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NATA 2020 Question Paper with Solution

National Aptitude Test in Architecture (NATA)

NATA 29 AUGUST 2020

PART- A (SET-1)

1. In the image below there are four tigers clearly visible at the center. There are others which are merged into the background. Checkout 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. 6
d. 12

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

2. Identify the four most important visual principles in the given two dimensional black and white - compositions.

a. Repetition
b. Parallelism
c. Radiating
d. Distortion
e. Depth
f. Hierarchy
g. Order
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

3. Indentify the four most important visual principles in the given two dimensional blacl composition.

Options

a. Repetition
b. Parallelism
c. Symmetry
d. 3D effect
e. Rhythm
f. Hierarchy
g. Order
h. Datum
i. Continuity

j. Direction
k. Vibration
l. Depth
m. Play of background and foreground
n. Intricacy
o. Delicateness
p. Balance

- Correct Answer : b,d,g,l,m,p

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

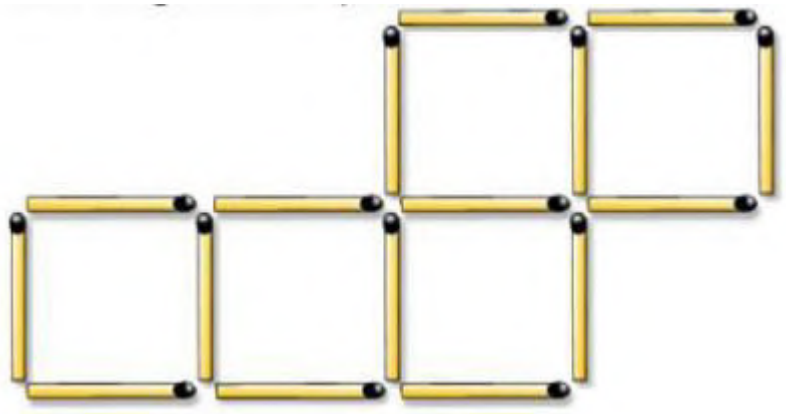
Options

a. Gradation
b. Parallelism
c. Radiation
d. Distortion
e. Depth
f. Contrast

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

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

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

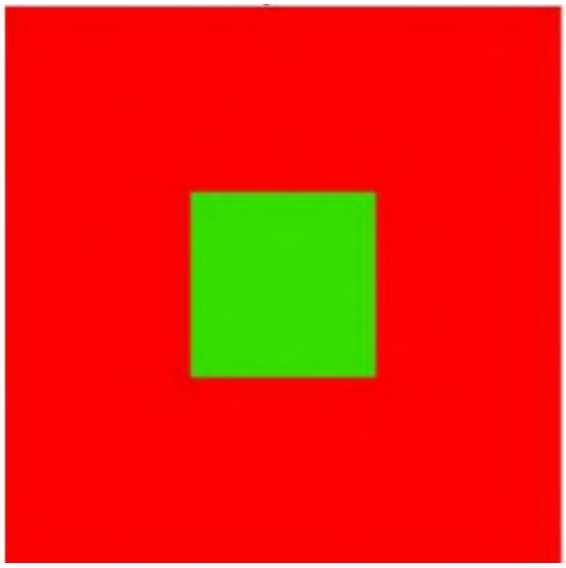


Options

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

Answer: d

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 the effect called?



a. Chromsomes
atic
c. Chromostereoposis
d. Colour sterosis

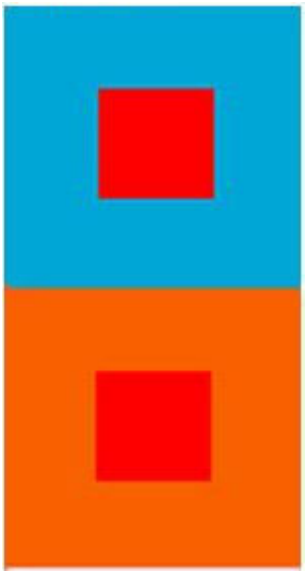
Answer-c

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?

a. Colour washing
b. Colour flowing
c. Colour blinding
d. Colour Mixing

Answer-a

8. Colours change their character if they are surrounded by different colors. What is tha as?



a. Bezos
b. Bezold
c. Bezubban
d. Bezonimic

Ans- b

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

Answer:b

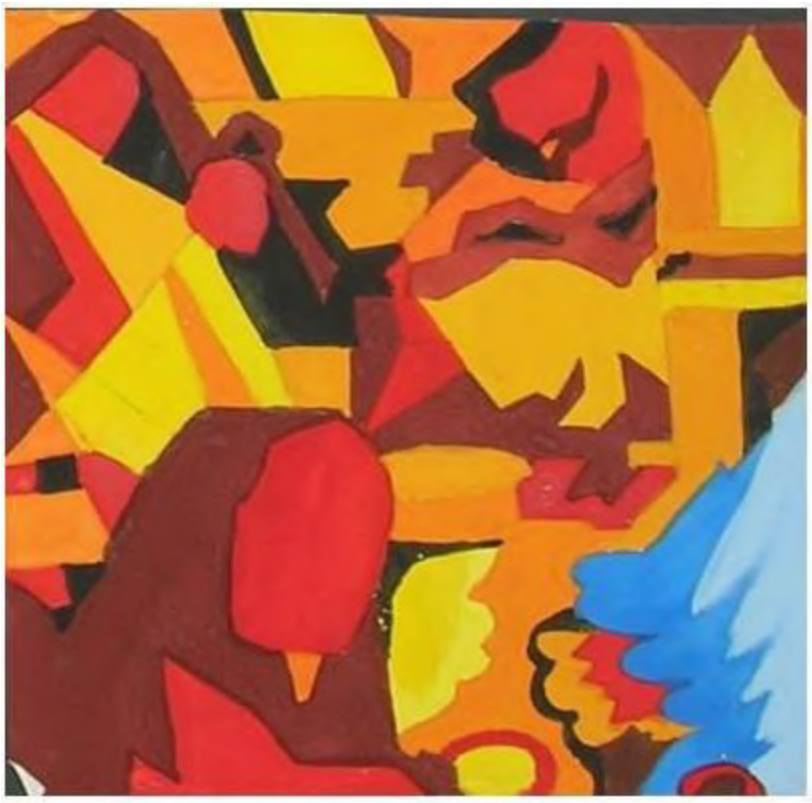
a. 

b. 

c. 

d. 

