PROVE UFFICIALI DEGLI ANNI PASSATI

TEST ARCHITETTURA

2019

IN INGLESE

PROVA UFFICIALE MUR

Il testo originale della prova

Ministero dell'Istruzione, dell'Università e della Ricerca

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 2019/2020

General Culture and Logical Reasoning Test

1. **Which of the following novelists was also a mathematician?**
   A) Lewis Carroll
   B) Michail A. Bulgakov
   C) George Eliot
   D) Gustave Flaubert
   E) George B. Shaw

2. **The Divine Comedy is divided into?**
   A) 3 canticles
   B) 99 chapters
   C) 12 books
   D) 34 songs
   E) 24 cantos

3. **Which of the following countries is not a member of the European Union?**
   A) Turkey
   B) Lithuania
   C) France
   D) Romania
   E) Sweden

4. **Which of the following plays was not written by William Shakespeare?**
   A) Lady Windermere's Fan
   B) The Taming of the Shrew
   C) Midsummer Night's Dream
   D) The Tempest
   E) The Merry Wives of Windsor

5. **Which of these countries does not share a border with Italy?**
   A) Croatia
   B) Austria
   C) Slovenia
   D) Switzerland
   E) France

6. **What is the Nevsky Prospect, one of St. Petersburg's main attractions?**
   A) A street
   B) A column
   C) A building
   D) A triumphal arch
   E) A church

7. Which physicist won the Nobel Prize in 1922 for his studies on the structure of the atom?

A) Niels H. D. Bohr
B) Joseph J. Thomson
C) Ernst Rutherford
D) Max Planck
E) Robert A. Millikan

8. Article 33 of the Constitution of the Italian Republic recites: "The Republic guarantees the freedom of …… which may be freely taught." Please fill in the blanks.

A) The arts and sciences
B) The humanities and techniques
C) Art and culture
D) The humanities and sciences
E) Culture and scientific research

9. The famous chorus *Va, pensiero* is part of which opera by Giuseppe Verdi?

A) Nabucco
B) Aida
C) La traviata
D) Il trovatore
E) Don Giovanni

10. The militant women's movement of the suffragette, a nationwide movement created to campaign for the right to vote for women, started in which country?

A) United Kingdom
B) Canada
C) France
D) United States
E) Germany

11. The famous film *The Panisperna Boys*, set in the 1930s, is about which of the following?

A) The story of a group of young physicists and mathematicians
B) The story of a group of young doctors
C) The story of a group of young dancers
D) The story of a group of young artists
E) The story of a group of young antifascist writers

12. The CERN is located in the suburbs of which city?

A) Geneva
B) Strasburg
C) Zurich
D) Basel
E) Bern

13. One of the following pairings is not coherent with the others. Which?

A) sticky – sparse
B) solid – reliable
C) opaque – dull
D) rigid – austere
E) smooth – fluid

14. **When a mass of water passes from a liquid to a solid state it increases by 1/11. When this same mass of ice passes from a solid to a liquid state it decreases by…….**
Choose the appropriate answer.
    A) 1/12
    B) 1/11
    C) 11/12
    D) 12/11
    E) 1/10

15. **The supermarket where Alice and Giorgio do their shopping offers one gadget for every 30 € spent. If you know that the total number of offered gadgets is 24, that Giorgio needs twice Alice's gadgets to complete the collection, and that Alice has 4 more gadgets than Giorgio, how many gadgets does Alice have?**
    A) 20
    B) 16
    C) 18
    D) 22
    E) 21

16. **Giorgio has to feed his fish; he has 20 fish in two separate tanks. If for each fish in the first tank Giorgio has to use five larva, while for each fish in the second tank he has to use six, how many of Giorgio's fish are in the second tank, if he uses a total of 112 larva to feed his 20 fish ?**
    A) 12
    B) 15
    C) 10
    D) 8
    E) 16

17. **How many pairs of positive whole numbers m, n (if m > n) are required so that $m^2 = n^2 + 60$?**
    A) 2
    B) 4
    C) 1
    D) 0
    E) 3

18. **Having drawn an isosceles triangle ABC consider the triangle ABD with the same base AB and its vertex on the extension of height CH. If height DH of ABD is double height CH of ABC, to which fraction of the area of ABD does the triangle ABC correspond?**
    A) 1/2
    B) 2
    C) 1/4
    D) The above data is insufficient to calculate the solution to the question
    E) 1

19. Premises: all fourth year architecture exams are very difficult; no very difficult exam has less than six credits. Which of the following statements is unquestionably true?

