

Total MCQs = 200

 NUST Past Paper
 Computer

Time allotted = 3 hours

1. $\frac{dy}{dx} + 2x \tan(x-y) = 1 \Rightarrow \sin(x-y) =$

- A. Ae^{-x^2}
- B. Ae^{2x}
- C. Ae^{x^2}
- D. Ae^{-2x}

2. The center of the circle $5x^2 + 5y^2 + 24x + 36y + 10 = 0$ is

- A. $\left[\frac{12}{5}, \frac{18}{5}\right]$
- B. $\left[-\frac{12}{5}, \frac{18}{5}\right]$
- C. $\left[\frac{12}{5}, -\frac{18}{5}\right]$
- D. $\left[-\frac{12}{5}, -\frac{18}{5}\right]$

 3. If $R \rightarrow R^2$ and $g: R^+ \rightarrow R$ are such that

$$G(f(x)) = |\sin x| \text{ and } f(g(x)) = (\sin \sqrt{x})^2, \text{ then a possible choice for } f \text{ and } g \text{ is}$$

- A. $F(x) = x^2, g(x) = \sin \sqrt{x}$
- B. $F(x) = \sin x, g(x) = |x|$
- C. $f(x) = \sin x, g(x) = \sqrt{x}$
- D. $f(g(x)) = (\sin \sqrt{x})^2$

 4. If $z \rightarrow$ is $f: z \rightarrow$ is defined by $f(x) = \begin{cases} \frac{x}{2} & \text{if } x \text{ is even} \\ 0 & \text{if } x \text{ is odd} \end{cases}$ then f is

- A. onto but not one to one
- B. one to one but not onto
- C. one to one and onto
- D. neither one to one nor onto

 5. An equation of the form $Ax^2 + By^2 + Cx + Cy + G = 0$ represents a circle if

- A. $A = 0$ or $B = 0$
- B. $A = B = 0$

- C. $A \neq B$
D. None of these
6. A regular polygon of n sides has 170 diagonals, then $n =$
- A. 12
B. 17
C. 20
D. 25
7. A committee of 12 members is to be formed from 9 women and 8 men. The number of committees in which the women are in majority is
- A. 2720
B. 2702
C. 2270
D. 2278
8. Circles $(x - 7)^2 + (y - 9)^2 = 3$ is not concentric to the circle.
- A. $(x - 7)^2 + (y - 9)^2 = 3$
B. $(x + 7)^2 + (y + 9)^2 = \sqrt{3}$
C. $(x + 7)^2 + (y + 9)^2 = 3\sqrt{3}$
D. $(x + 7)^2 + (y + 9)^2 = 9$
9. $\sum_{k=1}^x \sum_{r=0}^k \frac{1}{3k} {}^k C_r =$
- A. 13
B. $\frac{2}{3}$
C. 1
D. 2
10. Equations of circle with center (h, k) and radius r is
- A. $(x - h)^2 + (y + k)^2 = r^2$
B. $(x - h)^2 + (y - k)^2 = r^2$
C. $(x + h)^2 + (y + k)^2 = r^2$
D. $(x - h)^2 + (y - k)^2 = r^2$
11. $\frac{1}{x(x+1)(x+2)\dots(x+n)} = \frac{A_0}{x} + \frac{A}{x+1} + \dots + \frac{A_n}{x+n}, 0 \leq r \leq n \Rightarrow A =$

A. $(-1)^r \frac{1r!}{(n-r)!}$

B. $(-1)^r \frac{1}{r!(n-r)!}$

C. $\frac{1}{r!(n-r)!}$

D. $\frac{r}{(n-r)!}$

12. $1 + 1/3.2^2 + 1/5.2^4 + 1/7.2^0 + \dots =$

A. Log_e^2

B. Log_e^3

C. Log_e^4

D. Log_e^5

13. Circle is special use of

A. Parabola

B. Hyperbola

C. Ellipse

D. none

14. The product of real of the equation

$$|x|^{6/5} - 26 |x|^{3/5} - 27 = 0$$

A. -3^{10}

B. -3^{12}

C. $-3^{12/5}$

D. $-3^{21/5}$

15. If a, b, y are the roots of the equation $x^3 + px^2 + qx + r = 0$ then the coefficient of x in the cubic equation whose roots are a (B + y), B, (y + a) and y (a + B) is

A. $2q$

B. $Q^2 + pr$

C. $P^2 - qr$

D. $r(pq - r)$

16. The extremities of the transverse axis of hyperbola are called its

- A. foci
- B. vertices
- C. axis
- D. none

17. $A = \begin{bmatrix} i & -i \\ -i & i \end{bmatrix}$, $B = \begin{bmatrix} i & -i \\ -i & i \end{bmatrix} \Rightarrow A^8$

- A. 4B
- B. 8B
- C. 64B
- D. 128B

18. Parametric equations of circle $x^2 + y^2 = r^2$ are

- A. $X = r \cos \theta$, $y = \sin \theta$
- B. $X = r \sec \theta$, $y = r \tan \theta$
- C. $X = r \cosh \theta$, $y = r \sinh \theta$
- D. $X = r \cos \theta$, $y = r \sec \theta$

19. Equation of circle with center at origin and radius $\sqrt{5}$ is

- A. $x^2 + y^2 = \sqrt{5}$
- B. $x^2 + y^2 = 5$
- C. $x^2 + y^2 = 25$
- D. $(x - e)^2 + y^2 = 5$

20. If $a, b, c, d \in \mathbb{R}$ are such that $a^2 + b^2 = 4$ and $c^2 + d^2 = 2$ and if $(a+ib)^2 = (c+id)^2 (x+iy)$ then $x^2 +$

