ENGLISH

1. Give the meaning of the given idiom/phrase- 'Through and through'
   (a) Ultimately   (b) Entirely   (c) By the means of   (d) In the end

2. Given one-word substitution for the following expression- 'One who does not care for art and literature'
   (a) Bohemian   (b) Philistine   (c) Stoic   (d) Recluse

3. Spot the error which may be in one part of the sentence (a) or (b) or (c). If there is no error, the answer is (d) i.e. No error.
   He introduced (a)/ to the (b)/ Chief Minister. (c)/ No error. (d)

4. Change the Voice –
   Switch on the light.
   (a) Switch should be on by the light.   (b) The light should be on by the Switch.   (c) Let the light be switched on.   (d) You are ordered to on the light.

5. Change the Narration –
   The principal said to the peon, "Go away at once."
   (a) The Principal requested the peon to go at once.   (b) The Principal ordered the peon that he should go away at once.   (c) The Principal ordered the peon to go away at once.   (d) The Principal suggested the peon to go away at once.

   Directions: (Q. 6 & 7) – *Fill in the Blanks with correct Prepositions.*

6. He is good _____ Mathematics.
   (a) at   (b) in   (c) into   (d) on

7. He is addicted _____ gambling.
   (a) at   (b) on   (c) to   (d) by

8. He cannot pass the examination _____ he works hard.
   (a) so long as   (b) as long   (c) (a) unless   (d) when

9. The child ___ for being dragged away from its mother.
   (a) cried   (b) demanded   (c) claimed   (d) called

10. The feminine gender of Lover is –
    (a) Darling   (b) Dear   (c) Beloved   (d) Witch

11. Spot the miss-spelt word –
    (a) Transparent   (b) Binnoculars   (c) Camouflage   (d) Kennel

12. Choose the Synonym of 'ACQUITTED'
    (a) Nurtured   (b) Neglected   (c) Pardoned   (d) Abandoned

13. The plural of 'CRISIS' is
    (a) Crisises   (b) Crises   (c) Croses   (d) Creses

14. The Antonym of 'SHALLOW' is
    (a) High   (b) Long   (c) Wide   (d) Deep

15. The Adjective form of 'Strength' is –
    (a) Strong   (b) Strengthen   (c) Stronging   (d) Strengthning

16. Punctuate the following :-
    alas i am ruined
    (a) Alas! I am ruined   (b) Alas! i am ruined   (c) Alas! I am ruined!   (d) "Alas! I am ruined."

    Directions: In the following question, a sentence is divided into six parts (1), (P), (Q), (R), (S) and (6). The order of (1) and (6) is correct but (P), (Q), (R) and (S) are jumbled up. Find the correct order with the help of the option

17. **1:** The old man wanted to cross the road.
    P: The driver got off and came to him.
    Q: He was fed up and was about to return.
    R: Then a car stopped in front of him.
    S: He waited for a long time.
    6: Holding him by hand the driver helped him to cross the road.
    The proper sequence should be:
    (a) SQRP   (b) SPRQ   (c) QRSP   (d) PSRQ

Directions (18-20): Read the following passage carefully and answer each of the following questions given below in the context of the passage.

Passage

Our age is the age of specialization. Each one knows more about less and less. We concentrate on some narrow field and forget about the longer context in which we could understand the meaning of our own specialization. Modern specialization has led to the fragmentation of knowledge. We should not only be specialists but also have a sense of the meaning of life and of social responsibility, we have to reckon with the spirit of science, understand its limitation and develop an outlook which is consistent with its findings. It is no use clinging to traditional forms which have lost their meanings. We cannot ignore the World of scientific achievement and withdraw into the inner life of contemplation. We are involved in the mechanism of the modern World and so should seek even religious truth not merely with our emotions but with our minds. We cannot ignore the scientific civilization. Nor we can drop religion. To reconcile the two is the task set for our generation.

