UCEED Sample Paper

Duration: 180 Minutes **Maximum Marks: 300**

Instructions

- This is a full-length UCEED practice paper. **Part A** (Q1–Q57, 200 marks, computer-based) has three sections: **Section 1** NAT, Numerical Answer Type (Q1–Q14); **Section 2** MSQ, Multiple Select Questions (Q15–Q29); **Section 3** MCQ, Multiple Choice Questions (Q30–Q57). **Part B** (Q58–Q59, 100 marks, pen and paper) tests drawing and design aptitude.
- **Marking - Part A:** NAT: **+4**, no negative marking. MSQ: **+4** if all correct options and no wrong option are chosen; **+1** for each correct option chosen when no wrong option is chosen; **−1** if any wrong option is chosen. MCQ: **+3** for correct, **−0.71** for wrong.
- **Marking - Part B:** each of the two questions carries **50 marks**, evaluated on your drawing and design response. There is no negative marking in Part B.
- Tap **View Solution** (Part A) or **View Model Approach** (Part B) under any question to jump to its worked explanation. Calculators and electronic gadgets are not allowed.

Section 1: Numerical Answer Type (NAT)

Q1. In digital typography, 1 point equals $\frac{1}{72}$ inch, and a screen has 96 pixels in every inch. A page heading is set at a type size of 36 points. What is its height in pixels?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q2. If 1 inch = 25 mm = 6 pica and 1 pica = 12 points = 16 pixels, what is 6 points + 2 inches + 3 picas + 8 pixels + 25 mm, represented in pixels?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q3. A logo is enlarged so that its width grows from 40 mm to 50 mm while keeping the same shape (uniform scaling). By what percentage does the area of the logo increase?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q4. A cylindrical display canister has radius 7 cm and height 20 cm. Using $\pi = \frac{22}{7}$, what is its total surface area in square centimetres?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q5. What three-digit number can be made from the digits 2, 3, 5, and 7, such that no two digits of the three-digit number are the same and the three-digit number is divisible by each of the digits in it?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q6. An A4 sheet measures 210 mm by 297 mm. A designer leaves a uniform margin of 15 mm on all four sides. What is the area, in square centimetres, of the inner rectangle left for content?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q7. A rectangular business card has its two sides in the ratio 5 : 3. If the longer side is 90 mm, what is the perimeter of the card in millimetres?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q8. A print run of 2500 posters is expected to have 4% wastage due to misprints. How many good posters are expected to remain?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q9. 27 cubes of edge 10 cm are arranged to create a larger cube. If the cubes at the eight corners are replaced with spheres of diameter 10 cm, what is the minimum number of cubes that do not touch any of the spheres?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q10. A poster series is designed so the widths follow the arithmetic sequence 2, 5, 8, 11, ... centimetres. What is the width, in centimetres, of the 12th poster in the series?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q11. A design studio buys paint in cubic containers of edge 20 cm and repackages it into cubic sample boxes of edge 5 cm. How many sample boxes can be completely filled from one container?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q12. A typical football is made by stitching together 12 pentagons and 20 hexagons. How many vertices (junctions) are there in such a football?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q13. A honeycomb poster is built as rings of cells around a central cell. The centre has 1 cell, the first ring has 6 cells, the second ring has 12, the third ring has 18, and so on (each ring adds 6 more than the previous ring). How many cells are there in total up to and including the fourth ring?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Q14. An architect's drawing is made at a scale of 1 : 50. A wall on the drawing measures 8 cm. What is the real length of the wall in metres?

(Numerical Answer Type - enter a numerical value; no options.)

View Solution

Section 2: Multiple Select Questions (MSQ)

Q15. Which of the following statements about the Bauhaus school is / are correct?

(One or more options may be correct.)

(A) The Bauhaus was founded in Paris by Le Corbusier.

(B) Walter Gropius founded the Bauhaus in Weimar, Germany, in 1919.

(C) The Bauhaus rejected any link between art and industrial production.

(D) The Bauhaus promoted the unity of art, craft, and technology.

View Solution

Q16. Which of the options is / are CORRECT?

A. The cap of a water bottle is tightened by rotating it in the clockwise direction (as seen from the top).

B. To turn on a tap, the tap head is rotated clockwise; to turn it off it is rotated counter-clockwise (as seen from the top).

C. To loosen a nut of a car wheel, a spanner is turned counter-clockwise (from the point of view of the person using the spanner).

D. The earth as seen from the North Pole rotates clockwise about its axis.

(One or more options may be correct.)

(A) The cap of a water bottle is tightened by rotating it in the clockwise direction (as seen from the top).

(B) To turn on a tap, the tap head is rotated clockwise; to turn it off it is rotated counter-clockwise (as seen from the top).

(C) To loosen a nut of a car wheel, a spanner is turned counter-clockwise (from the point of view of the person using the spanner).

(D) The earth as seen from the North Pole rotates clockwise about its axis.

View Solution

Q17. Which of the following correctly describes the Indian craft of Bidriware?

(One or more options may be correct.)

(A) It is a hand-block printing technique on cotton cloth from Gujarat.

(B) It is a warm terracotta pottery tradition from West Bengal.

(C) It is a metal handicraft from Bidar, Karnataka, made from a blackened zinc-copper alloy inlaid with silver.

(D) It is a fine silk brocade weaving tradition from Varanasi.

View Solution

Q18. Which of the following statements about colour are correct?

(One or more options may be correct.)

(A) Red, green, and blue are the primary colours of subtractive (pigment) mixing.

(B) In additive colour mixing, combining red, green, and blue light produces white.

(C) Cyan, magenta, and yellow are the primary colours used in subtractive (printing) mixing.

(D) Complementary colours lie opposite each other on the colour wheel.

View Solution

Q19. An object was sharply focused and a photograph was taken using a camera. The photographer wants to blur the background (change the depth of field) in the next photograph. This can be achieved by changing the

(One or more options may be correct.)

(A) size of opening of the lens (aperture).

(B) distance of the object from the camera and again focusing.

(C) shutter speed to change the duration for which light enters the camera.

(D) focal length of the lens.

View Solution

Q20. Which of the following statements about Indian architecture are correct?

(One or more options may be correct.)

(A) The Taj Mahal in Agra is a Mughal mausoleum built mainly of white marble.

(B) The Sun Temple at Konark is shaped like a giant lotus flower.

(C) Fatehpur Sikri was built by the emperor Ashoka.

(D) Stepwells such as Rani ki Vav are traditional Indian water-storage structures.

View Solution

Q21. Which of the following statements about camera exposure are correct?

(One or more options may be correct.)

(A) A higher ISO setting always reduces the noise (grain) in an image.

(B) A larger f-number, such as f/16, corresponds to a wider lens aperture.

(C) A faster shutter speed reduces the amount of light reaching the sensor.

(D) Aperture, shutter speed, and ISO together form the exposure triangle.

View Solution

Q22. Which of the following statements about typography are correct?

(One or more options may be correct.)

(A) Kerning refers to the vertical spacing between successive lines of text.

(B) Serif typefaces have small strokes at the ends of the letterforms.

(C) Leading refers to the vertical spacing between successive lines of text.

(D) A typeface and a font mean exactly the same thing with no distinction.

View Solution

Q23. On 16th July 2022, Parvathy bought 4 new pairs of socks A, B, C and D to train herself for the Marathon race on Gandhi Jayanti. She started her training next day wearing the new socks. She trained every day, including the day of the marathon, wearing the socks (one pair every day) in the following sequence: C, A, B and D. Unfortunately, she could not train from 3rd to 22nd September 2022 as she was unwell. She resumed her training on 23rd wearing pair 'A' socks and continued with the same sequence till the event day. Identify the pair of socks that Parvathy wore the maximum during her entire training period.

(One or more options may be correct.)

(A) C

(B) A

(C) B

(D) D

View Solution

Q24. Which of the following are recognised principles of sustainable design?

(One or more options may be correct.)

(A) Reducing material use and designing products to last longer.

(B) Designing so that parts can be repaired or recycled at end of life.

(C) Preferring renewable or low-impact materials wherever possible.

(D) Considering the full life cycle of a product, from raw material to disposal.

View Solution

Q25. Which of the following statements about materials used in design are correct?

(One or more options may be correct.)

(A) Thermosetting plastics can be melted and remoulded again and again.

(B) Aluminium is valued in product design for its light weight and corrosion resistance.

(C) Glass is a highly ductile material that bends easily without breaking.

(D) Plywood is an engineered wood made by gluing together thin layers (veneers).

View Solution

Q26. Which of the following designer-work pairings are correct?

(One or more options may be correct.)

(A) The Wassily Chair was designed by Charles Rennie Mackintosh.

(B) The Eames Lounge Chair was designed by Antoni Gaudi.

(C) Charles and Ray Eames are known for their moulded plywood and fibreglass chairs.

(D) Raymond Loewy was an influential figure in industrial design.