$y^2 =$

- A. 4
- B. 3
- C. 2

D. 1

21. If z is complex number such that

$\left|z - \frac{4}{z}\right| = 2$, then the greatest value of $|z|$ is

A. $1 + \sqrt{2}$

B. $\sqrt{2}$

C. $\sqrt{23}$

D. $1 + \sqrt{5}$

22. If a is a non-real root of the equation $x^6 - 1 = 0$ then $\frac{a^2 + a^3 + a^4 + a^5}{a + 1}$

A. a

B. 1

C. 0

D. -1

23. The minimum value of $27 \tan^2\theta + 3 \cot^2\theta$ is

A. 15

B. 18

C. 24

D. 30

24. $\cos 36^\circ - \cos 72^\circ =$

A. 1

B. $\frac{1}{2}$

C. $\frac{1}{4}$

D. $\frac{1}{8}$

25. $\tan x + \tan(x + \pi/3) + \tan(x + 2\pi/3) = 3 \Rightarrow \tan 3x =$

- A. 3
- B. 2
- C. 1
- D. 0

26. $3\sin x + 4\cos x = 5 \Rightarrow 6\tan x/2 - 9\tan^2 x/2 =$

- A. 0
- B. 1
- C. 3
- D. 4

27. If $\frac{1}{2} \leq x \leq 1$ then $\cos^{-1}\left(\frac{x}{2} + \frac{1}{2}\sqrt{3-3x^2}\right) =$

- A. $\frac{\pi}{6}$
- B. $\frac{\pi}{3}$
- C. π
- D. 0

28. If a, b, c form a geometric

Progress with common ratio r, then the sum of the ordinates of the points of intersection of the line $ax + 2y^2 = 0$ is

- A. $-r^2/2$
- B. $-r/2$
- C. $r/2$
- D. r

29. The point (3,2) undergoes the following three transformations in the order given reflection about the line $y = x$ translation by the distance 1 unit in the positive direction of x-axis rotation by an angle $\frac{\pi}{4}$ about the origin in the anticlockwise direction.

Then the final position of the point is

- A. $(-\sqrt{18}, \sqrt{18})$

- B. (-2, 3)
- C. $(0\sqrt{18})$
- D. $3\sqrt{2}$

30. If x is a poisson variate such that $a = p(x=1) = p(x=2)$ then $p(x = 4) =$

- A. $2a$
- B. $a/3$
- C. ae^{-2}
- D. ae^2

31. Suppose x follows binomial distribution with parameters n and p where $0 < p < 1$. If

$\frac{p(x=r)}{p(x=n-r)}$ is independent of n for every r , then $p =$

- A. $1/2$
- B. $1/3$
- C. $1/4$
- D. $1/8$

32. In an entrance test three are multiple choice questions. There are four possible answers to each questions, or which one is correct. The probability that a student knows the answer to a question is $9/10$. If he gets the correct answer to a question, then the probability that he was guessing is

- A. $37/40$
- B. $1/37$
- C. $36/37$
- D. $1/8$

33. There are four machines and it is known that exactly two of them are faulty. They are tested on by one, in a random order till both the faulty machines are identified. Then the probability that only two tests are needed is

- A. $1/3$
- B. $1/6$
- C. $1/2$
- D. $1/4$

34. A fair coin is tossed 100 times. The probability of getting tails an odd number of times is

- A. $1/2$

- B. $1/4$
- C. $1/8$
- D. $3/8$

35. The radius of the circle

$$x^2 + y^2 + 2gx + 2fy + c = 0$$
 is

- A. $\sqrt{g^2 + f^2 + c}$
- B. $\sqrt{g^2 - f^2 - c}$
- C. $\sqrt{g^2 + f^2 - c}$
- D. $g^2 + f^2 - c$

36. Let a , b and c be three non-coplanar vectors and let p , q and r be the vectors defined by

$$p = \frac{b \times c}{[abc]}, q = \frac{c \times a}{[abc]}, r = \frac{a \times b}{[abc]}, \text{ then } (a + b) \cdot p, (b + c) \cdot q, (c + a) \cdot r =$$

- A. 0
- B. 1
- C. 2
- D. 3

37. Let

$$a = i + 2j + k, b = i - j + k, c = i - j - k.$$

A vector in the plane of a and b has projection $1/\sqrt{3}$ on c . then, one such vector is

- A. $4i + j - 4k$
- B. $3i + j - ek$
- C. $4i - j + 4k$
- D. $2i + j - 2k$

38. The point of intersection of the lines

$$l_1: r(t) = (i - 6j + 2k) + t(i + 2j + k)$$

$$l_2: R(u) = (4j + k) + u(2i + j + 2k)$$
 is

- A. (4,4,5)

- B. (6,4,7)
- C. (8,8,9)
- D. (10,12,11)

39. The vectors $AB = 3i - 2j + 2k$ and $BC = i - 2k$

Are the adjacent sides of a parallelogram? The angle between its diagonals is

- A. $\frac{\pi}{2}$
- B. $\frac{\pi}{3}$ or $\frac{2\pi}{3}$
- C. $\frac{3\pi}{4}$ or $\frac{\pi}{4}$
- D. $\frac{5\pi}{6}$ or $\frac{\pi}{6}$

40. If P^{th} , q^{th} , r^{th} terms of a geometric progression are the positive numbers a, b, c respectively, then the angle between the vectors

$(\log a^2) i + (\log b^2) j + (\log c^2) k$ and $(q-r) i + (r-p) j + (p-q) k$ is

- A. $\frac{\pi}{3}$
- B. $\frac{\pi}{2}$
- C. $\sin^{-1} \frac{1}{\sqrt{a^2+b^2+c^2}}$
- D.
- E. $\frac{\pi}{4}$