A) All the fourth year architecture exams are worth at least six credits.
B) No architecture exam, unless it is a fourth year exam, is worth at least six credits.
C) At the faculty of architecture only the fourth year exams and above are worth at least six credits.
D) At the faculty of architecture the exams of the first three years are worth a maximum of six credits
E) Every fourth year exam is worth six credits.

20. Truth tables are tables used in logic to determine whether, having assigned truth values to their propositional expressions, a certain propositional expression is true or false. The truth tables of conjunction ($\wedge$), implication ($\Rightarrow$) and negation ($\neg$) are respectively:

A	B	$A \wedge B$
V	V	V
V	F	F
F	V	F
F	F	F

A	B	$A \Rightarrow B$
V	V	V
V	F	F
F	V	V
F	F	V

A	$\neg A$
V	F
F	V

Which is the truth table of proposition P: $(\neg A \Rightarrow B) \wedge A)$?

A)

A	B	P
V	V	V
V	F	V
F	V	F
F	F	F

B)

A	B	P
V	V	F
V	F	V
F	V	V
F	F	F

C)

A	B	P
V	V	F
V	F	F
F	V	F
F	F	F

D)

A	B	P
V	V	V
V	F	F
F	V	F
F	F	F

E)

A	B	P
V	V	V
V	F	V
F	V	F
F	F	V

Excerpt 1

Read the excerpt below and answer each question based only on the information provided (explicitly or implicitly) in the excerpt and not based on what the candidate may already know about the subject.

THE BROKEN WINDOWS THEORY

[…] at the community level, disorder and crime are usually inextricably linked, in a kind of developmental sequence. Social psychologists and police officers tend to agree that if a window in a building is broken and is left unrepaired, all the rest of the windows will soon be broken. This is as true in nice neighbourhoods as in rundown ones. Window-breaking does not necessarily occur on a large scale because some areas are inhabited by determined window-breakers whereas others are populated by window-lovers; rather, one unrepaired broken window is a signal that no one cares, and so breaking more windows costs nothing. (It has always been fun.) Philip Zimbardo, a Stanford psychologist, reported in 1969 on some experiments testing the broken-window theory. He arranged to have an automobile without license plates parked with its hood up on a street in the Bronx and a comparable automobile on a street in Palo Alto, California. The car in the Bronx was attacked by "vandals" within ten minutes of its "abandonment." The first to arrive were a family--father, mother, and young son--who removed the radiator and battery. Within twenty-four hours, virtually everything of value had been removed. Then random destruction began--windows were smashed, parts torn off, upholstery ripped. Children began to use the car as a playground. Most of the adult "vandals" were well-dressed, apparently clean-cut whites. The car in Palo Alto sat untouched for more than a week. Then Zimbardo smashed part of it with a sledgehammer. Soon, passers-by were joining in. Within a few hours, the car had been turned upside down and utterly destroyed. Again, the "vandals" appeared to be primarily respectable whites. Untended property becomes fair game for people out for fun or plunder and even for people who ordinarily would not dream of doing such things and who probably consider themselves law-abiding. Because of the nature of community life in the Bronx--its anonymity, the frequency with which cars are abandoned and things are stolen or broken, the past experience of "no one caring"--vandalism begins much more quickly than it does in staid Palo Alto, where people have come to believe that private possessions are cared for, and that mischievous behaviour is costly […]

(excerpt from the book *Broken Windows* by James Wilson and George Kelling published in the magazine "*Atlantic Monthly*". March 1982).

21. After reading the *Excerpt 1*, it is possible to deduce the following:

P1 Neglect and disorder trigger an increase in antisocial behaviour.