View Solution

Q27. Consider the following quote from J C Kumarappa's Economy of Permanence: "Man comes nearest to his God, the creator, when he utilizes his brain power to marshal mechanical forces to serve his purposes. To do so in a way that will bring blessings and not destruction, he has to follow closely nature's way to get the best out of it. We cannot get the co-operation of nature purely on our own terms. Any attempt to do so will bring violent destruction in its wake." Which of the options is / are implied by the quote?

(One or more options may be correct.)

(A) Utilizing brain power to marshal mechanical forces to serve our purposes, if not done properly, can lead to destruction.

(B) Utilizing brain power to marshal mechanical forces to serve our purposes can bring man nearest to his God.

(C) While utilizing brain power to marshal mechanical forces to serve our purposes, the best way to proceed is to follow nature's way.

(D) Dealing with nature purely on our own terms will bring violent destruction.

View Solution

Q28. Which of the following statements about light and colour are correct?

(One or more options may be correct.)

(A) White light cannot be split into different colours by any means.

(B) A red object appears red because it reflects red light and absorbs the other wavelengths.

(C) The visible spectrum ranges roughly from violet at one end to red at the other.

(D) Black is a pure spectral colour of light.

View Solution

Q29. Which of the following statements about art movements is / are correct?

(One or more options may be correct.)

(A) Cubism is known for smooth, photorealistic portraits with fine detail.

(B) Art Nouveau is characterised by rigid straight lines and industrial grids.

(C) Minimalism relies on ornate, heavily decorated surfaces.

(D) Impressionism is known for capturing light and fleeting impressions using loose brushwork.

View Solution

Section 3: Multiple Choice Questions (MCQ)

Q30. The Bauhaus, the influential school of art, design and architecture founded in 1919 in Weimar, Germany, was established by which architect?

(A) Walter Gropius

(B) Le Corbusier

(C) Mies van der Rohe

(D) Frank Lloyd Wright

View Solution

Q31. What is the number of fonts used in the following sentence?

From the time of Leonardo Da Vinci, until the end of the eighteenth century, Science and Art were much closer than today.

(A) 3

(B) 6

(C) 5

(D) 9

View Solution

Q32. In the traditional RYB (red-yellow-blue) pigment colour model used by artists, mixing red and yellow produces which colour?

(A) Green

(B) Orange

(C) Violet

(D) Brown

View Solution

Q33. Vulcanization is an industrial process closely associated with which material?

(A) Glass

(B) Aluminium

(C) Rubber

(D) Ceramics

View Solution

Q34. The _____ government organizes the Hornbill Festival each December, promoting cultural heritage and fostering interaction between tribes. The festival has been named after a _____.

(A) Chhatisgarh, bird

(B) Nagaland, bird

(C) Manipur, flower

(D) Shillong, tribal musical instrument

View Solution

Q35. In typography and print, 1 inch is equal to how many points?

(A) 10

(B) 12

(C) 36

(D) 72

View Solution

Q36. The iconic Nike swoosh logo was designed in 1971 by which person, then a graphic-design student?

(A) Carolyn Davidson

(B) Paul Rand

(C) Saul Bass

(D) Milton Glaser

View Solution

Q37. The lost wax process is used for _____.

(A) Honey making

(B) Jaggery making

(C) Batik painting

(D) Metal casting

View Solution

Q38. The Lotus Temple in New Delhi, known for its petal-like white marble form, is a house of worship for which faith?

(A) Buddhism

(B) Baha'i

(C) Jainism

(D) Sikhism

View Solution

Q39. A wooden cube of side 3 cm is painted on all its outer faces and then cut into small cubes of side 1 cm. How many of the small cubes have exactly one face painted?

(A) 0

(B) 1

(C) 6

(D) 8

View Solution

Q40. You need to hang a large rectangular picture frame on a wall in an empty room. To ensure that it is vertical (and not tilted), which of the following will help you hang the picture correctly (not tilted)? (No additional items are to be used other than the ones specified in each of the options)

(A) A wooden stick, a cutter and a pencil

(B) A pencil, a compass and a cutter

(C) A flexible and transparent pipe and a mug of water

(D) Some card paper, a steel-ruler and a pair of scissors

View Solution

Q41. Find the next number in the series: 2, 3, 5, 8, 13, ?

(A) 18

(B) 19

(C) 20

(D) 21

View Solution

Q42. In design and ergonomics, the term anthropometry refers to the study of which of the following?

(A) Measurement of human body dimensions

(B) Study of colour perception

(C) Study of sound and acoustics

(D) Measurement of light intensity

View Solution

Q43. Which of the options is the odd one?

(A) Cobra

(B) Krait

(C) Rat Snake

(D) Viper

View Solution

Q44. Which gas released by human activities is the main contributor to the enhanced greenhouse effect and global warming?

(A) Oxygen

(B) Carbon dioxide

(C) Nitrogen

(D) Argon

View Solution

Q45. Pointillism, a technique of building an image from tiny separate dots of pure colour, is most closely associated with which artist?

(A) Georges Seurat

(B) Claude Monet

(C) Salvador Dali

(D) Henri Matisse

View Solution

Q46. Which of the following options is the odd one?

(A) Electroplating

(B) Anodizing

(C) Powder Coating

(D) Drilling

View Solution

Q47. Which of the following is a thermosetting plastic, that is, one that cannot be re-melted and reshaped once cured?

(A) Polythene

(B) PVC

(C) Bakelite

(D) Polypropylene

View Solution

Q48. The traditional Madhubani (Mithila) style of folk painting originates from which Indian state?

(A) Bihar

(B) Odisha

(C) Rajasthan

(D) Kerala

View Solution

Q49. The well-known masterpiece "Mona Lisa" was painted by Leonardo Da Vinci in the 16th Century. Nearly 500 years later another artist made a satirical reference to it; he copied the "Mona Lisa" but painted a moustache on her! Which art movement was this artist associated with?

(A) Dadaism

(B) Cubism

(C) Impressionism

(D) Pop-art

View Solution

Q50. A colour scheme built from colours that sit next to each other on the colour wheel (for example yellow, yellow-green and green) is called a/an:

(A) Complementary scheme

(B) Analogous scheme

(C) Triadic scheme

(D) Monochromatic scheme

View Solution

Q51. In a certain code, FLOWER is written as GMPXFS by shifting each letter one step forward in the alphabet. Using the same rule, how is GARDEN written?

(A) FZQCDM

(B) HBSDFO

(C) HBRDEO

(D) HBSEFO

View Solution

Q52. Which of the following is the hardest wood?

(A) Teak

(B) Thorny Acacia

(C) Mango

(D) Rosewood

View Solution

Q53. The layout and key buildings of the planned city of Chandigarh were designed by which internationally renowned architect?

(A) Le Corbusier

(B) Louis Kahn

(C) B. V. Doshi

(D) Charles Correa

View Solution

Q54. The international ISO A-series of paper sizes (A0, A1, A2, A3, A4 ...) is based on sheets whose sides are in which ratio?

(A) 1 : 1.5

(B) 1 : $\sqrt{2}$

(C) 2 : 3

(D) 1 : 1.618 (golden ratio)

View Solution

Q55. The Chipko movement, a landmark grassroots environmental campaign in India during the 1970s, was primarily aimed at protecting which of the following?

(A) Rivers

(B) Wildlife

(C) Wetlands

(D) Trees and forests

View Solution

Q56. Anodizing, an electrochemical surface treatment that grows a protective oxide layer, is most commonly applied to which metal?

(A) Iron

(B) Copper

(C) Aluminium

(D) Gold

View Solution

Q57. Which image file format supports lossless compression and transparency, making it a common choice for web logos and graphics with sharp edges?

(A) JPEG

(B) PNG

(C) BMP

(D) GIF

View Solution

Part B: Drawing and Design Aptitude (Pen and Paper)

Q58. [Drawing - 50 Marks]

It is early morning in your neighbourhood vegetable and fruit market. Vendors are setting up their stalls, arranging their produce into neat heaps and pyramids. A few early customers are bargaining, a cycle-cart is being unloaded, and a stray dog wanders between the baskets. Imagine and draw the scene, giving prominence to a vendor carefully arranging a pyramid of fruits at the front stall.

Note: Make pencil sketches only. Do not use colour.

Evaluation criteria: observation; composition of figures and objects; sense of perspective and proportion; quality of lines; attention to detail.

View Model Approach

Q59. [Design Aptitude - 50 Marks]

During the monsoon, students walking to college struggle to manage three things at once - an umbrella, a water bottle and their books or a laptop - often with wet hands and no free hand to spare. Design a single carry accessory that holds all three together, is easy to sling on and take off, keeps the books dry, and lets you pull out the umbrella quickly without putting everything down. Show your design (1) when it is slung on the shoulder ready to walk, and (2) at the moment the umbrella is being pulled out for use.

Note: Make pencil sketches only. Do not use colour. Explain your design only through visuals and short labels; do not write separate explanations.

View Model Approach

Detailed Solutions

Q1.

Q. In digital typography, 1 point equals $\frac{1}{72}$ inch, and a screen has 96 pixels in every inch. A page heading is set at a type size of 36 points. What is its height in pixels?