41. If a, b, y are length of the altitudes of a triangle ABC with area Δ , then

$$\Delta^2/R^2 (1/a^2 + 1/b^2 + 1/y^2) =$$

- A. $\sin^2 A + \sin^2 B + \sin^2 C$
- B. $\cos^2 A + \cos^2 B + \cos^2 C$
- C. $\tan^2 A + \tan^2 B + \tan^2 C$
- D. $\cot^2 A + \cot^2 B + \cot^2 C$

42. In an acute-angled triangle, $\cot B \cot C + \cot A \cot C + \cot A \cot B =$

- A. -1
- B. 0
- C. 1
- D. 2

43. $X = \log(1/y + \sqrt{1 + 1/y^2}) \Rightarrow y =$

- A. $\text{Tanh}x$
- B. $\text{Coth}x$
- C. $\text{Sech}x$
- D. $\text{Cosech}x$

44. The center of the circle

$$X^2 + Y^2 + 2gx + c = 0$$

- A. (g, f)
- B. (f, g)
- C. $(-f, -g)$
- D. $(-g, -f)$

45. The equation $x^2 - 5xy + py^2 - 3x - 8y + 2 = 0$ represents a pair of straight lines. If q is the angle between them, then $\sin q =$

- A. $1/\sqrt{50}$
- B. $1/7$
- C. $1/5$
- D. $1/\sqrt{10}$

46. The equation of the pair of lines passing through the origin whose sum and product of slopes are respectively the arithmetic mean and geometric mean of 4 and 9 is

- A. $12x^2 - 13xy + 2y^2 = 0$
- B. $12x^2 + 13xy + 2y^2 = 0$
- C. $12x^2 - 15xy + 2y^2 = 0$
- D. $12x^2 + 15xy - 2y^2 = 0$

47. If the point $(1, 2)$ and $(3, 4)$ lie on the same side of the straight line $3x - 5y + a = 0$ then a lies in the set

- A. $[7, 11]$
- B. $\mathbb{R} - [7, 11]$
- C. $[7, \infty)$
- D. $(-\infty, 11]$

48. If p and q are the perpendicular distances from the origin to the straight lines

$X \sec q - y \cos ecq + y \sin q = a \cos 2q$, then

- A. $4p^2 + q^2 = a^2$
- B. $p^2 + q^2 = a^2$
- C. $p^2 + 2q^2 = a^2$
- D. $4p^2 + q^2 = 2a^2$

49. Point (x_1, y_1) lies inside the circle $x^2 + y^2 + 2gx + 2fy + c = 0$, if

- A. $X_1^2 + y_1^2 + 2gx_1 + 2fy_1 + c < 0$
- B. $X_1^2 + y_1^2 + 2gx_1 + 2fy_1 + c = 0$
- C. $X_1^2 + y_1^2 + 2gx_1 + 2fy_1 + c > 0$
- D. $X_1^2 + y_1^2 = 0$

50. The random variable takes the values 1, 2, 3,....., m. if $P(X = n) = 1/m$ to each n, then the variance of X is

- A. $\frac{(m+1)(2m+1)}{6}$
- B. $\frac{m^2}{12}$
- C. $\frac{m+1}{12}$
- D. $\frac{m^2+1}{12}$

51. A bag contains $2n + 1$ coins. It is known that n of these coins have a head on both sides, whereas the remaining $n + 1$ coins are fair. A coin is picked up at random from the bag and tossed. If the probability that the toss results in a head is $31/24$, then $n =$

- A. 10
- B. 11
- C. 12
- D. 13

52. Two fair dice are rolled. The probability of the sum of digits on their faces to be greater than or equal to 10 is

- A. $1/5$
- B. $1/4$
- C. $1/8$
- D. $1/6$

53. Two numbers are chosen at random from $\{1, 2, 3, 4, 5, 6, 7, \text{ and } 8\}$ at a time. The probability that smaller of the two numbers is less than 4 is

- A. $7/14$
- B. $8/14$
- C. $9/14$
- D. $10/14$

54. If a and b are two non-zero perpendicular vector then a vector y satisfying equations $a \times y = c$ (c scalar and $a^1 \times y = b$) is

- A. $| a^2 | (ca - (ab))$
- B. $| a^2 | (ca + (ab))$
- C. $| 1/a^2 | (ca - (ab))$
- D. $| 1/a^2 | (ca + (ab))$

55. The length of the diameter of the circle represented by the equation $2x^2 + 2y^2 - 8 = 0$, is

- A. 8
- B. 4
- C. 2
- D. 16

56. The shortest distance between lines $r = 3i + 5j + 7k + l(i+2j+k)$

And $r = l - j + k + m(7i + 6j + k)$

- A. $16/5\sqrt{5}$
- B. $26/5\sqrt{5}$
- C. $36/5\sqrt{5}$
- D. $5 \frac{46}{\sqrt{5}}$

57. $A \cdot 0, b \cdot 0, c \cdot 0, a \cdot b = 0, b \cdot c = 0 \Rightarrow a \cdot c =$

- A. B
- B. A
- C. 0
- D. $l+j+k$

58. P, Q, R and S are four points with the positions vectors

$-3i+4j+3k$ respectively. Then the line PQ meets the line RQ at the pint.