P2 "Vandals" appear to be primarily respectable whites both in the Bronx and Palo Alto.

P3 Antisocial and destructive behaviour is much quicker to appear amongst the inhabitants of the Bronx than amongst the inhabitants in staid Palo Alto.

Which one/ones of the above statements is/are correct?

A) P1 and P_2
B) P2 and P_3
C) Only P_1
D) Only P_3
E) None of the above

22. After reading the *Excerpt 1*, it is possible to deduce the following:

P_1 Vandalism is not a prerogative of a rundown neighbourhood but is linked to a lower degree of reciprocal respect.

P_2 To test his theory Zimbardo chose two very different socio-cultural neighbourhoods.

P_3 Certain groups of social actors have intuitively reached the same conclusion as Zimbardo.

Which one/ones of the above statements is/are correct?

A) All the above
B) None of the above
C) Only P_1
D) Only P_2
E) Only P_3

History Test

23. What is the exact chronological sequence of the events show below?

a. Promulgation of the Italian Constitution
b. The Birth of the Italian Republic
c. Designation of Rome as the capital of Italy
d. The March on Rome
e. The End of the Second World War

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

24. What is the exact chronological sequence of the events show below?

a. The Storming of the Bastille
b. Napoleon's Russian Campaign
c. The United States Declaration of Independence
d. The Congress of Vienna
e. The End of Napoleon III's Empire

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

25. The socialist government known as the Paris Commune ruled in which year?

A) 1871
B) 1861
C) 1848
D) 1815
E) 1890

26. Who was the first President of Italy?

A) Enrico de Nicola
B) Luigi Einaudi
C) Giovanni Leone
D) Sandro Pertini
E) Antonio Gramsci

27. The expression Blitzkrieg ("lightning war") is mainly used to describe a tactic involving short, fast powerful attacks; it was exploited by:

A) Adolf Hitler
B) Federico II di Prussia
C) Josef von Radetzky
D) Otto von Bismarck
E) Klemens von Metternich

28. On what day was the State of Israel proclaimed?

A) 14 May 1948
B) 5 June 1967
C) 20 January 1933
D) 27 January 1945
E) 6 October 1973

29. What is the name given to the main square in Greek cities surrounded by all the most important buildings?

A) Agora
B) Forum
C) Acropolis
D) Platea
E) Peristylium

30. What style would you associate with the Leaning Tower of Pisa?

A) Romanesque
B) Renaissance
C) Neoclassical
D) Gothic
E) Classical

31. Which is the correct chronological sequence between the following architects?

a. Borromini
b. Vanvitelli
c. Bramante
d. Brunelleschi
e. Palladio

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

32. Who built the Malatesta Temple?

A) Leon Battista Alberti
B) Francesco di Giorgio Martini
C) Giuliano da Sangallo
D) Gianlorenzo Bernini
E) Giuseppe Piermarini

33. Which earlier models inspired the Christian basilica?

A) Roman
B) Greek
C) Jewish
D) Hellenic
E) Etruscan

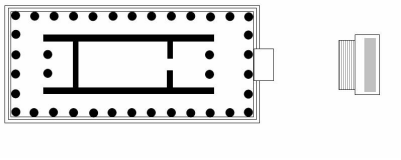
34. The Bauhaus was founded by:

A) Walter Gropius
B) Le Corbusier
C) Marcel Breuer
D) Ludwig Mies van der Rohe
E) Eugène Viollet-le-Duc

35. Who designed the Guggenheim Museum in Bilbao?

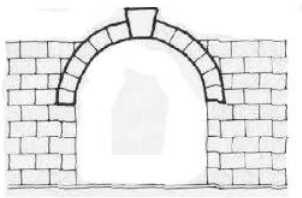
A) Frank O. Gehry
B) Massimiliano Fuksas
C) Zaha Hadid
D) Frank Lloyd Wright
E) Renzo Piano