Solution

Concept - Unit conversion (points to pixels): A point is $\frac{1}{72}$ inch and one inch holds 96 pixels, so convert points to inches first, then inches to pixels.

Step 1 - Points to inches: 36 points $= \frac{36}{72}$ inch $= 0.5$ inch.

Step 2 - Inches to pixels: $0.5 \times 96 = 48$ pixels.

Tip: Chain the units one step at a time; carrying a wrong ratio is the usual slip here.

Answer: 48 Go Back to Q1

Q2.

Q. If 1 inch = 25 mm = 6 pica and 1 pica = 12 points = 16 pixels, what is 6 points + 2 inches + 3 picas + 8 pixels + 25 mm, represented in pixels?

Solution

Concept - Chained unit conversion: Express every quantity in pixels using the given equalities, then add.

Step 1 - Pixel value of each unit: 1 pica $= 16$ px, so 1 point $= \frac{16}{12} = \frac{4}{3}$ px; 1 inch $= 6$ pica $= 96$ px; and 25 mm $= 1$ inch $= 96$ px.

Step 2 - Convert each term: 6 points $= 6 \times \frac{4}{3} = 8$ px; 2 inches $= 192$ px; 3 picas $= 48$ px; 8 pixels $= 8$ px; 25 mm $= 96$ px.

Step 3 - Add: $8 + 192 + 48 + 8 + 96 = 352$ pixels.

Tip: Reduce every mixed unit to a single common unit before summing; never add across units directly.

Answer: 352 Go Back to Q2

Q3.

Q. A logo is enlarged so that its width grows from 40 mm to 50 mm while keeping the same shape (uniform scaling). By what percentage does the area of the logo increase?

Solution

Concept - Area scales as the square of the linear factor: Under uniform scaling, area multiplies by the square of the length ratio.

Step 1 - Linear factor: $\frac{50}{40} = 1.25$.

Step 2 - Area factor: $1.25^2 = 1.5625$, an increase of 0.5625, i.e. 56.25%.

Tip: A 25% width gain is not a 25% area gain; always square the ratio for area.

Answer: 56.25 Go Back to Q3

Q4.

Q. A cylindrical display canister has radius 7 cm and height 20 cm. Using $\pi = \frac{22}{7}$, what is its total surface area in square centimetres?

Solution

Concept - Total surface area of a cylinder: TSA $= 2\pi r(r + h)$, the curved surface plus the two circular ends.

Step 1 - Substitute: $r = 7$, $h = 20$, so $r + h = 27$.

Step 2 - Compute: $2 \times \frac{22}{7} \times 7 \times 27 = 2 \times 22 \times 27 = 1188$ square cm.

Tip: Choosing $r = 7$ cancels the 7 in $\frac{22}{7}$, so keep the fraction until it cancels cleanly.

Answer: 1188 Go Back to Q4

Q5.

Q. What three-digit number can be made from the digits 2, 3, 5, and 7, such that no two digits of the three-digit number are the same and the three-digit number is divisible by each of the digits in it?

Solution

Concept - Divisibility constraints narrow the choices: The number must be divisible by each of its three distinct digits chosen from {2, 3, 5, 7}.

Step 1 - Rule out clashes: If 5 is a digit, the number must end in 5 (no 0 available), making it odd; then it cannot also be divisible by 2. So any set containing both 2 and 5 fails.

Step 2 - Test remaining sets: For {2, 3, 7}, it must end in 2 (even) and be a multiple of 7, but neither 372 nor 732 is divisible by 7. For {3, 5, 7}, it must end in 5: check 735, which is $3 \times 5 \times 49$. Indeed $735 \div 3 = 245$, $735 \div 5 = 147$, $735 \div 7 = 105$.

Tip: Use the last-digit rules for 2 and 5 first; they eliminate most candidates instantly.

Answer: 735 Go Back to Q5

Q6.

Q. An A4 sheet measures 210 mm by 297 mm. A designer leaves a uniform margin of 15 mm on all four sides. What is the area, in square centimetres, of the inner rectangle left for content?

Solution

Concept - Margins remove twice the width from each dimension: A 15 mm margin on both sides shortens a dimension by 30 mm.

Step 1 - Inner dimensions: width $= 210 - 2 \times 15 = 180$ mm; height $= 297 - 30 = 267$ mm.

Step 2 - Area and convert: $180 \times 267 = 48060$ square mm; dividing by 100 gives 480.6 square cm.

Tip: Subtract the margin from both edges (multiply by 2) before multiplying the sides.

Answer: 480.6 Go Back to Q6

Q7.

Q. A rectangular business card has its two sides in the ratio 5 : 3. If the longer side is 90 mm, what is the perimeter of the card in millimetres?

Solution

Concept - Ratio to actual lengths: The sides are 5 parts to 3 parts; find the value of one part, then both sides.

Step 1 - One part: 5 parts $=$ 90 mm, so 1 part $=$ 18 mm and the shorter side $= 3 \times 18 = 54$ mm.

Step 2 - Perimeter: $2 \times (90 + 54) = 2 \times 144 = 288$ mm.

Tip: Anchor the ratio to the known side first, then the other side follows in one step.

Answer: 288 Go Back to Q7

Q8.

Q. A print run of 2500 posters is expected to have 4% wastage due to misprints. How many good posters are expected to remain?

Solution

Concept - Percentage loss: Good posters are the total minus the wasted fraction.

Step 1 - Wastage: 4% of 2500 $= \frac{4}{100} \times 2500 = 100$ posters.

Step 2 - Remaining: $2500 - 100 = 2400$ posters.

Tip: You can also take 96% of 2500 directly to reach 2400.

Answer: 2400 Go Back to Q8

Q9.

Q. 27 cubes of edge 10 cm are arranged to create a larger cube. If the cubes at the eight corners are replaced with spheres of diameter 10 cm, what is the minimum number of cubes that do not touch any of the spheres?

Solution

Concept - An inscribed sphere touches only face-adjacent cells: A sphere of diameter 10 cm exactly fills a 10 cm cube position and touches the neighbouring cubes that share a full face with that corner position.

Step 1 - Classify the 27 positions: In a $3 \times 3 \times 3$ cube there are 8 corners, 12 edge cubes, 6 face-centre cubes, and 1 body-centre cube.

Step 2 - Which cubes get touched: Each corner sphere touches its 3 face-adjacent edge cubes. Across all 8 corners this reaches every one of the 12 edge cubes, so all 12 are touched.

Step 3 - Count the untouched: The remaining cubes are the 6 face-centre cubes and the 1 body-centre cube, none of which shares a face with any corner. That is $6 + 1 = 7$.

Tip: A sphere touching a cube face means only the cubes sharing that face are affected; diagonal neighbours are safe.

Answer: 7 Go Back to Q9

Q10.

Q. A poster series is designed so the widths follow the arithmetic sequence 2, 5, 8, 11, ... centimetres. What is the width, in centimetres, of the 12th poster in the series?

Solution

Concept - nth term of an arithmetic progression: $a_n = a + (n-1)d$, where a is the first term and d the common difference.

Step 1 - Identify values: $a = 2$, $d = 3$, $n = 12$.

Step 2 - Compute: $a_{12} = 2 + (12-1) \times 3 = 2 + 33 = 35$ cm.

Tip: Use $n - 1$, not n, for the number of steps taken from the first term.

Answer: 35 Go Back to Q10

Q11.

Q. A design studio buys paint in cubic containers of edge 20 cm and repackages it into cubic sample boxes of edge 5 cm. How many sample boxes can be completely filled from one container?

Solution

Concept - Volume ratio of similar cubes: The number of small cubes equals the cube of the edge ratio.

Step 1 - Edge ratio: $\frac{20}{5} = 4$.

Step 2 - Volume ratio: $4^3 = 64$ sample boxes.

Tip: For volume, cube the linear ratio; do not just multiply by it.

Answer: 64 Go Back to Q11

Q12.

Q. A typical football is made by stitching together 12 pentagons and 20 hexagons. How many vertices (junctions) are there in such a football?

Solution

Concept - Euler's formula for solids: $V - E + F = 2$, so first count faces and edges, then solve for vertices.

Step 1 - Faces and edges: $F = 12 + 20 = 32$. Counting sides, $12 \times 5 + 20 \times 6 = 60 + 120 = 180$, but each edge is shared by two faces, so $E = \frac{180}{2} = 90$.

Step 2 - Solve for vertices: $V = E - F + 2 = 90 - 32 + 2 = 60$.

Tip: Every edge belongs to exactly two faces; halving the side count is the key step.

Answer: 60 Go Back to Q12

Q13.

Q. A honeycomb poster is built as rings of cells around a central cell. The centre has 1 cell, the first ring has 6 cells, the second ring has 12, the third ring has 18, and so on (each ring adds 6 more than the previous ring). How many cells are there in total up to and including the fourth ring?

Solution

Concept - Sum of a hexagonal ring pattern: Ring n (for $n \geq 1$) holds $6n$ cells; add the central cell and the four rings.

