



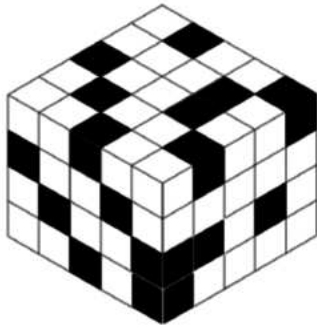
**PROVA DI AMMISSIONE AI CORSI DI LAUREA E DI LAUREA MAGISTRALE A CICLO UNICO  
DIRETTAMENTE FINALIZZATI ALLA FORMAZIONE DI ARCHITETTO (IN LINGUA INGLESE)**

Anno Accademico 2014/2015

**Test di Ragionamento Logico**

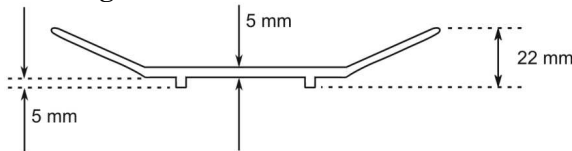
1. *When the heavy snow fell last week schools had to decide whether to close or remain open. The decision is always a difficult one, as there are a number of factors to consider. On the one hand, closing schools causes a lot of disruption, as working parents have to contact someone who can look after their children at short notice. On the other hand, it makes sense to try to keep the amount of traffic on the road as low as possible. However, if schools remain open when it snows, traffic increases as more parents take their children to school by car. Therefore all the schools in town should have been closed last week.*  
**Which one of the following is an assumption in the above argument?**
  - A) The problems caused by traffic are more significant than those caused to the parents by closing the schools
  - B) Parents wanted the schools to remain open
  - C) Teachers could have travelled into school
  - D) The schools that closed didn't consider their options carefully enough
  - E) Employers should take into account the needs of their employees who have children
  
2. *Doctors and nurses do not receive a bonus when they save a patient's life, as it is part of their job. It's the same with teachers when pupils do very well in their exams. However, in the UK it was recently proposed that police officers should be given a bonus of up to £1,000 per year based on their contribution to the detection of crime. This proposal should be rejected because public sector workers should just do their jobs well.*  
**Which one of the following, if true, most weakens the argument against the bonuses to police officers?**
  - A) In the UK there is a significant shortage of police officers
  - B) Teacher bonuses would actually depend on pupils' hard work
  - C) The National Health Service would not survive if it had to pay bonuses
  - D) The public is generally rather critical of police officers
  - E) In the private sector employers can pay bonuses to their employees at their discretion
  
3. *Luke has tried to avoid catching the football score before watching the highlights. He heard a cheer from the pub so he knows his team have scored at least one goal. They wouldn't have cheered like that for any other reason.*  
**Which one of the following most closely parallels the reasoning used in the above passage?**
  - A) Every night the next door family always make sure they turn out every light in the house before going to bed. Laura sees that their living room light is still on, so at least one of them must still be up
  - B) Every night the family next door always turn out every light in the house before going to bed. The hall light was on last night. There must be a reason for this. Maybe they've gone away on holiday
  - C) Every night the next door family always make sure they turn out every light in the house before going to bed. The living room light was on last night. The father has told Laura he is having difficulty sleeping, which would explain why the light was on
  - D) The family next door never turn all their lights off before going to bed, always leaving at least the hall light on. There have been no lights on now for three nights. Laura can conclude that they've gone away on holiday
  - E) The family next door leave lights on at night if their daughter is having nightmares. Their daughter was having nightmares last night, so they left the lights on

4. The cuboid shown below consists entirely of cubes that are identical, except that some are white and the rest are black.



What is the maximum possible number of black cubes in this cuboid?

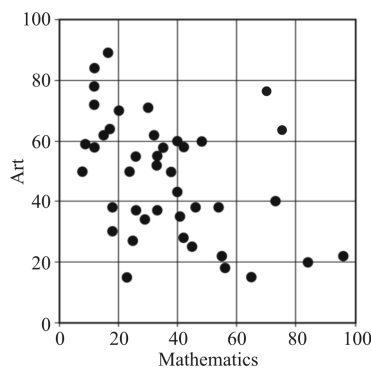
- A) 64
  - B) 56
  - C) 51
  - D) 66
  - E) 69
5. The diagram below shows a cross-section of one of Barbara's dinner plates.



Barbara is going to put a shelf in her kitchen cupboard. She wants to make sure that under the new shelf there is sufficient space to stack eight dinner plates (of the type shown in the diagram) and she also wants to make sure that there will remain a 5 mm space between the top plate and the shelf.

What is the minimum gap Barbara must leave beneath the shelf?

- A) 97 mm
  - B) 92 mm
  - C) 87 mm
  - D) 106 mm
  - E) 111 mm
6. A group of students takes two tests, one in art and one in mathematics. The tests are scored out of 100 and the results are shown below, with each spot representing one student's results.



Which one of the following can be reliably deduced from the chart above?

- A) Few students scored above average in both subjects
- B) Students generally scored similarly in both subjects
- C) A student who scored well in art generally also did well in mathematics
- D) A student who scored well in mathematics generally also did well in art
- E) The students found the mathematics test easier than the art test



7. The advertising agency *Beautiful Promotions* has a new logo. It has had the design engraved on glass and it will hang in the front window to be viewed from the outside as shown below:

bp

Unfortunately, the logo was hung upside down (i.e. rotated clockwise by 180°). Which one of the following shows how the logo appears from inside?