36. What word is used for the cella in Greek temples?



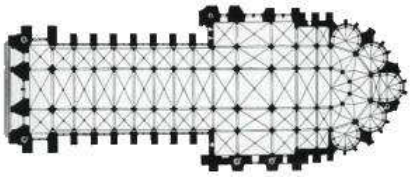
A) naos
B) pronaos
C) opisthodomos
D) peristasis
E) peristalsis

37. What is the name of the ashlar placed at the vertex of an arch?



A) Keystone
B) Pier
C) Impost
D) Metope
E) Acroterion

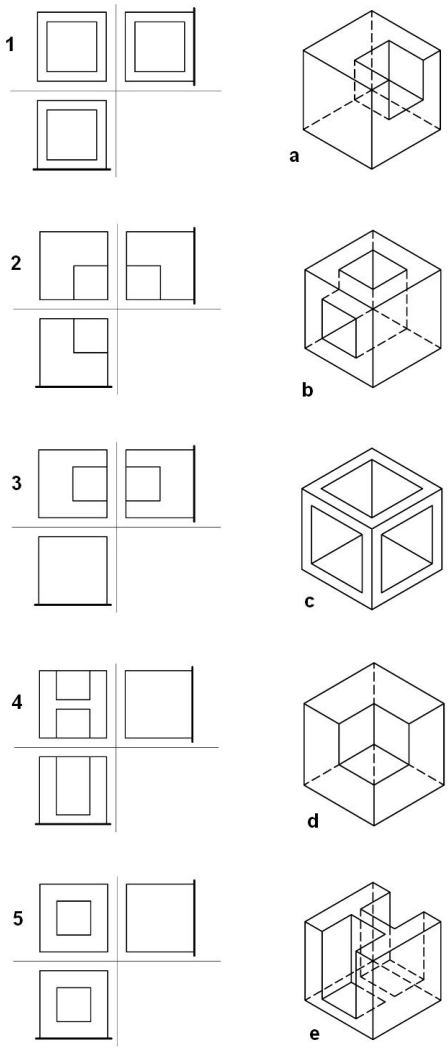
38. This is the plan of which kind of church?