Step 1 - List the counts: centre $= 1$; rings $= 6, 12, 18, 24$.

Step 2 - Add: $1 + 6 + 12 + 18 + 24 = 61$ cells.

Tip: Do not forget the single central cell; it is easy to leave out of the ring sum.

Answer: 61 Go Back to Q13

Q14.

Q. An architect's drawing is made at a scale of 1 : 50. A wall on the drawing measures 8 cm. What is the real length of the wall in metres?

Solution

Concept - Reading a scale: A scale of 1 : 50 means every 1 unit on paper equals 50 units in reality.

Step 1 - Scale up: 8 cm $\times\ 50 = 400$ cm.

Step 2 - Convert to metres: 400 cm $= 4$ m.

Tip: Multiply by the scale factor first, then convert units at the end.

Answer: 4 Go Back to Q14

Q15.

Q. Which of the following statements about the Bauhaus school is / are correct?

(A) The Bauhaus was founded in Paris by Le Corbusier.

(B) Walter Gropius founded the Bauhaus in Weimar, Germany, in 1919.

(C) The Bauhaus rejected any link between art and industrial production.

(D) The Bauhaus promoted the unity of art, craft, and technology.

Solution

Concept - Design history, the Bauhaus: The Bauhaus was a German design school (1919 to 1933) that fused fine art with craft and industry.

Step 1 - Evaluate A: False. It was founded in Weimar, Germany, by Walter Gropius, not in Paris and not by Le Corbusier.

Step 2 - Evaluate B: True. Walter Gropius founded it in Weimar in 1919.

Step 3 - Evaluate C and D: C is false because the Bauhaus actively embraced industrial production; D is true, as its core idea was uniting art, craft, and technology.

Tip: Link a movement to its founder and city; that pairing usually settles half the options.

Answer: B, D Go Back to Q15

Q16.

Q. Which of the options is / are CORRECT?

A. The cap of a water bottle is tightened by rotating it in the

clockwise direction (as seen from the top).

B. To turn on a tap, the tap head is rotated clockwise; to turn it off it is rotated counter-clockwise (as seen from the top).

C. To loosen a nut of a car wheel, a spanner is turned counter-clockwise (from the point of view of the person using the spanner).

D. The earth as seen from the North Pole rotates clockwise about its axis.

(A) The cap of a water bottle is tightened by rotating it in the clockwise direction (as seen from the top).
(B) To turn on a tap, the tap head is rotated clockwise; to turn it off it is rotated counter-clockwise (as seen from the top).
(C) To loosen a nut of a car wheel, a spanner is turned counter-clockwise (from the point of view of the person using the spanner).
(D) The earth as seen from the North Pole rotates clockwise about its axis.

Solution

Concept - Right-hand thread convention: Most caps, taps, and nuts use right-hand threads: clockwise tightens (righty-tighty) and counter-clockwise loosens (lefty-loosey).

Step 1 - Evaluate A: True. A bottle cap tightens when turned clockwise from the top.

Step 2 - Evaluate B: False. A tap closes (turns off) when rotated clockwise and opens when rotated counter-clockwise, the reverse of

the statement.

Step 3 - Evaluate C and D: C is true, as loosening a wheel nut needs a counter-clockwise turn. D is false, since from above the North Pole the earth spins counter-clockwise (anticlockwise).

Tip: Fix the direction of view first; clockwise from one side is counter-clockwise from the other.

Answer: A, C Go Back to Q16

Q17.

Q. Which of the following correctly describes the Indian craft of Bidriware?

(A) It is a hand-block printing technique on cotton cloth from Gujarat.
(B) It is a warm terracotta pottery tradition from West Bengal.
(C) It is a metal handicraft from Bidar, Karnataka, made from a blackened zinc-copper alloy inlaid with silver.
(D) It is a fine silk brocade weaving tradition from Varanasi.

Solution

Concept - Indian crafts and their regions: Each traditional craft is tied to a specific place, material, and technique.

Step 1 - Evaluate A and B: A describes block printing (Gujarat / Rajasthan), not Bidriware. B describes terracotta pottery, again not Bidriware.

Step 2 - Evaluate C: True. Bidriware comes from Bidar in

Karnataka and uses a blackened zinc-copper alloy with silver (and sometimes gold) inlay.

Step 3 - Evaluate D: False. Fine silk brocade from Varanasi is Banarasi weaving, a different craft.

Tip: The name often carries the place: Bidri comes from Bidar.

Answer: C Go Back to Q17

Q18.

Q. Which of the following statements about colour are correct?

(A) Red, green, and blue are the primary colours of subtractive (pigment) mixing.
(B) In additive colour mixing, combining red, green, and blue light produces white.
(C) Cyan, magenta, and yellow are the primary colours used in subtractive (printing) mixing.
(D) Complementary colours lie opposite each other on the colour wheel.

Solution

Concept - Additive vs subtractive colour: Coloured light mixes additively (RGB); pigments and inks mix subtractively (CMY).

Step 1 - Evaluate A: False. Red, green, and blue are the additive (light) primaries, not the subtractive ones.

Step 2 - Evaluate B: True. Red, green, and blue light together make white.

Step 3 - Evaluate C and D: C is true, since cyan, magenta, and yellow are the subtractive printing primaries. D is true, as complementary colours sit opposite each other on the wheel.

Tip: Light adds up to white; inks pile up toward black. Keep the two systems separate.

Answer: B, C, D Go Back to Q18

Q19.

Q. An object was sharply focused and a photograph was taken using a camera. The photographer wants to blur the background (change the depth of field) in the next photograph. This can be achieved by changing the

(A) size of opening of the lens (aperture).
(B) distance of the object from the camera and again focusing.
(C) shutter speed to change the duration for which light enters the camera.
(D) focal length of the lens.

Solution

Concept - What controls depth of field: Depth of field depends on aperture, focal length, and the focus (object) distance; shutter speed does not affect it.

Step 1 - Evaluate A: True. A wider aperture gives a shallower depth of field, blurring the background.

Step 2 - Evaluate B: True. Moving closer and refocusing changes the depth of field and background blur.

Step 3 - Evaluate C and D: C is false, because shutter speed changes exposure and motion blur, not depth of field. D is true, since a longer focal length reduces depth of field.

Tip: Shutter speed governs time and motion, never depth of field.

Answer: A, B, D Go Back to Q19

Q20.

Q. Which of the following statements about Indian architecture are correct?

(A) The Taj Mahal in Agra is a Mughal mausoleum built mainly of white marble.
(B) The Sun Temple at Konark is shaped like a giant lotus flower.
(C) Fatehpur Sikri was built by the emperor Ashoka.
(D) Stepwells such as Rani ki Vav are traditional Indian water-storage structures.

Solution

Concept - Landmarks of Indian architecture: Each monument has a known builder, era, and form.

Step 1 - Evaluate A: True. The Taj Mahal is a Mughal mausoleum built largely in white marble.

Step 2 - Evaluate B: False. The Konark Sun Temple is designed as a colossal chariot with carved wheels and horses, not a lotus.

Step 3 - Evaluate C and D: C is false, since Fatehpur Sikri was built by Akbar, not Ashoka. D is true, as stepwells like Rani ki Vav stored water and served communities.

Tip: Match monument to dynasty; Ashoka predates the Mughals by many centuries.

Answer: A, D Go Back to Q20

Q21.

Q. Which of the following statements about camera exposure are correct?

(A) A higher ISO setting always reduces the noise (grain) in an image.

(B) A larger f-number, such as f/16, corresponds to a wider lens aperture.

(C) A faster shutter speed reduces the amount of light reaching the sensor.

(D) Aperture, shutter speed, and ISO together form the exposure triangle.

Solution

Concept - The exposure triangle: Exposure is set by aperture, shutter speed, and ISO working together.

Step 1 - Evaluate A: False. A higher ISO increases sensitivity but adds noise, it does not reduce grain.

Step 2 - Evaluate B: False. A larger f-number means a smaller aperture; f/16 is narrower than f/2.

Step 3 - Evaluate C and D: C is true, since a faster shutter lets in light for less time. D is true, as these three controls form the exposure triangle.

Tip: Bigger f-number equals smaller hole; the ratio is inverted.

Answer: C, D Go Back to Q21

Q22.

Q. Which of the following statements about typography are correct?

(A) Kerning refers to the vertical spacing between successive lines of text.

(B) Serif typefaces have small strokes at the ends of the letterforms.

(C) Leading refers to the vertical spacing between successive lines of text.

(D) A typeface and a font mean exactly the same thing with no distinction.

Solution

Concept - Typography vocabulary: Kerning, leading, and serifs each name a distinct idea.

Step 1 - Evaluate A: False. Kerning is the horizontal space between specific letter pairs, not the space between lines.

Step 2 - Evaluate B: True. Serif faces carry small finishing strokes at the ends of letters.

Step 3 - Evaluate C and D: C is true, since leading is the vertical spacing between lines. D is false, because a typeface is the design while a font is a specific style or size of it.

