

Test for Lateral Entry to B Tech Programmes

1. Identify in which part of the sentence there is an error:

Rajesh, the school topper, can speak French and German, isn't it?

- (A) Rajesh, the school topper,
- (B) can speak
- (C) French and German
- (D) isn't it?

2. Identify in which part of the sentence there is an error:

Mr. Sukbir Singh is senior than all the other staff in this office.

- (A) Mr. Sukbir Singh
- (B) is senior than
- (C) all the other staff
- (D) in this office

3. Identify in which part of the sentence there is an error:

No one writes on the black board as neat as our Science teacher does.

- (A) No one writes
- (B) on the black board
- (C) as neat as
- (D) our Science teacher does

4. Identify in which part of the sentence there is an error:

Everyone knows that the Mt. Everest is the tallest peak in the world.

- (A) Everyone knows that
- (B) the Mt. Everest
- (C) is the tallest peak
- (D) in the world

5. Identify in which part of the sentence there is an error:

Unfortunately, neither Jimmy nor Aneesh have passed the preliminary exam.

- (A) Unfortunately,
- (B) neither Jimmy nor Aneesh have
- (C) passed the
- (D) preliminary exam

6. Choose the correct meaning of the underlined idiom.

My cousin turned a deaf ear to the instructions given by his parents.

- (A) Not able to hear
- (B) Examined
- (C) Prepared
- (D) Disregarded

7. Choose the correct meaning of the underlined idiom.

Our captain Savithri is someone who can always put two and two together.

- (A) Handle mathematics well
- (B) Good in addition
- (C) Reason logically
- (D) Perfect in calculation

8. Suggest one-word substitutes by choosing the most appropriate answer.

Work for which no salary is paid

- (A) Arduous
- (B) Honorary
- (C) Wages
- (D) Novice

9. Suggest one-word substitutes by choosing the most appropriate answer.

A person who is involved in drawing or producing maps

- (A) Calligrapher
- (B) Cartographer
- (C) Indologist
- (D) Entomologist

10. Choose the word with correct spelling to fill in the blank.

I am grateful to be in such a large house.

- (A) accommodated
- (B) accomodated
- (C) acomodated
- (D) accomodated

11. Choose the word with correct spelling to fill in the blank.

The College decided to hold a national quiz competition on the of the birth anniversary of the founder.

- (A) occassion
- (B) occasion
- (C) ocassion
- (D) occasoin

12. Choose the word with correct spelling to fill in the blank.

I think we need to talk to the three brothers

- (A) seperately
- (B) seperetely
- (C) seperateley
- (D) separately

13. Choose the word with correct spelling to fill in the blank.

Recent studies show that Bengaluru is one of the mostcities in India.

- (A) populous
- (B) pupulous
- (C) populuos
- (D) populos

14. Choose the word that is **most similar** in meaning to the word in CAPITAL letters

INCULCATE

- (A) Corroborate
- (B) Teach
- (C) Destroy
- (D) Avenge

15. Choose the word that is **most similar** in meaning to the word in CAPITAL letters

IMBIBE

- (A) Reject
- (B) Eject
- (C) Emit
- (D) Absorb

16. Choose the word that is **opposite** in meaning to the word in CAPITAL letters

SENILE

- (A) Sensible
- (B) Youthful
- (C) Intelligent
- (D) Bright

17. Choose the word that is **opposite** in meaning to the word in CAPITAL letters

COHESIVE

- (A) Attached
- (B) Detached
- (C) Associated
- (D) Affiliated

18. Choose the word or phrase that is **opposite** in meaning to the word in CAPITAL letters

AUTONOMOUS

- (A) Magnanimous
- (B) Ambiguous
- (C) Dependent
- (D) Operated by hand

19. Choose the word or phrase that is **opposite** in meaning to the word in CAPITAL letters

DEARTH

- (A) Birth
- (B) Scantiness
- (C) Abundance
- (D) Brilliance

20. Choose the word or phrase that is **opposite** in meaning to the word in CAPITAL letters

VOCIFEROUS

- (A) Laudable
- (B) Quiet
- (C) Dangerous
- (D) Powerful

21. It is given that a point P is equidistant from the points $X(1, 3)$, $Y(-3, 5)$ and $Z(5, -1)$. Then PY is equal to
- (A) 5
 - (B) $5\sqrt{5}$
 - (C) $5\sqrt{10}$
 - (D) $5\sqrt{15}$
22. The intercept made by a line on x -axis is triple to the intercept made by it on y -axis. Given that it passes through the point $(3, 1)$. The equation of the line is
- (A) $3x + y = 12$
 - (B) $x + 3y = 6$
 - (C) $2x + 3y = 9$
 - (D) $3x + y = 10$
23. The distance between the lines $3x - 4y + 9 = 0$ and $6x - 8y - 15 = 0$ is
- (A) $\frac{13}{10}$
 - (B) $\frac{20}{13}$
 - (C) $\frac{10}{13}$
 - (D) $\frac{33}{10}$
24. If $x - 2y + 4 = 0$ and $2x + y - 5 = 0$ are the sides of a isosceles triangle having area 10 sq. unit. Equation of the third side is
- (A) $x - 3y = 19$
 - (B) $3x - y = 11$
 - (C) $x + 3y = 19$
 - (D) $3x - y = 19$

25. The area of the parallelogram formed by the lines $y = mx$, $y = mx + 1$, $y = nx$ and $y = nx + 1$ equals

(A) $\frac{|m+n|}{(m-n)^2}$

(B) $\frac{2}{|m+n|}$

(C) $\frac{1}{|m+n|}$

(D) $\frac{1}{|m-n|}$

26. The area enclosed by the curves $3|x| + 2|y| = 6$ is

(A) 24 sq. unit

(B) 16 sq. unit

(C) 12 sq. unit

(D) 8 sq. unit

27. A circle with centre $(2, 1)$ touches the line $3x + 4y = 5$. The equation of the circle is

(A) $x^2 + y^2 - 4x - 2y - 5 = 0$

(B) $x^2 + y^2 - 4x - 2y + 5 = 0$

(C) $x^2 + y^2 - 4x - 2y + 4 = 0$

(D) $x^2 + y^2 - 4x - 2y - 4 = 0$

28. Consider the circles $x^2 + y^2 = 16$ and $x^2 + y^2 - 2y = 0$. Then there

(A) is one pair of common tangents

(B) is no common tangents

(C) are three common tangents

(D) are two pair of common tangents

9. The equation of the line touching the parabolas $y^2 = 4x$ and $x^2 = -32y$ is

(A) $x + 2y + 4 = 0$

(B) $2x - y - 4 = 0$

(C) $x - 2y - 4 = 0$

(D) $x - 2y + 4 = 0$

30. Equation of the tangent to the ellipse $\frac{x^2}{9} + \frac{y^2}{16} = 1$ which is parallel to the line $x + y + 1 = 0$ is
- (A) $x + y - 5 = 0$
 - (B) $2x + y - 5 = 0$
 - (C) $x + y + 6 = 0$
 - (D) $x + y - 6 = 0$
31. Given that the points $(1, 2)$ and $(c, -1)$ are conjugates with respect to the ellipse $2x^2 + 3y^2 = 6$. Then the value of 'c' is
- (A) 8
 - (B) 6
 - (C) 4
 - (D) 2
32. The distance between directrices of a rectangular hyperbola is 20. Then the distance between its foci will be
- (A) 10
 - (B) 20
 - (C) 30
 - (D) 40
33. Solution set of $|x^2 - 10| \leq 6$ is
- (A) $(4, 6]$
 - (B) $[-4, -2] \cup [2, 4]$
 - (C) $(-4, -2)$
 - (D) $[-4, -2] \cup (2, 4)$
34. The number of solutions for the equation $6 - y = \log_2(y + 5)$ is
- (A) 0
 - (B) 1
 - (C) 2
 - (D) infinitely many