A) Gothic
B) Baroque
C) Early Christian
D) Romanesque
E) Renaissance

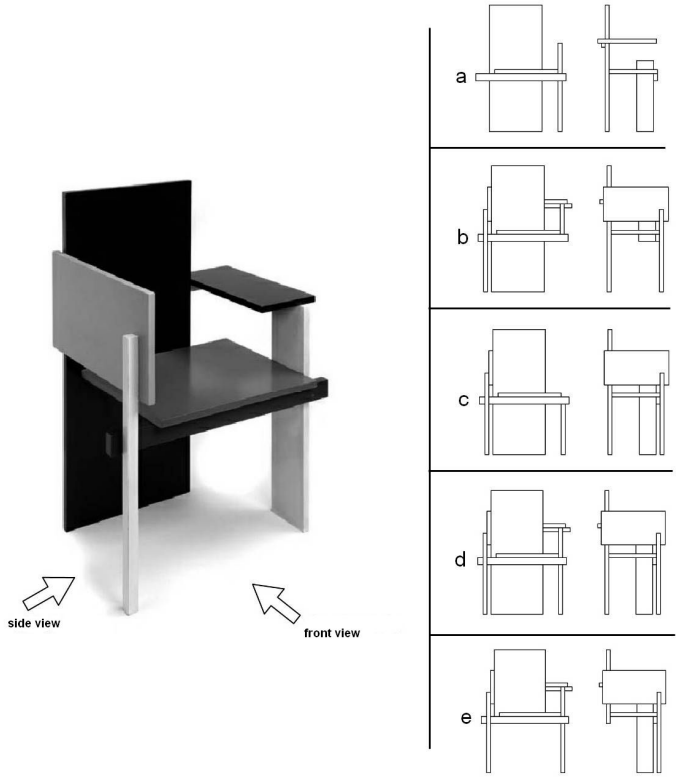
Drawing and Representation Test

39. Correctly pair the isometric axonometric figures with the corresponding orthogonal projections.



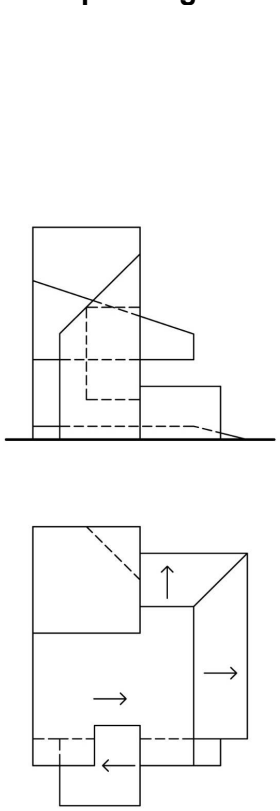
A) 1-c; 2-d; 3-a; 4-e; 5-b;
B) 1-a; 2-b; 3-c; 4-d; 5-e;
C) 1-c; 2-d; 3-e; 4-a; 5-b;
D) 1-c; 2-d; 3-a; 4-b; 5-e;
E) 1-d; 2-c; 3-a; 4-e; 5-b;

40. Examine the three-dimensional image of the chair, then choose the pair of orthogonal projections (front and side view) that correspond exactly.

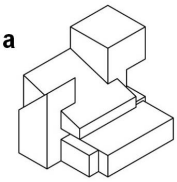


A) d
B) b
C) c
D) a
E) e

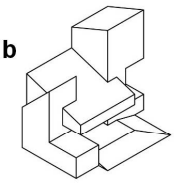
41. Given the orthogonal projection of a solid (plan and side elevation) choose the corresponding exact axonometric view.