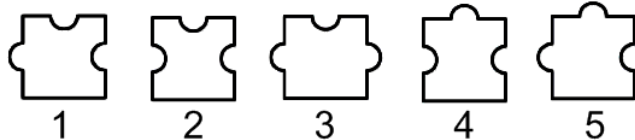
pb    qd    pd    bp    dq  
1       2       3       4       5

- A) 1  
B) 2  
C) 3  
D) 4  
E) 5

8. A child wants to put together a jigsaw puzzle with six pieces, but has lost one piece. The five remaining pieces are shown below:

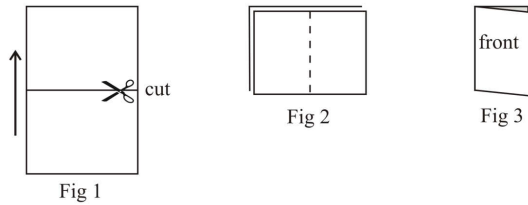


Which of the following pieces is the one that the child lost?



- A) 5  
B) 2  
C) 3  
D) 4  
E) 1

9. An eight-page booklet is to be made from a single sheet of paper which is printed before cutting and folding. As shown below, in stage 1 the paper is cut in half and the lower piece lifted and placed on top of the upper piece without changing its orientation. The two stacked sheets are then folded, as shown in figures 2 and 3, so that the top sheet ends up in the centre of the booklet.



The first page of the booklet is labelled F (front), the following pages are numbered from 1 to 6 in sequence and the last page is labelled B (back). Which one of the following layouts of the sheet shows the correct sequence of letters and/or numbers which should appear on the sheet before cutting and folding?

5	2	3	4	F	R	1	6	6	1
F	R	1	6	5	2	3	4	4	3
1	2	3	4	5	6	1	2	3	4

- A) 4  
B) 1  
C) 2  
D) 3  
E) 5

10. Three of the Tuesdays in a particular month of the year fall on even numbered days. What day is the 19<sup>th</sup> of that particular month?

- A) Friday  
B) Tuesday  
C) Wednesday  
D) Thursday  
E) Saturday

11. Identify the word whose etymology does NOT follow the same “logic” of the other words:

- A) ambitious  
B) ambivalent  
C) ambidextrous  
D) ambigender  
E) ambisexual

12. Identify the word whose etymology does NOT follow the same “logic” of the other words:

- A) paraffin  
B) paragon  
C) paradox  
D) parallel  
E) parallax

13. Which is the only pair of words that logically completes the following verbal equation?

$x : \text{philosophy} = \text{biochemistry} : y$

- A)  $x = \text{hermeneutics}$      $y = \text{chemistry}$   
B)  $x = \text{logistics}$          $y = \text{natural science}$   
C)  $x = \text{graphology}$         $y = \text{biology}$   
D)  $x = \text{criminology}$        $y = \text{biophysics}$   
E)  $x = \text{epistemology}$       $y = \text{biotechnology}$



Passage 1

Features of Chinese architecture

*Read the following passage and answer the questions referring to its content*

Chinese architecture refers to a style of architecture that has taken shape in Asia over the centuries. The structural principles of Chinese architecture have remained largely unchanged. The architecture of China is as old as Chinese civilisation. There is strong evidence from the artistic and literary sources available to us that the Chinese have always employed an indigenous system of construction that has retained its principal characteristics from prehistoric times to the present day. That this system of construction could perpetuate itself for more than four thousand years over such a vast territory and still remain a living architecture, is a phenomenon comparable only to the continuity of the civilisation of which it is an integral part. Chinese architecture retains its principal characteristics in spite of repeated foreign invasions – military, intellectual, spiritual.

There are certain features common to all Chinese architecture regardless of specific region or use. The most important is the emphasis of the horizontal axis, in particular the construction of a heavy platform and a large roof that floats over this base. The vertical walls are not as well emphasised. This contrasts with Western architecture which tends to grow in height and depth. Chinese architecture stresses the visual impact of the width of buildings. The halls and palaces in the Forbidden City, for example, have rather low ceilings when compared to stately buildings in the West. This of course does not apply to pagodas, which in any case are relatively rare.

Chinese buildings may be built with either grey or red bricks, but wooden structures are the most common: these are more capable of withstanding earthquakes, but are more vulnerable to fire. The roof of a typical Chinese building is curved; there are strict classifications of gable types, comparable with the classical orders of European columns.

Certain architectural features were reserved solely for buildings built for the Emperor. One example is the use of yellow roof tiles, yellow having been the Imperial colour. The Temple of Heaven, however, uses blue roof tiles to symbolise the sky. The wooden columns of the buildings, as well as the surface of the walls, tend to be red. Black is also widely used as it was believed that the colour black inspired the gods to descend to earth.

Numerology heavily influenced Imperial Architecture, hence the use of nine in much of construction (nine being the greatest number) and the reason why The Forbidden City in Beijing is said to have 9,999.5 rooms, just short of the 10,000 mythical rooms in heaven. The importance of the East (the direction of the rising sun) in orienting and siting imperial buildings is a form of worship found in many ancient cultures.

