NATA 2018 Question Paper with Solution

National Aptitude Test in Architecture (NATA)

National Aptitude Test in Architecture (NATA) 2018
Council of Architecture

Participant ID:	
App Sequence no:	
Participant Name:	
Test Center Name:	
Test Date:	
Test Time:	
Subject:	
Marks Obtained:	

Section : **Mathematics**

Q.1 The logarithm of $\dfrac{1}{256}$ to the base $2\sqrt{2}$ is

Ans

1. $\dfrac{-16}{3}$

2. $\dfrac{8}{3}$

3. $\dfrac{-8}{3}$

4. $\dfrac{-14}{3}$

Q.2 The equation of the normal to the circle $x^2 + y^2 = 2x$ which is parallel to the straight line $x + 2y = 3$ is given by

Ans

1. $x + 2y - 1 = 0$

2. $2x - y + 1 = 0$

3. $x + 2y + 1 = 0$

4. $x - 2y + 1 = 0$

Q.3 A straight highway leads to the foot of a 50m tall tower. From the top of the tower the angle of depression of the two cars on the highway are $30°$ and $60°$. Then the distance between the two cars is

Ans

1. $\sqrt{3}/10\,\text{m}$

2. $100/\sqrt{3}\,\text{m}$

3. $10\sqrt{3}\,\text{m}$

4. $100\sqrt{3}\,m$

Q.4 If $\tan A = 1$ and $\tan B = \sqrt{3}$, then $\cos(A+B)$ is equal to

Ans

1. $\dfrac{1-\sqrt{3}}{2\sqrt{2}}$

2. 1

3. $\dfrac{\sqrt{3}}{2\sqrt{2}}$

4. $\dfrac{1+\sqrt{3}}{2\sqrt{2}}$

Q.5 If $A = \begin{pmatrix} 0 & -i \\ i & 0 \end{pmatrix}$ and $B = \begin{pmatrix} 1 & 0 \\ 0 & -1 \end{pmatrix}$ are matrices, then $AB + BA$ is

Ans

1. a null matrix

2. a diagonal matrix

3. an invertible matrix

4. a unit matrix

Q.6 If a, b, c are in A.P., as well as in G.P., then

Ans

1. $a = b \neq c$
2. $a \neq b = c$
3. $a \neq b \neq c$
4. $a = b = c$

Q.7 The distance between two parallel lines $5x - 12y + 2 = 0$ and $5x - 12y - 3 = 0$ is given by

Ans

1. $5/13$
2. $1/13$
3. $1/17$
4. $5/14$

Q.8 The sum of the 24 terms of the series $\sqrt{2} + \sqrt{8} + \sqrt{18} + \sqrt{32} + \ldots$ is

Ans

1. $100\sqrt{2}$

2. $500\sqrt{2}$

3. $300\sqrt{2}$

4. $200\sqrt{2}$

Q.9 If $A = \begin{pmatrix} 1 & 0 & 2 \\ 5 & 1 & x \\ 1 & 1 & 1 \end{pmatrix}$ is a singular matrix, then the value of x is

Ans
1. 9
2. -11
3. -9
4. 11

Q.10 The tangents of two points A and B on the circle with centre O intersect at a point P. If, in quadrilateral PAOB, $\angle AOB : \angle APB = 5 : 1$, then the measure of $\angle APB$ is given by

Ans
1. 60°
2. 15°
3. 30°
4. 45°

Q.11 If $\tan(A-B) = \dfrac{1}{\sqrt{3}}$ and $\tan(A+B) = \sqrt{3}$, then the values of A and B are respectively

Ans
1. $45^{\circ}, 15^{\circ}$
2. $40^{\circ}, 20^{\circ}$
3. $30^{\circ}, 60^{\circ}$
4. $30^{\circ}, 30^{\circ}$

Q.12 In a circle of radius 17cm, two parallel chords are drawn on opposite side of a diameter. The distance between the chords is 23cm. If the length of one chord is 16cm, then the length of the other chord is

Ans
1. 30cm
2. 15cm
3. 34cm
4. 23cm

Q.13 Two girls and four boys are to be seated in a row in such a way that the girls do not sit together. In how many different ways can it be done?