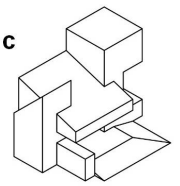
a



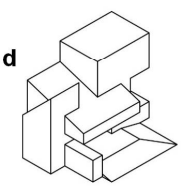
b



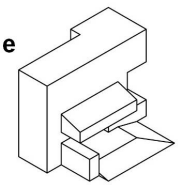
c



d

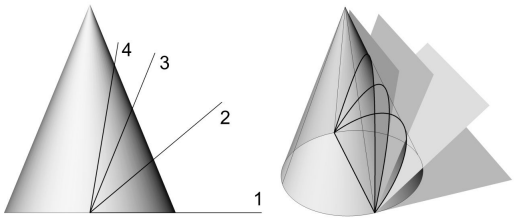


e



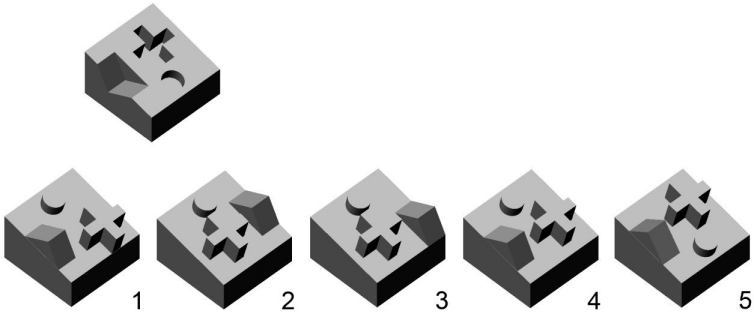
A) c
B) b
C) a
D) d
E) e

42. When a straight circular cone is sectioned by a plane it will produce, respectively:



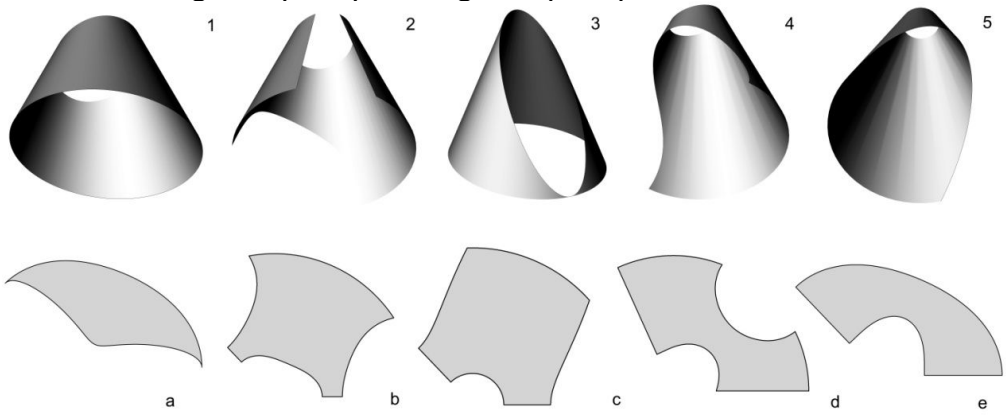
A) 1-circumference, 2-ellipse, 3-parabola, 4-hyperbola
B) 1- parabola, 2-hyperbola, 3-circumference, 4-ellipse
C) 1-circumference, 2-parabola, 3-ellipse, 4-hyperbola
D) 1-hyperbola, 2-ellipse, 3-parabola, 4-circumference
E) 1- ellipse, 2-circumference, 3-parabola, 4-hyperbola

43. Which of the solid figures (1 - 5), when overturned and combined with the single figure above, will create a complete cube?