**14. In paragraph 1 the author's view of continuity of the principal features of Chinese architecture is that it is:**  
(see *passage 1*)

- A) continuity of Chinese architecture is tightly linked to the extraordinary continuity of the Chinese civilisation
- B) unsurprising, given the strong emphasis on the use of indigenous construction
- C) typical of the architectural continuity of Asia over many years
- D) interesting in its use of influences from other civilisations
- E) apparently impervious to the influence of other cultures following invasions

**15. Chinese architecture is concerned with:** (see *passage 1*)

- A) width rather than height
- B) vertical emphasis
- C) scale to indicate status
- D) regional features
- E) height rather than width

**16. From the information in *passage 1*, the common use of wooden structures suggest that the designers:**

- A) saw earthquakes as a significant risk
- B) wanted material which was cheaply available
- C) moved their ideas away from use of brick and tiles
- D) wanted buildings which would withstand fire
- E) thought wood a good medium to take the colours red and black

**17. According to *passage 1*, Chinese architects shared common ground with other ancient cultures in:**

- A) siting buildings to face the rising sun
- B) worship of the gods
- C) using ideas about the number nine to determine the number of rooms
- D) using curved roofs
- E) using the colour yellow to indicate status

**18. The author of *passage 1* suggests that pagodas:**

- A) are not common in Chinese architecture
- B) are wrongly associated with Chinese architecture
- C) were part of an ancient culture but became less common
- D) used the colour black to invoke the gods
- E) are held in high esteem in China

**Passage 2**

**Modern Decadence**

***Read the following passage and answer the questions referring to its content***

An obvious difference between the ancient world and today is the speed of our scientific progress and the immediate application of the findings of scientific research in ever more sophisticated technology. Whereas the aeolipile invented by Hero of Alexandria and considered the forerunner of the steam engine remained a toy, the discoveries of modern scientists and inventors have been swiftly used for practical ends. In this respect the 19th and 20th centuries have differed from all that have preceded them in "the cumulative products of scientific research and its utilitarian application, which in its degree is altogether unexampled in the history of mankind".

The fact that progress of a certain kind continues and accelerates can obscure the features of our own decline, since this decline has by no means reached the depths of sterility shown by Rome in the 3rd and 4th centuries AD. Our situation is more like that of the Greeks, whose faith in progress, particularly in technology and medicine, continued from the great age of the 5th century into the 4th BC, in the same way that similar expectations in these spheres have continued from the 19th century into the present. There was however "no falling off in creative energy": it was the age of the greatest orators and philosophers, when new forms of art and literature appeared, with remarkable advances in mathematics and astronomy. But, as in our case, "something at least of the old confidence had been lost".

With us scientific and technological advance continues apace, and the exploration of space leads to amazing astronomical discoveries. Inventiveness in new forms of culture continues – science fiction, impressionism in art and literature, the achievements in film, radio and television – we are far from the cultural barrenness which overcame Rome in the 4th century AD. Where this threatens, and most obviously resembles that of Rome, is in our architecture. In the 3rd century the Classical orders dissolved into plain walls and bare facades, in the same way as our glass and concrete houses have succeeded the buildings of the 19th and earlier 20th centuries, so varied in design and ornament.

In sculpture Thorvaldsen, Gibson and Bates, with the light-hearted charm of Carpeaux, mark the sunset of a long tradition, though elements of it linger in the ponderous forms of Maillol and Henry Moore. With Rodin something new appears, his "Balzac" reflecting the spirit and personality of the subject by effects of light and shade, optical illusions in the place of clear-cut form; or in the clay-modelled construction of his human figures with a plasticity maintained in the bronze casting and even when copied in marble. This style recalls third century impressionist sculpture, and goes along with the many modern experiments of more or less abstract kind. In this respect too, the part played by abstract designs parallels the variety of non-figural motifs in the post-Classical and Byzantine periods, later intensified by iconoclasm and the influence of Islam. The disparate and anarchist trends in today's art are expressive of our own Age of Anxiety – most obviously in the movements of painting as it ruptured the Classical mould, to the further movement represented by Picasso, from naturalism to abstraction and symbolism.

The oncoming anguish of the age is expressed by nineteenth century artists like Van Gogh in his self-portraits and his writhing, agonised landscapes, and in Munch's "Scream" of 1893. Almost a century earlier Goya had painted his "3rd May 1808". In his "Disasters of war" and the "dark paintings" of his final phase he presents war and all sorts of nastiness in a totally different manner to academic Classicism. Another century had to elapse before the cruel wastage and mutilation of young lives came to public consciousness in the terrible years which followed the glamorous expectations of August 1914, but already Goya was portraying war's effects in negating humanity among the stinking corpses, raped women and their wailing children. The bloodthirsty, sadistic evil is expressed in the "Disparates" (or "Absurdities") – no laughing matter these – and in the leering faces and monstrous Satanism of "Witches' Sabbaths" and other depictions of the dark side of human existence. Fuseli too hints at occult forces taking power, but the full dimension of this menace as the nineteenth century opens is left to Goya: the sinister onset of a phase of history, which with its torture, holocausts and military massacres, its terrorism and inhumanity, begins to rival, in the lives and deaths of millions, the miseries of the last century BC.

