Aptitude Test.
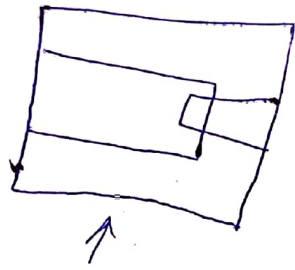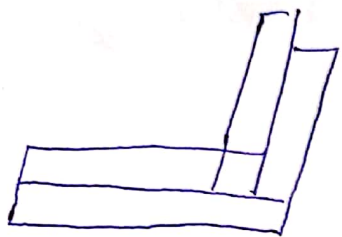
4. I (two same figures given) (diagram questions.

5. Where from among the following is the famous St. Peters located.?

a) Venice b) Denmark. c) Rome d) Norway.

6.) What is the texture of sand-paper.

a) shiny b) smooth c) coarse d) glossy

7) which one of the following is considered to be a calming color?

a) Blue b) green c) red d) orange.

8) what among the following is the thickness of a two-brick wall?

a) 18" b) 22" c) 20" d 16"

9. Where from the following is the National gallery of Modern Art. Located.?

a) New Delhi b) Mysore c) Lucknow d) Bangalore.

10) In the Northern Hemisphere the winter sun rises from which one of the following directions.

a) North east b) North West c) South east d) South west.

11) Who was the architect of the LIC Building in Cannaught Place, New Delhi

a) Louis Khan. b) Raj Sewal c) Zaha Hadid d) Charles Koerra.

12) What is the purpose of a chimney in a building.

a) To hold the building up b) To make the building water proof
c) To give strength to a building d) To take out the smoke from a fire place.

13. Who among the following is an architect?

a) Geoffery Bawa b) Donald Trump c) Louis Armstrong

d) Sharmila Tagore.

14) Which one of the following is a secondary colour.

a) Yellow b) red c) Blue d) Green.

15) Which one of the following is a purpose for installing false ceilings?
a) making the space accoustically effective b) supporting the walls.
c) making the building waterproof d. Making the building fire proof.

16) In which State in India are the large Tea Gardens located.?

a) UP b) Odishe c) Kerala d) Punjab.

' Who was the architect of the glass pyramid at the Louvre Paris?
a. I.M Pei   b) Frank Lloyd Wright   c) Charles Correa   d) Walter Gropius.

○ What among the following would be the ideal material for flooring of a Steel factory?
a) Granite   b) steel   c) Tilee   d. wood.

○ Buckingham Palace is the Residence of which one of the following?
a) King of Nepal   b) King of Prussia   c) Queen of England   d) King of Netherlands.

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45   Planning.

full form of CrPS.

Secondary sector economic activity is related to
a Tourism   b) Agriculture   c) Industrial   d) Trade & Commerce.

Drawing.

○. In the space provided for the answer of this question, draw an aesthetic composition appropriate to this space using only equilateral Triangles. There is no restriction to number, sizes, placement and directions of these shapes. Colour this composition so that it becomes visually exciting.

1 Draw from imagination a mother cooking in the kitchen
Draw from imagination a beautiful building
Draw from memory the face of one of your parent.

1. Let the ellipse, $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, $a > b$, pass through the point $(2,3)$ and have eccentricity equal to $\frac{1}{2}$. Then, equation of the normal to the ellipse at $(2,3)$ is

   a) $2y - x = 4$ b) $2x - y^2 = 1$ c) $3x - 2y = 0$ d) $3x - y = 3$.