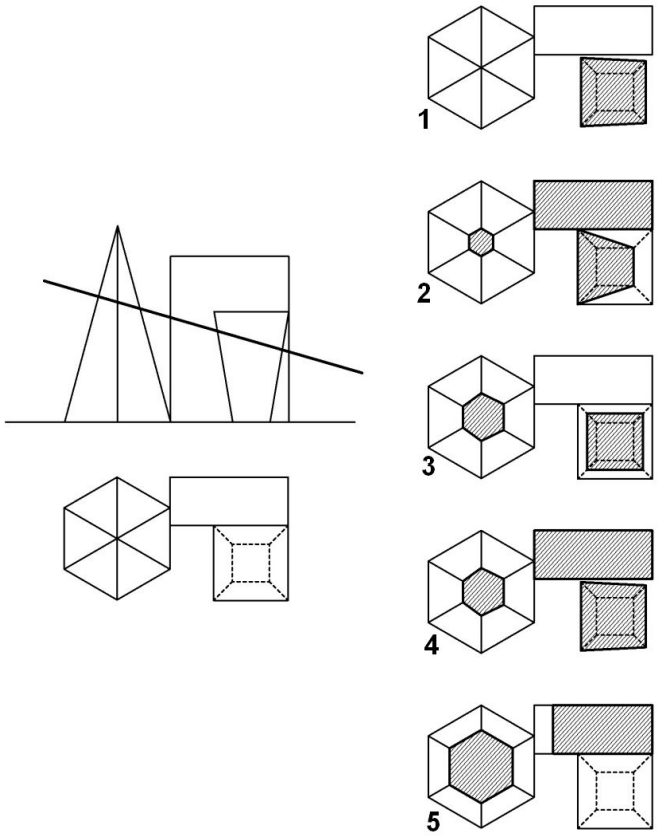
A) 4
B) 1
C) 2
D) 3
E) 5

44. Match cone figures (1 – 5) with figures (a – e).



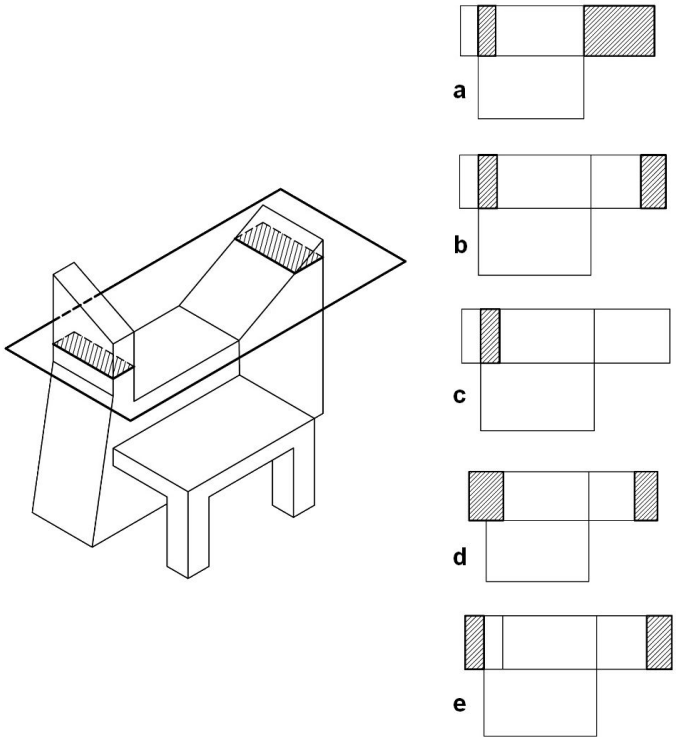
A) 1-e, 2-d, 3-a, 4-b, 5-c
B) 1-a, 2-b, 3-c, 4-d, 5-e
C) 1-e, 2-d, 3-b, 4-a, 5-c
D) 1-e, 2-d, 3-a, 4-c, 5-b
E) 1-c, 2-d, 3-a, 4-b, 5-e

45. Observe the figure of the section plane cutting through the composition of solids shown in plan and elevation and choose the correct sectioned plan.



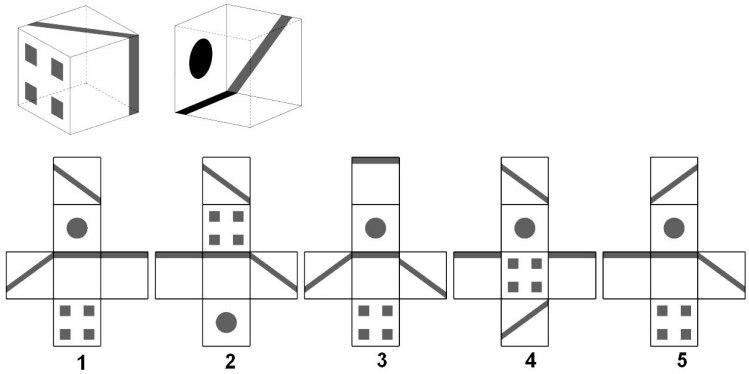
A) 4
B) 1
C) 2
D) 3
E) 5

46. Observe the plane sectioning all the solids and then choose the section with the correct orthogonal projections.



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

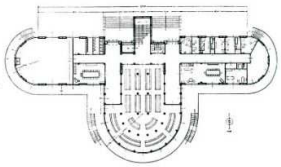
47. Observe the two views of a cube with figures on its sides (above) and then choose the correct corresponding plan (1 – 5).



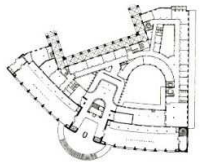
A) 1
B) 2
C) 3
D) 4
E) 5

48. Correctly combine the photographs of buildings (1 – 5) with their corresponding plans (a – e).

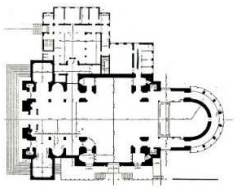
1 

a 

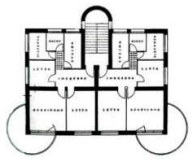
2 

b 

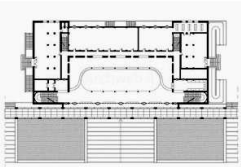
3 

c 

4 

d 

5 

e 

A) 1-d; 2-e; 3-a;4-c;5-b
B) 1-a; 2-b; 3-c;4-d;5-e
C) 1-d; 2-a; 3-e;4-b;5-c
D) 1-e; 2-d; 3-a;4-c;5-b
E) 1-d; 2-e; 3-a;4-b;5-c

Mathematics and Physics Test

49. On diameter AB = 2r of a semicircle establish point C anywhere (but not at the extremities) and create two semicircumferences of diameters AC and CB within this semicircle. The ensuing figure, limited by the three semicircumferences, known as arbelos, was studied by Archimedes.
What is the measurement of the perimeter of the arbelos?