- A. $3i+4j+3k$
- B. $-3i+4j+3k$
- C. $-i+4j+k$
- D. $i+j+k$

59. The circumference of the circle represented by

$$X^2+2x+1+y^2+2y+1 = 25$$
 is

- A. 2π
- B. 25π
- C. 10π
- D. 5π

60. A person observes the top of a tower from a point A on the ground. The elevation of the tower from this point is 60° . He moves 60 m in the direction perpendicular to the line joining A and base of the tower. The angle of elevation of the tower from this point is 45° . Then the height of the tower (in meters) is

- A. $60\frac{\sqrt{3}}{2}$
- B. $60\sqrt{2}$
- C. $60\sqrt{3}$
- D. $60\frac{\sqrt{2}}{3}$

61. If in $\triangle ABC$, $\frac{1}{a+b} \cdot \frac{1}{b+c} = \frac{3}{a+b+c}$ then the angle C =

- A. 30°
- B. 45°
- C. 60°
- D. 90°

62. In any triangle ABC, $r_1r_2+r_2r_3+r_3r_1 =$

- A. D^2/r^2
- B. D/r
- C. D^2/r
- D. D^2

63. $\sin q + \cos q = \sin^3 q + \cos^3 q = q \phi p (p^2 - 3) =$

- A. Q
- B. 2q
- C. -q
- D. -2q

64. If $f(x) = (p-x^n)^{1/n}$, $p > 0$ and n is a positive integer, then $f(f(x)) =$

- A. X
- B. x^n
- C. $p^{1/n}$
- D. p^{-n}

65. 10 men and 6 women are to be seated in a row so that no two women sit together. The number of ways they can be seated is:

- A. $11! 10!$
- B. $11! / 6! 5!$
- C. $10! 9! / 5!$
- D. $11! 10! / 5!$

66. If a point P is outside the circle then from this point we can draw

- A. One tangent to the circle
- B. Two tangent to the circle
- C. Three tangent to the circle
- D. No tangent to the circle

67. If x is small so that x^2 and higher powers can be neglected, then the approximate value for

$$\frac{(1-2x)^{-1} (1-3x)^{-2}}{(1-4x)^{-3}} \text{ is}$$

- A. $1-4x$
- B. $1-3x$
- C. $1-4x$
- D. $1-5x$

68. If $g^2 + f^2 - c = 0$ then the circle reduces to

- A. A line
- B. A point

- C. Two points
D. None of these
69. If the harmonic mean between the roots $(5+\sqrt{2})x^2 - bx + (8+2\sqrt{5}) = 0$ is 4, then the value of b.
- A. 2
B. 3
C. $4-\sqrt{5}$
D. $4+\sqrt{5}$
70. The set of solutions satisfying both $x^2 + 5x + 6 \geq 0$ and $x^2 + 3x - 3 < 0$ is
- A. $(-4,1)$
B. $(-4,-3) \cup (-2,1)$
C. $(-4,-3) \cup (-2,1)$
D. $(-4,-3) \cup (-2,1)$
71. If the roots of $x^3 - 42x^2 + 336x - 512 = 0$, are in increasing geometric progression, then its common ratio is
- A. 2
B. 3
C. 4
D. 6
72. If a and b are the roots of the equation $x^2 - 2x + 4 = 0$, then $a^9 + b^9 =$
- A. -2^8
B. 2^9
C. -2^{10}
D. 2^{10}
73.
$$\begin{matrix} x+2 & x+3 & x+5 \\ x+4 & x+6 & x+9 \\ x+8 & x+11 & x+15 \end{matrix}$$
- A. $3x^2 + 4x + 5$
B. $x^3 + 8x + 2$
C. 0
D. -2

74. The system of equations $3x + 2y + z = 6$, $3x + 4y + 3z = 14$, $6x + 10y + 8z = a$, has infinite number of solutions, if $a =$

- A. 8
- B. 12
- C. 23
- D. 36

75. The number of real value of t such that the system of homogeneous equations

$$tx + (t - 1)y + (t - 1)z = 0$$

$$(t + 1)x + ty + (t + 2)z = 0$$

$$(t - 1)x + (t + 2)y + tz = 0$$

Has non-trivial solutions, is

- A. 3
- B. 2
- C. 1
- D. 4

76. $\left(\frac{1+i}{1-i}\right)^4 + \left(\frac{1-i}{1+i}\right)^4 =$

- A. 0
- B. 1
- C. 2
- D. 4

77. If a complex number z satisfies $|z^2 - 1| = |z|^2 + 1$, then z lies on:

- A. The real axis
- B. The imaginary axis
- C. $Y = X$
- D. A circle

78. The solution of the differential equation $\frac{dy}{dx} - 2y \tan 2x = e^x \sec 2x$ is:

- A. $Y \sin 2x = e^2 + c$
- B. $Y \cos 2x = e^x + c$
- C. $Y = e^x \cos 2x + c$

D. $Y \cos 2x + e^x = c$

79. An integration factor of the equation

$$(1-y=x^2y) dx + (x+x^3) dy = 0$$
 is

- A. e^x
- B. x^2
- C. $1/x$
- D. X

80. The approximate value of $\int_1^3 \frac{dx}{2+3x}$ using Simpson's rule and dividing the interval [1,3] into two parts is

- A. $1/3 \log (11/5)$
- B. $107/110$
- C. $29/110$
- D. $119/440$

81. The manifestation of band structure in solids is due to

- A. Heisenberg's uncertainty principle
- B. Pauli's exclusion principle
- C. Bohr's correspondence principle
- D. Boltzmann's law

82. When p-n junction diode is forward biased

- A. The depletion region is reduced and barrier height is increased
- B. The depletion region is widened and barrier height is reduced
- C. Both the depletion region and barrier height reduced
- D. Both the depletion region and barrier height increased

83. Ohm x farad is equivalent to:

- A. Second
- B. weber
- C. Henry
- D. Tesla

84. An angular ring inner and outer radii R_1 and R_2 is rolling without slipping with a uniform angular speed. The ratio of the forces experienced by the two particles situated on the inner and outer parts of the ring, F_1/F_2 is