Tip: Kerning is between letters, leading is between lines; keep the

pair straight.

Answer: B, C Go Back to Q22

Q23.

Q. On 16th July 2022, Parvathy bought 4 new pairs of socks A, B, C and D to train herself for the Marathon race on Gandhi Jayanti. She started her training next day wearing the new socks. She trained every day, including the day of the marathon, wearing the socks (one pair every day) in the following sequence: C, A, B and D. Unfortunately, she could not train from 3rd to 22nd September 2022 as she was unwell. She resumed her training on 23rd wearing pair 'A' socks and continued with the same sequence till the event day. Identify the pair of socks that Parvathy wore the maximum during her entire training period.

(A) C

(B) A

(C) B

(D) D

Solution

Concept - Counting over a repeating cycle: The socks repeat in the order C, A, B, D; count wearings before and after the break, then compare.

Step 1 - Before the break: Training runs 17 July to 2 September (she is unwell from 3 September). That is $15 + 31 + 2 = 48$ days, exactly 12 full cycles, so each of A, B, C, D is worn 12 times.

Step 2 - After the break: Resuming 23 September with A and going to the marathon on 2 October is 10 days: A, B, D, C, A, B, D, C, A, B. This gives A three times, B three times, and C and D twice each.

Step 3 - Totals: A $= 12 + 3 = 15$; B $= 12 + 3 = 15$; C $= 12 + 2 = 14$; D $= 12 + 2 = 14$. The maximum is shared by A and B.

Tip: When a cycle divides the day count evenly, every item ties; the tail after the break breaks the tie.

Answer: A, B Go Back to Q23

Q24.

Q. Which of the following are recognised principles of sustainable design?

(A) Reducing material use and designing products to last longer.
(B) Designing so that parts can be repaired or recycled at end of life.
(C) Preferring renewable or low-impact materials wherever possible.
(D) Considering the full life cycle of a product, from raw material to disposal.

Solution

Concept - Principles of sustainable design: Sustainable design lowers environmental impact across a product's whole life.

Step 1 - Evaluate A and B: A is true; using less material and designing for durability cuts waste. B is true; repairability and

recyclability extend useful life.

Step 2 - Evaluate C: True. Renewable or low-impact materials reduce the footprint.

Step 3 - Evaluate D: True. Life-cycle thinking, from raw material to disposal, is central to sustainability.

Tip: If a statement lowers impact across make, use, and disposal, it fits sustainable design.

Answer: A, B, C, D Go Back to Q24

Q25.

Q. Which of the following statements about materials used in design are correct?

(A) Thermosetting plastics can be melted and remoulded again and again.

(B) Aluminium is valued in product design for its light weight and corrosion resistance.

(C) Glass is a highly ductile material that bends easily without breaking.

(D) Plywood is an engineered wood made by gluing together thin layers (veneers).

Solution

Concept - Material properties: Each material has characteristic behaviour under heat and load.

Step 1 - Evaluate A: False. Thermosetting plastics set permanently

and cannot be remelted; thermoplastics can.

Step 2 - Evaluate B: True. Aluminium is light and resists corrosion, so it is popular in product design.

Step 3 - Evaluate C and D: C is false, since glass is brittle, not ductile. D is true, as plywood is built from glued veneer layers.

Tip: Thermo-set stays set; thermo-plastic can be reshaped. The prefix tells the story.

Answer: B, D Go Back to Q25

Q26.

Q. Which of the following designer-work pairings are correct?

(A) The Wassily Chair was designed by Charles Rennie Mackintosh.
(B) The Eames Lounge Chair was designed by Antoni Gaudi.
(C) Charles and Ray Eames are known for their moulded plywood and fibreglass chairs.
(D) Raymond Loewy was an influential figure in industrial design.

Solution

Concept - Designers and their signature works: Knowing who made a landmark object settles these pairings.

Step 1 - Evaluate A: False. The Wassily Chair was designed by Marcel Breuer, not Mackintosh.

Step 2 - Evaluate B: False. The Eames Lounge Chair was designed by Charles and Ray Eames, not Gaudi.

Step 3 - Evaluate C and D: C is true, as the Eameses pioneered moulded plywood and fibreglass seating. D is true, since Raymond Loewy was a major industrial designer.

Tip: Watch out for swapped names; a famous object is often mispaired with a famous designer.

Answer: C, D Go Back to Q26

Q27.

Q. Consider the following quote from J C Kumarappa's Economy of Permanence: "Man comes nearest to his God, the creator, when he utilizes his brain power to marshal mechanical forces to serve his purposes. To do so in a way that will bring blessings and not destruction, he has to follow closely nature's way to get the best out of it. We cannot get the co-operation of nature purely on our own terms. Any attempt to do so will bring violent destruction in its wake." Which of the options is / are implied by the quote?

(A) Utilizing brain power to marshal mechanical forces to serve our purposes, if not done properly, can lead to destruction.
(B) Utilizing brain power to marshal mechanical forces to serve our purposes can bring man nearest to his God.
(C) While utilizing brain power to marshal mechanical forces to serve our purposes, the best way to proceed is to follow nature's way.
(D) Dealing with nature purely on our own terms will bring violent destruction.

Solution

Concept - Reading for implied meaning: An option is implied if it follows from what the passage states, even if worded differently.

Step 1 - Evaluate A: True. The text warns that marshalling forces badly brings destruction rather than blessings.

Step 2 - Evaluate B: True. It opens by saying man comes nearest to God when he uses his brain power this way.

Step 3 - Evaluate C and D: C is true, as the passage urges following nature's way for the best result. D is true, since dealing with nature purely on our own terms is said to bring violent destruction.

Tip: Check each option against a specific line; here every option maps to a sentence in the quote.

Answer: A, B, C, D Go Back to Q27

Q28.

Q. Which of the following statements about light and colour are correct?

(A) White light cannot be split into different colours by any means.
(B) A red object appears red because it reflects red light and absorbs the other wavelengths.
(C) The visible spectrum ranges roughly from violet at one end to red at the other.
(D) Black is a pure spectral colour of light.

Solution

Concept - How we see colour: Objects show the colours they reflect; white light contains the full visible spectrum.

Step 1 - Evaluate A: False. A prism splits white light into its component colours.

Step 2 - Evaluate B: True. A red object reflects red light and absorbs the rest.

Step 3 - Evaluate C and D: C is true, as the visible spectrum runs from violet to red. D is false, since black is the absence of light, not a spectral colour.

Tip: A surface's colour is the light it sends back to your eye, not the light it soaks up.

Answer: B, C Go Back to Q28

Q29.

Q. Which of the following statements about art movements is / are correct?

(A) Cubism is known for smooth, photorealistic portraits with fine detail.
(B) Art Nouveau is characterised by rigid straight lines and industrial grids.
(C) Minimalism relies on ornate, heavily decorated surfaces.
(D) Impressionism is known for capturing light and fleeting impressions using loose brushwork.

Solution

Concept - Identifying art movements by style: Each movement has a recognisable visual approach.

Step 1 - Evaluate A: False. Cubism fragments subjects into geometric planes; it is not photorealistic.

Step 2 - Evaluate B: False. Art Nouveau is defined by flowing, organic curves inspired by nature, not rigid grids.

Step 3 - Evaluate C and D: C is false, because Minimalism strips away decoration for simple forms. D is true, since Impressionism captures light and momentary impressions with loose brushwork.

Tip: Pair each movement with one keyword: Cubism-geometry, Art Nouveau-curves, Minimalism-bare, Impressionism-light.

Answer: D Go Back to Q29

Q30.

Q. The Bauhaus, the influential school of art, design and architecture founded in 1919 in Weimar, Germany, was established by which architect?

(A) Walter Gropius
(B) Le Corbusier
(C) Mies van der Rohe
(D) Frank Lloyd Wright

Solution

Concept - Design history, Bauhaus: The Bauhaus united craft and fine art under one modern school and shaped 20th-century design

education.

Step 1 - Founder: Walter Gropius founded the Bauhaus in Weimar in 1919 and served as its first director.

Step 2 - Rule out others: Mies van der Rohe led the Bauhaus later, but did not found it. Le Corbusier and Frank Lloyd Wright were major modern architects unconnected with its founding.

Tip: Link the date 1919 and the city Weimar directly to Gropius.

Answer: A Go Back to Q30

Q31.

Q. What is the number of fonts used in the following sentence?

From the time of Leonardo Da Vinci, until the end of the eighteenth century, Science and Art were much closer than today.

(A) 3
(B) 6
(C) 5
(D) 9

Solution

Concept - Typography, counting typefaces: A font change shows up as a shift in letterform style (serif vs sans, weight, slant, or family), not just size.

Step 1 - Scan for style breaks: Read the line and group runs of text that share the same letter shapes; each distinct visual style is one font.

Step 2 - Total the distinct styles: Counting each unique typeface across the sentence gives 5 different fonts.

Tip: Judge by letterform, weight and slant together, not by the size of the text.