10. Which black and white composition on the right hand side, resembles left hand side coloured composition?



a. 

b. 

c. 

d. 

Answer-c

PART- A (SET-2)

1. There is subtle difference in the two images given below. Can you spot how many differences are there in the two images and tick the number that you can identify amongst the answer options provided.

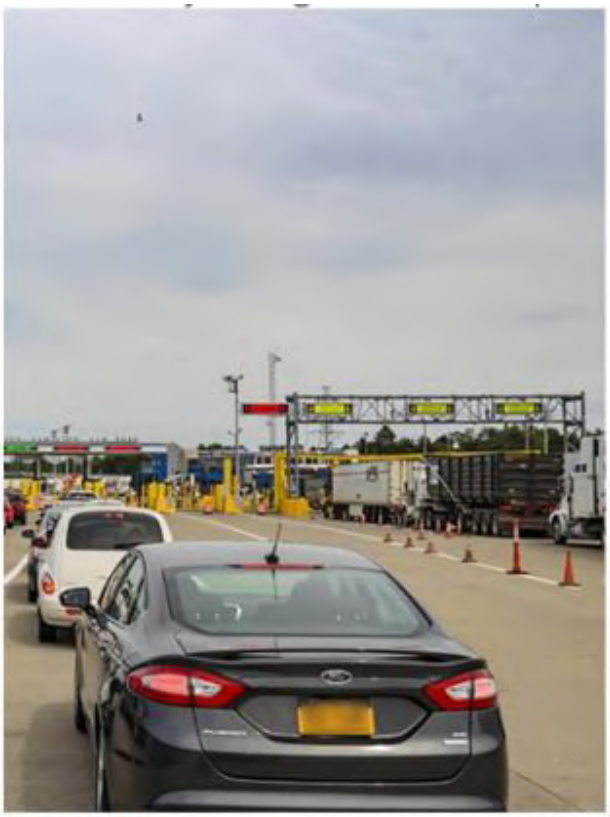


IMAGE (1)

IMAGE (2)

a.9

b.5

c.8

d. 10

- **Correct Answer :** a=12,c=7,d=17

2. Identify the four most appropriate terms that describe the image given below from the answer options provided.

a. Vihara
b. Dynamic
c. Mound
d. Dome
e. Oasis
f. Circumambulation
g. Planes
h. Stupa
i. Pagoda
j. Buddhist
k. Hindu
l. Arcuate
m. Stone
n. Asymmetry
o. Chaitya
p. Post and Lintel

- **Correct Answer :** c,f,h,j,m,p

3.Identify the important terms from the answer choices given, that most aptly describe the two images which are related in some way or the other? Tick any four appropriate answer options.

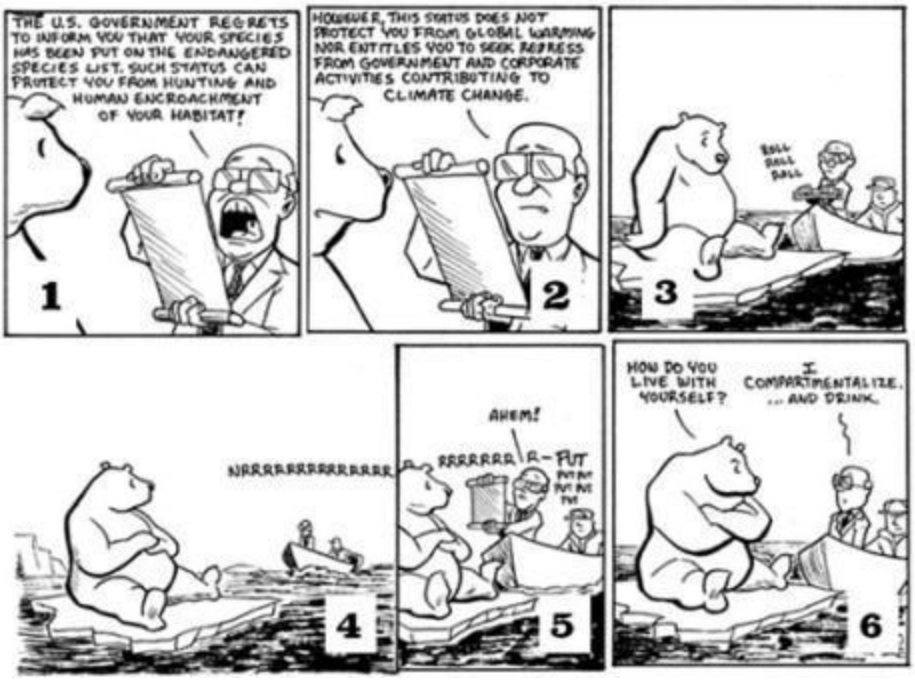
a. Balance
b. Chaos
c. Monochromatic
d. Proportion
e. Animated
f. Tranquil
g. Violation
h. Contrast
i. Order
j. Conformity
k. Rhythm
l. Dense
m. Urban
n. Colonnade
o. Ascending
p. Movement

Answer- b,e,g,l,m,p

4.The three images given below are all related to each other in some way or the other Which of the answer options provided would most aptly describe them?

a. Orthodox
b. Pop
c. Picasso
d. Violation
e. Render
f. Abstraction
g. Monochromatic
h. Polychromatic
i. 3 Dimensional
j. Static
k. Geometric
l. Bauhaus
m. Commonplace
n. Cubist
o. 2 dimensional

5.The image below form a story board whose sequence is jumbled. Choose the right sequence of the images from the choices given to construct the correct narrative.



a. 6,1,2,5,3,4
b. 4,5,2,1,3,6
c. 6,5,2,1,4,3
d. 4,5,1,2,3,6

Answer-d

6.the three images below belong to one colour scheme theory. Identify the colour scheme theory they belong to from the choices given.

a. Complementary scheme
b. Achromatic scheme
c. Analogous scheme
d. Triadic scheme

Answer-c

7. To what genre do the depicted colour schemes belong?

a. Vibrating colour

b. High Contrast colour

c. Simultaneous contrast colors

d. Low contrast colours

Answer-b

8. The six image parts in each of the answer options given, when combined together as they are, form the two dimensional composition given below.

Tick the correct answer option.

a. 

b. 

c. 

d. 

- Correct Answer : b

9. The six image parts in each of the answer options given, when combined together as they are, form the two dimensional composition given below.

