NATA 2020

FIRST TEST

QUESTION PAPER with ANSWER KEY

aglasem

Part A

Q.1 What is the molecular mass of a glucose molecule?

Options :

a. 192.422

b. 80.619

c. 240.886

d. 180.162

- Correct Answer: d

Q.2 What is the correct order of the metallic character of the following elements?

Options :

a. B > Al > Mg > K

b. Al > Mg > B > K

c. Mg > Al > K >B

d. K > Mg > Al > B

- Correct Answer: d

Q.3 Dipole - Dipole interaction energy between rotating polar molecules is inversely proportional to the distance between polar molecules as

Options :

a. r

b. r^3

c. r^6

d. r^2

- Correct Answer: c

Q.4 Which one of the following is not a type of hydride?

Options :

a. saline

b. molecular

c. metallic

d. electrolytic

- Correct Answer: d

Q.5 Sodium hydroxide is manufactured by the

Options :

a. Castner - Keller process

b. Solvay process

c. Mannheim process

d. Hargreaves process

- Correct Answer: a

Q.6 If 3^{rd}, 6^{th} & 11^{th} terms of an Arithmetic Progression are in Geometric Progression, then the common ratio of the Geometric Progression is

Options :

a. $\frac{4}{3}$

b. $\frac{5}{3}$

c. $\frac{8}{3}$

d. $\frac{11}{3}$

- Correct Answer: b

Q.7 The value of $3\left[\sin^4\left(\frac{3\pi}{2}-a\right)+\sin^4(3\pi+a)\right]-2\left[\sin^4\left(\frac{\pi}{2}+a\right)+\sin^4(3\pi-a)\right]$ is

Options :

a. 0

b. 1

c. 3

d. $\sin 4a + \cos a$

- Correct Answer: b

Q.8 If non-zero numbers a,b,c are in Harmonic Progression, then the straight line $\frac{x}{a}+\frac{y}{b}+\frac{1}{c}=0$ always passes through the fixed point

Options :

a. $(-1,-2)$

b. $(-1,2)$

c. $\left(1,-\frac{1}{2}\right)$

d. $(1,-2)$

- Correct Answer: d

Q.9 The value of $\int_0^1 \sqrt{\frac{1-x}{1+x}}\,dx$ is

Options :

a. $\frac{\pi}{2}+1$

b. 1

c. $\frac{\pi}{2}-1$

d. -1

- Correct Answer: c

Q.10 The number of arrangements of the letters in the word 'POTATO', in which two 'T's do not appear adjacently, is

Options :

a. 40

b. 60

c. 80

d. 120

- Correct Answer: b

Q.11 If a charged spherical conductor of radius 10 cm has potential V at a point distant 5cm from the center, then the potential at the point at the distant 15 cm from the center will be

Options :

a. 1/3 V

b. 3/2 V

c. 3 V

d. 2/3 V

- Correct Answer: d

Q.12 The magnetic susceptibility is negative for

Options :

a. Diamagnetic material

b. Paramagnetic material

c. Ferromagnetic material

d. Para & Ferromagnetic materials

- Correct Answer: a

Q.12 The magnetic susceptibility is negative for

Options :

a. Diamagnetic material

b. Paramagnetic material

c. Ferromagnetic material

d. Para & Ferromagnetic materials

- Correct Answer: a

Q.13 A circular loop of radius R carrying current I lies in X -Y plane with its center at origin, the total magnetic flux through X- Y Plane is

Options :

a. Directly proportional to current I

b. Directly proportional to radius R

c. Directly proportional to R^2

d. Zero

- Correct Answer: d

Q.14 If we need peak load voltage of 40V out of a bridge rectifier, what is the approximate rms value of secondary voltage

Options :

a. 28.3 V

b. 0 V

c. 4.4 V

d. 56.6 V

- Correct Answer: a

Q.15 A potential barrier of 0.6 V exists across a PN junction, if the depletion region is 1μm wide, what is the intensity of electric field in the region?

Options :

a. $4\times 10^{5}Vm^{-1}$

b. $5\times 10^{5}Vm^{-1}$

c. $6\times 10^{5}Vm^{-1}$

d. $2\times 10^{5}Vm^{-1}$

- Correct Answer: c

Q.16 Tiling used to cover the lower most portion of the wall is termed as a _____.

Options :

a. Dado

b. Handrail

c. Skirting

d. Nosing

- Correct Answer: c

Q.17 Which of the following material has the highest fire resistance?