Answer: C Go Back to Q31

Q32.

Q. In the traditional RYB (red-yellow-blue) pigment colour model used by artists, mixing red and yellow produces which colour?

(A) Green
(B) Orange
(C) Violet
(D) Brown

Solution

Concept - Colour theory, secondary colours: In the RYB model the three secondary colours come from mixing pairs of primaries.

Step 1 - Apply the pairing: Red and yellow give orange, yellow and blue give green, blue and red give violet.

Step 2 - Select: Red plus yellow is orange.

Tip: The secondary sits between its two parent primaries on the colour wheel.

Answer: B Go Back to Q32

Q33.

Q. Vulcanization is an industrial process closely associated with which material?

(A) Glass
(B) Aluminium
(C) Rubber
(D) Ceramics

Solution

Concept - Materials and processes, vulcanization: Vulcanization treats raw rubber with sulphur and heat so the polymer chains cross-link.

Step 1 - Effect: Cross-linking makes rubber stronger, more elastic and less sticky, which is why tyres are vulcanized.

Step 2 - Rule out: Glass, aluminium and ceramics are shaped by melting, casting or firing, not by vulcanization.

Tip: Vulcanization plus sulphur equals durable rubber.

Answer: C Go Back to Q33

Q34.

Q. The _____ government organizes the Hornbill Festival each December, promoting cultural heritage and fostering interaction between tribes. The festival has been named after a _____.

(A) Chhatisgarh, bird
(B) Nagaland, bird
(C) Manipur, flower

(D) Shillong, tribal musical instrument

Solution

Concept - Environmental and cultural awareness, festivals of India: The Hornbill Festival is a well-known celebration of North-East Indian tribal culture.

Step 1 - Host state: It is organised by the Nagaland government every December near Kohima.

Step 2 - Namesake: It is named after the hornbill, a bird revered in the folklore of many Naga tribes.

Tip: Hornbill is a bird, and the festival belongs to Nagaland.

Answer: B Go Back to Q34

Q35.

Q. In typography and print, 1 inch is equal to how many points?

(A) 10
(B) 12
(C) 36
(D) 72

Solution

Concept - Typographic units, point system: The point is the base unit of type size in the modern DTP system.

Step 1 - Relation: By definition 1 inch contains 72 points, and 1

pica contains 12 points, so 1 inch equals 6 picas.

Step 2 - Select: 72 points is correct.

Tip: Remember 72 points to the inch and 12 points to the pica.

Answer: D Go Back to Q35

Q36.

Q. The iconic Nike swoosh logo was designed in 1971 by which person, then a graphic-design student?

(A) Carolyn Davidson
(B) Paul Rand
(C) Saul Bass
(D) Milton Glaser

Solution

Concept - Designers and logos: Many famous marks are tied to a specific designer.

Step 1 - Attribution: Carolyn Davidson designed the Nike swoosh in 1971 while a student at Portland State University.

Step 2 - Rule out: Paul Rand designed the IBM and ABC logos, Saul Bass created many corporate marks and film titles, and Milton Glaser designed the I love NY logo.

Tip: The Nike swoosh suggests motion and the wing of the goddess of victory.

Answer: A Go Back to Q36

Q37.

Q. The lost wax process is used for _____.

(A) Honey making

(B) Jaggery making

(C) Batik painting

(D) Metal casting

Solution

Concept - Materials and processes, casting: Lost wax (cire perdue) is an ancient method for making detailed metal objects.

Step 1 - How it works: A wax model is coated in clay, the wax is melted out, and molten metal is poured into the empty cavity.

Step 2 - Select: This is a metal casting technique, famously used for Dhokra craft.

Tip: The wax is lost so the metal can take its exact shape.

Answer: D Go Back to Q37

Q38.

Q. The Lotus Temple in New Delhi, known for its petal-like white marble form, is a house of worship for which faith?

(A) Buddhism

(B) Baha'i

(C) Jainism

(D) Sikhism

Solution

Concept - Architecture of India: The Lotus Temple, completed in 1986 and designed by Fariborz Sahba, is shaped like a half-open lotus with 27 marble petals.

Step 1 - Faith: It is a Baha'i House of Worship, open to people of all religions.

Step 2 - Rule out: It has no idols or altars, unlike Buddhist, Jain or Sikh places of worship.

Tip: Lotus form plus nine sides and nine pools signals the Baha'i faith.

Answer: B Go Back to Q38

Q39.

Q. A wooden cube of side 3 cm is painted on all its outer faces and then cut into small cubes of side 1 cm. How many of the small cubes have exactly one face painted?

(A) 0
(B) 1
(C) 6
(D) 8

Solution

Concept - Spatial reasoning, painted cube: For a cube cut into n^3 small cubes, the count with exactly one painted face is $6(n-2)^2$.

Step 1 - Substitute: Here $n = 3$, so one-face cubes $= 6(3-2)^2 =$

$6 \times 1 = 6$.

Step 2 - Check: These are the centre cubes of each of the 6 faces.

Tip: One-face cubes come from face centres, two-face from edges, three-face from corners.

Answer: C Go Back to Q39

Q40.

Q. You need to hang a large rectangular picture frame on a wall in an empty room. To ensure that it is vertical (and not tilted), which of the following will help you hang the picture correctly (not tilted)? (No additional items are to be used other than the ones specified in each of the options)

(A) A wooden stick, a cutter and a pencil
(B) A pencil, a compass and a cutter
(C) A flexible and transparent pipe and a mug of water
(D) Some card paper, a steel-ruler and a pair of scissors

Solution

Concept - Design problem solving, using physical principles: Water always settles to the same horizontal level, which can define a true level or plumb reference.

Step 1 - Build a water level: Filling a transparent flexible pipe with water lets the two open ends show matching water heights, giving a reliable horizontal reference.

Step 2 - Rule out others: Sticks, pencils, compasses, card and rulers cannot on their own guarantee true horizontal or vertical

without a reference like gravity-fed water.

Tip: A water-filled tube is a simple, accurate spirit-level substitute.

Answer: C Go Back to Q40

Q41.

Q. Find the next number in the series: 2, 3, 5, 8, 13, ?

(A) 18
(B) 19
(C) 20
(D) 21

Solution

Concept - Logical reasoning, additive series: Each term is the sum of the two terms before it.

Step 1 - Verify: $2 + 3 = 5$, $3 + 5 = 8$, $5 + 8 = 13$, which fits the pattern.

Step 2 - Next term: $8 + 13 = 21$.

Tip: When differences themselves look like the series, test a Fibonacci-style add rule.

Answer: D Go Back to Q41

Q42.

Q. In design and ergonomics, the term anthropometry refers to the study of which of the following?

(A) Measurement of human body dimensions
(B) Study of colour perception
(C) Study of sound and acoustics
(D) Measurement of light intensity

Solution

Concept - Ergonomics, anthropometry: Anthropometry means the systematic measurement of the size and proportions of the human body.

Step 1 - Use in design: Designers use body-dimension data (reach, height, grip) to size chairs, tools and workspaces for comfort and safety.

Step 2 - Rule out: Colour perception, acoustics and light measurement are separate fields.

Tip: Anthropo (human) plus metry (measure) equals body measurements.

Answer: A Go Back to Q42

Q43.

Q. Which of the options is the odd one?

(A) Cobra
(B) Krait
(C) Rat Snake
(D) Viper

Solution

Concept - Observation and classification, odd one out: Group the items by a shared property and spot the one that breaks it.

Step 1 - Common trait: Cobra, krait and viper are all venomous snakes.

Step 2 - The exception: The rat snake is non-venomous, so it is the odd one out.

Tip: Look for the single feature (here, venom) that three share and one lacks.

Answer: C Go Back to Q43

Q44.

Q. Which gas released by human activities is the main contributor to the enhanced greenhouse effect and global warming?

(A) Oxygen
(B) Carbon dioxide
(C) Nitrogen
(D) Argon

Solution

Concept - Environmental awareness, greenhouse gases: Greenhouse gases trap outgoing heat and warm the atmosphere.

Step 1 - Main human-driven gas: Carbon dioxide from burning fossil fuels is the largest human contributor to warming.

Step 2 - Rule out: Nitrogen, oxygen and argon are the bulk of

clean air but are not significant greenhouse gases.

Tip: Fossil-fuel burning links directly to rising carbon dioxide.

Answer: B Go Back to Q44

Q45.

Q. Pointillism, a technique of building an image from tiny separate dots of pure colour, is most closely associated with which artist?

(A) Georges Seurat
(B) Claude Monet
(C) Salvador Dali
(D) Henri Matisse

Solution

Concept - Art history, Post-Impressionism: Pointillism relies on the eye to blend adjacent dots of colour into tones.

Step 1 - Pioneer: Georges Seurat developed the technique, seen in A Sunday Afternoon on the Island of La Grande Jatte.

Step 2 - Rule out: Monet was an Impressionist, Dali a Surrealist and Matisse a Fauvist.

Tip: Dots of pure colour that mix in the eye equal Seurat and Pointillism.