Tick the correct answer option.

Options :

a. 

b. 

c. 

d. 

Answer-c

10. Which black and white composition from amongst the given answer choices most closely resembles the coloured composition given below. Tick he correct options.

a. 

b. 

c. 

d. 

- **Correct Answer :** b

PART- A (SET-3)

1. The image is a painting titled Wedding party by artist Pietro Barucci on display at the Slovak National Gallery. While image (A) is the original painting: in image (B) subtle changes have been made. Can you spot how many differences are there in two images and tick the number that yu can identify from the answer options given

IMAGE (1)

IMAGE (2)

a.7

b.4

c.6

d, 8

Correct answer-a-12, c-7, d-17

2. Identify the most important visual principles and terms that describes the image given below. Tick any four appropriate answer options.

a. Boundary
b. Post and lintel
c. Egyptians
d. Stonehenge
e. Random
f. Oasis
g. Man and woman
h. Cantilever
i. Converging
j. Mayan
k. Megalith
l. Ritual
m. Radial

n. Cemetery
o. Symmetry
p. Centralized

Answer-a,b,d,k,l,p

3. The three images given below are all related in some way to each other. Which of the following terms from the answer options given would most aptly describe them? Tick any four appropriate answer options.

a. Pop Art
b. Geometric
c. Monochromatic
d. Poly chromatic
e. Cartoon
f. Avant Garde
g. Bohemian
h. Orthodox
i. Conformity
j. Analogous
k. Humour
l. Naturalistic
m. Collage
n. Commonplace
o. Elitist
p. Abstract

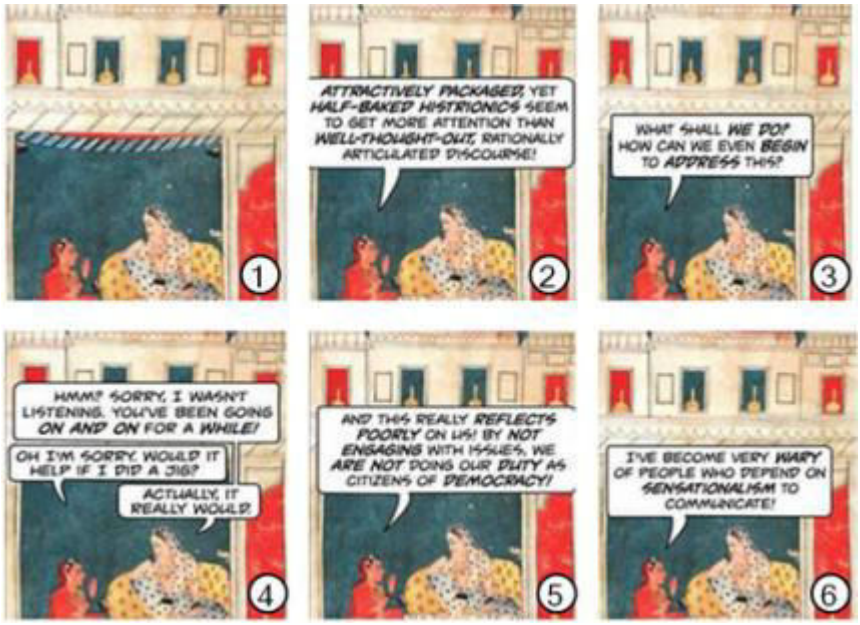
Answer-a,d,e,g,k,n

4. Identify the most important visual principles and terms that are aptly suited for the two images given below from the answer options. Tick out any four answers options.

a. Contrast
b. Gradation
c. Tree of life
d. Distortion
e. Earthy
f. Folk Art
g. Warli
h. Symmetry
i. Intricacy
j. Light and shade
k. Kalamkari
l. Continuity
m. Ascending
n. Madhubani
o. Pattern

Answer-c,e,f,l,k,p

5. The images below form a story board, the sequence of which is jumbled. Choose the right sequence of images from the answer options given to construct the correct narrative.



a. 6,3,2,5,4,1
b. 1,6,2,5,3,4
c. 6,2,5,1,3,4
d. 6,2,4,1,3,5

Answer-c

6. Which of the following options aptly describe the colour maixingmodel of the image given below?

Options

a. Achromatic color mixing model
b. Subtractive color mixing model
c. Primary color mixing model
d. Additive color mixing model

Answer-d

7. What is a painting in which abrupt transitions are found between colour areas which are often of one unvarying colour called? Refer to the image represents below and provide the right answer choice.

a. Soft colour painting
b. Hard edge painting
c. Colour field art painting
d. Colour washing

Answer-b

8. The six image parts in the answer options given, when combined together as they are, form the two dimensional compositions given below. Tick the correct answer.

Options :

a.

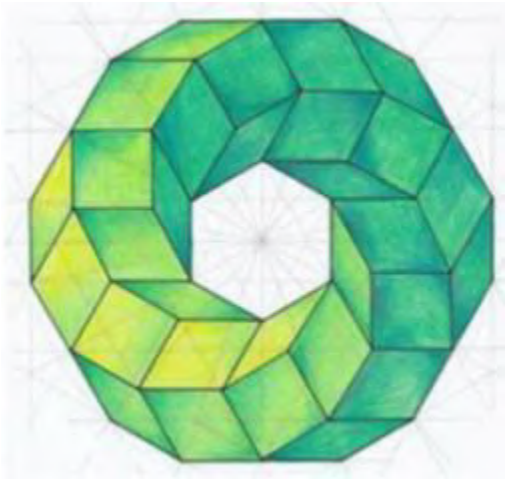
b.

c.

d.

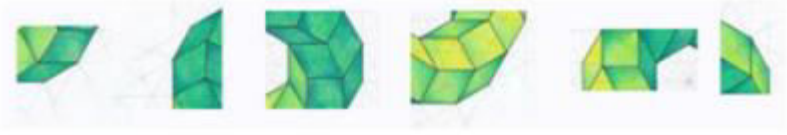
Answer- d

9.The six image parts in the answer options given, when combined together as they are, form the two dimensional compositions given below. Tick the correct answer.



Options :

a. 

b. 

c. 

d. 

Answer-c

9. Which black and white line composition from amongst the answer options given resembles the coloured composition given below? Tick he correct answer.

Options :

a. 

b. 

c. 

d. 