Ans
1. 720
2. 480
3. 240
4. 360

Q.14 An angle which is greater than 180° but less than 360° is known as

Ans
1. an adjacent angle

2. an alternate angle

3. a right angle

4. a reflex angle

Q.15 The number of common tangents that can be drawn to two given circles is at the most

Ans

1. two

2. one

3. four

4. three

Q.16

$$\lim_{x \to \infty} \left(\sqrt{x + \sqrt{x + \sqrt{x}}} - \sqrt{x} \right) \text{ is equal to}$$

Ans

1. $\log_e(2)$

2. 0

3. 0.5

4. 2

Q.17 If $\log_{\sqrt{5}}(x) + \log_{\sqrt[3]{5}}(x) \log_{\sqrt[4]{5}}(x) + \dots$ up to 7 terms $= 35$, then the value of x is

Ans

1. 5

2. 75

3. 125

4. 25

Q.18 AB is a straight line and O is a point on the line AB. If one draws a line OC not coinciding with OA or OB, then the $\angle AOC$ and $\angle BOC$ are

Ans

1. complementary

2. together equal to $130°$

3. supplementary

4. equal

Q.19 Three vertices of $\triangle ABC$ are A(1, 4), B(-2, 2) and C(3, 2). Then the area of $\triangle ABC$ is

Ans

1. 7 sq. units

2. 5 sq. units

3. 15 sq. units

4. 6 sq. units

Q.20 The equation of the plane passing through the point (1, -1, 2) and parallel to the plane 3x + 4y -5z = 0 is

Ans

1. $3x + 4y - 5z + 11 = 0$

2. $3x + 4y - 5z - 1 = 0$

3. $3x + 4y - 5z - 11 = 0$

4. $3x + 4y - 5z + 1 = 0$

Section : **General Aptitude**

Q.1 Let Z denote the set of all integers. If a relation R is defined on Z as follows:
$(x, y) \in R$ if and only if x is multiple of y, then R is

Ans

1. symmetric, transitive but not reflexive

2. reflexive, symmetric but not transitive

3. reflexive, transitive but not symmetric

4. neither reflexive nor transitive but symmetric

Q.2 Paris Summit discusses which of the following issues?

Ans

1. Natural conservation

2. Migration

3. Climate change

4. Built Heritage

Q.3 On weekends, Mr. Sanjay spends many hours working in his vegetable and flower gardens. Mrs. Sanjay spends her free time reading and listening to classical music. Both Mr. Sanjay and Mrs. Sanjay like to cook.

Ans

1. Mrs. Sanjay enjoys reading nineteenth century novels.

2. Mr. Sanjay enjoys planting and growing vegetables.

3. Mrs. Sanjay cooks the vegetables that Mr. Sanjay grows.

4. Mr. Sanjay does not like classical music.

Q.4 Which Indian city ranks in UNESCO World Heritage list 2017 ?

Ans

1. Chandigarh

2. Kanchipuram
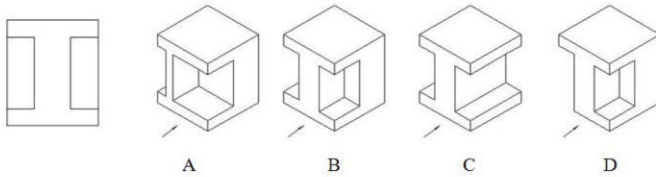
3. Kolkata

4. Ahmedabad

Q.5 Jodhpur is referred as

Ans
1. Pink city
2. White city
3. Golden city
4. Blue city

Q.6 Answer the correct 3D view for the given elevation:

A   B   C   D

Ans
1. D
2. C
3. A
4. B

Q.7 Which of the following compound propositions are tautologies?
- (i) $(P \wedge \neg P) \rightarrow \neg P$
- (ii) $(\neg Q \rightarrow P) \wedge Q$
- (iii) $(Q \rightarrow P) \wedge (\neg P \wedge Q)$
- (iv) $P \rightarrow (P \vee Q)$

Ans
1. (ii) and (iv) but not (i) and (iii)
2. (ii) and (iii) but not (i) and (iv)
3. (i) and (iv) but not (ii) and (i)
4. (i) and (ii) but not (iii) and (iv)

Q.8 A rectangular park 60m long and 40 m wide has two pathways of equal width running in the longitudinal and transverse direction and crossing each other at right angles in the middle of the park. The rest of the park is used as lawn. If the area of the lawn is 2109 sq.m, then what is the width of the pathway?

Ans
1. 2.5m
2. 4.5m
3. 3m
4. 6m

Q.9 2018 Pritzker prize was awarded to which architect?