- A. R_2/R_1

- B. (R_2/R_1)
C. 1
D. R_1/R_2
85. A smooth block is released at rest on a 45° incline and then slides a distance d . The time taken to slide is n times as much to slide on a rough incline than on a smooth incline. The coefficient of friction is
- A. $\mu_k = 1 - \frac{1}{n^2}$
B. $\mu_k = \sqrt{1} - \frac{1}{n^2}$
C. $\mu_s = 1 - \frac{1}{n^2}$
D. $\mu_s = \sqrt{1} - \frac{1}{n^2}$
86. The upper half of an inclined plane with inclination ϕ is perfectly smooth while the lower half is rough. A body starting from rest at the top will again come to rest at the bottom if the coefficient of friction for the lower half is given by
- A. $2\sin \phi$
B. $2\cos \phi$
C. $2\tan \phi$
D. $\tan \phi$
87. A bullet fired into a fixed target loses half of its velocity after penetrating 3 cm. How much further it will penetrate before coming to rest assuming that it faces constant resistance to motion?
- A. 3.0 cm
B. 2.0 cm
C. 1.5 cm
D. 1.0 cm
88. A wire of uniform cross section A , length l and resistance R is cut into two equal pieces. The resistivity of each piece will be
- A. The same
B. One fourth
C. Double
D. One half
89. Two metallic conductors have the same value of resistivity. These conductors can be differentiated from the values of their:
- A. Temperature coefficient
B. Resistances
C. Conductance
D. Conductivity

90. When a horse pulls a wagon, the force that causes the horse to move forward is the force
- The ground exerts on him
 - The exerts on the ground
 - The wagon exerts on him
 - He exerts on the wagon
91. A particle is moving eastwards with a velocity of 5m/s in 10 seconds the velocity changes to 5m/s northwards. The average acceleration in this time is
- $1/\sqrt{2}$ m /s² towards north-east
 - $1/2$ m/s² towards north
 - Zero
 - $1/\sqrt{2}$ m /s² towards northwest
92. A parachutist after bailing out falls 50 m without friction. When parachute opens. It decelerates at 2 m/s². He reaches the ground with speed of 3 m/s. at what height, did he bail out?
- 91m
 - 182m
 - 293m
 - 111m
93. A spherical ball of mass 20 kg is stationary at the top of a hill of height 100m. it rolls down a smooth surface to the ground, then climbs up another hill of height 30 m and finally rolls down to a horizontal base at a height of 20 m above the ground. The velocity attained by the ball is:
- 40m/s
 - 20m/s
 - 10m/s
 - $10\sqrt{30}$ m/s
94. A body A of mass M while falling vertically downwards under gravity breaks into two parts; a body B of mass 1/3 and a body C of mass 2/3 M. the center of mass of bodies B and C taken together shifts compared to that of body A towards
- Depends on height of breaking
 - Does not shift
 - Body C
 - Body B
95. Moment of inertia of a thin ring or hoop is
- Mr^2
 - $1/2 mr^2$

- C. $\frac{5}{6} mr^2$
D. $\frac{2}{5} mr^2$
96. A particular of mass 0.3kg is subjected to a force $F = -kx$ with $k = 15 \text{ N/m}$. what will be its initial acceleration if it is released from a point 20 cm away from the origin?
A. 3m/s^2
B. 15m/s^2
C. 5m/s^2
D. 10m/s^2
97. A 20 cm long capillary tube dipped in water. The water rises up to 8 cm. if the entire arrangement is put in a freely falling elevator the length of water column in the capillary tube will be
A. 8cm
B. 10cm
C. 4cm
D. 20cm
98. If S is stress and Y is young's modules of material of a wire, the energy stored in the wire per unit volume is
A. $2S^2y$
B. $S^2/2y$
C. $2y/s^2$
D. $s/2y$
99. The metallic wires are laying parallel. If the current in these wires be following in the same direction, the wires will:
A. Attract each other
B. Repel each other
C. Have no force of attraction or repulsion
D. Remain stationary
100. A body of mass m is accelerated uniformly from rest to a speed v in a time T . the instantaneous power delivered to the body as a function of time is given by
A. $\frac{mv^2}{T^2} \cdot t$
B. $\frac{mv^2}{T^2} \cdot t^2$
C. $\frac{1}{2} \frac{mv^2}{T^2} \cdot t$
D. $\frac{1}{2} \frac{mv^2}{T^2} \cdot t^2$
101. Consider a car moving on a straight road with a speed of 100 m/s. The distance at which car stops in $[\mu_k = 0.5]$
A. 800m

- B. 1000m
C. 100m
D. 400m
102. The SI unit of magnetic flux is weber which is equal to :
- A. NmA^{-1}
B. $\text{Nm}^2 \text{A}^{-1}$
C. NAm^{-1}
D. NmA^{-2}
103. The change in the value of g at a height h above the surface of the earth is the same as at a depth d below the surface of earth. When both d and h are much smaller than the radius of earth, then which one of the following is correct?
- A. $d = h/2$
B. $d = 3h/2$
C. $d = 2h$
D. $d = h$
104. An electron and proton are projected with same velocity normal to magnetic field which one will suffer greater deflection?
- A. Proton
B. Electron
C. Both will suffer greater deflection
D. None of these
105. A gaseous mixture consists of 16kg of helium and 16kg of oxygen. The ratio C_p/C_v of the mixture is
- A. 1.59
B. 1.62
C. 1.4
D. 1.54
106. The intensity of gamma radiation from a given source is I . On passing through 36 mm of lead, it reduced to $1/8$. The thickness of lead which will reduce the intensity to $1/2$ will be
- A. 6mm
B. 9mm
C. 18mm
D. 12mm