Answer- c

Test Date : 29-Aug-2020
Test Name : PART-B

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

Options :

a. 192.422

b. 80.619

c. 240.896

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 3rd, 6th & 11th 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 $3\left[\sin^4\left(\frac{3\pi}{2}-a\right)+\sin^4(3\pi+a)\right]-2\left[\sin^6\left(\frac{\pi}{2}+a\right)+\sin^6(5\pi-a)\right]$ 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.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

- **Correct Answer:** b

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

- **Correct Answer:** b

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

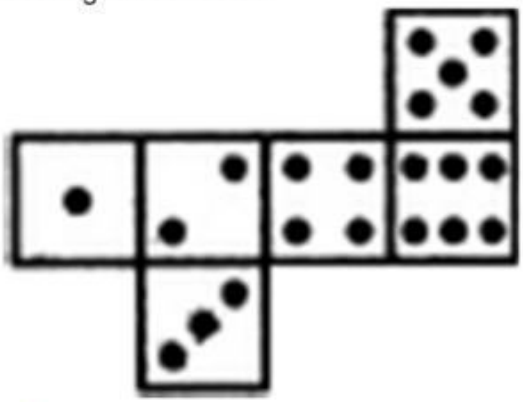
b. Mies Van Der Rohe

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

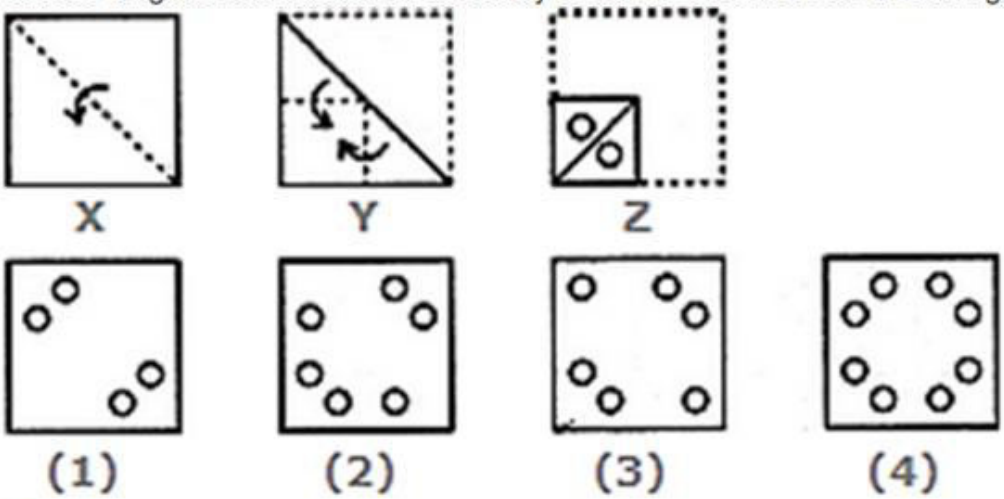
b. 4

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)

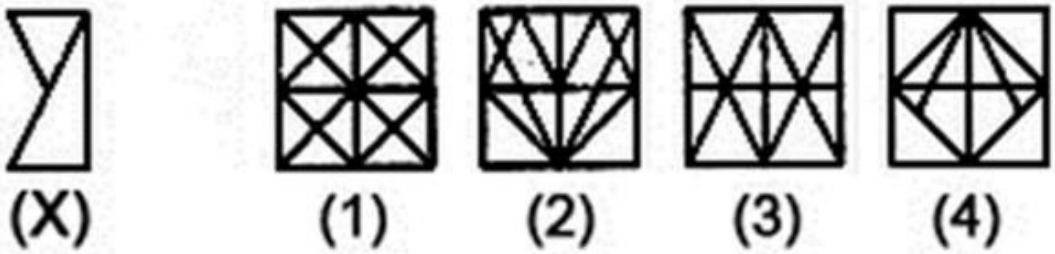
b. figure (2)

c. figure (3)

d. figure (4)

- Correct Answer: d

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



Options :

a. figure (1)

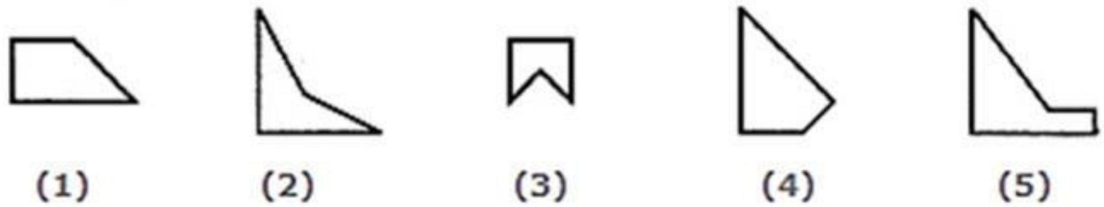
b. figure (2)

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.



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

Options :

a. figure (1)

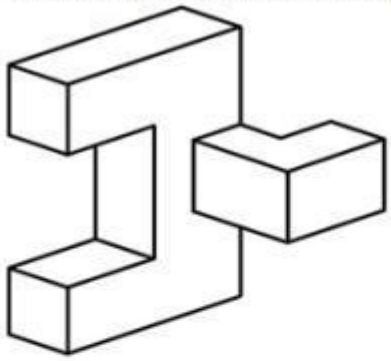
b. figure (2)

c. figure (3)

d. figure (4)

- Correct Answer: c

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



Options :

a. 16

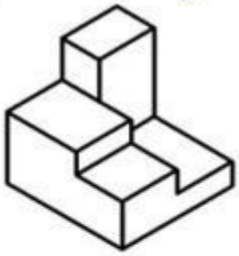
b. 10

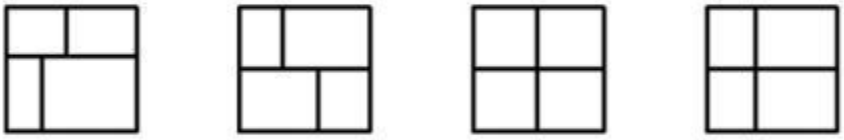
c. 12

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

SET-2 (PART B)

Q.1 A 100 watt bulb emits monochromatic light of wavelength 400nm.The number of photons emitted by the bulb is