35. Let $x = \sqrt{7} - \sqrt{5}$ and $y = \sqrt{13} - \sqrt{11}$. Then
- (A) $x < y$
 - (B) $3x = 4y$
 - (C) $x = y$
 - (D) $x > y$
36. For two complex numbers z_1, z_2 , let $\left| \frac{z_1}{z_2} \right| = 1$ and $\arg(z_1 z_2) = 0$. Then
- (A) $|z_2|^2 = z_1 z_2$
 - (B) $z_1 = z_2$
 - (C) $z_1 z_2 = 1$
 - (D) $z_1 \bar{z}_2 = 1$
37. Let $1, \omega, \omega^2$ be cubic roots of unity. Then the roots of the equation $(x + 1)^3 + 8 = 0$ are
- (A) $-1, 1 + 2\omega, 1 + 2\omega^2$
 - (B) $-1, 1 + 2\omega, -1 + 2\omega^2$
 - (C) $-3, -1 - 2\omega, 1 + 2\omega^2$
 - (D) $-3, -1 - 2\omega, -1 - 2\omega^2$
38. If $\operatorname{Re}\left(\frac{z + 2i}{z + 4}\right) = 0$, then z lies on a circle with centre
- (A) $(-2, -1)$
 - (B) $(-2, 1)$
 - (C) $(2, -1)$
 - (D) $(2, 1)$

39. The radius of the circle $\left| \frac{z-i}{z+i} \right| = 5$ is

(A) $\frac{1}{12}$

(B) $\frac{12}{3}$

(C) $\frac{5}{12}$

(D) $\frac{5}{3}$

40. If a, b, c, d are in Harmonic Progression, then $ab + bc + cd$ is equal to

(A) $4ad$

(B) $3ad$

(C) $2(a + d)$

(D) $3(a + d)$

41. The sum of p terms of an AP is q and that of q terms is p . Then the sum of $p + q$ terms will be

(A) $p + q$

(B) $-p + q$

(C) $p - q$

(D) $-p - q$

42. For an n , let $704 + \frac{1}{2}(704) + \frac{1}{4}(704) + \dots$ up to n terms is equal to

$1984 - \frac{1}{2}(1984) + \frac{1}{4}(704) - \dots$ up to n terms. Then n is equal to

(A) 5

(B) 3

(C) 4

(D) 10

43. The sum of first 30 terms of the series $\sqrt{3} + \sqrt{12} + \sqrt{27} + \dots$ is
- (A) $400\sqrt{3}$
 - (B) 400
 - (C) $415\sqrt{3}$
 - (D) $465\sqrt{3}$
44. Let $y = x^{n-1} \log x$. Then $x^2 y_2 + (3-2n)xy_1$ is equal to
- (A) $(n-1)^2 y$
 - (B) $n^2 y$
 - (C) $-(n-1)^2 y$
 - (D) $-n^2 y$
45. If $y = |\sin x - \cos x|$, then $f'\left(\frac{\pi}{4}\right) =$
- (A) $\sqrt{2}$
 - (B) $-\sqrt{2}$
 - (C) 0
 - (D) does not exist
46. Let $x = \cos^{-1}\left(\frac{1}{\sqrt{1+t^2}}\right)$ and $y = \sin^{-1}\left(\frac{1}{\sqrt{1+t^2}}\right)$. Then $\frac{dy}{dx}$ is equal to
- (A) $\sin t \cos t$
 - (B) $\tan t$
 - (C) 0
 - (D) 1
47. The range of the function $y = \sin^{-1}\left(\frac{x^2}{1+x^2}\right)$ is
- (A) $(0, \pi/2)$
 - (B) $[0, \pi/2)$
 - (C) $[0, \pi/2]$
 - (D) $(0, \pi)$

48. Let $f_1(n) = 1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{n}$, then $f_1(1) + f_1(2) + \dots + f_1(n)$ is equal to

- (A) $nf_1(n) - 1$
- (B) $(n + 1)f_1(n) - n$
- (C) $(n + 1)f_1(n) + n$
- (D) $nf_1(n) + n$

49. The set of points of discontinuity of the function $f(x) = \frac{|\sin x|}{\sin x}$ is

- (A) $\{0\}$
- (B) $\{n\pi : n \in I\}$
- (C) ϕ
- (D) $\{0, \pi\}$

50. The value of $\lim_{x \rightarrow 1} \sin^{-1} x$ is

- (A) $\frac{\pi}{2}$
- (B) 0
- (C) 1
- (D) ∞

51. $\lim_{x \rightarrow \infty} \frac{\sin(\pi \cos^2 x)}{x^2}$

- (A) $-\pi$
- (B) π
- (C) 1
- (D) $\frac{\pi}{2}$

52. If a function f satisfies $f(f(x)) = x + 1$ for all real values of x and if $f(0) = \frac{1}{2}$, then $f(1)$ is equal to
- (A) 1
(B) $\frac{1}{2}$
(C) $\frac{3}{2}$
(D) 2
53. The area of the triangle formed by a tangent to the curve $2xy = a^2$ and the coordinate axes is
- (A) a^2
(B) $2a^2$
(C) $3a^2$
(D) $4a^2$
54. The function $f(x) = -2x^3 + 21x^2 - 60x + 41$ in the interval $(-\infty, 1)$ is
- (A) < 0
(B) ≤ 0
(C) > 0
(D) ≥ 0
55. The number of real roots of $(x + 3)^4 + (x + 5)^4 = 16$ is
- (A) 0
(B) 1
(C) 2
(D) 4
56. Let $\log_{10} x + \log_{10} y \geq 4$. Then the smallest value of $x + y$ is
- (A) 10
(B) 20
(C) 200
(D) 1000