Options :

a. Wood

b. Stone

c. Fabric

d. Jute

Q.18 Space left around or in front of a building is typically termed as:

Options :

a. Setback

b. Fore set

c. Inset

d. Offset

- Correct Answer: a

Q.19 Typical reinforcements used in making RCC structures are:

Options :

a. Wooden sticks

b. Steel rods

c. Brick

d. Aluminium bars

Q.20 Which of the following is not suitable for building construction?

Options :

a. Stainless steel

b. Beach sand

c. crushed stone

d. Wooden planks

- Correct Answer: b

Q.21 Architect _____ is a pioneer of Modern architecture.

Options :

a. Zaha Hadid

b. Rem Koolhaas

c. Antonio Gaudi

d. Walter Gropius

- Correct Answer: d

Q.22 Five Points of Architecture is an architecture manifesto by

Options :

a. Zaha Hadid

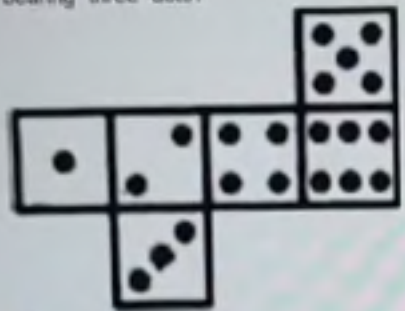
b. Mies Van Der Rohe

c. Le Corbusier

d. Walter Gropius

- Correct Answer: c

Q.23 When the following figure is folded to form a cube, how many dots lie opposite the face bearing "three" dots?



Options :

a. 2

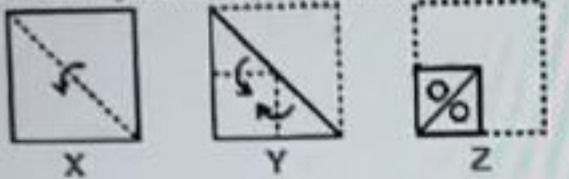
b. 4

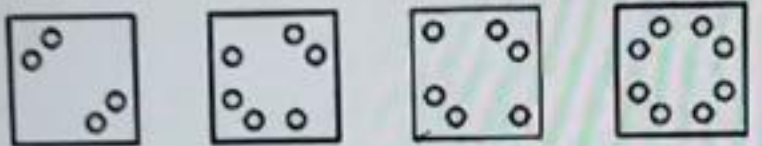
c. 5

d. 6

- Correct Answer: c

Q.24 Choose a figure which would most closely resemble the unfolded form of Figure (Z).





Options :

a. figure (1)

b. figure (2)

c. figure (3)

d. figure (4)

- Correct Answer: d

Q.25 Find out the alternative figure which contains figure (X) as its part.



(X) (1) (2) (3) (4)

Options :

a. figure (1)

b. figure (2)

c. figure (3)

d. figure (4)

- Correct Answer: c

Q.26 Select the alternative which represents three out of the five alternative figures which when fitted into each other would form a complete square.



(1) (2) (3) (4) (5)

Options :

a. (1) (3) (4)

b. (1) (2) (4)

c. (2) (3) (4)

d. (3) (4) (5)

- Correct Answer: a

Q.27 Choose the alternative which is closely resembles the Mirror-image of the given combination.

D6Z7F4

(1) D0Z⅃Ь4 (2) Q0Z⅃ƒ4

(3) D0Z⅃Ь4 (4) Q0Z⅂ƒ4

Options :

a. figure (1)

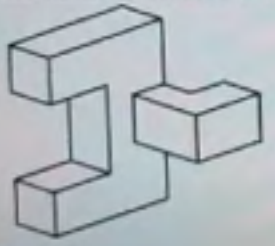
b. figure (2)

c. figure (3)

d. figure (4)

- Correct Answer: c

Q.28 The number of surfaces for the given object is:



Options :

a. 16

b. 10

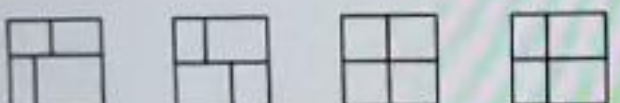
c. 12

d. 18

- Correct Answer: a

Q.29 Identify the correct top view for the given 3D object





Options :

a. figure (1)

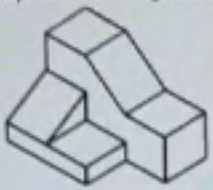
b. figure (2)

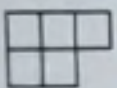
c. figure (3)

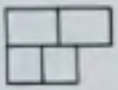
d. figure (4)

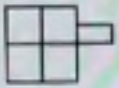
- Correct Answer: b

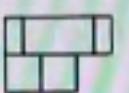
Q.30 Identify the correct top view for the given 3D object