18. The writer says that we should
    (a) Follow the religious path
    (b) Follow the scientific way
    (c) Reject both the scientific way and the religious path
    (d) Adopt both the religious Path and Scientific

19. The writer says that
    (a) We should not be specialists
    (b) We should be specialists
    (c) We should not be specialists but have a sense of the meaning of life
    (d) We should be specialist and we should also have a sense of the meaning of life and of Social responsibility.

20. 'Fragmentation' of knowledge means
    (a) Increase of knowledge
    (b) Assimilation of Knowledge
    (c) Splitting the knowledge into different fields
    (d) Distribution of knowledge

1. Let $A = [x : x \in R, |x| < 1]$; $B = [x : x \in R, |x-1| \geq 1]$ and $A \cup B = R - D$, then the set D is
   (a) $[x : 1 < x \leq 2]$ (b) $[x : 1 \leq x < 2]$
   (c) $[x : 1 \leq x \leq 2]$ (d) None of these

2. Let $f(x) = \begin{cases} \dfrac{1}{2}, & if \ 0 \leq x \leq \dfrac{1}{2} \\ \dfrac{1}{3}, & if \ \dfrac{1}{2} < x \leq 1 \end{cases}$, then $f(x)$ is
   (a) A rational function   (b) A trigonometric function
   (c) A step function   (d) An exponential function

3. The principal value of $\sin^{-1}\left(-\dfrac{\sqrt{3}}{2}\right)$ is:
   (a) $\dfrac{2\pi}{3}$ (b) $\dfrac{-\pi}{3}$
   (c) $\dfrac{-2\pi}{3}$ (d) $\dfrac{5\pi}{3}$

4. If $A(3,5), B(-5,-4), C(7,10)$ are the vertices of a parallelogram, taken in the order, then the co-ordinates of the fourth vertex are:
   (a) (10, 19)   (b) (15, 10)
   (c) (19, 10)   (d) (15, 19)

5. If $z = \dfrac{1 - i\sqrt{3}}{1 + i\sqrt{3}}$, then $arg(z) =$
   (a) 60° (b) 120°
   (c) 240° (d) 300°

6. The sum of infinity of a geometric progression is $\dfrac{4}{3}$ and the first term is $\dfrac{3}{4}$. The common ratio is
   (a) 7/16   (b) 9/16
   (c) 1/9   (d) 7/9

7. $\int \log x \, dx =$
   (a) $x + x \log x + c$ (b) $x \log x - x + c$
   (c) $x^2 \log x + c$ (d) $\dfrac{1}{x} \log x + x + c$

8. $\int_0^{\pi/2} \dfrac{\sqrt{\cot x}}{\sqrt{\cot x} + \sqrt{\tan x}} \, dx =$
   (a) π (b) $\pi/2$
   (c) $\pi/4$ (d) $\pi/3$

9. $10^n + 3(4^{n+2}) + 5$ is divisible by $(n \in N)$
   (a) 7   (b) 5
   (c) 9   (d) 17

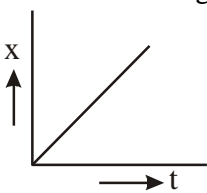10. $\dfrac{1}{n^2} + \dfrac{1}{2n^4} + \dfrac{1}{3n^6} + \ldots\infty$ is equal to-

(a) $\log_e\left(\dfrac{n^2}{n^2+1}\right)$

(b) $\log_e\left(\dfrac{n^2+1}{n^2}\right)$

(c) $\log_e\left(\dfrac{n^2}{n^2-1}\right)$

(d) None of these

11. Differential coefficient of x^3 with respect to x^2 is

(a) $\dfrac{3x^2}{2}$

(b) $\dfrac{3x}{2}$

(c) $\dfrac{3x^3}{2}$

(d) $\dfrac{3}{2x}$

12. Let $A = \{1, 2, 3, 4\}$ and R be a relation in A given by $R = \{(1, 1), (2, 2), (3, 3), (4, 4), (1, 2), (2, 1), (3, 1), (1, 3)\}$.