57. If the roots of $x^2 + x + \beta = 0$ exceed β , then
- (A) $\beta = -2$
 - (B) $\beta < -2$
 - (C) $\beta > -2$
 - (D) $\beta < 2$
58. Given that $m > n$. Then the equation $(x - n)(x - m) - 1 = 0$ has
- (A) one root in $(-\infty, n)$ and the other in (m, ∞)
 - (B) both roots in $[n, m]$
 - (C) both roots in (∞, n)
 - (D) both roots in (m, ∞)
59. The number of points (m, n) where m and n are integers that lie exactly in the interior of the triangle with vertices $(0, 0)$, $(0, 21)$ and $(21, 0)$ is
- (A) 133
 - (B) 190
 - (C) 233
 - (D) 205
60. The number of 6 digits numbers that can be formed from the digits of the number 112233 is
- (A) 90
 - (B) 60
 - (C) 30
 - (D) 120
61. Out of 9 given points 3 are collinear. The number of different straightlines that can be drawn by joining any two points from 9 points is
- (A) 26
 - (B) 33
 - (C) 34
 - (D) 36

62. Matrix A satisfies $A^2 = 2A - I$ where I is the identity matrix.

Then, for an integer $n \geq 3$, A^n is equal to

- (A) $nA - I$
- (B) $nA - (n - 1)I$
- (C) $2^{n-1}A - I$
- (D) $2^{n-1}A - (n - 1)I$

63. The rank of the matrix $\begin{pmatrix} -1 & 2 & 5 \\ 2 & -4 & a-4 \\ 1 & -2 & a+1 \end{pmatrix}$

- (A) 2 if $a = 6$
- (B) 2 if $a = -1$
- (C) 1 if $a = 2$
- (D) 1 if $a = -6$

64. The value of $1 - \log 2 + \frac{(\log 2)^2}{2!} - \frac{(\log 2)^3}{3!} + \dots + \infty$ is

- (A) 2
- (B) $\frac{1}{2}$
- (C) $\log 3$
- (D) 4

65. $\sum_{k=1}^{\infty} \frac{1}{k} \left(\sum_{n=1}^k 2^{n-1} \right)$ is equal to

- (A) e
- (B) $e^2 + e$
- (C) e^2
- (D) $e^2 - e$

66. The function $f : R \rightarrow R$ defined by $f(x) = (x-1)(x-2)(x-3)$ is
- (A) one-to-one but not onto
 - (B) onto but not one-to-one
 - (C) both one-to-one and onto
 - (D) neither one-to-one nor onto
67. Three different numbers are selected at random from the set $A = \{1, 2, \dots, 10\}$. The probability that the product of two of the numbers is equal to the third is
- (A) $\frac{1}{20}$
 - (B) $\frac{3}{4}$
 - (C) $\frac{1}{40}$
 - (D) $\frac{1}{8}$
68. Let A and B be two independent events such that $P(A) = \frac{1}{5}$, $P(A \cup B) = \frac{6}{10}$. Then $P(\bar{B})$ is equal to
- (A) $\frac{1}{2}$
 - (B) $\frac{3}{8}$
 - (C) $\frac{1}{4}$
 - (D) $\frac{1}{8}$

69. A die is thrown 7 times. The probability that an odd number turns up at least 4 times is

(A) $\frac{1}{2}$

(B) $\frac{5}{12}$

(C) $\frac{2}{3}$

(D) $\frac{6}{11}$

70. The solution of the differential equation $xy^2 dy - (x^3 + y^3)dx = 0$ is

(A) $y^3 = 3x^3 \log(cx)$

(B) $y^3 = 3x^3 + \log(cx)$

(C) $y^3 = 3x^3 + c$

(D) $y^3 + 3x^3 = \log(cx)$

71. The resultant of two forces P and Q acting on a body making an angle θ with each other is given by

(A) $\sqrt{P^2 + Q^2 + 2PQ \sin \theta}$

(B) $\sqrt{P^2 + Q^2 + 2PQ \cos \theta}$

(C) $\sqrt{P^2 + Q^2 - 2PQ \sin \theta}$

(D) $\sqrt{P^2 + Q^2 - 2PQ \cos \theta}$

72. Three forces acting on a point are in equilibrium. If they make angle 120° with each other, then the proportions of forces are

(A) 1:1:1

(B) 1:2:1

(C) 1:1:2

(D) 2:1:1

73. For a given system of concurrent forces $\sum F_H = -16$ and $\sum F_V = -8$, the resultant force will fall in quadrant
- (A) First
 - (B) Second
 - (C) Third
 - (D) Fourth
74. Two parallel forces 100 kN and 75 kN act on a body and have a resultant 25 kN. Then the two forces are
- (A) Like parallel forces
 - (B) Unlike parallel forces
 - (C) Concurrent forces
 - (D) None of the above
75. The moment of a force is a Quantity.
- (A) Vector
 - (B) Scalar
 - (C) Either (A) or (B)
 - (D) None of the above
76. The centroid of an equilateral triangle with side 'a' from its base is
- (A) $(a/2)*\sqrt{3}$
 - (B) $(a/3)*\sqrt{2}$
 - (C) $a/(2\sqrt{3})$
 - (D) $a/(3\sqrt{2})$
77. A circular hole of radius R is cut-out from a circular disc of radius $2R$ in such a way that the diagonal of the hole is the radius of disc. The centre of gravity of the remaining portion lies at
- (A) Centre of the disc
 - (B) Centre of the hole
 - (C) Somewhere in the hole
 - (D) Somewhere in the disc
78. The theorem of perpendicular axis can be used for finding moment of inertia of
- (A) Triangular lamina
 - (B) Circular lamina
 - (C) Rectangular lamina
 - (D) All of the above

79. If a ladder is not in equilibrium against a smooth vertical wall, then it can be made in equilibrium by
- (A) Decreasing angle of inclination with vertical wall
 - (B) Increasing angle of inclination with vertical wall
 - (C) Decreasing angle of inclination with horizontal surface
 - (D) None of the above
80. A body of weight 200 N rests on a horizontal plane having $\mu = 0.25$. The minimum force applied along the horizontal plane to move the body is
- (A) $100\sqrt{3}$ N
 - (B) 50 N
 - (C) 100 N
 - (D) $100\sqrt{2}$ N
81. When a body resting on an inclined plane slides down under its own weight, the angle of inclination of the inclined plane is
- (A) Greater than angle of repose
 - (B) Less than angle of repose
 - (C) Equal to angle of repose
 - (D) None of the above
82. The displacement of a moving body with respect to time is given by $C_1 + C_2t$, its velocity will be
- (A) C_1
 - (B) C_2
 - (C) $C_1 + C_2$
 - (D) $0.5(C_1 + C_2)$
83. The velocity of a moving particle is given by $v = (5 - t^2)$ m/s. The average acceleration of the particle between 3 and 5 seconds is
- (A) 2 m/s^2
 - (B) -16 m/s^2
 - (C) 9 m/s^2
 - (D) -8 m/s^2