Options :

a. figure (1)

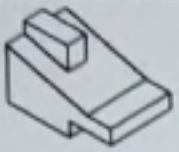
b. figure (2)

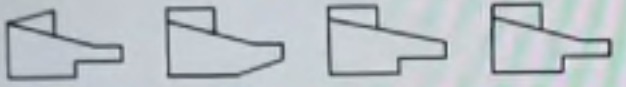
c. figure (3)

d. figure (4)

- Correct Answer: a

Q.31 Identify the correct side view for the given 3D object





Options :

a. figure (1)

b. figure (2)

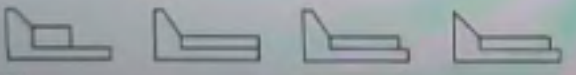
c. figure (3)

d. figure (4)

- Correct Answer: d

Q.32 Identify the correct side view for the given 3D object





Options :

a. figure (1)

b. figure (2)

c. figure (3)

d. figure (4)

- Answer Option: a

Q.33 The ratio between the length and the breadth of a rectangular park is 4: 2. If a man cycling along the boundary of the park at the speed of 9 km/hr completes one round in 8 minutes, then the area of the park (in sq. m) is:

Options :

a. 60000

b. 76000

c. 86000

d. 80000

- Correct Answer: d

Q.34 Count the number of squares in the given figure.



Options :

a. 6

b. 9

c. 8

d. 10

- Correct Answer: b

Q.35 Which word does NOT belong with the others?

Options :

a. Sofa

b. Table

c. Carpet

d. Chair

- Correct Answer: c

Q.36 Identify the next pair of number in the given sequence.

14 14 26 26 38 38 50

Options :

a. 50 72

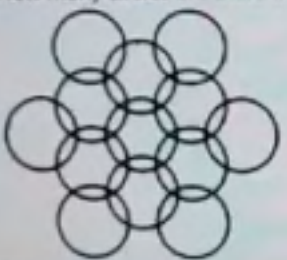
b. 50 62

c. 62 62

d. 62 80

- Correct Answer: b

Q.37 How many circles are there in the given figure:



Options :

a. 13

b. 12

c. 11

d. 14

- Correct Answer: a

Q.38 GRIHA Council is related to rating of

Options :

a. Reforestation

b. Professional ethics

c. Ecological footprint

d. Green building

- **Correct Answer:** d

Q.39 The Pritzker Prize winner of 2018 is

Options :

a. Yvonne Farrell

b. Arata Isozaki

c. Balkrishna Doshi

d. Zaha Hadid

- **Correct Answer:** c

Q.40 The total greenhouse emissions released into the atmosphere is referred to as :

Options :

a. Green footprint

b. Water footprint

c. Carbon footprint

d. Ecological footprint

- **Correct Answer:** c

Q.41 Which of the following architect is referred to as deconstructivist architect

Options :

a. Peter Zumthor

b. Le Corbusier

c. Toyo Ito

d. Daniel Libeskind

- Correct Answer: d

Q.42 Sydney Opera house is designed by:

Options :

a. Jørn Utzon

b. Bjarke Ingles

c. Walter Groplus

d. Kim Utzon

- Correct Answer: a

Q.43 Random rubble relates to

Options :

a. Mould work

b. Wood work

c. Masonry work

d. Metal work

- Correct Answer: c

Q.44 In a class of 95 students, 40 play cricket, 50 play football and 10 play both cricket and football. How many students play neither cricket nor football?

Options :

a. 80

b. 40

c. 30

d. 15

- Correct Answer: d

Q.45 In a class of 150 students, 50 students passed in Maths, 40 students failed only in chemistry and 20 students failed in both the subjects. How many of them failed in at least one of the subjects?

Options :

a. 20

b. 130

c. 125

d. 140

- Correct Answer: d

Q.46 $(p \wedge \sim q) \wedge (\sim p \wedge q)$ is a

Options :

a. Tautology

b. Contradiction

c. Tautology & Contradiction

d. Contingency

Q.47 If p and q have truth value 'F' then

$(\sim p \vee q) \leftrightarrow \sim (p \wedge q)$ and $\sim p \leftrightarrow (p \rightarrow \sim q)$ respectively are

Options :

a. F,F

b. T,T

c. T,F

d. F,T

- Correct Answer: b

Q.48 Which of the following statements are compound statements?

Options :

a. 15 is neither an evennumber nor a prime number

b. I would like some coffeeor tea

c. Ram and Rahim are friends

d. 2 is both an even number and a prime number

- Correct Answer: c

Q.49 In an organization of pollution control board, engineers are represented by a circle, legal experts by a rectangle and environmentalist by a triangle. Who is most represented in the board as shown in the following figure?