Ans
1. I.M.Pei
2. Philip Johnson
3. B.V.Doshi
4. Tadao Ando

Q.10

Which of the following composition best fits Hierarchy?
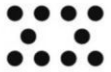
A   B   C   D

Ans

1. A
2. D
3. C
4. B

Q.11 Which of the following best illustrates a colonnade?

A   B   C   D

Ans

1. D
2. A
3. C
4. B

Q.12 Which number replaces the question mark?

5   6   9   16   ?

Ans

1. 29
2. 31
3. 27
4. 32

Q.13 Which plantation helps in preventing erosion and protecting the coastal shoreline ?

Ans

1. Mango
2. Mangrove
3. Palm
4. Coconut

Q.14 The Indian state which is called as "Bamboo Queen" is

Ans

1. West Bengal
2. Assam
3. Kerala
4. Mizoram

Q.15

Answer the correct TOP view for the given 3D object:
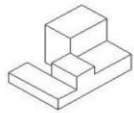
A   B   C   D

Ans
1. A
2. D
3. B
4. C

Q.16 Answer the correct 3D view for the given elevation:
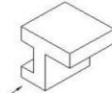
A   B   C   D

Ans
1. A
2. C
3. D
4. B

Q.17 Which letter replaces the question mark?
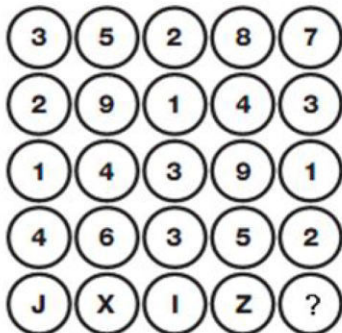
Ans
1. K
2. N
3. M
4. Y

Q.18 Adobe is associated with _____ construction.

Ans
1. Masonry
2. Wooden
3. Metal
4. Earthern

Q.19

Haveli's are traditional buildings found in

Ans
1. Karnataka
2. Andhra Pradesh
3. Rajasthan
4. Tamil Nadu

Q.20 The predominant material used in the construction of Eiffel tower is?

Ans
1. Wrought Iron
2. Aluminium
3. Cast Iron
4. Stainless steel

Q.21 The substitute for River sand in building construction is

Ans
1. Brick sand
2. Pit sand
3. Sea sand
4. Manufactured sand

Q.22 Choose logical sequence which replaces the question mark.
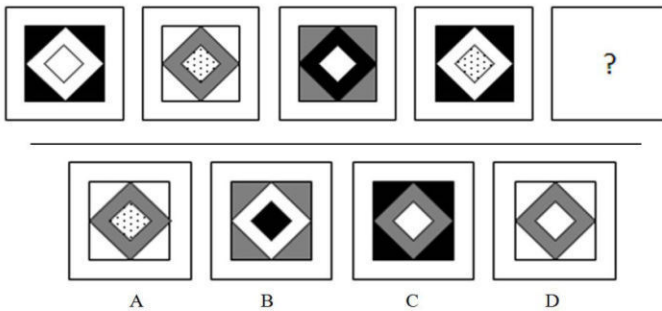
Ans
1. A
2. B
3. C
4. D

Q.23 Answer the correct TOP view for the given 3D object:
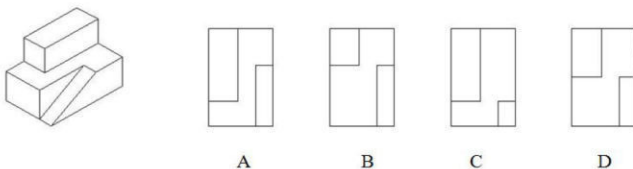
Ans
1. A
2. D
3. B
4. C

Q.24

One of the following answer figure is hidden in the given problem figure, in the same size and direction. Select which one is correct?

A   B   C   D

Ans
1. D
2. A
3. B
4. C

Q.25 Franco Indian architecture is found in which Indian city?

Ans
1. Kolkata
2. New Delhi
3. Pondicherry
4. Ahmednagar

Q.26 Which picture cube does the unfolded shape make?
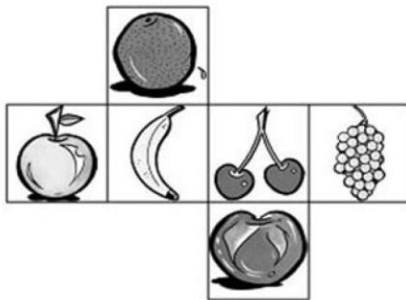
A   B   C   D

Ans
1. A
2. D
3. B
4. C

Q.27 The internal angle formed by the edges of a cube in isometric projection is?