84. A particle has to attain a maximum height of 10 m. What will be its initial velocity?
- (A) 18 m/s
 - (B) 14 m/s
 - (C) 10 m/s
 - (D) 7 m/s
85. The velocity of a particle decreases uniformly from 15 m/s to 5 m/s in 5 seconds. Then the retardation of the particle will be
- (A) 2 m/s^2
 - (B) 10 m/s^2
 - (C) 7 m/s^2
 - (D) None of the above
86. The distance travelled by a particle in t^{th} second is given by
- (A) $S = u - 0.5a(2t - 1)$
 - (B) $S = u + 0.5a(2t - 1)$
 - (C) $S = u - 0.5t(2a - 1)$
 - (D) None of the above
87. A military plane is moving along a circle of radius R in vertical plane, the minimum velocity at the highest point is
- (A) $\sqrt{3gR}$
 - (B) $\sqrt{gR/2}$
 - (C) \sqrt{gR}
 - (D) $\sqrt{2gR}$
88. The velocity of piston of an Internal Combustion engine is maximum when obliquity is
- (A) Maximum
 - (B) Minimum
 - (C) Zero
 - (D) Average
89. The horizontal range of a projectile is
- (A) $(u \cdot \sin 2\alpha)/g$
 - (B) $(u^2 \cdot \sin 2\alpha)/g$

- (C) $(u \cdot \sin 2\alpha)/2g$
- (D) $(u^2 \cdot \sin 2\alpha)/2g$

90. Time to reach the greatest height of a projectile is

- (A) $(u \cdot \sin \alpha)/g$
- (B) $(2u \cdot \sin \alpha)/g$
- (C) $(u^2 \cdot \sin \alpha)/2g$
- (D) $(u^2 \cdot \sin^2 \alpha)/g$

91. In simple harmonic motion, frequency means

- (A) Number of beats per second
- (B) Number of oscillations per second
- (C) Number of half oscillations per second
- (D) None of the above

92. If a horizontal surface is moving up on which a body of mass m is placed and acceleration is a , then the force causing motion is

- (A) $m \cdot (a + g)$
- (B) $m \cdot (a - g)$
- (C) $m \cdot (g - a)$
- (D) ma

93. When coefficient of restitution is one, the bodies are

- (A) Perfectly elastic
- (B) Inelastic
- (C) Near elastic
- (D) None of the above

94. Given that $P + Q = R$ and also $P = Q = R$. Then the angle between the vectors P and Q is

- (A) 0
- (B) $\pi/3$
- (C) $2\pi/3$
- (D) π

95. For first half of time, a car travels with velocity v_1 and for the second half of time, it travels with velocity v_2 . The average velocity of car is
- (A) $(v_1 + v_2)/2$
 - (B) $2v_1v_2/(v_1 + v_2)$
 - (C) $\sqrt{(v_1v_2)}$
 - (D) $v_1v_2/2(v_1 + v_2)$
96. A particle moves with uniform acceleration along a straight line ABC . The speeds of the particle at positions A and C are 5 cm/s and 25 cm/s respectively. If point B lies midway between A and C , the ratio of times taken by the particle to travel distance AB and BC is
- (A) 2:1
 - (B) 1:1
 - (C) 1:2
 - (D) 1:5
97. The polar moment of inertia for the area of ring of inner and outer radii r_1 and r_2 is
- (A) $\pi(r_2^4 - r_1^4)/2$
 - (B) $\pi(r_2^4 - r_1^4)$
 - (C) $2\pi(r_2^4 - r_1^4)$
 - (D) $\pi(r_2^4 - r_1^4)/4$
98. A heavier weight and a light weight have equal kinetic energies. Then
- (A) Both have equal linear momentums
 - (B) Heavier weight will have greater linear momentum
 - (C) Lighter weight will have greater linear momentum
 - (D) Comparison cannot be made on the basis of given data
99. A projectile has been fired at an angle of 45° to the horizontal such that it reaches a maximum height of 16 m. Which of the following statement is wrong?
- (A) The projectile will have zero velocity at the height point
 - (B) The range of the projectile is 64 m
 - (C) The range of the projectile would decrease if it is fired at an angle of 30° to the horizontal
 - (D) The velocity at the highest point decreases with an increase in the angle of projection

100. In simple harmonic motion, the acceleration is proportional to
- (A) Displacement
 - (B) Linear velocity
 - (C) Angular velocity
 - (D) Rate of change of angular velocity
101. A ring of mass 10 kg and diameter 0.4 m is made to turn 2100 rpm about its axis. The ring will then have an angular momentum of
- (A) $44 \text{ kg.m}^2/\text{s}$
 - (B) $88 \text{ kg.m}^2/\text{s}$
 - (C) $132 \text{ kg.m}^2/\text{s}$
 - (D) $176 \text{ kg.m}^2/\text{s}$
102. A person standing on a uniformly rotating table has his arms held close to his chest. If he outstretches his arms
- (A) the moment of inertia will decrease
 - (B) the angular momentum will increase
 - (C) the speed of rotation will decrease
 - (D) the angular velocity will remain constant
103. If the earth were to suddenly contract to $1/8^{\text{th}}$ of its present volume without any change in its mass, then duration of its new day will be
- (A) 3 hours
 - (B) 6 hours
 - (C) 8 hours
 - (D) 24 hours
104. Choose the statement that does **NOT** conform to circular motion.
- (A) The magnitude of velocity remains the same but there occurs a change in the direction of velocity vector
 - (B) The direction of velocity vector at any point on the circular orbit is along the tangent to the circle at that point
 - (C) The acceleration experienced by the particle lies perpendicular to the velocity vector and hence along the radius directed towards the centre
 - (D) When the string of a ball being whirled in a circle is released, the centripetal force on the ball ceases to act and the ball flies off along the radius

105. The escape velocity of an object from a planet of radius R and mass M is
- (A) $\sqrt{GM/R}$
 - (B) $\sqrt{2GM/R}$
 - (C) $\sqrt{GM/2R}$
 - (D) \sqrt{GR}
106. The moments of inertia of a solid circular section of radius r and of a hollow circular section of radii R and r , each about the diametral lines, are equal. Then
- (A) $R = 2r$
 - (B) $R = \sqrt{2} (r)$
 - (C) $R = 4r$
 - (D) $R^2 = \sqrt{2} (r^2)$

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107. Which of the following statements is **WRONG**?
- (A) Impulse equals the change in momentum
 - (B) Action and reaction are equal and opposite and hence cancel each other
 - (C) The momentum of a system of two bodies is conserved when there is no external force acting on either body
 - (D) The work done on a particle must be equal to the change in its kinetic energy
108. The dimensional formula of power is
- (A) ML^2T^{-3}
 - (B) ML^2T^{-2}
 - (C) MLT^{-2}
 - (D) ML^2T^{-1}
109. D'Alembert's principle is used for
- (A) reducing a problem of kinetics to equivalent statics problem
 - (B) determining stresses in the truss
 - (C) stability of floating bodies
 - (D) solving kinematic problems
110. In case of simple harmonic motion the period of oscillation is given by
- (A) $T = 2\omega/\pi^2$
 - (B) $T = 2\pi/\omega$
 - (C) $T = \omega/2\pi$
 - (D) $T = \pi/2\omega$
111. The length to width ratio of a drawing sheet is
- (A) 2:1
 - (B) $\sqrt{2}$:1
 - (C) 3:1
 - (D) $\sqrt{3}$:1
112. The symbol “ ϕ ” (phi) followed by a numerical value in drawing dimensioning represents
- (A) diameter
 - (B) angle of inclination to HP
 - (C) sphere
 - (D) None of the above