Answer: A Go Back to Q45

Q46.

Q. Which of the following options is the odd one?

(A) Electroplating
(B) Anodizing
(C) Powder Coating
(D) Drilling

Solution

Concept - Materials and processes, surface finishing: Classify each process as either a surface treatment or a shaping operation.

Step 1 - Common trait: Electroplating, anodizing and powder coating all add or modify a surface layer for protection or finish.

Step 2 - The exception: Drilling removes material to make holes; it is a machining, not a surface-finishing, process.

Tip: Three coat the surface, one cuts into it - drilling is the outlier.

Answer: D Go Back to Q46

Q47.

Q. Which of the following is a thermosetting plastic, that is, one that cannot be re-melted and reshaped once cured?

(A) Polythene
(B) PVC
(C) Bakelite
(D) Polypropylene

Solution

Concept - Materials, thermoplastics vs thermosets: Thermoplastics soften on heating and can be reshaped; thermosets set permanently after curing.

Step 1 - Identify: Bakelite is a cured phenol-formaldehyde thermoset used in electrical fittings and handles.

Step 2 - Rule out: Polythene, PVC and polypropylene are all thermoplastics that can be re-melted.

Tip: If a plastic chars rather than melts on reheating, it is likely a thermoset.

Answer: C Go Back to Q47

Q48.

Q. The traditional Madhubani (Mithila) style of folk painting originates from which Indian state?

(A) Bihar
(B) Odisha
(C) Rajasthan
(D) Kerala

Solution

Concept - Indian art and craft, folk painting: Regional folk styles are tied to specific areas and communities.

Step 1 - Origin: Madhubani, also called Mithila painting, comes from the Mithila region of Bihar.

Step 2 - Feature: It uses bold outlines, natural dyes and filled

patterns with no empty space left.

Tip: Mithila equals Bihar, home of Madhubani painting.

Answer: A Go Back to Q48

Q49.

Q. The well-known masterpiece "Mona Lisa" was painted by Leonardo Da Vinci in the 16th Century. Nearly 500 years later another artist made a satirical reference to it; he copied the "Mona Lisa" but painted a moustache on her! Which art movement was this artist associated with?

(A) Dadaism
(B) Cubism
(C) Impressionism
(D) Pop-art

Solution

Concept - Art history, 20th-century movements: Dada rejected traditional aesthetics through absurd, provocative gestures.

Step 1 - The work: Marcel Duchamp added a moustache and goatee to a Mona Lisa postcard in his piece L.H.O.O.Q.

Step 2 - Movement: Duchamp was a leading figure of Dadaism.

Tip: Mocking a revered masterpiece is a classic Dada gesture.

Answer: A Go Back to Q49

Q50.

Q. A colour scheme built from colours that sit next to each other on the colour wheel (for example yellow, yellow-green and green) is called a/an:

(A) Complementary scheme
(B) Analogous scheme
(C) Triadic scheme
(D) Monochromatic scheme

Solution

Concept - Colour theory, harmony schemes: Colour schemes are named by how the chosen hues are placed on the wheel.

Step 1 - Definition: Colours adjacent on the wheel form an analogous scheme, giving a calm, unified look.

Step 2 - Rule out: Complementary uses opposites, triadic uses three evenly spaced hues, and monochromatic uses one hue in different tints and shades.

Tip: Neighbours on the wheel equal analogous.

Answer: B Go Back to Q50

Q51.

Q. In a certain code, FLOWER is written as GMPXFS by shifting each letter one step forward in the alphabet. Using the same rule, how is GARDEN written?

(A) FZQCDM
(B) HBSDFO

(C) HBRDEO

(D) HBSEFO

Solution

Concept - Logical reasoning, letter-shift coding: Each letter is replaced by the next letter in the alphabet.

Step 1 - Apply the shift: G to H, A to B, R to S, D to E, E to F, N to O.

Step 2 - Assemble: The code is HBSEFO.

Tip: Encode letter by letter and re-check each substitution to avoid slips.

Answer: D Go Back to Q51

Q52.

Q. Which of the following is the hardest wood?

(A) Teak

(B) Thorny Acacia

(C) Mango

(D) Rosewood

Solution

Concept - Materials, timber hardness: Hardness of wood is judged by density and resistance to denting.

Step 1 - Compare: Among the given woods, rosewood is the

densest and hardest, prized for fine furniture and instruments.

Step 2 - Rule out: Teak, acacia and mango are durable but softer than rosewood.

Tip: Dense, heavy hardwoods like rosewood resist scratches and dents best.

Answer: D Go Back to Q52

Q53.

Q. The layout and key buildings of the planned city of Chandigarh were designed by which internationally renowned architect?

(A) Le Corbusier
(B) Louis Kahn
(C) B. V. Doshi
(D) Charles Correa

Solution

Concept - Modern Indian architecture: Chandigarh was independent India's first major planned city.

Step 1 - Architect: Le Corbusier prepared the master plan and designed the Capitol Complex, including the High Court and Assembly.

Step 2 - Rule out: Louis Kahn designed IIM Ahmedabad, while Doshi and Correa are noted Indian architects not responsible for Chandigarh's plan.

Tip: Chandigarh's grid of sectors is Le Corbusier's signature.

Answer: A Go Back to Q53

Q54.

Q. The international ISO A-series of paper sizes (A0, A1, A2, A3, A4 ...) is based on sheets whose sides are in which ratio?

(A) $1 : 1.5$

(B) $1 : \sqrt{2}$

(C) $2 : 3$

(D) $1 : 1.618$ (golden ratio)

Solution

Concept - Design mensuration, paper proportions: The A-series keeps the same shape each time a sheet is halved.

Step 1 - Why root two: A side ratio of $1 : \sqrt{2}$ means folding the long side in half gives a smaller sheet with the identical ratio.

Step 2 - Result: So A4 is exactly half of A3, both sharing the $1 : \sqrt{2}$ proportion.

Tip: Halving an A-sheet preserves its shape only because of the $\sqrt{2}$ ratio.

Answer: B Go Back to Q54

Q55.

Q. The Chipko movement, a landmark grassroots environmental campaign in India during the 1970s, was primarily aimed at protecting which of the following?

(A) Rivers
(B) Wildlife
(C) Wetlands
(D) Trees and forests

Solution

Concept - Environmental awareness, Indian movements:
Chipko means to hug or cling.

Step 1 - Action: Villagers, many of them women, hugged trees to stop them being felled by contractors in the Himalayan region.

Step 2 - Aim: The movement protected trees and forests and inspired wider ecological awareness.

Tip: Hugging trees to save them is the image at the heart of Chipko.

Answer: D Go Back to Q55

Q56.

Q. Anodizing, an electrochemical surface treatment that grows a protective oxide layer, is most commonly applied to which metal?

(A) Iron
(B) Copper
(C) Aluminium
(D) Gold

Solution

Concept - Materials and processes, surface protection: Anodizing thickens the natural oxide film on a metal to resist corrosion and take colour.

Step 1 - Best fit: Aluminium anodizes readily, giving a hard, durable and dyeable surface used in window frames and gadgets.

Step 2 - Rule out: Iron rusts rather than forming a protective oxide, and gold does not need it; copper is usually treated differently.

Tip: Anodizing and aluminium go together for coloured, corrosion-resistant finishes.

Answer: C Go Back to Q56

Q57.

Q. Which image file format supports lossless compression and transparency, making it a common choice for web logos and graphics with sharp edges?

(A) JPEG
(B) PNG
(C) BMP
(D) GIF

Solution

Concept - Digital imaging, file formats: Formats differ in compression type, colour depth and transparency support.

Step 1 - Match the needs: PNG offers lossless compression, full

colour and an alpha transparency channel, ideal for crisp logos.

Step 2 - Rule out: JPEG is lossy with no transparency, BMP is uncompressed and heavy, and GIF is limited to 256 colours.

Tip: For sharp-edged web graphics with transparent backgrounds, choose PNG.

Answer: B Go Back to Q57

Q58.

Q (Drawing). It is early morning in your neighbourhood vegetable and fruit market. Vendors are setting up their stalls, arranging their produce into neat heaps and pyramids. A few early customers are bargaining, a cycle-cart is being unloaded, and a stray dog wanders between the baskets. Imagine and draw the scene, giving prominence to a vendor carefully arranging a pyramid of fruits at the front stall.

Note: Make pencil sketches only. Do not use colour.

Evaluation criteria: observation; composition of figures and objects; sense of perspective and proportion; quality of lines; attention to detail.

Model Approach and Evaluation

There is no single correct drawing. You are judged on observation, composition and rendering of a lively market scene, so plan the layout before committing lines.

Step 1 - Set depth with perspective: choose an eye level and let the row of stalls and the market lane recede to a vanishing point.

This gives the crowd and stalls believable depth.

Step 2 - Compose in layers: Foreground - the fruit vendor and the pyramid of fruits (your focal point), largest and most detailed. Middle ground - baskets, a weighing scale, a bargaining customer, the cycle-cart. Background - other stalls, a tarpaulin roof, hanging bananas, distant figures. Overlap objects to read as depth.