107. The motional e. m. f depends upon
- Strength of magnetic field
 - Length of conductor
 - Speed of conductor
 - All of these
108. A photocell is illuminated by a small bright source placed 1m away. When the same source of light is placed $\frac{1}{2}$ m away, the number of electrons emitted by photo cathode would
- Decreased by factor of 4
 - Increased by factor of 4
 - Decreased by factor of 2
 - Increased by factor of 2
109. $\frac{\text{volt}\times\text{second}}{\text{ampere}}$ is equal to
- Gauss
 - Weber
 - Henry
 - Tesla
110. If radius of ${}_{13}^{24}\text{Al}$ nucleus is estimated to be 3.6 Fermi the radius ${}_{52}^{125}\text{Te}$ nucleus is nearly
- 6 Fermi
 - 8 Fermi
 - 4 Fermi
 - 5 Fermi
111. The function $\sin^2(\omega t)$ represents
- A periodic, but not simple harmonic motion with a period $2\pi \omega$
 - A periodic, but not simple harmonic motion with a period $\pi \omega$
 - A simple harmonic motion with a period $2\pi/\omega$
 - A simple harmonic motion with a period $\pi \omega$
112. A young's double slit experiment uses a monochromatic source. The shape of the interference fringes formed on a screen is

- A. Hyperbola
B. circle
C. Straight line
D. Parabola
113. The counter torque produced in the moving coil of generator is called:
A. Restoring torque
B. Deflection torque
C. Back motor effect
D. All of these
114. A fish looking up through the water see the outside world contained in a circular horizon. If the reflective index of water is $4/3$ and the fish is 12cm below the surface, the radius if this circle in cm is
A. $36\sqrt{7}$
B. $36/\sqrt{7}$
C. $36\sqrt{5}$
D. $4\sqrt{5}$
115. Two points white dots are 1 mm apart on a black paper. They are viewed by eye of pupil diameter 3 mm approximately. What is the maximum distance at which these dots can be resolved by the eye? [take wavelength of light = 500 nm]
A. 5m
B. 1m
C. 6m
D. 3m
116. When U^{235} is bombarded with one neutron the fission course and the products are tree neutrons, ${}_{36}\text{Kr}^{94}$
A. ${}_{53}\text{I}^{142}$
B. ${}_{56}\text{Ba}^{139}$
C. ${}_{58}\text{Ce}^{139}$
D. ${}_{54}\text{Xe}^{139}$
117. The inductive reactance of the coil having inductance of 0.5 henry in which AC of 50 Hz flows is:

- A. $94.2\ \Omega$
B. $1.57\ \Omega$
C. $157\ \Omega$
D. $9.42\ \Omega$
118. In a common base amplifier, the phase difference between the input single voltage and output voltage is
A. $\pi/4$
B. π
C. 0
D. $\pi/2$
119. In a full wave rectifier circuit operating from 50Hz mains frequency, the fundamental frequency in the ripple would be
A. 50 Hz
B. 25 Hz
C. 100 Hz
D. 70.7 Hz
120. A nuclear transformation is denoted by $X(n, a) {}_6^7\text{Li}$, which of the following is the nucleus of element X?
A. ${}^{12}\text{C}_6$
B. ${}^{10}\text{B}_5$
C. ${}^9\text{B}_5$
D. ${}^9\text{B}_4$
121. A moving coil galvanometer has 150 equal divisions per mill ampere and voltage sensitivity is 2 divisions per millivolt,. In order that each division reads 1 volt, the resistance in ohms needed to be connected in series with the coil will be
A. 10^3
B. 10^5
C. 99995
D. 9995
122. In RLC series circuit when the frequency of AC source is very low, the circuit is a / an:
A. Resistive circuit
B. Capacitive circuit
C. Inductive circuit
D. Resonant circuit

123. Which of the following makes the motion of a perpetual motion machine a physical impossibility?
- First law of thermodynamics
 - Second law of thermodynamics
 - Third law of thermodynamics
 - None of these
124. A heater coil is cut into two equal parts and only one part is now used in the heater. The heat generated will now be
- Doubled
 - Four times
 - One fourth
 - Halved
125. Two thin long parallel wires separated by a distance carry a current of "I" A in the same direction. They will
- Attract each other with a force of $\frac{\mu_0 I^2}{2\pi d}$
 - Repel each other with a force of $\frac{\mu_0 I^2}{2\pi d}$
 - Attract each other with a force of $\frac{\mu_0 I^2}{2\pi d^2}$
 - Repel each other with a force of $\frac{\mu_0 I^2}{2\pi d^2}$
126. When a polarized light of intensity I_0 is incident on a polarizing sheet, the intensity of the light which does not get transmitted is
- $\frac{1}{2}I_0$
 - $\frac{1}{4}I_0$
 - Zero
 - I_0
127. A parallel plate capacitor is made by stacking n equally spaced plates connected alternatively. If the capacitance between any two adjacent plates is C then the resultant capacitance is

- A. $(n-1)C$
 - B. $(n+1)C$
 - C. C
 - D. NC
128. When the tuning forks (fork 1 and fork 2) are sounded simultaneously, 4 beats per second are heard. Now, some tape attached on the prong of the fork 2. When the tuning forks are sounded again, 6 beats per second are heard. If the frequency of fork 1 is 200 Hz, then what was the original frequency of fork 2?
- A. 200 Hz
 - B. 202 Hz
 - C. 19 Hz
 - D. 204 Hz
129. The process of combining low frequency signal with high frequency carriers waves is called
- A. Rectification
 - B. Amplification
 - C. Modulation
 - D. Magnification
130. The Bob of a simple pendulum is a spherical hollow ball filled with water. A plugged near the bottom of the oscillation bob gets suddenly unplugged. During observation, till water is coming, out the time period of oscillation would
- A. First increase and then decrease to the original value.
 - B. First decrease and then increase to the original value
 - C. Remain unchanged
 - D. Increase towards a saturation value
131. An observer moves towards a stationary source of a sound with a velocity one fifth of the velocity of sound. What is the percentage increase in the apparent frequency?
- A. Zero
 - B. 0.5%
 - C. 5%
 - D. 20%
132. The ratio of volumetric strain to volumetric stress is called:
- A. Compressibility
 - B. Young's modulus
 - C. Bulk's modulus
 - D. Shear's modulus