113. Centre lines in drawings are made using
- (A) HB pencil
 - (B) H pencil
 - (C) 2H pencil
 - (D) 3H pencil
114. A line is perpendicular to VP. What is its top view?
- (A) A point
 - (B) A line shorter in length
 - (C) A line of true length
 - (D) A line parallel to XY line
115. A line 100 mm long makes 20° to HP and 60° to VP. What is the length of its front view?
- (A) 20 mm
 - (B) 60 mm
 - (C) 50 mm
 - (D) 94 mm
116. If the front view of a line crosses XY line, which statement given below is **TRUE**?
- (A) The line crosses HP
 - (B) The line crosses VP
 - (C) The line is in II quadrant
 - (D) The line is in IV quadrant
117. If the top view and front view of a point K coincides and is above xy line, the point K is in
- (A) III quadrant
 - (B) II quadrant
 - (C) I quadrant
 - (D) IV quadrant
118. If end projectors of a line 80 mm long coincide, which statement is **TRUE**?
- (A) The sum of its inclinations to HP and VP is 90°
 - (B) The line is lying on VP
 - (C) The line is lying on the joint between the two planes
 - (D) The line is lying on HP

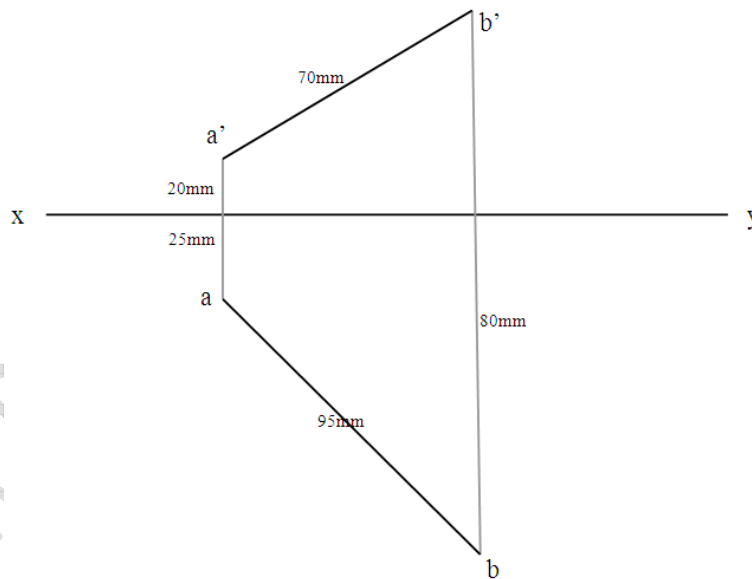
119. End A of a line AB is 30 mm above HP and 30 mm behind VP. End B is 30 mm above HP and 50 mm in front of VP. The projectors of A and B are 60 mm apart. What is the true length of line AB?

- (A) 110 mm
- (B) 100 mm
- (C) 70 mm
- (D) 80 mm

120. End A of a line AB is 30 mm above HP and 30 mm behind VP. End B is 30 mm above HP and 50 mm in front of VP. The projectors of A and B are 60 mm apart. Where is its vertical trace?

- (A) 30 mm above HP
- (B) 50 mm below HP
- (C) 70 mm in front of VP
- (D) 80 mm behind VP

121. The projections of a line AB are given here (not to scale). Which statement about the line is **CORRECT**?



- (A) inclination of AB to HP is more than inclination of AB to VP
- (B) inclination of AB to HP is less than inclination of AB to VP
- (C) inclination to HP and VP are equal
- (D) (inclination to HP + inclination to VP) = 90°

122. A cube is resting on HP on an edge which is perpendicular to VP. Which statement is **TRUE**?

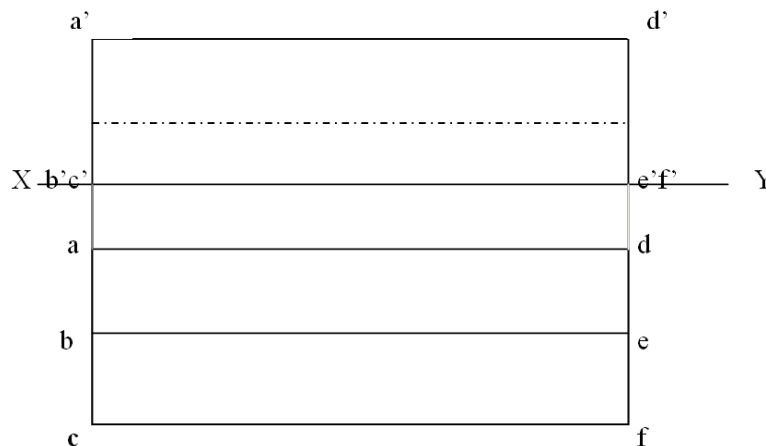
- (A) Front view is a square
- (B) Top view is a square
- (C) Side view is a square
- (D) None of the above

123. A cube is suspended on a string fixed at a corner. Which statement is **TRUE**?

- (A) Front view always will be a hexagon
- (B) Top view always will be a hexagon
- (C) Side view always will be a hexagon
- (D) None of the above

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124. Which statement is **CORRECT** with reference to the given figure?

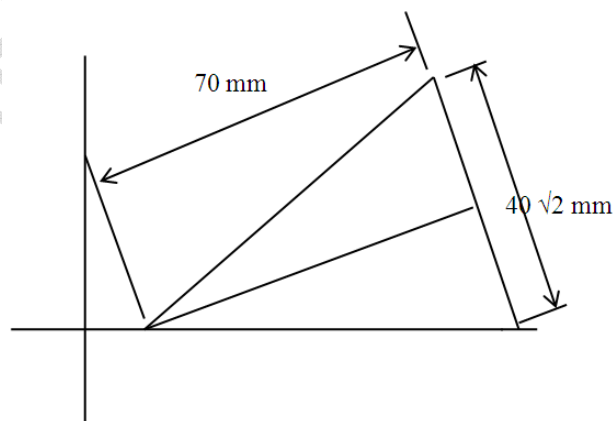


- (A) One rectangular face of the prism is parallel to VP
- (B) One rectangular face of the prism is parallel to HP
- (C) One rectangular face of the prism is parallel to both HP and VP
- (D) One rectangular face of the prism is perpendicular to both HP and VP

125. A tetrahedron of 50 mm side has

- (A) 4 axes of 50 mm length
- (B) 3 axes of $(50\sqrt{3})$ mm length
- (C) 4 axes of $(50/\sqrt{3})$ mm length
- (D) 4 axes of $(50\sqrt{2})/\sqrt{3}$ mm length

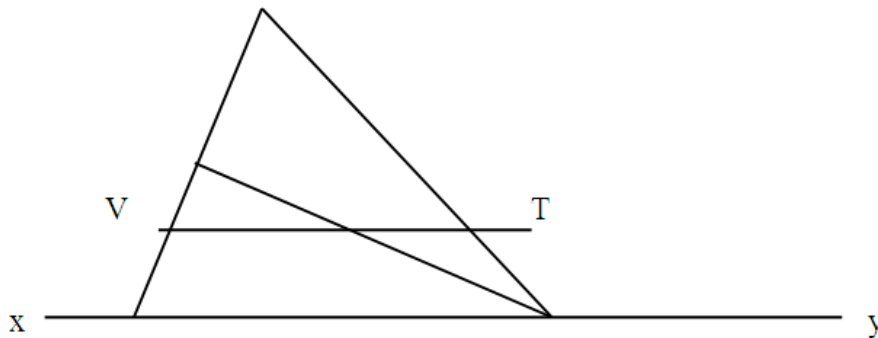
126. The drawing represents the endview from left of a square pyramid 40 mm side of base and 70 mm axis (I angle projection). How is the pyramid?