2. $\lim_{x \to 1} \left\{ \log_e (e^{x(x-1)} - e^{x(1-x)}) - \log_e (4x(x-1)) \right\}$ is equal to:

   a) $-2\log_e 2$ b) 1 c) $1 - \log_e 2$ d) $-\log_e 2$

3. The area (in sq. units) of the region $\left\{ (x-y) : \frac{1}{2} \le y \le \sin x, \ 0 \le x \le \pi \right\}$ is:

   a) $3 - \frac{2\pi}{3}$ b) $\sqrt{3} - \frac{\pi}{6}$ c) $3 - \frac{\pi}{3}$ d) $\sqrt{3} - \frac{\pi}{3}$

4. A bag contains 6 red balls and 10 green balls. 3 balls are drawn from it one by one randomly without replacement. If the third drawn ball is red, then the probab. that the first two drawn balls are green is :

   a) $3/7$ b) $9/49$ c) $9/56$ d) $3/8$

5. Let the data $4, 10, x, y, 27$ be in increasing order. If the median of data is 18 and its mean deviation about mean is 7.6, then the mean of this data is:

   a) 17 b) 16 c) 16.5 d) 15.5.

6. If a variable plane in 3-D space moves in such a way that the sum of its intercepts on the x and y-axes exceeds, the reciprocal of its intercept on the z-axis by 2, then all such planes will pass through the point :

   a) $\left(\frac{1}{2}, \frac{1}{2}, -\frac{1}{2} \right)$ b) $\left(\frac{1}{2}, \frac{1}{2}, \frac{1}{2} \right)$ c) $\left(\frac{1}{2}, -\frac{1}{2}, -\frac{1}{2} \right)$ d) $\left(\frac{1}{2}, -\frac{1}{2}, \frac{1}{2} \right)$

7. If m be the latest value of $|z-3+i4|^2 + |z-5-i2|^2$, $z \in \mathbb{C}$ attained at $z = z_0$, then the ordered pair $(|z_0|, m)$ is equal to:

   a) $(\sqrt{13}, 10)$ b) $(\sqrt{17}, 20)$ c) $(\sqrt{17}, 10)$ d) $(\sqrt{13}, 20)$

8. Let $A = \begin{bmatrix} x & 2y \\ -1 & y \end{bmatrix}$; $x, y \in \mathbb{R}$.

   If $AA^T = \begin{bmatrix} 1 & 0 \\ 0 & \alpha \end{bmatrix}$ ($\alpha \in \mathbb{R}$), then $\alpha + y^2$ is equal to

   a) $\sqrt{2} - 1$ b) 1 c) 2 d) $\sqrt{2}$

9. A ray of light is projected from the origin at angle of $60°$ with the positive direction of x-axis towards the line, $y = 2$, which gets reflected from the point $(\alpha, 2)$. Then the distance of the reflected ray of light from the point $(2,2)$ is :

   a) $3 - \sqrt{3}$ b) $1 - \frac{1}{\sqrt{3}}$ c) $\sqrt{3} - 1$ d) $2\left(1 - \frac{1}{\sqrt{3}}\right)$

10. If $\sum_{r=1}^{9} \left(\frac{r+3}{2^r} \right) {}^9C_r = \alpha \left[\frac{3}{2} \right]^9 + \beta$, then $\alpha + \beta$ is equal to.

    a) 9 b) 3 c) 6 d) 2.

11. Let S_n denote the sum of the first n terms of an A.P., $a_1, a_2, a_3, \ldots, a_n$. If $a_5 + a_9 = 1$ and $S_9 = 6$, then which of the following is not true?

    a) $a_6 + a_8 = 1$ b) $S_6 = \frac{19}{2}$ c) $S_{13} = \frac{13}{2}$ d) $a_{13} = 0$

12. The function $f(x) = e^{x+1}(4x^2 - 16x + 11)$

    a) decreasing in $\left[-\infty, -\frac{5}{2} \right) \cup \left[\frac{1}{2}, \infty \right)$ b) dem in $\left[-\infty, \frac{1}{2} \right] \cup \left[\frac{5}{2}, \infty \right)$

    c) increasing in $(-\infty, -2) \cup (2, \infty)$ d) incr in $\left(-\infty, -\frac{1}{2} \right) \cup \left[\frac{5}{2}, \infty \right]$

13. If $10 \sin^4\alpha + 15 \cos^4\alpha = 6$, $\alpha \in \left[-\frac{\pi}{2}, \frac{\pi}{2}\right)$, then $27 \csc^6\alpha + 8 \sec^6\alpha$ is equal to:

a) 250   b) 280   c) 270   d) 240.