(a) Reflexive

(b) Symmetric

(c) Transitive

(d) An equivalence relation

13. A point inside the circle $x^2 + y^2 + 3x - 3y + 2 = 0$ is:

(a) $(-1, 3)$

(b) $(-2, 1)$

(c) $(2, 1)$

(d) $(-3, 2)$

14. The equation of the normal to the ellipse $\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$ at the point $(a\cos\theta, b\sin\theta)$ is:

(a) $\dfrac{ax}{\sin\theta} - \dfrac{by}{\cos\theta} = a^2 - b^2$

(b) $\dfrac{ax}{\sin\theta} - \dfrac{by}{\cos\theta} = a^2 + b^2$

(c) $\dfrac{ax}{\cos\theta} - \dfrac{by}{\sin\theta} = a^2 - b^2$

(d) $\dfrac{ax}{\cos\theta} - \dfrac{by}{\sin\theta} = a^2 + b^2$

15. The complete solution of the inequation $x^2 - 4x < 12$ is

(a) $x < -2$ or $x > 6$

(b) $-6 < x < 2$

(c) $2 < x < 6$

(d) $-2 < x < 6$

16. The number of triangles that can be formed by 5 points in a line and 3 points on a parallel line is

(a) $^8C_3$

(b) $^8C_3 - {}^5C_3$

(c) $^8C_3 - {}^5C_3 - 1$

(d) None of these

17. Area bounded by curve $y = x^3$, x–axis and ordinates $x = 1$ and $x = 4$, is

(a) 64 *sq. unit*

(b) 27 *sq. unit*

(c) $\dfrac{127}{4}$ *sq. unit*

(d) $\dfrac{255}{4}$ *sq. unit*

18. The solution of $e^{dy/dx} = (x+1)$, $y(0) = 3$ is

(a) $y = x\log x - x + 2$

(b) $y = (x+1)\log|x+1| - x + 3$

(c) $y = (x+1)\log|x+1| + x + 3$

(d) $y = x\log x + x + 3$

19. If $(1, 3)$, $(2, 5)$ and $(3, 3)$ are three elements of $A \times B$ and the total number of elements in $A \times B$ is 6, then the remaining elements of $A \times B$ are

(a) $(1, 5; 2, 3; 3, 5)$

(b) $(5, 1; 3, 2; 5, 3)$

(c) $(1, 5; 2, 3; 5, 3)$

(d) None of these

20. The number of real values of the parameter k for which $(\log_{16} x)^2 - \log_{16} x + \log_{16} k = 0$ with real coefficients will have exactly one solution is

(a) 2
(b) 1
(c) 4
(d) None of these

21. If $f(x) = \dfrac{\alpha x}{x+1}$, $x \neq -1$. Then, for what value of α is $f(f(x)) = x$

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

22. $\lim\limits_{\theta \to 0} \dfrac{1 - \cos \theta}{\theta^2}$ is equal to-

(a) 1
(b) 2
(c) $\dfrac{1}{2}$
(d) $\dfrac{1}{4}$

23. The angular elevation of a tower CD at a point A due south of it is 60° and at a point B due west of A, the elevation is 30°. If $AB = 3\ km$, the height of the tower is:

(a) $2\sqrt{3}\ km$
(b) $2\sqrt{6}\ km$
(c) $\dfrac{3\sqrt{3}}{2}\ km$
(d) $\dfrac{3\sqrt{6}}{4}\ km$

24. If the given lines $y = m_1 x + c_1$, $y = m_2 x + c_2$ and $y = m_3 x + c_3$ be concurrent, then:

(a) $m_1(c_2 - c_3) + m_2(c_3 - c_1)$ $+ m_3(c_1 - c_2) = 0$
(b) $m_1(c_2 - c_1) + m_2(c_3 - c_2) +$ $m_3(c_1 - c_3) = 0$
(c) $c_1(m_2 - m_3) + c_2(m_3 - m_1)$ $+ c_3(m_1 - m_2) = 0$
(d) None of these

25. The radical centre of three circles described on the three sides of a triangle as diameter is:

(a) The orthocentre
(b) The circumcentre
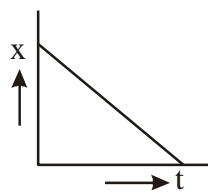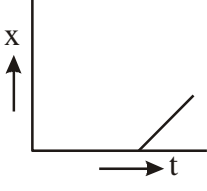(c) The incentre of the triangle
(d) The centroid