- (A) Lying on HP on a slant edge which is perpendicular to VP
- (B) Lying on HP on a slant edge which is parallel to VP
- (C) Lying on HP on a triangular face with axis inclined to VP
- (D) Lying on HP on a triangular face with axis inclined to HP

130. When a cone is suspended on a string tied at a point of its base circle, its axis will be
- (A) parallel to HP
 - (B) perpendicular to HP
 - (C) inclined to HP
 - (D) perpendicular to VP
131. A regular tetrahedron has
- (A) 3 edges
 - (B) 4 edges
 - (C) 5 edges
 - (D) 6 edges
132. The front view of a tetrahedron kept in Ist quadrant is an equilateral triangle with its centre connected to the three corners by straight lines. Which statement about the tetrahedron is correct?
- (A) Tetrahedron is resting on HP on a triangular face
 - (B) Tetrahedron has its triangular face in profile plane
 - (C) Tetrahedron has one of its triangular faces parallel to VP
 - (D) Tetrahedron has one of its triangular faces perpendicular to VP
133. Three equal spheres of 40 mm diameter rest on the ground touching each other. A fourth sphere of 50 mm diameter sits centrally on top of these spheres. What is the height of centre of the fourth sphere from the ground?
- (A) 40 mm
 - (B) 50 mm
 - (C) 65 mm
 - (D) 59 mm
134. A cone 60 mm diameter and 80 mm axis standing on HP on its base is cut by a plane parallel to the base and passing through a point on the axis 60 mm above the base. What is the true shape of section?
- (A) Circle of 15 mm diameter
 - (B) Circle of 60 mm diameter
 - (C) Circle of 30 mm diameter
 - (D) Circle of 40 mm diameter

135. A hexagonal pyramid lying on HP on triangular face is cut by a plane parallel to HP as shown in figure. What is the true shape of section?

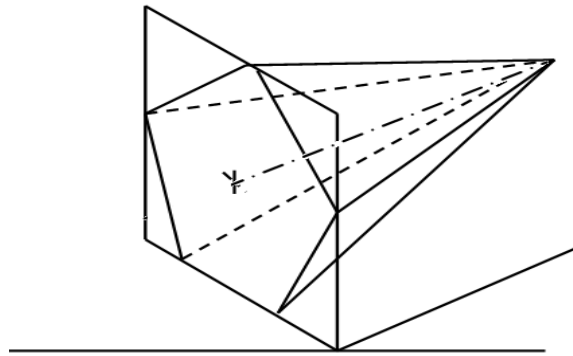


- (A) Hexagon
(B) Rhombus
(C) Trapezium
(D) Square
136. A sphere 60 mm diameter resting on HP is cut by a horizontal cutting plane so that the true shape is a circle of diameter 30 mm. The cutting plane passes through
- (A) the midpoint of the radius
(B) the centre of the sphere
(C) a point 30 mm above the centre
(D) None of the above
137. When a solid is cut by a plane perpendicular to both HP and VP
- (A) no sectional view will give true shape of section
(B) sectional elevation will give true shape of section
(C) sectional plan will give true shape of section
(D) sectional side view will give true shape of section
138. Central plane in perspective projection is a plane passing through
- (A) the axis of solid
(B) the eye and parallel to ground plane
(C) the eye and perpendicular to ground plane
(D) the midpoint of axis of solid

139. The reason for taking isometric lengths along the isometric axes while drawing isometric projection is that the lengths along x, y, z axes are inclined to VP by

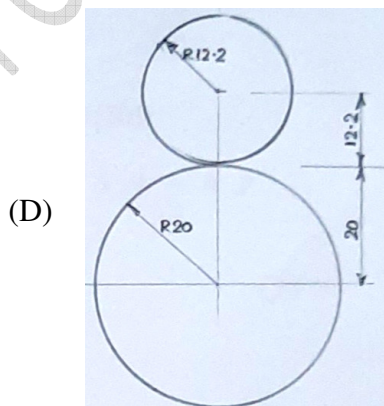
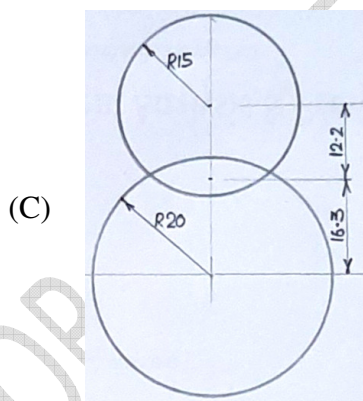
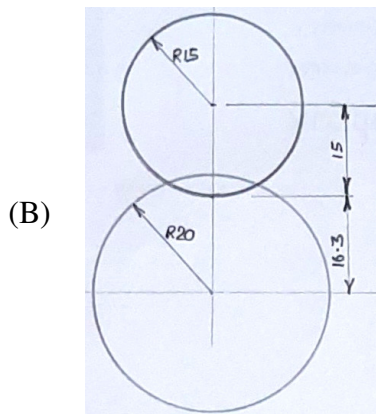
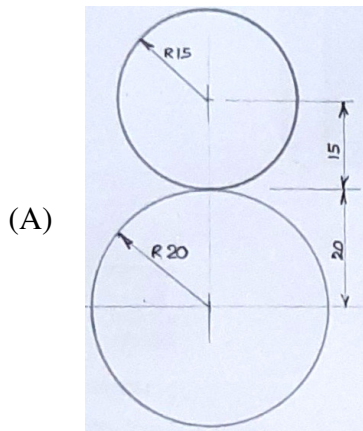
- (A) 22.8°
- (B) 30°
- (C) 15°
- (D) 35.25°

140. Isometric view of a pentagonal pyramid shown here. Which statement is correct?



- (A) It is lying on HP on a triangular face
- (B) It is lying on HP on a triangular face with axis parallel to VP
- (C) Its axis is perpendicular to VP
- (D) None of the above

141. A sphere 15 mm radius is resting on top of another sphere 20 mm radius with their centres lying in a vertical line. Out of the four drawings given below, which one represents the isometric projection? (All dimensions are marked in millimetres.)