133. Two concentric coils each of radius is to 2π are placed at right angles to each other. 3 ampere and 4 ampere are the current following in each coil respectively. The magnetic induction in weber/m² at the center of the coils will be ($\mu_0 = 4\pi \times 10^{-7}$ WB/A m)
- A. 12×10^{-5}
 - B. 10^{-5}
 - C. 5×10^{-5}
 - D. 7×10^{-5}
134. A coil of inductance 300 MH and resistance $2\ \Omega$ is connected to a source of voltage 2V. the current reaches half of its steady state value in
- A. 0.05s
 - B. 0.1s
 - C. 0.15s
 - D. 0.3s
135. The self-inductance of the motor of an electric fan is 10 h. in order to impart maximum power at 50 Hz. it should be connected to a capacitance of
- A. $4\ \mu\text{F}$
 - B. $8\ \mu\text{F}$
 - C. $1\ \mu\text{F}$
 - D. $2\ \mu\text{F}$
136. An energy source will supply a constant resistance is
- A. Equal to the resistance of the load
 - B. Very large as compared to the load resistance
 - C. Zero
 - D. Non-zero but less than the resistance of the load
137. A circuit has a resistance of $12\ \Omega$ and an impedance of $15\ \Omega$. The power factor of the circuit will be
- A. 0.8
 - B. 0.4
 - C. 1.5
 - D. 0.125
138. The substance which undergoes plastic deformation until it breaks is:
- A. Ductile substance
 - B. Brittle substance
 - C. Plastic substance
 - D. All of these

139. A uniform electric field and a uniform magnetic field are acting along the same direction in a certain region, if an electron is projected along the direction of the fields with a certain velocity the
- A. Its velocity will decrease
 - B. Its velocity will increase
 - C. It will remain turn towards right of direction of motion
 - D. It will turn towards left of direction of motion
140. Which of the following when added as an impurity into the silicon produces n-type semi-conductor?
- A. P
 - B. Al
 - C. B
 - D. Mg
141. The first digital computer built with IC chip known as
- A. IBM 7090
 - B. Apple-1
 - C. IBM/360
 - D. VAX-790
142. Which is the main part of the computer system???
- A. Monitor
 - B. CPU
 - C. Printer
 - D. Scanner
143. A piece of computer hardware that is physically placed between two devices each of which manages data in different ways is called
- A. Modem
 - B. Interface
 - C. Cluge
 - D. Data bus
144. The monitor of the computer is connected to it by
- A. Cable
 - B. Wire
 - C. Bus
 - D. Modem
145. _____ is used for drawing & graphics.
- A. Photoshop
 - B. Win Word
 - C. Excel

- D. Access
146. The function of status register is to
- A. Transfer data or programs form the input unit to the main memory
 - B. Transfer data or programs from the main memory to the output.
 - C. Check the operation or ALU
 - D. Take data values from RAM through MBR during program execution.
147. DOS stand for
- A. Dual operating system
 - B. Double operating system
 - C. Disk operating system
 - D. Disk operation system
148. Four bytes can store any number between
- A. 0 to 1
 - B. 0 to 255
 - C. 0 to 65535
 - D. 0 to 4.924, 967.295
149. One day computer all over the world can talk to each other. Which one of the special accessories is essential for this purpose?
- A. Keyboard
 - B. Modem
 - C. Scanner
 - D. Fax
150. The speed of any communications between any two devices on on Ethernet LAN is
- A. 10 mbps
 - B. 100mhps
 - C. 1000 Mbps
 - D. 10000mhps
151. ISO stand for
- A. International system organization
 - B. International small organization
 - C. International standards organization
 - D. International supers organization

152. Most satellites providing point to point service today use frequency _____ bandwidth in the range for transmission from satellite to earth
- A. 3.65 to 6.0GHz
 - B. 4.0'to7.0 GHz
 - C. 5.92 to 6.4 GHz
 - D. 4.5 to 6.54Ghz
153. MAC stand for
- A. Mass access control
 - B. Media access control
 - C. Modulator access control
 - D. Multiple access control
154. TCP stand for
- A. Terminal control protocol
 - B. Telecommunications control protocol
 - C. Transmission control protocol
 - D. Transport control protocol
155. An agreement in which data can be receive or sent simultaneously is called:
- A. Simples
 - B. Full-duplex
 - C. Half-duplex
 - D. Multi-duplex
156. _____ system use very high frequency radio signal to transmit data through space.
- A. Fiber optics cable
 - B. Microwave
 - C. Co-axial ~able
 - D. fiberglass-cable
157. Permission to use computer software on a fixed number of computer in an office is called
- A. Software licenses
 - B. Site licenses
 - C. Software copyright
 - D. Site copyright
158. Easiest way of burning out your computer is
- A. Poor electricity connection
 - B. Lack of proper grounding for the computer
 - C. Overloading of a power point
 - D. All of the above