Options :

a. Environmentalists

b. Legal Experts

c. Engineers with legal background

d. Environmentalists with Engineering background

- Correct Answer: d

Q.50 Stupas are monolithic structures pertaining to which architectural style:

Options :

a. Mughal style

b. Renaissance style

c. Victorian style

d. Buddhist style

- Correct Answer: d

Part B

Q.1 In the image below there are four tigers clearly visible in the center. There are others that are merged in to the background. Check out the image to find where the other tigers are hidden and how many of them can you locate. Tick your answer.



Options :

a. 10

b. 14

c. 06

d. 12

- **Correct Answer** : a = 12 marks, c = 07 marks, d = 17 marks

Q.2 Indentify the **four** most important visual principles in the given two dimensional black and white composition



Options :

a. Repetition

b. Parallelism

c. Radiating

d. Distortion

e. Depth

f. Hierarchy

g. Order

h. Datum

h. Datum
i. Continuity
j. Direction
k. Vibration
l. Intricacy
m. Delicateness
n. Focal point
o. Contrast
p. Complexity

- **Correct Answer** : a,c,i,l,n,p

Q.3 indentify the **four** most important visual principles in the given two dimensional black and white composition



Options :

a. Repetition

b. Parallelism

c. Symmetry

d. 3D Effect

e. Rhythm

f. Hierarchy

g. Order

h. Datum

i. Continuity

j. Direction

i. Continuity

j. Direction

k. Vibration

l. Depth

m. Play of background & foreground

n. Intricacy

o. Delicateness

p. Balance

- **Chosen Option** : a,h,m,p
- **Correct Answer** : b,d,g,l,m,n

Q.4 Indentify the **four** most important visual principles in the given two dimensional black and white composition



Options :

a. Gradation

b. Parallelism

c. Radiation

d. Distortion

e. Depth

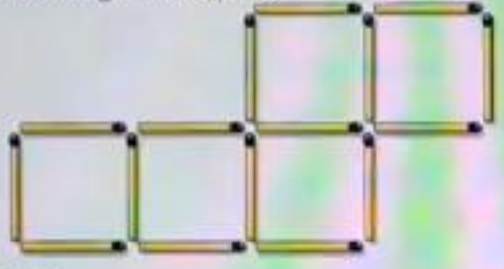
f. Contrast

g. Rhythm

g. Rhythm
h. Focal point
i. Play of background & foreground
j. Continuity
k. Direction
l. Vibration
m. Repetition
n. Luminance
o. Flow
p. Intricacy

- **Correct Answer** : a,f,g,h,m,p

Q.5 Move two matchsticks from the choice given on the right hand side to create four squares from the given five squares



Options :

a. Bottom row second and center row fourth

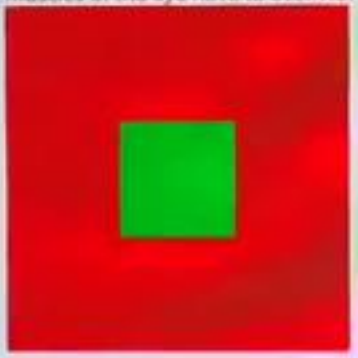
b. Two at the bottom right corner

c. Two at the top left corner.

d. Top row first and bottom row center

- Correct Answer : d

Q.6 When two or more bright colours as indicated in the image below are viewed at length, tiny muscles of the eye have to over work resulting in visual fatigue. What is that effect called?



Options :

a. Chromsomes

b. Achromatic

c. Chromostereoposis

d. Colourstenosis

- Correct Answer : c

Q.7 What is it called when our eyes are exposed to similar shades of a colour as indicated in the image below for some time?



Options :

a. Colour washing

b. Colour flowing

c. Colour blinding

d. Colour mixing

- Correct Answer : a

Q.8 Colors change their character if they are surrounded by different colors. What is that effect called as?



Options :

a. Bezos

b. Bezoid

c. Bezubban

d. Bezonimic

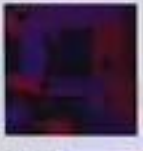
- Correct Answer : b

Q.9 Which colour scheme of the images on the right hand side, resembles closest the colour scheme of the left hand side mural?



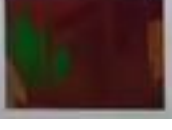
Options :

a.



b.





c.



d.



- Correct Answer : b

Q.10 Which one black and white composition on right hand side resembles left hand side coloured composition?



Options :

a. 

b. 

c. 

d. 

- Correct Answer : c