142. Two plain scales drawn together with same RF and with related units is called
- (A) diagonal scale
 - (B) comparative scale
 - (C) scale of chords
 - (D) vernier scale
143. What is meant by diameter of an ellipse?
- (A) major axis
 - (B) line with end points on the curve, passing through the centre
 - (C) distance between two foci
 - (D) (major axis + minor axis)/ 2
144. If we draw a curve parallel to an ellipse some distance away from it, we get
- (A) another ellipse of same eccentricity
 - (B) another ellipse with another eccentricity
 - (C) another ellipse with eccentricity more than the first
 - (D) a curve that is not a true ellipse but closely resembles to ellipse
145. A ball is thrown from the ground and it just passes over a tree 5 m tall and falls to the ground tracing a parabolic path. The focus of the curve is on the ground itself. What is the size of the rectangle in which the curve can be drawn?
- (A) 5 m × 5 m
 - (B) 5 m × 10 m
 - (C) 20 m × 5 m
 - (D) 25 m × 5 m
146. In hyperbola, the line that divides the semi-transverse axis in the ratio of its eccentricity is named as
- (A) Asymptote
 - (B) Conjugate axis
 - (C) Directrix
 - (D) Ordinate
147. A circular lamina 50 mm diameter rests on HP on a point with the diametrically opposite point on VP in such a way that its top view is an ellipse with minor axis 40 mm. What is the shape of its front view?
- (A) Ellipse of minor axis 30 mm
 - (B) Circle of 40 mm diameter
 - (C) Circle of 50 mm diameter
 - (D) Ellipse of minor axis 40 mm

148. A rectangular lamina $40 \text{ mm} \times 80 \text{ mm}$ sides rests on HP on a shorter side with the surface perpendicular to VP and inclined to HP by 60° . What is the shape of its top view?
- (A) Rectangle
 - (B) Rhombus
 - (C) Line
 - (D) Square
149. A rhombus of diagonals $40 \text{ mm} \times 70 \text{ mm}$ is in space in such a way that the top view is a square. What is the size of this square?
- (A) Square with sides 70 mm
 - (B) Square with diagonals 40 mm
 - (C) Square with diagonals 70 mm
 - (D) Square with sides 40 mm
150. An isosceles triangular lamina of base 50 mm and altitude 70 mm is visible as an equilateral triangle in the front view. What is the length of side of this triangle?
- (A) 70 mm
 - (B) 50 mm
 - (C) 20 mm
 - (D) $50\sqrt{2} \text{ mm}$
151. The preferred surveying method to determine the natural features such as valleys, rivers, lakes etc. is
- (A) city surveying
 - (B) location surveying
 - (C) cadastral surveying
 - (D) topographical surveying
152. The collimation method for obtaining the reduced levels of points does not provide a check on
- (A) fore sights
 - (B) back sights
 - (C) change points
 - (D) intermediate sights

153. The continuous strain, which the concrete undergoes due to application of external loads, is called
- (A) creep
 - (B) bleeding
 - (C) segregation
 - (D) workability
154. The cement concrete, from which entrained air and excess water are removed after placing it in position, is called
- (A) prestressed concrete
 - (B) light weight concrete
 - (C) vacuum concrete
 - (D) sawdust concrete
155. The process of proper and accurate measurement of all concrete materials for uniformity of proportions and aggregate grading is called
- (A) proportioning
 - (B) grading
 - (C) mixing
 - (D) batching
156. Gypsum is added in the manufacture of Portland cement
- (A) while mixing the raw materials
 - (B) during burning in the rotary kiln
 - (C) at the beginning of grinding the clinker
 - (D) at the end of grinding the clinker into powder
157. The minimum load which will cause failure of a foundation is called
- (A) ultimate tensile strength
 - (B) nominal strength
 - (C) ultimate bearing power
 - (D) ultimate compressive strength
158. A foundation consisting of thick reinforced concrete slab covering the entire area of the bottom of the structure, is known as
- (A) pile foundation
 - (B) pier foundation
 - (C) raft foundation
 - (D) machine foundation

159. A type of bond in which all the bricks are laid as headers on the faces of walls, is known as
- (A) raking bond
 - (B) dutch bond
 - (C) facing bond
 - (D) heading bond
160. The expansion of soil due to shear at a constant value of pressure is called
- (A) apparent cohesion
 - (B) true cohesion
 - (C) dilatancy
 - (D) consistency
161. The number of working strokes per minute in case of four stroke IC engine will be equal to
- (A) $N/2$
 - (B) N
 - (C) $2N$
 - (D) $4N$
162. A four stroke petrol engine theoretically operates on
- (A) Otto cycle
 - (B) Brayton cycle
 - (C) Joule cycle
 - (D) Bell Coleman cycle
163. For an isolated system executing a process:
1. No heat is transferred
 2. No work is done
 3. No mass flows across the system boundary
 4. No chemical reaction takes place within the system
- Which of the above statements are correct?
- (A) 1, 2 and 3
 - (B) 1, 3 and 4
 - (C) 2, 3 and 4
 - (D) 1, 2, 3 and 4

164. Zeroth law of thermodynamics forms the basis of measurement.
- (A) pressure
 - (B) temperature
 - (C) heat
 - (D) work
165. Which one of the following gases will have the maximum value of characteristic gas constant?
- (A) Nitrogen
 - (B) Carbon dioxide
 - (C) Sulphur dioxide
 - (D) Oxygen
166. The heat absorbed by water at its saturation temperature to get converted into dry steam at the same temperature is called
- (A) sensible heat
 - (B) specific heat
 - (C) latent heat
 - (D) total heat
167. The presence of in boiler exhaust indicates incomplete combustion
- (A) oxygen
 - (B) water vapour
 - (C) CO
 - (D) CO₂
168. What is the function of a steam trap?
- (A) To arrest water particles going along with steam
 - (B) To drain of water resulting from partial condensation of steam in pipes
 - (C) To prevent steam from leaking out from the boiler
 - (D) To regulate steam flow rate from the boiler
169. For a practical petrol engine working on Otto cycle, the compression ratio usually lies in the range
- (A) 3 – 5
 - (B) 6 – 8
 - (C) 10 – 15
 - (D) 16 – 22

170. The degree of reaction is defined as the ratio of
- (A) heat drop in moving blades to heat drop in fixed blades
 - (B) heat drop in moving blades to heat drop in the entire stage of reaction turbine
 - (C) heat drop in fixed blades to heat drop in the entire stage of reaction turbine
 - (D) heat drop in fixed blades to heat drop in moving blades
171. Ionic wind voltmeter is used for measuring
- (A) leakage inductance
 - (B) low voltage
 - (C) stray capacitance
 - (D) high voltage
172. Which of the following instrument can be used for measuring alternating current only?
- (A) Permanent magnet type ammeter
 - (B) Moving iron voltmeter
 - (C) Moving iron ammeter
 - (D) Induction type ammeter
173. A milliammeter can be used as
- (A) energy meter
 - (B) wattmeter
 - (C) voltmeter and ammeter
 - (D) ohmmeter
174. Which of the following instrument has the lowest resistance?
- (A) Megger
 - (B) Ammeter
 - (C) Voltmeter
 - (D) Frequency meter
175. Which circuit component opposes the change in current through a circuit?
- (A) Inductance
 - (B) Resistance
 - (C) Conductance
 - (D) Capacitance