**19. Which one of the following is NOT a characteristic of the modern age? (see *passage 2*)**

- A) A falling off in creative energy
- B) New forms of culture
- C) Undecorated architecture
- D) Anarchist trends in art
- E) Ever more sophisticated technology

**20. Which one of the following options does NOT explain the decay of Roman art? (see *passage 2*)**

- A) Iconoclasm and the influence of Islam
- B) The disappearance of the classical orders in architecture
- C) Non-figurative art
- D) Impressionist sculpture
- E) The arts becoming sterile



21. **Rodin marks the turning point in modern sculpture because: (see passage 2)**
- A) He used optical illusion and light and shade to reflect the personality of the subject
  - B) He rejected the light-hearted charm of Carpeaux
  - C) There was no continuity with the past in his work
  - D) His style anticipates the ones of Maillol and Moore
  - E) He worked in bronze and marble
22. **Of the works considered in the passage 2, the earliest expression in painting of the “anguish of the age” was:**
- A) Goya’s “Disasters of war”
  - B) Van Gogh’s self-portraits
  - C) Munch’s “Scream”
  - D) The work of Fuseli
  - E) Van Gogh’s landscapes
23. **According to passage 2, for which of the following reasons is the modern age most similar to Rome in the fourth century AD?**
- A) There were similarities in Roman and modern architectural developments
  - B) Life was miserable in Ancient Rome as in the modern world
  - C) Faith in progress, especially in mathematics and astronomy
  - D) The arts continued to progress in Rome, and they do so in the modern world
  - E) In both Rome and the modern world faith in progress remained

**Test di Cultura Generale**

24. **Title V of the Italian Constitution was the subject of constitutional reform in 2001. What is it about?**
- A) The ordering of the Local Authorities
  - B) The guarantees set down in order to preserve the Constitution
  - C) The judicial system
  - D) The relations between the Italian government and the European Union
  - E) The rights and duties of citizens in matters of ethical and social relations
25. **What is the common name for the series of protests and unrest that began in the winter of 2010/11 in the Arab world?**
- A) The Arab Spring
  - B) The Gulf War
  - C) The October Revolution
  - D) Pan-Arabism
  - E) The Arab League
26. **Which treaty, signed on 7 February 1992, established the European Union?**
- A) Treaty of Maastricht
  - B) Treaty of London
  - C) Treaty of Schengen
  - D) Treaty of Lisbon
  - E) Treaty of Rome

27. In which foreign museum in 2013 was there a major exhibition of the archaeological finds from Pompeii and Herculaneum?
- A) British Museum
  - B) Frankfurt Archaeological Museum
  - C) The Louvre
  - D) Taipei National Palace Museum
  - E) Metropolitan Museum of Art

Test di Storia

28. This building is typical of the style known as:



- A) Art Nouveau
- B) Rococo
- C) Neo-classical
- D) Baroque
- E) Futurist

29. Which one of the following historical events is represented in this painting?



- A) The shooting of civilians after an uprising occurred in 1808 in Madrid
- B) The killing of civilians in Russia by Napoleon's troops in 1812
- C) The Revolution of Naples in 1799
- D) The Boston Massacre of 1770
- E) An episode that took place in France in 1793 during the Reign of Terror





30. Select the series that places the European architects in correct chronological order:

- A) Bramante, Herrera, Bernini, Viollet-le-Duc, Gaudí
- B) Herrera, Bramante, Bernini, Gaudí, Viollet-le-Duc
- C) Bernini, Bramante, Viollet-le-Duc, Gaudí, Herrera
- D) Gaudí, Viollet-le-Duc, Bramante, Herrera, Bernini
- E) Viollet-le-Duc, Bernini, Gaudí, Herrera, Bramante

31. The only surviving book about architecture from the Classical World is *De Architectura*, written in the 1st century BC. Who was its author?

- A) Vitruvius
- B) Strabo
- C) Tacitus
- D) Vergil
- E) Ptolemy

32. Which one of the following architects is associated with the Bauhaus school?



- A) Walter Gropius
- B) Frank Lloyd Wright
- C) Le Corbusier
- D) Giles Gilbert Scott
- E) Alvar Aalto

33. Select the series in which the following philosophers are correctly arranged in chronological order:

- A) Pythagoras-Socrates-Plato-Aristotle-Epicurus
- B) Pythagoras-Epicurus-Socrates-Plato-Aristotle
- C) Epicurus-Pythagoras-Aristotle-Plato-Socrates
- D) Epicurus-Plato-Aristotle-Socrates-Pythagoras
- E) Aristotle-Socrates-Pythagoras-Epicurus-Plato

34. This painting is the work of:



- A) Titian
- B) Raphael
- C) Michelangelo
- D) Velázquez
- E) El Greco

35. Which one of the following was the writer and revolutionary who founded *Young Italy* and inspired the Risorgimento?

- A) Mazzini
- B) Manzoni
- C) Garibaldi
- D) Cavour
- E) Gioberti

36. The construction of the Palace of Versailles, as shown in the photograph, began in the reign of which sovereign?



- A) Louis XIV
- B) Louis XVI
- C) Louis XVIII
- D) Louis XIII
- E) Louis XV



37. Which one of the following was the site of a famous battle in the Second Italian War of Independence?

- A) Solferino
- B) Anzio
- C) Montecassino
- D) Caporetto
- E) Lepanto

38. On what date did Hitler become Chancellor of Germany?

- A) January 1933
- B) October 1929
- C) August 1934
- D) July 1932
- E) May 1928

39. The technique of which 20th Century painter consists of dripping paint onto the canvas?

- A) Jackson Pollock
- B) Mark Rothko
- C) Piet Mondrian
- D) Georges Braque
- E) Roy Lichtenstein

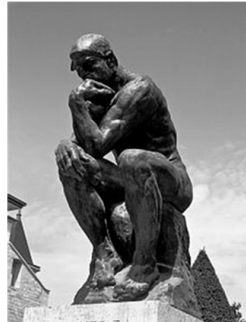
40. Which one of the following statements is NOT correct about the French Revolution?