1. Sound waves in air differ from the electromagnetic waves in that they cannot be:
   (a) Reflected
   (b) Refracted
   (c) Diffracted
   (d) Polarised

2. On which of the following factors does the total energy of the oscillator executing simple harmonic motion depend?
   (a) Displacement
   (b) Frequency
   (c) Velocity
   (d) Acceleration

3. Pitch of a tone depends upon:
   (a) Frequency
   (b) Intensity
   (c) Amplitude
   (d) None of the above

4. A body starts from rest and acquires a velocity V in time T. The work done on the body in time t will be proportional to:
   (a) $\dfrac{V}{T}t$
   (b) $\dfrac{V^2}{T}t^2$
   (c) $\dfrac{V^2}{T^2}t$
   (d) $\dfrac{V^2}{T^2}t^2$

5. Which of the following is not conserved during elastic collisions?
   (a) Momentum
   (b) Energy
   (c) Kinetic energy
   (d) None of the above

6. A body is at rest on the surface of the Earth. Which of the following statements is correct?
   (a) No force is acting on the body
   (b) Only weight of the body acts on it
   (c) Net downward force is equal to the net upward force
   (d) None of the above statement is correct

7. The property of liquids by virtue of which their free surface behaves as a stretched membrane is called:
   (a) Cohesion
   (b) Adhesion
   (c) Viscosity
   (d) Surface tension

8. Efficiency of adiabatic process will be?
   (a) 0
   (b) ∞
   (c) 1
   (d) 0.5

9. How does the Young's modulus vary with the increase of temperature?
   (a) Decrease
   (b) Increase
   (c) Remains constant
   (d) First increases and then decreases

10. In which of the following cells polarization is the major defect?
    (a) Voltaic cell
    (b) Leclanche cell
    (c) Daniel cell
    (d) None of the above

11. What is the current through 100 W, 250 V lamp?
    (a) 2.50 A
    (b) 1.00 A
    (c) 0.40 A
    (d) 0.25 A

12. A voltmeter of range 3V and resistance 200Ω cannot be converted to an ammeter of range:
    (a) 10 mA
    (b) 100 mA
    (c) 1A
    (d) 10A

13. The measured mass and volume of a body is 20.00g and 5 cm^3 respectively, with possible errors 0.01g and 0.1 cm^3. The maximum error in density is about:
    (a) 0.2%
    (b) 2%
    (c) 5%
    (d) 10%

14. If $\vec{P}.\vec{Q} = |\vec{P} \times \vec{Q}|$. The angle between $\vec{P}$ and $\vec{Q}$ is:
   (a) Zero
   (b) $\pi/2$
   (c) π
   (d) None of the above

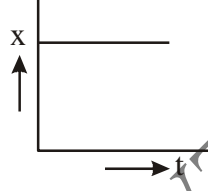15. Which of the following cannot be the distance time graph?
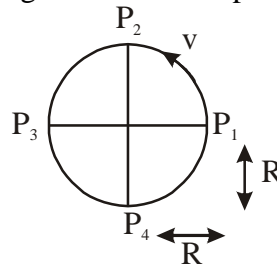
   (a)
   (b)
   (c)
   (d)

16. The phase angle between the projections of uniform circular motion on two mutually perpendicular diameters is:
   (a) Zero
   (b) $\dfrac{\pi}{2}$
   (c) $\dfrac{3\pi}{4}$
   (d) π

17. In case of vibrating string, the frequency of the first overtone is equal to frequency of the:
   (a) Fundamental note
   (b) First harmonic
   (c) Second harmonic
   (d) None of the above

18. The frequency of a man's voice is 300 Hz. If velocity of sound waves is 336 ms^{-1}, the wavelength of the sound is:
   (a) 330/336 m
   (b) 300×336 m
   (c) 1.12m
   (d) None of the above

19. The kinetic energy of a body is decreased by 19%. What is the percentage decrease in momentum?
   (a) 20%
   (b) 15%
   (c) 10%
   (d) 5%