176. Kirchhoff's laws are valid for
- (A) passive time invariant circuits
 - (B) linear circuits only
 - (C) non-linear circuits only
 - (D) both linear and non-linear circuits
177. A series RLC circuit draws current at leading power factor at
- (A) the resonant frequency
 - (B) frequency more than resonant frequency
 - (C) frequency less than resonant frequency
 - (D) frequencies both less and more than resonant frequency
178. According to Ohm's law
- (A) V is directly proportional to I
 - (B) V is inversely proportional to I
 - (C) V is directly proportional to R
 - (D) All of the above
179. During a hot sunny day, temperature changes from 23°C to 42°C . A current of 2A is flowing into resistor with a potential difference of 2V across it. The resistance of the resistor using Ohm's law is calculated as
- (A) 4 Ohm
 - (B) 1 Ohm
 - (C) 0.5 Ohm
 - (D) Cannot be determined using Ohm's law
180. The law of Physics that defines the amount of force between two stationary electrically charged particles is known as
- (A) Kirchhoff Law
 - (B) Thevenins Theorem
 - (C) Coloumbs Law
 - (D) Faradays Law
181. What will be the current gain of a transistor in common collector mode, if it has a current gain of 0.99 in common base mode?
- (A) 1.01
 - (B) 0.99
 - (C) 100
 - (D) 99

182. For a transistor the expression for β in terms of α is given by

(A) $\frac{\alpha}{1-\alpha}$

(B) $\frac{\alpha}{1+\alpha}$

(C) $\frac{1-\alpha}{\alpha}$

(D) $\frac{1+\alpha}{\alpha}$

183. The forward cutin voltage for a silicon diode is

(A) 0.2 volt

(B) 1 volt

(C) 0.6 volt

(D) 2 volts

184. Negative feedback in amplifiers will

(A) improve signal to noise ratio at the output

(B) reduce signal to noise ratio at the input

(C) not affect the output signal to noise ratio

(D) All of the above

185. The ripple factor of a full wave rectifier without filter is

(A) 1.21

(B) 0.482

(C) 2.01

(D) 0.842

186. If the temperature of a Semi Conductor is increased, its resistance

(A) Increases

(B) Decreases

(C) Remains Same

(D) Cannot be determined

187. The resistance offered by an ideal diode in forward bias is
- (A) Zero
 - (B) Finite
 - (C) Infinite
 - (D) None of the above
188. The negative temperature coefficient is a characteristics of which breakdown?
- (A) Zener
 - (B) Avalanche
 - (C) Both (A) and (B)
 - (D) None of the above
189. In an electronics circuit the rectifiers are used to
- (A) DC to AC conversion
 - (B) AC to DC conversion
 - (C) Both (A) and (B)
 - (D) None of the above
190. Maximum Efficiency of Half wave and Full wave rectifiers respectively are
- (A) 81%, 25%
 - (B) 41%, 81%
 - (C) 65%, 41%
 - (D) 25%, 41%
191. Which protocol provides e-mail facility among different hosts?
- (A) FTP
 - (B) SMTP
 - (C) TELNET
 - (D) SNMP
192. Which output device is used for translating information from a computer into pictorial form on paper?
- (A) Mouse
 - (B) Plotter
 - (C) Touch panel
 - (D) Card punch

193. Which is a fast speed printer?

- (A) Laser printer
- (B) Jet printer
- (C) Thermal printer
- (D) Daisy wheel printer

194. What is the permanent memory built into your computer called?

- (A) RAM
- (B) ROM
- (C) CPU
- (D) CD-ROM

195. The server on the Internet is also known as a

- (A) Hub
- (B) Host
- (C) Gateway
- (D) Repeater

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196. What is the full name of FAT?
- (A) File Attribute Table
 - (B) File Allocation Table
 - (C) Font Attribute Table
 - (D) Format Allocation Table
197. Which of the following listed below is not an operating system?
- (A) LINUX
 - (B) Windows
 - (C) DOS
 - (D) Oracle
198. The storage of firmware is in
- (A) Cache
 - (B) ROM
 - (C) RAM
 - (D) Hard disk
199. Compiler is an example for
- (A) System software
 - (B) Application software
 - (C) System hardware
 - (D) None of the above
200. The maximum number of dimension an array can be assigned in C programming language is
- (A) Two
 - (B) Eight
 - (C) Sixteen
 - (D) Theoretically no limit

Final Answer Key

Sl. No	Key	Sl. No	Key	Sl. No	Key	Sl. No	Key	Sl. No	Key	Sl. No	Key	Sl. No	Key
1	D	31	B	61	C	91	B	121	B	151	D	181	C
2	B	32	D	62	B	92	A	122	A	152	D	182	A
3	C	33	B	63	D	93	A	123	B	153	A	183	C
4	B	34	B	64	B	94	C	124	B	154	C	184	A
5	B	35	D	65	D	95	A	125	D	155	D	185	B
6	D	36	A	66	B	96	B	126	A	156	D	186	B
7	C	37	D	67	C	97	A	127	D	157	C	187	A
8	B	38	A	68	A	98	B	128	B	158	C	188	A
9	B	39	C	69	A	99	A	129	D	159	D	189	B
10	A	40	B	70	A	100	A	130	C	160	C	190	B
11	B	41	D	71	B	101	B	131	D	161	A	191	B
12	D	42	A	72	A	102	C	132	C	162	A	192	B
13	A	43	D	73	C	103	B	133	D	163	A	193	A
14	B	44	C	74	B	104	D	134	A	164	B	194	B
15	D	45	D	75	A	105	B	135	A	165	A	195	B
16	B	46	D	76	C	106	D	136	D	166	C	196	B
17	B	47	B	77	D	107	B	137	D	167	C	197	D
18	C	48	B	78	D	108	A	138	C	168	B	198	B
19	C	49	B	79	A	109	A	139	D	169	B	199	A
20	B	50	A	80	B	110	B	140	C	170	B	200	D
21	C	51	B	81	A	111	B	141	C	171	D		
22	B	52	C	82	B	112	A	142	B	172	D		
23	D	53	A	83	D	113	C	143	B	173	C		
24	B	54	C	84	B	114	C	144	D	174	B		
25	D	55	C	85	A	115	C	145	C	175	A		
26	C	56	C	86	B	116	A	146	C	176	D		
27	C	57	B	87	C	117	B	147	A	177	C		
28	B	58	A	88	A	118	A	148	D	178	A		
29	D	59	B	89	B	119	B	149	B	179	D		
30	A	60	A	90	A	120	A	150	B	180	C		