- A) King Louis XVI was beheaded in 1790
- B) The attack on The Bastille on 14th July 1789 was one of the most important events of the Revolution
- C) A motto of the Revolution was "liberty, equality, fraternity"
- D) Robespierre and the Jacobins were the dominant group during the Reign of Terror
- E) Napoleon Bonaparte overthrew the Directory in 1799

41. What is the correct chronological order of the following sculptures?



a



b



c



d

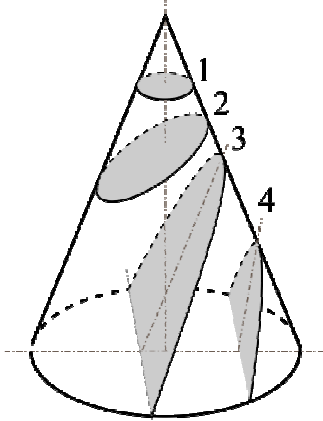


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- A) b-a-c-e-d
- B) a-b-c-d-e
- C) c-d-b-e-a
- D) c-a-b-e-d
- E) b-d-c-e-a

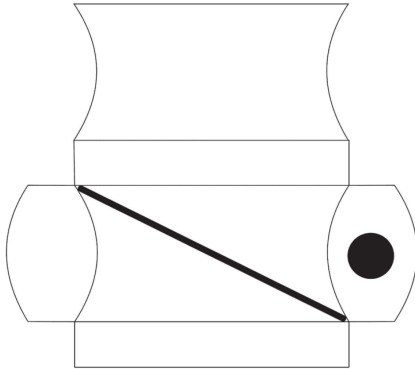
**Test di Disegno e Rappresentazione**

42. By sectioning the right circular cone with planes 1, 2, 3, 4, we will obtain respectively:

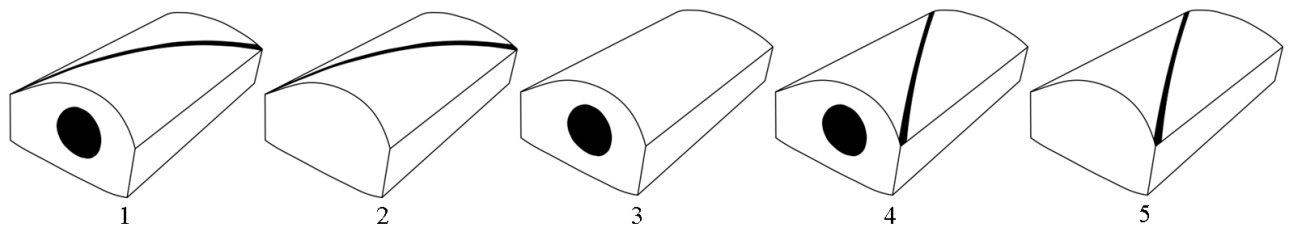


- A) 1–Circle, 2–Ellipse, 3–Parabola, 4–Hyperbola
- B) 1–Ellipse, 2–Circle, 3–Parabola, 4–Hyperbola
- C) 1–Circle, 2–Ellipse, 3–Hyperbola, 4–Parabola
- D) 1–Ellipse, 2–Circle, 3–Hyperbola, 4–Parabola
- E) 1–Parabola, 2–Hyperbola, 3–Circle, 4–Ellipse

43. The cardboard cut-out shown below can be folded to make a small box.



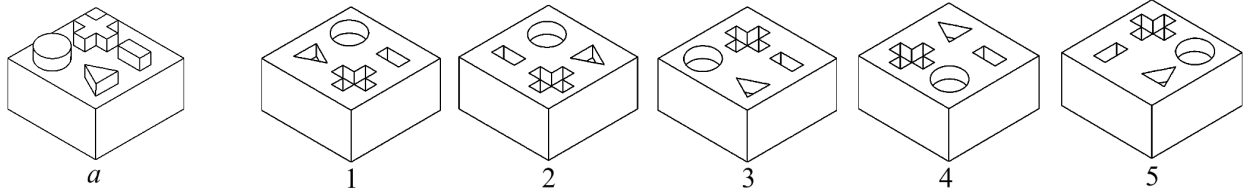
Which of the small boxes shown below could be made from the cut-out above?



