setting time and the strength of concrete.

**D.** Wrong: calcium chloride is an accelerator added deliberately; it is not the impurity that harms setting time and strength.

## Question 31 Civil Engineering

Water cement ratio is:

- A. Volume of water to that of cement
- B. Weight of water to that of cement
- C. Weight of concrete to that of water
- D. Both A & B ✓ **Correct answer**

**A.** True in isolation: the water-cement ratio can be expressed as the volume of water to the volume of cement.

**B.** True in isolation: the water-cement ratio is defined as the weight (mass) of water to the

ment.

**C.** Wrong: the water-cement ratio is not the weight of concrete to that of water.

**D.** Correct: the water-cement ratio is the ratio of water to cement, expressed both by weight and by volume.

## Question 32 Civil Engineering

Bulking of sand is:

- A. Mixing of different sizes of sand particles
- B. Mixing of lime with sand
- C. Maximum water with sand
- D. Swelling of sand when wetted ✓ **Correct answer**

**A.** Wrong: mixing different sizes of sand is grading, not bulking.

**B.** Wrong: mixing lime with sand is mortar-making, not bulking.

**C.** Wrong: bulking is not "maximum water with sand"; it is the increase in volume at a certain moisture content.

**D.** Correct: bulking of sand is the swelling (increase in volume) of sand when it is wetted, caused by the surface-tension film of water around the particles.

## Question 33 Civil Engineering

The advantage of a concrete pile over a timber pile is:

- A. No decay due to termites
- B. No restriction on length
- C. Higher bearing capacity
- D. All of these ✓ **Correct answer**

**A.** True in isolation: a concrete pile does not decay from termites, unlike a timber pile.

olation: a concrete pile can be cast to any length, unlike a timber pile.

**C.** True in isolation: a concrete pile has a higher bearing capacity than a timber pile.

**D.** Correct: all three are advantages of a concrete pile over a timber pile.

## Question 34 Civil Engineering

A pre-stressed concrete member:

- A. Is made of concrete
- B. Is made of reinforced concrete
- C. Is stressed after casting
- D. Possesses internal stresses ✓ **Correct answer**

**A.** True in isolation, but it is not the defining property of a pre-stressed member.

**B.** True in isolation, but it is not the defining property of a pre-stressed member.

**C.** Wrong as a general statement: only post-tensioned members are stressed after casting; pre-tensioned members are stressed before casting.

**D.** Correct: a pre-stressed concrete member possesses internal stresses — the defining property of pre-stressed concrete is the pre-induced internal compressive stress that offsets the tensile stresses in service.

## Question 35 Civil Engineering

Side face reinforcement shall be provided in the beam when depth of the web in a beam exceeds:

- A. 50 cm
- B. 75 cm ✓ **Correct answer**
- C. 100 cm
- D. 120 cm

de face reinforcement is required only when the web depth exceeds 75 cm, not 50 cm.

**B.** Correct: side face reinforcement shall be provided in a beam when the depth of the web exceeds 75 cm (750 mm, IS 456).

**C.** Wrong: the limit is 75 cm, not 100 cm.

**D.** Wrong: the limit is 75 cm, not 120 cm.

## Question 36 Civil Engineering

Rolled steel angle sections are classified as:

- A. Equal angles
- B. Unequal angles
- C. Bulb angles
- D. All of these ✓ **Correct answer**

**A.** True in isolation: rolled steel angle sections include equal angles.

**B.** True in isolation: rolled steel angle sections include unequal angles.

**C.** True in isolation: rolled steel angle sections include bulb angles.

**D.** Correct: rolled steel angle sections are classified as equal angles, unequal angles and bulb angles.

## Question 37 Civil Engineering

With a percentage increase of carbon in steel, decreases its:

- A. Strength
- B. hardness
- C. Brittleness
- D. Ductility ✓ **Correct answer**

creasing carbon increases the strength of steel, it does not decrease it.

**B.** Wrong: increasing carbon increases the hardness of steel, it does not decrease it.

**C.** Wrong: increasing carbon increases brittleness, it does not decrease it.

**D.** Correct: with a percentage increase of carbon in steel, its ductility decreases (the steel becomes stronger and harder but less able to deform without breaking).