Options :

a. $1.012 \times 10^{20}\ s^{-1}$

b. $5.012 \times 10^{20}\ s^{-1}$

c. $9.012 \times 10^{20}\ s^{-1}$

d. $2.012 \times 10^{20}\ s^{-1}$

- Correct Answer : d

Q.2 Which of the following is not associated with chemical bonds

Options :

a. Bond length

b. Bond gap

c. Bond order

d. Bond polarity

- Correct Answer : b

Q.3 Pressure of 1g of an ideal gas A at $27^{o}C$ is found to be 2 bar. When 2g of another ideal gas B is introduced in the same flask at the same temperature the pressure becomes 3 bar. What is the relationship between the molecular masses of A and B

Options :

a. $M_A = M_B$

b. $M_A = 2M_B$

c. $M_B = 3M_A$

d. $M_B = 4\ M_A$

- Correct Answer : d

Q.4 What is the strength of 10 volume solution of hydrogen peroxide

Options :

a. 2% H_2O_2 solution.

b. 3% H_2O_2 solution.

c. 4% H_2O_2 solution.

d. 5% H_2O_2 solution.

- Correct Answer : b

Q.5 In the preparation of hydrogen from methane using steam at 1273 k the catalyst used is

Options :

a. Iron

b. Platinum

c. Nickel

d. Vanadium Pent oxide

- Correct Answer : c

Q.6 If the geometric mean of two numbers a & b, $a > b > 0$, is one fifth of their arithmetic mean, then the value of $\frac{a-b}{a+b}$ is

Options :

a. $\frac{2\sqrt{5}}{7}$

b. $\frac{2\sqrt{6}}{5}$

c. $\frac{3\sqrt{6}}{8}$

d. $\frac{3\sqrt{5}}{8}$

- Correct Answer : b

Q.7 The number of real values of (for which the system of linear equations

$$2x+4y-\lambda z=0$$
$$4x+\lambda y+2z=0$$
$$\lambda x+2y+2z=0$$

has infinitely many solutions, is

Options :

a. 0

b. 1

c. 2

d. 3

- Correct Answer : b

Q.8 The value of $\frac{\tan\theta+\sec\theta-1}{\tan\theta-\sec\theta+1}$ is

Options :

a. $\frac{1-\sin\theta}{\cos\theta}$

b. $\frac{1+\sin\theta}{2\cos\theta}$

c. $\frac{\cos\theta}{1+\sin\theta}$

d. $\frac{1+\sin\theta}{\cos\theta}$

- Correct Answer : d

Q.9 On the interval $[0,1]$, the function $x^{25}(1-x)^{75}$ takes its maximum value at

Options :

a. $x = 0$

b. $x = 1/4$

c. $x = 1/2$

d. $x = 1/3$

- **Correct Answer :** b

Q.10 In how many ways, 8 questions can be selected in a question paper containing 12 questions so that it always contains question numbers 1, 5 and 10?

Options :

a. 126

b. 252

c. 495

d. 512

- **Correct Answer :** a

Q.11 5A of current flowing through a resistor for 2 minutes produces 3000 Joules of heat , the value of resistance is

Options :

a. 1 ohm

b. 5 ohms

c. 4 ohms

d. 2 ohms

- **Correct Answer :** a

Q.12 An alternating current has

Options :

a. Only positive value

b. Only negative value

c. Both positive and negative value

d. Steady state

- Correct Answer : c

Q.13 The particle of mass 3×10^{-6} g has the same wavelength as an electron moving with a velocity of 6×10^{6} m/s, The velocity of particle is

Options :

a. 1.82×10^{-18} m/s

b. 9×10^{-2} m/s

c. 3×10^{-30} m/s

d. 1.82×10^{-15} m/s

- Correct Answer : d

Q.14 In a hydrogen atom, the electron revolving in the fourth orbital has the angular momentum equal to

Options :

a. h

b. $2h/\pi$

c. $\frac{4h}{\pi}$

d. h/π

- Correct Answer : b

Q.15 Which one of the following is the universal gate?

Options :

a. NAND gate

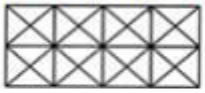
b. OR gate

c. AND gate

d. NOT gate

- Correct Answer : a

Q.16 How many total numbers of squares are there in the figure given below?



Options :

a. 11

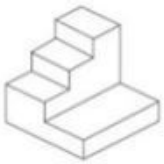
b. 21

c. 24

d. 26

- Correct Answer : c

Q.17 The 3- D figure shows the view of an object. Identify the correct top view from amongst the answer figures.



Options :

a. 

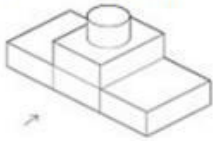
b. 

c. 

d. 

- **Correct Answer :** b

Q.18 The 3- D figure shows the view of an object. Identify the correct front view from amongst the answer figures, looking in the direction of the arrow.



Options :

a. 

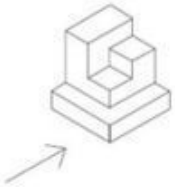
b. 

c. 

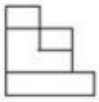
d. 

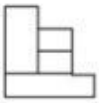
- **Correct Answer :** c

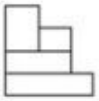
Q.19 The 3- D figure shows the view of an object. Identify the correct front view from amongst the answer figures. looking in the direction of the arrow.

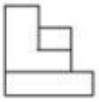


Options :

a. 

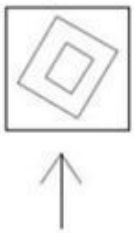
b. 

c. 

d. 

- **Correct Answer :** d

Q.20 The problem figure shows the top view of an object.
Identify the correct elevation from amongst the answer figures, looking in the direction of the arrow.



Options :

a. 

b. 

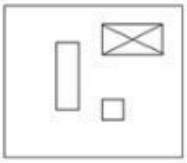
c. 

d. 

- Correct Answer : b

Q.21 The top view of objects is shown in the figure.

Identify the correct elevation from amongst the answer figures, looking in the direction of the arrow.



Options :

a. 

b. 

c. 

d. 

- Correct Answer : c

Q.22 When is World Architecture Day celebrated ?

Options :

a. 21st June

b. First Monday every October

c. Second Saturday every March

d. 5th June

- Correct Answer : b

Q.23 Where is Char Minar located?

Options :

a. Hyderabad

b. Allahabad

c. Cochin

d. Chennai

- **Correct Answer :** a

Q.24 In which metropolitan city is the Jehangir Art Gallery located?