Step 3 - Give the vendor prominence: place him off-centre on a third line, mid-action (hands stacking a fruit), with the sharpest detail and strongest tonal contrast here so the eye lands on him first. The fruit pyramid is a natural focal shape - use it.

Step 4 - Proportion and telling detail: keep heads near a common eye-level line, scale figures down as they recede, and add believable props - a hanging weighing balance, crates, a price board, the stray dog - without clutter.

Tip: vary line weight (firm for the vendor and fruits, lighter for the background), and leave a little breathing space around the focal group. Finish by strengthening line quality rather than adding more objects. **Go Back to Q58**

Q59.

Q (Design Aptitude). During the monsoon, students walking to college struggle to manage three things at once - an umbrella, a water bottle and their books or a laptop - often with wet hands and no free hand to spare. Design a single carry accessory that holds all three together, is easy to sling on and take off, keeps the books dry, and lets you pull out the umbrella quickly without putting everything down. Show your design (1) when it is slung on the shoulder ready to walk, and (2) at the moment the umbrella is

being pulled out for use.

Note: Make pencil sketches only. Do not use colour. Explain your design only through visuals and short labels; do not write separate explanations.

Model Approach and Evaluation

This tests design thinking. Marks come from an accessory that truly solves the stated problem (three items, wet hands, quick umbrella access) and is explained through clear visuals and short labels.

Step 1 - Nail the requirements: carries umbrella + bottle + books/laptop together; slings on and off easily; keeps books dry; umbrella reachable one-handed without setting the bag down. Choose ONE coherent form - for example a water-resistant sling bag with a dedicated side sleeve for the umbrella and a mesh bottle pocket.

Step 2 - Show the two required states: draw (1) the accessory slung on the shoulder, closed and ready to walk, and (2) the moment the umbrella slides out of its side sleeve while the bag stays on the body. Keep both at the same scale.

Step 3 - Label features, do not write essays: short call-outs with leader lines - 'quick-draw umbrella sleeve', 'waterproof flap', 'roll-top book compartment', 'drainage mesh bottle pocket', 'padded cross-body strap'. Add a small human figure for scale.

Step 4 - Prove it works: a tiny sketch of a student walking with it, umbrella up and hands otherwise free, shows the idea succeeds. Hint at materials (coated nylon, mesh) with simple texture.

Tip: examiners reward suitability to the context, ease of carry and

use, uniqueness, attention to detail, and communication through visuals only. A simple, clearly-drawn mechanism beats a complex one that is hard to read. **Go Back to Q59**

Answer Key (Part A)

Section 1 - NAT (Numerical Answer Type)

Q1	Q2	Q3	Q4	Q5	Q6	Q7
48	352	56.25	1188	735	480.6	288

Q8	Q9	Q10	Q11	Q12	Q13	Q14
2400	7	35	64	60	61	4

Section 2 - MSQ (Multiple Select - one or more correct)

Q15	Q16	Q17	Q18	Q19
B, D	A, C	C	B, C, D	A, B, D

Q20	Q21	Q22	Q23	Q24
A, D	C, D	B, C	A, B	A, B, C, D

Q25	Q26	Q27	Q28	Q29
B, D	C, D	A, B, C, D	B, C	D

Section 3 - MCQ (single correct)

Q30	Q31	Q32	Q33	Q34	Q35	Q36
A	C	B	C	B	D	A

Q37	Q38	Q39	Q40	Q41	Q42	Q43
D	B	C	C	D	A	C

Q44	Q45	Q46	Q47	Q48	Q49	Q50
B	A	D	C	A	A	B

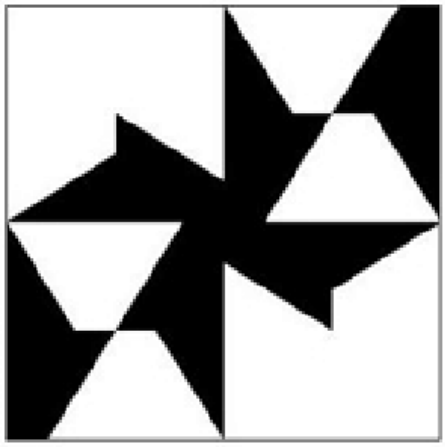
Q51	Q52	Q53	Q54	Q55	Q56	Q57
D	D	A	B	D	C	B

Part B (Q58-Q59) is subjective; see the Model Approach for each under Detailed Solutions.

Appendix: Visual Reasoning
Practice from Past UCEED Papers

These are **real questions from past UCEED papers**, included so you can practise on the actual figure style the exam uses. They are visual-reasoning questions, so work each one out yourself - no answer key is given here (this mirrors how such questions feel in the real test). A short **How to approach** note follows each figure.

P1. **(Past UCEED)** What is the area of the black portion in the square of side 16 cm?

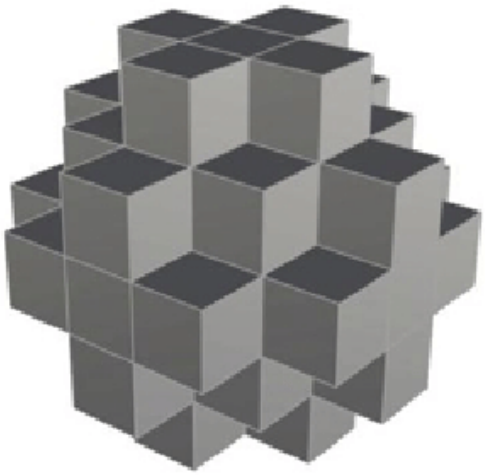


How to approach

The whole square has area $16 \times 16 = 256$ square cm. First check the figure for symmetry: if the black and white regions map onto each other under a rotation or reflection about the centre, then the black area is exactly half the square. If they do not, split the black shape into simple triangles and rectangles, read each base and height off the figure, find each area with $\frac{1}{2} \times$ base $\times$ height or length times breadth, and add them up.

P2. **(Past UCEED)** A solid object made of cubes is shown. It is symmetric about all three axes and has no cavities. How many cubes does the

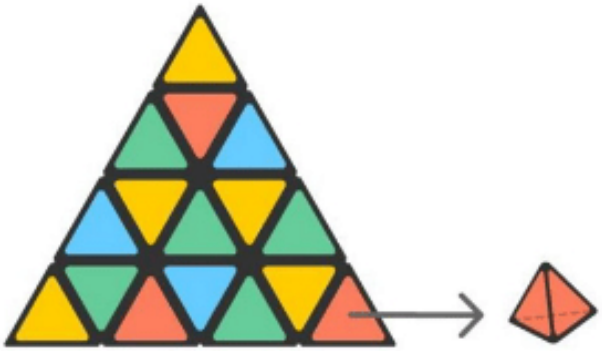
solid contain?



How to approach

Use the symmetry. Count the cubes in one horizontal layer (or one octant of the shape), then multiply by the number of identical layers, taking care not to double-count cubes that lie on a shared axis or plane. Because the solid has no cavities, build it up layer by layer from the bottom so you do not miss any hidden cubes tucked behind the front faces.

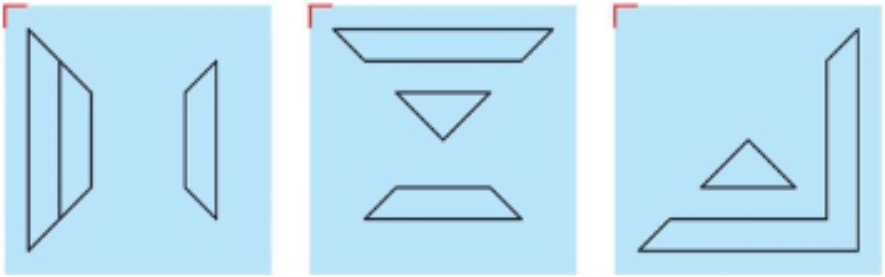
P3. (Past UCEED) A tetrahedral puzzle is made of smaller tetrahedrons. One face of the larger tetrahedron is shown divided into smaller triangles. Assuming all faces are the same, how many small tetrahedrons are there on the faces of the larger tetrahedron?



How to approach

First count the small triangles on the single face shown: a triangle whose edge is divided into 4 equal parts breaks into $4^2 = 16$ small triangles. Then decide which of those correspond to a small tetrahedron resting on the face, and remember the large tetrahedron has 4 identical faces. Watch the pieces at the corners and edges, which are shared between two or three faces, so they must not be counted more than once.

P4. (Past UCEED) Three transparent glass pieces with different engravings are shown. They are overlapped one on top of the other, with the marked (red) corner exactly matching each other. What is the total number of triangles in the resultant figure?



How to approach

Line up the three pieces exactly, matching the marked corner, and imagine all of their lines drawn on one square. Redraw this combined set of lines on rough paper. Then count triangles in a fixed order: first the smallest single triangles, then the larger triangles made of two or more small pieces, so that you neither miss any nor count one twice.