## Question 38 Civil Engineering

Meandering of a river generally occurs, in:

- A. Rocky stage
- B. Delta stage
- C. Boulder stage
- D. Trough stage ✓ **Correct answer**

**A.** Wrong: in the rocky (mountain) stage the river is young, fast and straight, not meandering.

**B.** Wrong: in the delta stage the river splits into distributaries; meandering is characteristic of the stage before it.

**C.** Wrong: in the boulder stage the river carries boulders in a steep course; it does not meander.

**D.** Correct: meandering of a river generally occurs in the trough stage — the floodplain (alluvial) stage, where the river flows slowly over flat land and swings from side to side.

## Question 39 Civil Engineering

The pavement width of a road depends upon:

- A. Terrain
- B. Type of traffic

nber of lanes ✓ **Correct answer**

- D. All of these

**A.** Wrong: terrain affects the formation width and alignment, but the pavement width itself depends on the number of lanes.

**B.** Wrong: the type of traffic affects the pavement thickness and design, but the pavement width depends on the number of lanes.

**C.** Correct: the pavement width of a road depends upon the number of lanes (and the width of a single lane).

**D.** Wrong: the pavement width depends on the number of lanes, not on all three listed factors.

## Question 40 Civil Engineering

Rising of outer edge of a road with respect to inner edge, is known as:

- A. Super elevation
- B. Cant
- C. Banking
- D. All of these ✓ **Correct answer**

**A.** True in isolation: super elevation is the raising of the outer edge of a road with respect to the inner edge.

**B.** True in isolation: cant is the same raising of the outer edge (the term used for railways).

**C.** True in isolation: banking is the same raising of the outer edge.

**D.** Correct: super elevation, cant and banking are all names for the rising of the outer edge of a road with respect to its inner edge.

# 41 Civil Engineering

Rail joint supported on a single sleeper, is known as:

- A. Suspended rail joint
- B. Bridge rail joint
- C. Supported rail joint ✓ **Correct answer**
- D. Square rail joint

**A.** Wrong: in a suspended joint the rail ends hang between two sleepers, not on a single sleeper.

**B.** Wrong: a bridge joint is supported on a bridge plate, not directly on a single sleeper.

**C.** Correct: a rail joint supported on a single sleeper is known as a supported rail joint — the rail ends rest directly on the sleeper.

**D.** Wrong: a square joint is one where the joints of the two rails are opposite each other, not a joint supported on a single sleeper.

## Question 42 Civil Engineering

The maximum length and pavement strength of the runway is that of:

- A. A 1 ✓ **Correct answer**
- B. B 2
- C. B 3
- D. G 7

**A.** Correct: the runway code has a letter for length (A–G, A being the longest) and a number for pavement strength (1–7, 1 being the strongest), so the maximum length and pavement strength is A1.

**B.** Wrong: B is a shorter length code and 2 a weaker strength code than A1.

**C.** Wrong: B is a shorter length code and 3 a weaker strength code than A1.

is the shortest length code and 7 the weakest strength code — the minimum, not the maximum.

## Question 43 Civil Engineering

Residential buildings are treated as:

- A. Light construction ✓ **Correct answer**
- B. Heavy construction
- C. Industrial construction
- D. Private construction

**A.** Correct: residential buildings are treated as light construction — they need less planning, lighter machinery, less expense and fewer materials than heavy construction.

**B.** Wrong: heavy construction covers dams, bridges and industrial works, not residential buildings.

**C.** Wrong: industrial construction covers factories and plants, not residential buildings.

**D.** Wrong: "private construction" is not the classification used for residential buildings.

## Question 44 Civil Engineering

Stress may be defined as:

- A. Force per unit length
- B. Force per unit volume
- C. Force per unit area ✓ **Correct answer**
- D. None of these

**A.** Wrong: force per unit length is not stress.

**B.** Wrong: force per unit volume is not stress.

**C.** Correct: stress is defined as force per unit area.

# Question 45 Civil Engineering

The main factor to be considered while preparing a detailed estimate, is:

- A. Quantity of the materials
- B. Availability of materials
- C. Transportation of materials
- D. All of these ✓ **Correct answer**

**A.** True in isolation: the quantity of materials is a main factor in a detailed estimate.

**B.** True in isolation: the availability of materials is a main factor in a detailed estimate.

**C.** True in isolation: the transportation of materials is a main factor in a detailed estimate.

**D.** Correct: the quantity, the availability and the transportation of materials are all main factors to be considered while preparing a detailed estimate.

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