Options :

a. Hyderabad

b. Agra

c. Delhi

d. Mumbai

- **Correct Answer :** d

Q.25 What was the theme of the World Environment Day 2020?

Options :

a. Connect people to Nature

b. Beat Air Pollution

c. Celebrate Biodiversity

d. Beat Plastic Pollution

- **Correct Answer :** c

Q.26 If n (u) =700, n (A) = 200, n (B) = 300 and n (A ∩ B) = 100, then n (A′ ∩ B′) is?

Options :

a. 300

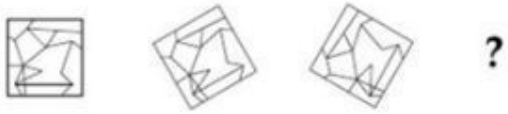
b. 200

c. 400

d. 600

- Correct Answer : a

Q.27 Which one of the answer figures will complete the sequence of the three problem figures?



Options :

a. A. 

b. B. 

c. C. 

d. D. 

- Correct Answer : d

Q.28 In a certain code language COMPUTER is written as RFUVQNPC. How will MEDICINE be written in that code language?

Options :

a. MFEDJJOE

b. EOJDEJFM

c. EOJDJEFM

d. MFEJDJOE

- Correct Answer : c

SET – 3

Q.1 Which of the following will have the least negative gain enthalpy

Options :

a. P

b. S

c. Cl

d. F

- Correct Answer : a

Q.2 For the oxidation of iron $4Fe(s) + 3O_2(g) \rightarrow 2Fe_2O_3(s)$ entropy change is - 549.4$JK^{-1}mol^{-1}$ at 298 K. Heat of reaction is ΔH_r is -1648 x10^3 $Jmol^{-1}$. The total entropy is

Options :

a. 5530$JK^{-1}mol^{-1}$

b. 4980.6 $JK^{-1}mol^{-1}$

c. 4569.5 $JK^{-1}mol^{-1}$

d. 4287.2 $JK^{-1}mol^{-1}$

- Correct Answer : b

Q.3 What is the molar solubility of $Ni(OH)_2$ in a 0.10 M NAOH. The ionic product of $Ni(OH)_2$ is 2.0×10^{-15}

Options :

a. 2.0×10^{-15} M

b. 2.0×10^{-14} M

c. 2.0×10^{-13} M

d. 2.0×10^{-12} M

- Correct Answer : c

Q.4 Which one of the following is an allotrope of carbon?

Options :

a. Carbon dioxide

b. Activated Carbon

c. Fullerene

d. Charcoal

- Correct Answer : c

Q.5 Sodium Chlorate is a type of

Options :

a. Herbicide

b. Fungicide

c. Insecticide

d. weedicide

- Correct Answer : a

Q.6 If $a_1, a_2, \ldots a_n, \ldots$ are in geometric progression, then the value of the determinant $\begin{vmatrix} \log a_n & \log a_{n+1} & \log a_{n+2} \\ \log a_{n+3} & \log a_{n+4} & \log a_{n+5} \\ \log a_{n+6} & \log a_{n+7} & \log a_{n+8} \end{vmatrix}$ is

Options :

a. 0

b. 1

c. 2

d. 4

- Correct Answer : a

Q.7 The incentre of the triangle with vertices $(1, \sqrt{3})$, $(0,0)$ & $(2,0)$ is

Options :

a. $\left(1, \sqrt{\frac{3}{2}}\right)$

b. $\left(\frac{2}{3}, \frac{1}{\sqrt{3}}\right)$

c. $\left(\frac{2}{3}, \sqrt{\frac{3}{2}}\right)$

d. $\left(1, \frac{1}{\sqrt{3}}\right)$

- Correct Answer : d

Q.8 The edges of a parallelepiped are of unit length and are parallel to non-coplanar unit vectors $\hat{a},\hat{b},\hat{c}$ such that $\hat{a}\cdot\hat{b}=\hat{b}\cdot\hat{c}=\hat{c}\cdot\hat{a}=1/2$. Then the volume of the parallelepiped is

Options :

a. $\frac{1}{\sqrt{3}}$

b. $\frac{2}{\sqrt{3}}$

c. $\frac{1}{\sqrt{2}}$

d. $\frac{1}{2\sqrt{2}}$

- Correct Answer : c

Q.9 Which of the following functions is differentiable at x=0?

Options :

a. $\cos(|x|)+|x|$

b. $\cos(|x|)-|x|$

c. $\sin(|x|)+|x|$

d. $\sin(|x|)-|x|$

- Correct Answer : d

Q.10 What is the probability that a leap year selected randomly will have 53 Mondays?

Options :

a. $\frac{1}{7}$

b. $\frac{2}{7}$

c. $\frac{3}{7}$

d. $\frac{4}{7}$

- Correct Answer : b

Q.11 Two Electric bulbs whose resistances are in the ratio of 1:2 are connected in parallel to a constant voltage source the power dissipated in them will have the ratio

Options :

a. 1:2

b. 1:1

c. 2:1

d. 1:4

- **Correct Answer :** c

Q.12 A resistor and a capacitor are connected in series with an ac source. If the potential drop across the capacitor is 5V and that across resistor is 12V, the applied voltage is

Options :

a. 13 V

b. 17 V

c. 5 V

d. 12 V

- **Correct Answer :** a

Q.13 When the number of turns in a coil is made four times without any change in the length of the coil, its self inductance becomes

Options :

a. Unchanged

b. Two times

c. Four times

d. Sixteen times

- **Correct Answer :** d

Q.14 If the kinetic energy of the free electron is made double, change in de- Broglie wavelength will be

Options :

a. √2

b. 1/√2

c. 2

d. 1/2

- Correct Answer : b

Q.15 When source voltage increase in a Zener diode, which of these currents remain approximately constant?

Options :

a. Series current

b. Zener current

c. Total current

d. Load current

- Correct Answer : d

Q.16 In which country is the oval amphitheatre called the Coliseum located?

Options :

a. Sicily

b. Greece

c. Italy

d. France

- Correct Answer : c

Q.17 What does Plinth in a building refer to?

Options :

a. Roof of a building

b. Raised platform

c. Wall openings

d. Shallow wall

- Correct Answer : b

Q.18 What does the term "Monastery" refer to?

Options :

a. Industrial shed

b. Entertainment building

c. Domestic quarters

d. Commercial streets

- Correct Answer : c

Q.19 Which of these is not a work of Leonardo da Vinci.