- A) 1, 2 and 3
- B) 1, 3 and 5
- C) 2, 3 and 4
- D) 3, 4 and 5
- E) 2, 3 and 5

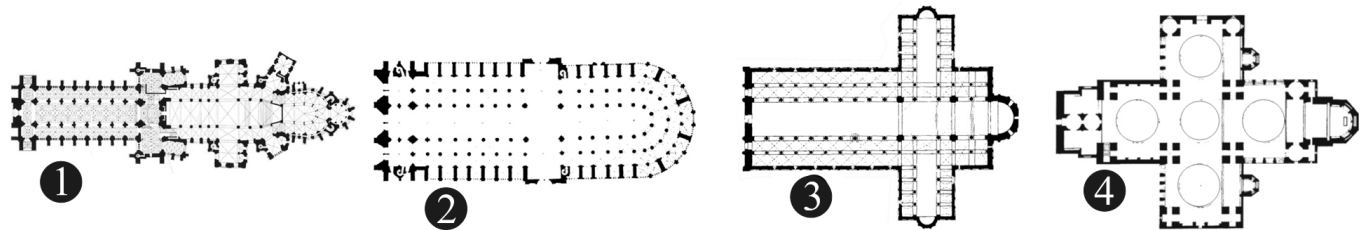
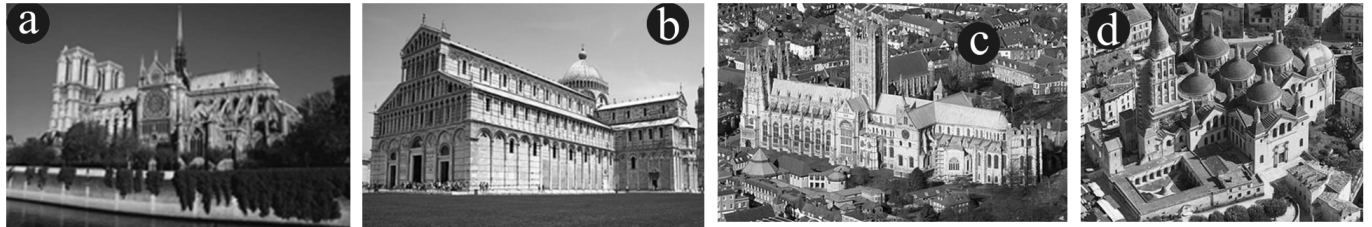


44. Which one of the solids (1-5) can be added to the solid (a) to make a cube?



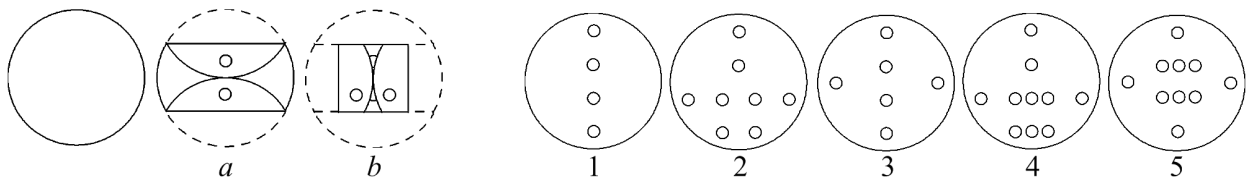
- A) 5
- B) 2
- C) 3
- D) 1
- E) 4

45. Identify the plans that correspond to each of the photographic images below.



- A) 1-c, 2-a, 3-b, 4-d
- B) 1-a, 2-d, 3-c, 4-b
- C) 1-c, 2-a, 3-d, 4-b
- D) 1-d, 2-c, 3-b, 4-a
- E) 1-a, 2-b, 3-c, 4-d

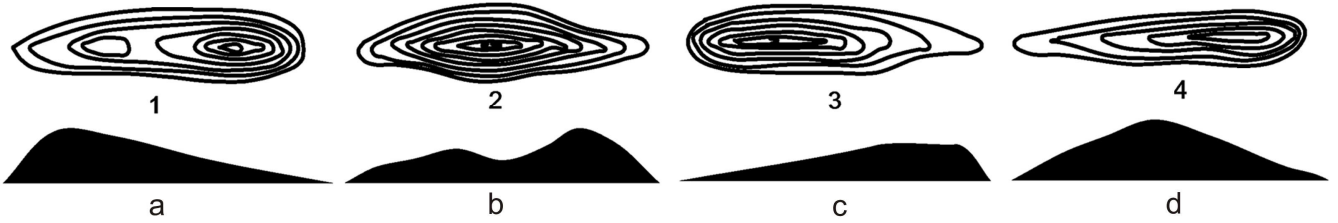
46. A circular piece of paper is folded and then punched as shown in diagram a. The paper is then folded and then punched again as shown in diagram b.



Which one of the 5 views above shows how the paper would look when fully unfolded?