14. let a function, $f : (-1, 3) \to \mathbb{R}$ be defined as $f(x) = \min\{x[x], |x[x] - 2| + 2\}$, where $[x]$ denotes the greatest integer $\leq x$, Then f is:

a) neither continuous nor differentiable at exactly 3 points.   b) not continuous at only one pt. and not differentiable at 3 points.

c) neithe $\cdots \cdots$ at exactly two points.

d) $\cdots$ at two pts. and at 3 pt.

15. If $A = \{1, 2, 3, 4\}$, then the number of functions on the set A, which are not one-one, is :

a) 240   b) 248   c) 232   d) 256

16. If $x = x(y)$ is the solution of the differential equation, $y\,dx - (x + 2y^2)dy = 0$, with $x(-\pi) = \pi^2$, then x is equal to:

a) $-2y^2 + 3\pi y$ b) $2y^2 + \pi y$ c) $2y^2 - \pi^2$ d) $y^2 - 2\pi y$

17. which of the following is not equivalent to $\sim p \wedge q$?

a) $\sim(q \to p)$ b) $\sim p \wedge (\sim p \to q)$ c) $\sim(p \vee \sim q)$ d) $\sim p \to \sim q$

18. The sum of the values of x satisfying the equation, $\sqrt{x}(\sqrt{x} - 4) - 3|\sqrt{x} - 2| + 6 = 0$ $(x \geq 0)$, is :

a) 20   b) 10   c) 25   d) 8

19. If the volume of a parallelopiped whose coterminous edges are $\vec{a} = \hat{i} + \hat{j} + 2\hat{k}$, $\vec{b} = 2\hat{i} + \lambda\hat{j} + \hat{k}$ and $\vec{c} = 2\hat{i} + 2\hat{j} + \lambda\hat{k}$ is 35 cu.m, then a value of $\vec{a}\cdot\vec{b} + \vec{b}\cdot\vec{c} - \vec{c}\cdot\vec{a}$ is :

a) -10   b) 2   c) 22   d) -14

20. If for some $c < 0$, the quadratic equation, $2cx^2 - 2(2c - 1)x + 3c^2 = 0$ has two distinct real roots, $\frac{1}{a}$ and $\frac{1}{b}$, then the value of the determinant $\begin{vmatrix} 1+a & 1 & 1 \\ 1 & 1+b & 1 \\ 1 & 1 & 1+c \end{vmatrix}$ is :

a) $\frac{4}{3}$ b) 0   c) 1   d) 2

21) If $\int e^{2x}(\cos x + 7 \sin x)\,dx = e^{2x}g(x) + c$, where c is a constant of integration, then $g(0) + g\left(\frac{\pi}{2}\right)$ is equal to ___.

- no options.

22) If the line joining the points $(-1, 2, 5)$ and $(3, 4, -10)$ intersects the xy-plane at the point (x, y, z), the $\frac{y}{x}$ is equal to? .

- no options.

23) het $f(x) = \begin{cases} |x - 3|, & \text{if } x < -1, \\ 3x + 4, & \text{if } x \geq -1 \end{cases}$ $g(x) = x^2 - bx - 2$ $(x \in \mathbb{R})$ and b is a real constant. If g of is continuous $x = -1$, then b is equal to ___.

- no opt.

24) If the total number of ways in which 8-digit numbers can be formed by using all the digits 0, 1, 2, 3, 4, 5, 7, 9 such that no two even digits appear together is $(5!)K$, then K is equal to ___ .

- no opt.

25) let $a, b \in \mathbb{R}$ and $a > 0$. If the tangent at the point $(2, 2)$ to the circle $x^2 + y^2 = 8$ touches the parabola $y^2 = 2\,4a(x - b)$, then $b - a$ is equal to ___.

- no apt.