20. A stone is whirled along a circular path with uniform speed. Which of the following is constant both in magnitude and direction?
   (a) Velocity
   (b) Angular velocity
   (c) Acceleration
   (d) Centripetal acceleration

21. A satellite is orbiting around the earth with a period T. If the earth suddenly shrinks to half its radius without change in mass, the period of revolution of the satellite will be:
   (a) $T/\sqrt{2}$
   (b) T/2
   (c) T
   (d) 2T

22. How is the velocity of thermal radiations (v) related to the velocity of light (c)?
   (a) v > c
   (b) v = c
   (c) v < c
   (d) The relation depends upon the wavelength of the radiations

23. During wind storm, roofs of houses may be blown off because:
   (a) of their typical shape
   (b) wind creates high pressure over the roof
   (c) wind creates low pressure over the roof
   (d) roofs are not tightly bound.

24. An ice cube contains a large air bubble. The cube is floating on the surface of water contained in a trough. What will happen to the water level, when the cube melts?
    (a) It will remain unchanged
    (b) It will fall
    (c) It will rise
    (d) First it will fall and then rise

25. Figure shows a body of mass M moving with uniform speed v along a circle of Radius R.

What is the change in angular velocity in going from P_1 to P_2?
    (a) Zero
    (b) $\sqrt{2}v / R$
    (c) $v / \sqrt{2R}$
    (d) $2v / R$

1. Blue Revolution is related to :
   - (a) Food Production
   - (b) Oilseed Production
   - (c) Milk Production
   - (d) Fish Production

2. Who was the chairman of the first Finance Commission ?
   - (a) K.C. Neogi
   - (b) K Santhanam
   - (c) A. K. Chandra
   - (d) J. N. Shelet

3. Where is the headquarter of international Red Cross?
   - (a) Geneva
   - (b) New York
   - (c) Stockholm
   - (d) Paris

4. The word 'Secular' added in the preamble by
   - (a) 25th amendment
   - (b) 42nd amendment
   - (c) 44th amendment
   - (d) 52nd amendment

5. The Preamble enshrines certain ideals that were first spelt out in:
   - (a) the speech by Jawahar Lal Nehru on the banks of Ravi when he called for Purna Swaraj
   - (b) the Nehru Report
   - (c) a resolution adopted at Karachi session of the Indian National Congress
   - (d) the objective resolution adopted by the Constituent Assembly

6. Haryana State was formed on November 1st, 1966 on the recommendation of:
   - (a) LB Shastri
   - (b) Indira Gandhi
   - (c) Sardar Hukum Singh
   - (d) Sir Chhotu Ram

7. Which state of India is known as 'Silicon state'?
   - (a) Goa
   - (b) Andhra Pradesh
   - (c) Karnataka
   - (d) Kerala

8. Which language is spoken most in India?
   - (a) Hindi
   - (b) Telgu
   - (c) Tamil
   - (d) Marathi

9. Nagarjuna Sagar is situated on
   - (a) Godavari
   - (b) Krishna
   - (c) Penganga
   - (d) Tungabhadra

10. India's Eastern Ghats and Western Ghats meet at the:
    - (a) Cardamon hills
    - (b) Annamalai hills
    - (c) Nilgiri hills
    - (d) Palani hills

11. Which is the smallest planet of our solar system?
    - (a) Saturn
    - (b) Mars
    - (c) Venus
    - (d) Mercury

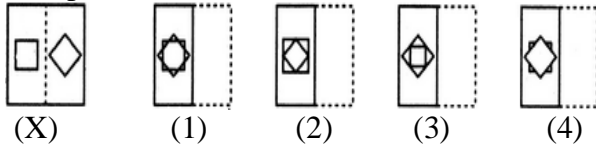12. Gobi desert is located in which country ?
    - (a) Mexico
    - (b) Somalia
    - (c) Mangolia
    - (d) Egypt

13. At which of the following place the evidence of burying the dog with human dead body has been found?
    - (a) Burzhom
    - (b) Coladihawa
    - (c) Chopanimando
    - (d) Mando