- A) 4
- B) 5
- C) 1
- D) 3
- E) 2

47. Match each contour map (1, 2, 3, 4) to the corresponding image (a, b, c, d).



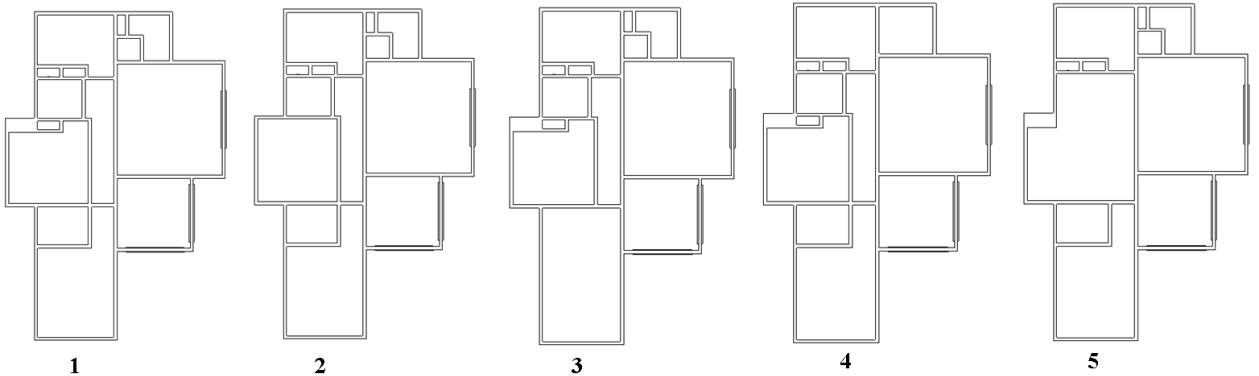
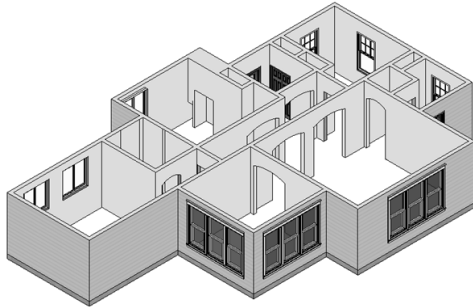
- A) Sectional view a - 3; Sectional view b - 1; Sectional view c - 4; Sectional view d - 2
- B) Sectional view a - 1; Sectional view b - 2; Sectional view c - 3; Sectional view d - 4
- C) Sectional view a - 4; Sectional view b - 1; Sectional view c - 3; Sectional view d - 2
- D) Sectional view a - 2; Sectional view b - 3; Sectional view c - 4; Sectional view d - 1
- E) Sectional view a - 4; Sectional view b - 2; Sectional view c - 3; Sectional view d - 1

48. Only ONE elevation (V, W, X, Y, Z) corresponds to the roofing plan shown below. Which one is it?



- View from above
- A) X
  - B) V
  - C) W
  - D) Y
  - E) Z

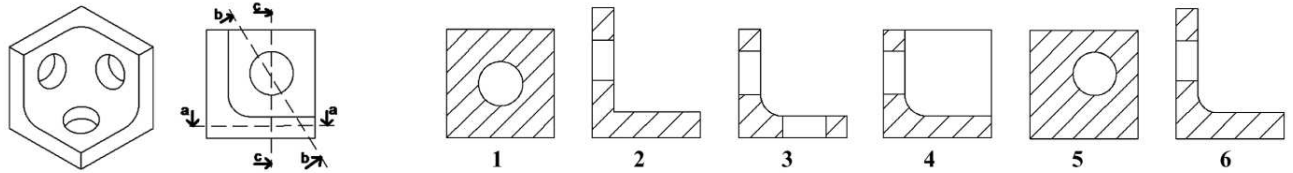
49. Identify the floor plan that corresponds to the cross-sectional isometric view of the building below.



- A) 1
- B) 2
- C) 3
- D) 4
- E) 5

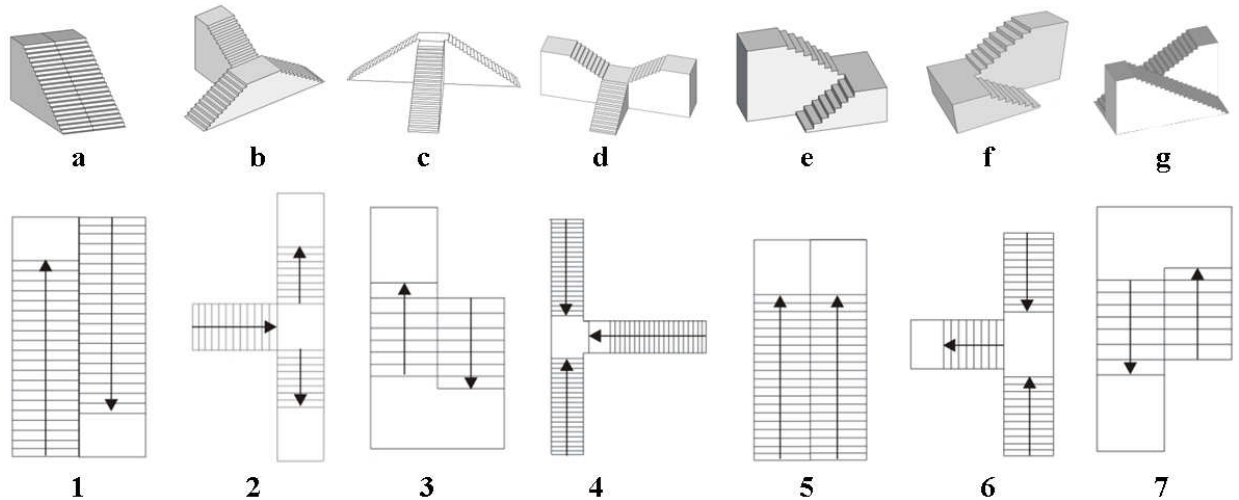


50. Match the correct sectional views (1-6) with the section planes a-a, b-b, c-c.



- A) a-5, b-6, c-3
- B) a-5, b-3, c-4
- C) a-1, b-3, c-2
- D) a-1, b-6, c-2
- E) a-5, b-6, c-2

51. Associate the 3-dimensional views of the staircases with the plan projections below.



- A) 1-g, 2-d, 3-f, 4-c, 5-a, 6-b, 7-e
- B) 1-a, 2-d, 3-f, 4-b, 5-g, 6-c, 7-e
- C) 1-g, 2-c, 3-e, 4-b, 5-a, 6-d, 7-f
- D) 1-g, 2-d, 3-e, 4-c, 5-a, 6-b, 7-f
- E) 1-a, 2-d, 3-f, 4-c, 5-g, 6-b, 7-e