A) $2\pi r$
B) $1{,}5\pi r$
C) $3\pi r$
D) $2{,}5\pi r$
E) πr

50. Which one/ones of the following pairs of functions:

C_1:

$f(x) = \cos x$

$g(x) = \cos|x|$

C_2

$f(x) = \sin x$

$g(x) = |\sin x|$

C_3

$f(x) = \sqrt{\tan^2 x}$

$g(x) = \tan x$

is/are made up of functions with the same graph for $-\pi/2 < x < \pi/2$

A) Only pair C_1
B) Pairs C_1 and C_3
C) Only pair C_2
D) Pairs C_2 and C_3
E) None of the pairs

51. Which one/ones is/are the real solution/solutions for equation: $\frac{3}{x} = \sqrt{6}$ **?**

A) $\sqrt{\frac{3}{2}}$
B) $\frac{3}{2}$
C) $\pm\sqrt{\frac{3}{2}}$
D) $\frac{\sqrt{6}}{3}$
E) There are no real solutions

52. Which are the solutions of the equation $\sin x + \cos x = 1$ **when** $0 \le x < 2\pi$ **?**

A) $x = 0$ and $x = \pi/2$
B) $x = 0$ and $x = \pi$
C) $x = \pi$ and $x = 3\pi/2$
D) $x = \pi$ and $x = 2\pi$
E) The equation has no solution for the assigned interval

53. What is the ensemble of the real solutions for inequality $2\ln^2 x + \ln x < 1$?

A) $\frac{1}{e} < x < \sqrt{e}$

B) $0 < x < \frac{1}{e}$

C) The empty ensemble

D) $x > 0$

E) $x < -e$

54. Given the three straight lines of plane xy of equation $y = x$, $2x - y - 1 = 0$, $4y - x - 3 = 0$, which of the following statements is true?

A) They all pass through the same point

B) They are orthogonal in pairs

C) They are all parallel

D) At least one straight line has a negative angular coefficient

E) The second and third straight line both intersect the negative semi axis of

55. Based on the second law of dynamics, which of the following statements is correct?

A) Force and acceleration have directly proportional modules

B) Mass and module of acceleration are directly proportional

C) The directions of force and acceleration are perpendicular

D) Force and velocity have inversely proportional modules

E) The vectors force and acceleration always move in different directions

56. In the Cartesian plane xOy (the same unit of measure – cm – is used on the axes) one charge $q_1 = -4 \times 10^{-7}$C is placed in point (3,0), and a second charge $q_2 = 12 \times 10^{-7}$C is placed in point (0,6). What is the intensity of the resulting force acting on charge $q_3 = 10^{-6}$C placed at the source (approximate Coulomb constant k with 9×10^9 Nm^2/C^2)?

A) 5 N

B) 5×10^4 N

C) -1 N

D) 10^4 N

E) 7 N

57. A uniform 2.6 m long horizontal pole weighs 6 N and is hinged at one end. At the other end force *F* is applied forming a 30° angle with the pole, facing upwards. What is the intensity of the force so that the pole remains balanced in a horizontal position?

A) 6 N

B) 12 N

C) 3 N

D) 9 N

E) 15 N

58. Two stone blocks with masses of $m_1 = 2$ kg and $m_2 = 3$ kg respectively are tied to a rope and rest on a frictionless horizontal plane. If a force of 10 N is horizontally applied to the object with a smaller mass so as to pull the two masses, what is the tension of the rope in Newtons?

A) 6

B) 10

C) 5

D) 4

E) 2

59. A force with intensity *F* (measured in N) variable in time according to law *F*(*t*) = *t*/3 is applied to a material point for 12 seconds starting from *t* = 0 s. What is the variation in the quantity of movement of the point in those 12 seconds?

A) 24 Nxs
B) 48 Nxs
C) 6 Nxs
D) 36 Nxs
E) 8 Nxs

60. A spring with constant *k* = 800 N/m is compressed by 10 cm. What is the module of the work performed to compress the spring?

A) 4 J
B) 80 J
C) 4000 J
D) 8 J
E) 0 J

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

In all the presented questions the right answer is at letter A)

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