14. Rangpur, where the Harappan civilization is found contemporarily is situated in?
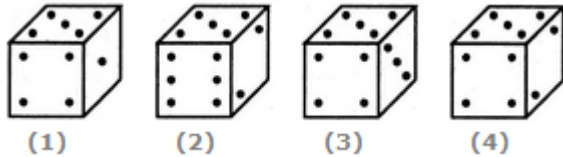   - (a) Punjab
    - (b) Eastern U.P.
    - (c) Saurashtra
    - (d) Rajasthan

15. The word 'gotra' was used for the first time in?
    (a) Atharvaveda   (b) Riveda
    (c) Samveda   (d) Yazurved

16. $\dfrac{1}{(216)^{-2/3}} + \dfrac{1}{(256)^{-3/4}} + \dfrac{1}{(243)^{-1/5}} = ?$
    (a) 103   (b) 105
    (c) 107   (d) None of these

17. In an office, 1/3 of the workers are women, 1/2 of the women are married and 1/3 of the married woman have children. If 3/4 of the men are married and 2/3 of the married men have children, what part of the workers and without children ?
    (a) 4/9   (b) 5/18
    (c) 11/18   (d) 17/36

18. $\dfrac{\sqrt{16}}{\sqrt{25}} \times \dfrac{\sqrt{x}}{\sqrt{25}} \times \dfrac{16}{25} = \dfrac{256}{625}$ then the value of x will be
    (a) 8   (b) 16
    (c) 5   (d) None of these

19. By selling a horse for Rs. 570, a tradesman would loss 5%, at what price must he sell it to gain 5% ?
    (a) Rs. 600   (b) Rs. 750
    (c) Rs. 630   (d) Rs. 800

20. If a square and a rhombus stand on the same base, then the ratio of the areas of the square and rhombus is
    (a) area of square > area of rhombus   (b) area of square < area of rhombus
    (c) area of square = area of rhombus   (d) area of rhombus does not the same base of square

21. At what rate percent per annum of simple interest, will a sum of money double itself in 12 years ?
    (a) $8\dfrac{1}{3}\%$ p.a.   (b) 20% p.a.
    (c) $13\dfrac{1}{3}\%$ p.a.   (d) $17\dfrac{1}{2}\%$ p.a.

22. A train can travel 50% faster than a car. Both start from point A at the same time and reach point B 75 kms away from A at the same time. On the way, however, the train lost about 12.5 minutes while stopping at the stations. The speed of the car is:
    (a) 100 kmph   (b) 110 kmph
    (c) 120 kmph   (d) 130 kmph

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24. Choose the alternative which is closely resembles the water-image of the given combination.

    bridge
    (1) pɪ¡qɑ̄e   (2) pʟɪqɑ̄e
    (3) pɪ¡qɑ̄e   (4) pʟɪpɑ̄e

    (a) (1)   (b) (2)
    (c) (3)   (d) (4)

25. Find out from amongst the four alternatives as to how the pattern would appear when the transparent sheet is folded at the dotted line.

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

(a)   (1)   (b)   (2)
(c)   (3)   (d)   (4)

26. In a certain code, SIKKIM is written as THLJJL, how will TRAINING be written in that code?
    (a)   SQBHOHOF   (b)   UQBHOIOF
    (c)   UQBHOHOI   (d)   UQBHOHOF

27. Amongst the following figures, find the correct one, if it is known that the total number of dots on opposite faces of the cube shown is always 7.

(a)   Fig.1   (b)   Fig.2
(c)   Fig.3   (d)   Fig.4

28. At 3:40, the hour hand and the minute hand of a clock form an angle of:
    (a)   120°   (b)   125°
    (c)   130°   (d)   135°

29. Pointing towards a man, a woman said, "His mother is the only daughter of my mother." How is the woman related to the man?
    (a)   Mother   (b)   Grandmother
    (c)   Sister   (d)   Daughter

30. Choose the word which is different from the rest.
    (a)   Run   (b)   Walk
    (c)   Think   (d)   Move