**Test di Fisica e Matematica**

52. Calculate:  $\log_2 16 - \log_2(0,25) - 2\log_2 32$

- A) -4
- B) 9
- C) 4
- D) 0
- E) 8

53. What is the equation of the straight line which passes through the points (2, 5) and (6, -1)?

- A)  $2y + 3x = 16$
- B)  $3y + 2x = 16$
- C)  $2y = 3x - 20$
- D)  $3y = 2x - 15$
- E)  $2y = 3x + 4$

54. The triangle ABC is right-angled at vertex C. The length of AC is 5 cm. The angle CAB is 60 degrees. A line segment is drawn from C to intersect AB at the point H, such that CHB is a right-angled triangle. What is the length of HB in centimetres?

- A) 7,5
- B) 10
- C) 2,5
- D)  $5\sqrt{3}/2$
- E)  $5\sqrt{3}$

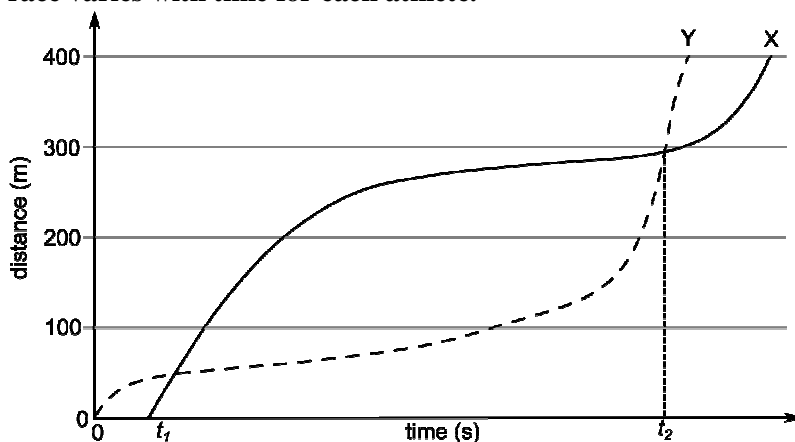
55. The equation  $x^2 + 3x = c - 5x$ , with the real parameter  $c$ , has a real repeated root of  $x$ . What is the value of  $c$ ?

- A) -16
- B) -4
- C) -1
- D) 4
- E) 16

56. The set A contains all of the numbers that are positive integer divisors of 30. The set B contains all of the numbers that are multiples of 5. How many numbers are in both set A and set B?

- A) 4
- B) 0
- C) 2
- D) 3
- E) 6

57. Two athletes (X and Y) run in a 400 m race. The graph shows how the distance covered during the race varies with time for each athlete.



Below are four possible statements about this race:

- 1 Athlete X reached the finishing line at 400 m before Athlete Y
- 2 Athlete X led the race at half distance
- 3 Athlete X started before Athlete Y
- 4 Athlete Y overtook athlete X at  $t_2$

Which statement(s) is/are correct?

- A) 2 and 4 only
- B) 1 only
- C) 2 only
- D) 1 and 3 only
- E) 2, 3 and 4 only





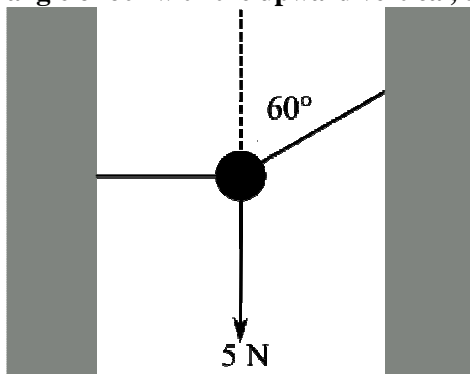
58. 50 grams of water at  $20\text{ }^{\circ}\text{C}$  is poured into a container holding 200 grams of water at  $70\text{ }^{\circ}\text{C}$ . What is the final temperature of the water after it is thoroughly mixed?  
[Assume there is no transfer of heat between the water and its surroundings, including the container]

A)  $60\text{ }^{\circ}\text{C}$   
B)  $30\text{ }^{\circ}\text{C}$   
C)  $40\text{ }^{\circ}\text{C}$   
D)  $45\text{ }^{\circ}\text{C}$   
E)  $50\text{ }^{\circ}\text{C}$

59. A cyclist accelerates uniformly from an initial speed of  $3.0\text{ ms}^{-1}$  to  $5.0\text{ ms}^{-1}$  in a time of 4.0 seconds. She then maintains this speed for a further 6.0 seconds. How far did the cyclist travel in these 10 seconds?

A) 46 m  
B) 31 m  
C) 34 m  
D) 62 m  
E) 38 m

60. A particle of weight 5 N is held in position by two light ropes as shown below. One of the ropes makes an angle of  $60^{\circ}$  with the upward vertical, the other is horizontal. What is the tension in the horizontal rope?



A)  $5\sqrt{3}\text{ N}$   
B)  $1,25\sqrt{3}\text{ N}$   
C)  $10\sqrt{3}\text{ N}$   
D) 5 N  
E) 10 N

\*\*\*\*\* FINE DELLE DOMANDE \*\*\*\*\*

**In tutti i quesiti proposti la soluzione è la risposta alla lettera A)**