Options :

a. Mona Lisa

b. The Last Supper

c. The Starry Night

d. Vitruvian Man

- Correct Answer : c

Q.20 1 feet equals to

Options :

a. 1 inch

b. 10 inch

c. 6 inch

d. 12 inch

- **Correct Answer :** d

Q.21 Which of the following suits the term sustainable construction?

Options :

a. Reducing the usage of local materials

b. Excessive Deforestation

c. Increasing carbon foot print

d. Reducing the impact on environment

- **Correct Answer :** d

Q.22 CFC (Chlorofluorocarbons) can be related to

Options :

a. Water purifying agent

b. Ozone depletion

c. Deforestation

d. Renewable energy source

- **Correct Answer :** b

Q.23 ..... is a large unfinished Roman Catholic Basilica designed by Antoni Gaudi.

Options :

a. Frauenkirche, Dresden

b. Sagrada Familia, Barcelona

c. Santhome Basilica, Chennai

d. Ronchamp Chapel, Ronchamp

- Correct Answer : b

Q.24 Who designed the India Habitat Center at New Delhi ?

Options :

a. Edwin Lutyens

b. Charles Correa

c. Joseph Allen Stein

d. Balkrishna Vithaldas Doshi

- Correct Answer : c

Q.25 Retaining walls are primarily used to

Options :

a. Retain soil

b. Store timber

c. Retain wind

d. Prevent heat

- Correct Answer : a

Q.26 The term "Ekistics" refers to study of

Options :

a. Human Settlements

b. Ecology

c. Sound and light

d. Energy studies

- **Correct Answer :** a

Q.27 What is the standard height of a typical staircase handrail ?

Options :

a. 200 mm -300 mm

b. 450 mm - 550 mm

c. 750 mm - 900 mm

d. 1800 mm - 2100 mm

- **Correct Answer :** c

Q.28 Which of the following is Odd function?

Options :

a. $\cos x + |x|$

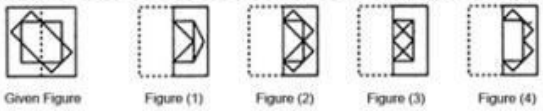
b. $\cos x^2$

c. $\sin |x|$

d. x^3

- **Correct Answer :** d

Q.29 Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line as in the given figure.



Options :

a. Figure (1)

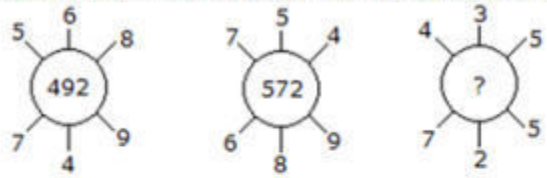
b. Figure (2)

c. Figure (3)

d. Figure (4)

- Correct Answer : b

Q.30 Which number will replace the question mark?



Options :

a. 135

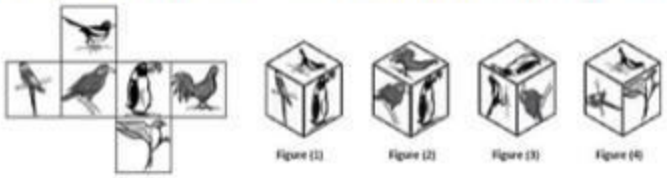
b. 130

c. 115

d. 140

- Correct Answer : b

Q.31 Which picture cube does the unfolded surface make?



Options :

a. Figure (1)

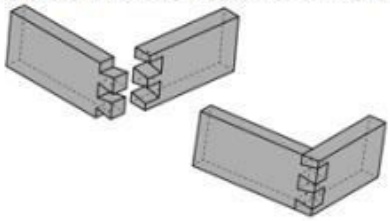
b. Figure (2)

c. Figure (3)

d. Figure (4

- Correct Answer : c

Q.32 The given figure represents joinery in carpentry and Timber construction works. What is it called?



Options :

a. Dowelled Joint

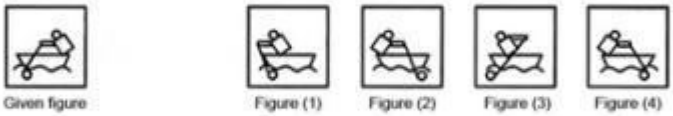
b. Dovetail Joint

c. Rabbeted Joint

d. Mortise & wedge joint

- Correct Answer : b

Q.33 Identify the correct mirror image of the given figure.



Options :

a. Figure (1)

b. Figure (2)

c. Figure (3)

d. Figure (4)

SET – 4

Q.1 What is the mass of the photon with wave length 3.6 A

Options :

a. 6.125×10^{-29} kg

b. 6.125×10^{-27} kg

c. 6.125×10^{-21} kg

d. 6.125×10^{-19} kg

- Correct Answer : a

Q.2 In the modern periodic table, the period indicates the value of

Options :

a. atomic number

b. atomic mass

c. principal quantum number

d. Azimuthal quantum number

- Correct Answer : c

Q.3 One mole of H_2O + one mole of CO are taken in a10 L vessel and heated to 725 K. At equilibrium 40% of water (by mass) reacts with CO according to the equation H_2O (g) + CO (g) ⇌ H_2 (g) + CO_2 (g) The equilibrium constant is equal to

Options :

a. 0.88

b. 0.66

c. 0.44

d. 0.22

- **Correct Answer :** c

Q.4 Hydrogen peroxide is sold in the market as an antiseptic as

Options :

a. perhydrol

b. hydrates

c. hydroquinone

d. tartaric acid

- **Correct Answer :** a

Q.5 The reaction used in the preparation of higher alkenes containing even number of carbon atoms is

Options :

a. Wurtz Reaction

b. Shift Reaction

c. Dumas Reaction

d. Fisher - Tropsch Reaction

- **Correct Answer :** a

Q.6 The value of $\sum_{r=16}^{30}(r-2)(r+3)$ is

Options :

a. 8470

b. 8070

c. 7180

d. 8710

- Correct Answer : a

Q.7 If A is a 3x3 non-singular matrix such that $AA^T=A^TA$ & $B=A^{-1}A^T$, then BB^T equals