159. Operating system can do which of the following options?
- A. It control the hardware
 - B. It provide user an interface to control the computer
 - C. It provide users interface to use the resources of the computer
 - D. All the above
160. Folders are containers that arrange the data files and other information in
- A. A systematic way B.
 - B. For easy access C.
 - C. For easy management
 - D. All of these
161. Which of the shortcut key is use to cut off a selected item in the windows environment?
- A. Ctrl + A
 - B. Ctrl + X
 - C. Ctrl + C
 - D. Ctrl + V
1622. In order to set all the items when desktop is active, which of the following short key is used?
- A. Ctrl + A
 - B. Alt + A
 - C. Shift + Alt + A
 - D. Alt + Ctrl + A
163. From the start menu, which of the following work you can do?
- A. Open recently use documents
 - B. Customize the look and feel of the window
 - C. Hide all files and folder
 - D. All the above
164. Desktop has the responsibility for which of the following?
- A. Enables you to enter internet addresses for the site that open in the default browser.
 - B. For the selection of a program
 - C. Display a button for each item on the desktop
 - D. To contains Links to Internet resources
165. Shift + Ctrl + D is used for which of the following purpose?

- A. To change the case or selected text
- B. To format the selected text as all capitals
- C. To underline words only
- D. To double underline text

166. Shift + Ctrl + = is used for which of the following purpose?

- A. To format selected letters as small capital
- B. To apply subscript format
- C. To apply superscript format
- D. To display non printing characters

167. When you select entire document, then which of the following key is passed?

- A. Ctrl +W
- B. Alt + A
- C. Ctrl + W
- D. Alt + A

168. Text tool is used for which of the following purpose?

- A. For typing the text
- B. Works by pointing and clicking
- C. To create a arc
- D. To create a polygon

169. Which of the following statement is correct, related with By Type, in order to arrange the listing of the files?

- A. Sorts in ascending alphabetical order by file type
- B. Sort in ascending alphanumerical order by file type
- C. Sort in descending alphabetical order by file type
- D. Sort in descending alphanumerical order by file type

170. To delete file completely with using the recycle bin, which of the following key is pressed?

- A. Del
- B. Ctrl + Del
- C. Alt + Del
- D. Shift + Del

171. That overhead projector _____ thousand rupees.

- A. Nearly cost sixty
- B. Cost sixty nearly
- C. Cost nearly sixty
- D. Cost sixty nearly

172. The lady in the dining room is a _____ woman.

- A. Extremely pleasant
- B. Extreme pleasantly
- C. Extreme pleasant
- D. Pleasant extremely

173. He looks _____.

- A. In black handsomely
- B. Handsomely in black
- C. Handsome in black
- D. Black handsomely

174. The songs of new age sound _____ me.

- A. Badly to
- B. Badly
- C. Bad
- D. Bad to

175. He appeared _____ began to take the exam.

- A. Nervous as he
- B. Nervously when he
- C. Nervously as he
- D. None

176. ABHOR: DISLIKE:: (Analogy)

- A. Calcify : Petrify
- B. Rebuke : Ridicule
- C. Torture : Discomfort
- D. Fodder : Cattle

177. Argument: Debate:: (Analogy)

- A. Violence : Peace
- B. Fight : Contest
- C. Challenge : opponent
- D. Doe : stag

178. Anger: Insult:: (Analogy)

- A. Business : Judgment
- B. Admiration : Happiness
- C. Conduct : Behavior

D. Appreciation : Kindness

179. Author: Inventor ::(Analogy)

- A. Copyright : Patent
- B. Plot : Machine
- C. Technology : Gadget
- D. Book : Factory

180. ABOLITIONIST: SLAVERY:: (Analogy)

- A. Prohibitionist : Liquor
- B. Capitalist : Commerce
- C. Peace : War
- D. Glass : jug

181. ALLURING (synonym)

- A. Deceptive
- B. Contentious
- C. Sensible
- D. Enticing

182. SOMNABULIST (Synonym)

- A. Sleepwalker
- B. Escapist
- C. Soothsayer
- D. Hypnotist

183. Occult (Antonym)

- A. Intelligible
- B. Crooked
- C. Sectary
- D. Medieval

184. Resolved (Antonym)

- A. Circumnutated
- B. Normalized
- C. Decided
- D. Stable

185. CAPTURE (Antonym)

- A. Confined
- B. Free
- C. Apprehend
- D. Seize

186. Before Islam the religion of the majority of the Arab was:

- A. Shanto Mat
- B. Jewish
- C. Idolatrous
- D. Hinduism

187. In Islamic traditions, which of the following does not represent the "people of the book"??

- A. Jew
- B. Christian
- C. Tao
- D. None of these

188. The group of religion was known as Abrahamic include Islam Judasim and:

- A. Hinduism
- B. Christianity
- C. Buddhism
- D. None of these

189. Which of the following religion is not considered monotheistic:

- A. Islam
- B. Judaism
- C. Paganism
- D. None of these

190. In which religion Zoroastrianism has been included:

- A. Parsi
- B. Jewish
- C. Confucianism
- D. None of these

191. In which religion wine is not prohibited:

- A. Christianity
- B. Zoroastrianism
- C. Sikhism
- D. Buddhism

192. Name the God of the virtue Zoroastrianism:

- A. Brahma
- B. Buddha
- C. Ganesh
- D. Ormuzd

193. The pioneer of the religion Zoroastrianism was:

- A. Buddha
- B. Brahma
- C. Zoroast
- D. Nowsherwan

194. Which is the oldest religion which was based by Hazart Ibrahim (A.S)

- A. Judaism
- B. Christianity
- C. Islam
- D. Hanfa

195. To which the prophet did the Jew's call the son of Allah?

- A. Hazrat Haroon(A.S)
- B. Hazrat Essaa (A.S)
- C. Hazrat Moossaa (A.S)
- D. Hazrat Oozair (A.S)