Ans
1. 90 degree
2. 120 degree
3. 60 degree
4. 45 degree

Q.28 Which of the following countries is below sea level

Ans
1. Costa Rica
2. Maldives
3. Netherlands
4. Spain

Q.29 Find the odd figure in the problem

      A   B   C   D

Ans
1. D
2. A
3. B
4. C

Q.30 Which of these is not a structural part of a building?

Ans
1. Doors and windows
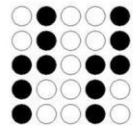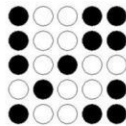2. Foundation
3. Roof Framing structure
4. Column & Beam

Q.31
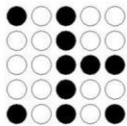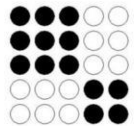
      A   B   C   D

Ans
1. B
2. D
3. C
4. A

Q.32 Ganesh is older than her cousin Malavika. Malavika's brother Bharat is older than Ganesh. When Malavika and Bharat are visiting with Ganesh, all three like to play a game of Monopoly. Malavika wins more often than Ganesh does.

Ans
1. When he plays Monopoly with Malavika and Ganesh, Bharat often loses.
2. Of the three, Ganesh is the oldest.
3. Of the three, Malavika is the youngest.
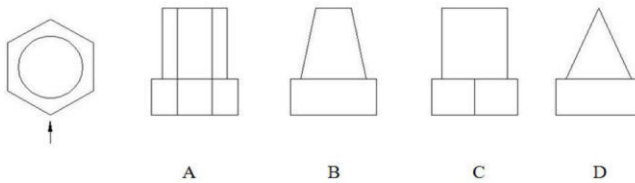4. Ganesh hates to lose at Monopoly.

Q.33

Answer the correct FRONT view for the given top view:
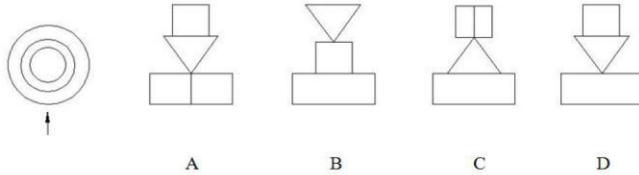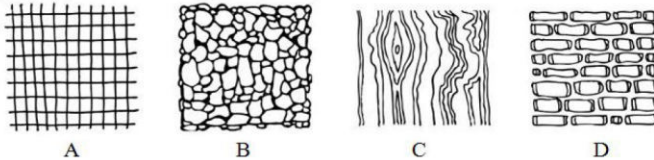

Ans
1. C
2. B
3. A
4. D

Q.34 Answer the correct FRONT view for the given top view:

Ans
1. B
2. C
3. D
4. A

Q.35 Which of the following best represents wood?

Ans
1. A
2. D
3. B
4. C

Q.36 Geodesic domes are strong and rigid due to its _____ structural elements.

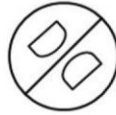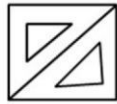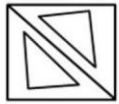**Ans**
1. Square
2. Trapezoidal
3. Pentagonal
4. Triangular

Q.37 When was the Earth Day 2018 celebrated?

Ans
1. 23nd February, 2018
2. 25nd March, 2018
3. 12th January, 2018

4. 22nd April, 2018

Q.38 Find the odd figure in the problem
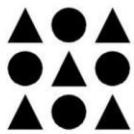

A   B   C   D

Ans

1. A
2. B
3. D
4. C

Q.39 Which composition best fits variety?

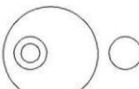A   B   C   D

Ans

1. D
2. A
3. C
4. B

Q.40 Which of the following diagrams indicates the best relation between Paris, France, Italy and World?

A   B   C   D

Ans

1. B
2. C
3. D
4. A

Section : Drawing Test

Q.1 You are sitting at a table in front of a tea stall in the early morning sipping a hot cup of tea while your companion is reading a newspaper. The tea stall is located in a park and you are observing a man walking his dog and the beautiful garden landscape around you.

Sketch the scenario described above and render light and shade using drawing pencils.

Q.2

Using all the three shapes given below, create a visually pleasing composition. The shapes are to be used in the same size as illustrated below and they can be repeated, rotated, overlapped, interlocked and mirrored to create the composition.

Use not more than 20 nos. of the shapes (all put together) and colour the composition using not more than 3 colours from analogous colour scheme.