Options :

a. I

b. B^{-1}

c. $(B^{-1})^T$

d. $I+B$

- Correct Answer : a

Q.8 From a point P $(\lambda,\lambda,\lambda)$, perpendiculars PQ & PR are drawn respectively on the lines $y=x, z=1$ & $y=-x, z=-1$. If P is such that $\angle QPR$ is a right angle, then the possible value of λ is

Options :

a. $\sqrt{2}$

b. 1

c. -1

d. $-\sqrt{2}$

- Correct Answer : c

Q.9 The parabola $y^2 = 4ax$ is cut orthogonally by

Options :

a. $x^2 + y^2 = a^2$

b. $y = e^{-\frac{x}{2a}}$

c. $y = ax$

d. $x^2 = 4ay$

- **Correct Answer :** d

Q.10 If the mean of the numbers a, b, 8, 5, 10 is 6 and variance is 6.8, then the possible values of a & b are

Options :

a. $a = 3, b = 4$

b. $a = 0, b = 7$

c. $a = 5, b = 2$

d. $a = 1, b = 6$

- **Correct Answer :** a

Q.11 When a point charge of 6mC is moved between two points in an electric field, the work done is 1.8 x 10^{-5} J. The potential difference between the two points is

Options :

a. 1.08 V

b. 1.08 mV

c. 3V

d. 30 V

- **Correct Answer :** c

Q.12 A wire of length 1 meter carrying current of 2 Amp is placed inside a field of magnetic induction 20 T such that it makes an angle of 30 ^{o} with the direction of the field. The force experienced by the wire is

Options :

a. 40 N

b. 20 N

c. $10\sqrt{3}$ N

d. $40\sqrt{3}$ N

- **Correct Answer :** b

Q.13 If a secondary coil has 40 turns and primary coil has 20 turns is charged with 50V of potential difference, then potential difference of secondary coil would be

Options :

a. 25 V

b. 50 V

c. 60 V

d. 100 V

- **Correct Answer :** d

Q.14 The speed of light in an isotropic medium is depends on

Options :

a. It's intensity

b. It's wavelength

c. The nature of propagation

d. The motion of the source with respect to medium

- **Correct Answer :** b

Q.15 In a good conductor the forbidden energy gap between the conduction band and valence band is

Options :

a. infinity

b. zero

c. narrow

d. wide

- **Correct Answer :** b

Q.16 Which ancient text consists of hymns on Indian architecture?

Options :

a. Rig Veda

b. Yajur Veda

c. Sama Veda

d. Adharva Veda

- **Chosen Option :** d
- **Correct Answer :** a

Q.17 Identify the building which is not designed by an Indian architect.

Options :

a. Amdavad ni Gufa, Ahmedabad

b. Hall of Nations, New Delhi

c. Indian Parliament House, New Delhi

d. Sabarmati Ashram, Ahmedabad

- **Correct Answer :** c

Q.18 Which one of the seven wonders of the ancient world still exists?

Options :

a. Hanging gardens of Babylon

b. The Great Pyramid of Giza

c. Taj Mahal

d. Colossus of Rhodes

- **Correct Answer :** b

Q.19 It is a war memorial constructed for the soldiers of the British Indian army who lost their lives in the first world war.

Options :

a. India Gate, New Delhi

b. Charminar, Hyderabad

c. Gateway of India, Mumbai

d. Raj Ghat, Delhi

- **Correct Answer :** a

Q.20 In which style of Architecture is the Brihadeshwara temple is designed and constructed?

Options :

a. Dravidian

b. Mughal

c. Indo Saracenic

d. Kalinga

- **Correct Answer :** a

Q.21 Which is an award related to architecture?

Options :

a. Academy Awards

b. Utham Jeevan Raksha Padak

c. Abel Prize

d. Pritzker Prize

- **Correct Answer :** d

Q.22 What is the origin of the lion pillar at Sarnath?

Options :

a. Jain

b. Sikh

c. Buddhist

d. Nayak

- **Correct Answer :** c

Q.23 Which is the tallest building in the world as on date?

Options :

a. One World Trade Centre

b. Burj Khalifa

c. Shanghai Tower

d. Petronas Towers

- **Correct Answer :** b

Q.24 Which is the world's largest stone sun dial located?

Options :

a. Royal Observatory Greenwich, London

b. Jantar Mantar, Jaipur

c. Paris Observatory, Paris

d. Sun Temple, Konark

- **Correct Answer :** b

Q.25 Which among the following are structures carved out of monolithic stones.

Options :

a. Jagannath Temple, Puri

b. Papanatha Temple, Patadakal

c. Durga Temple Aihole

d. Pancha Rathas, Mahabalipuram

- **Correct Answer :** d

Q.26 Complete the series

Options :

a. A) 

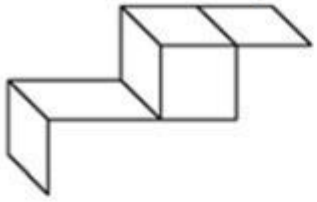
b. B) 

c. C) 

d. D) 

- **Correct Answer :** a

Q.27 Which of the following is hidden in the 3d composition?

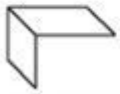


Options :

a. A) 

b. B) 

c. C) 

d. D) 

- Correct Answer : c

Q.28 In the following sequence find the odd one out.

Options :

a. A) 

b. B) 

c. C) 

d. D) 

- Correct Answer : d

Q.29 Which of the following graphic depicts weight?

Options :

a. A) BIG SMALL

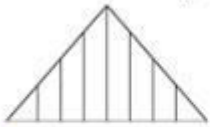
b. B) BIG SMALL

c. C) BIG SMALL

d. D) BIG SMALL

- Correct Answer : c

Q.30 How many triangles are hidden in the given figure?



Options :

a. 8

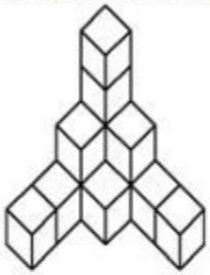
b. 9

c. 10

d. 11

- Correct Answer : b

Q.31 A total of how many cubes can be located in the following composition.



Options :

a. 13

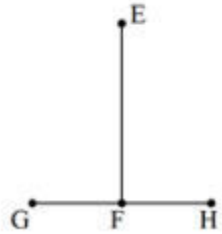
b. 12

c. 11

d. 10

- **Correct Answer :** a

Q.32 What is the relationship between the GH and EF



Options :

a. GH > EF

b. GH = EF

c. GH < EF

d. GH ≠ EF