Total MCQs = 200 | NUST Past Paper (4) Computer | Time allotted = 3 hours

MATHEMATICS

1. Let

$$1 = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \text{ and } P = \begin{pmatrix} 1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -2 \end{pmatrix}$$

Then the matrix $P^3 + 2P^2$ is equal to

A. P
B. 1-P
C. 21+P
D. 21-P

2. If a, B are the roots of the quadratic equation $x^2+ax+b=0$, $(b\neq0)$; then the quadratic equation whose roots are $a - \frac{1}{B}$, $B - \frac{1}{a}$ is

A. $ax^2 + a(b-1) x + (a-1)^2 = 0$
B. $bx^2 + a(b-1) x + (b-1)^2 = 0$
C. $x^2+ax+b = 0$
D. $abx^2+bx+a = 0$

3. The equation of the circle with center origin and radius $2\sqrt{2}$ is

A. $x^2+y^2=2\sqrt{2}$
B. $x^2+ y^2=8$
C. $x^2-y^2=2\sqrt{2}$
D. $x^2- y^2=8$

4. The value of the determinant

$$\begin{vmatrix} 1 + a2 - b2 & 2ab & -2b \\ 2ab & 1 - a2 + b & 2a \\ 2b & -2a & 1 - a2 - b2 \end{vmatrix}$$

Equal to

A. 0
B. $(1+a^2+b^2)$

C. $(1+a^2+b^2)^2$

D. $(1+a^2+b^2)^3$

5. The end points of the major axis of the ellipse are called its

A. Foci
B. Vertices
C. Covertices
D. None of these

6. For the curve $x^2+4xy+8y^2=64$ the tangent are parallel to the x-axis only at the points

A. $(0,2\sqrt{2})$ and $(0,-2\sqrt{2})$
B. $(8,-4)$ and $(-8,4)$
C. $(8\sqrt{2}, -2\sqrt{2})$ and $(-8\sqrt{2}, 2\sqrt{2})$
D. $(8,0)$ and $(-8,0)$

7. The value of

$$\int_0^{\pi/4} (\tan n^1 x) \, dx + 1/2 \int_0^{\pi/2} \tan n^{-1}(x/2) dx$$

Is equal to

A. $1/n$
B. $\dfrac{n+2}{2n+1}$
C. $\dfrac{2n+2}{n}$
D. $\dfrac{n-3}{3n-2}$

8. The vertices of the ellipse $x2+4y2=16$ are

A. $(\pm, 4,0)$

B. $(0,\pm 4)$

C. $(\pm, 2,0)$

D. $(0,\pm 4)$

9. Let f(x) = $\begin{cases} x2 - 3x + 2, & x < 2 \\ x3 = 6x2 + 9x + 2, & x \geq 2 \end{cases}$

   A. $\frac{lim}{x\to 2}$ f(X) does not exist
   B. F is not continuous at x=2
   C. F is continuous but not differentiable at x=2
   D. F is continuous and differentiate at x=2

10. The limit $\sum_{n=1}^{1000}(-1)^n x^n$ as x→ ∞

    A. Does not exist
    B. Exist and equal to 0
    C. Exist and approaches + ∞
    D. Exist and approaches - ∞

11. If f(X) = e^x (x-2)^2 then

    A. F is increasing in(-∞,0) and (2, ∞) and decreasing in (0,2)
    B. F is increasing in(-∞,0) and decreasing in (0,∞)
    C. F is increasing in (2, ∞) and decreasing in (−∞,0)
    D. F is increasing in (0,2,) and decreasing in (−∞, 0) and (2,∞)

12. Let f: R → R be such that f is injective and f(x)f(y) = f(x+y) for all x,y ∈ R. if f(x), f(z) are inG.P., then x,y,z are in

    A. A.P always
    B. G.P always
    C. A.P depending on the values of x,y,z
    D. G.P depending on the value of x,y,z

13. The line y-q/3e=0

    A. Is a tangent to the circle x2+y2=40
    B. Is a normal to the circle x2+y2=40
    C. Does not meet the circle x2+y2=40
    D. Does not pass thro' the origin

14. The value of the integral

$\int_1^2 e2 (\log e\, x + \frac{x+1}{x}) \, dx$ is

A. $e^2 (1+\log_e 2)$

B. $e^2 - e$

C. $e^2 (1+\log_e 2) -e$

D. $e^2 -e (1+\log_e 2)$

15. Let P = $1+ \frac{1}{2\times2} + \frac{1}{3\times4} +$ ....and Q = $\frac{1}{1\times2} + \frac{1}{3\times4} + \frac{1}{5\times6} +$........then

A. p=q

B. 2p=q

C. P=2q

D. P=4q

16. Let f(x) = $\sin x +2 \cos^2 x$. $\frac{\pi}{4} \leq x \frac{3\pi}{4}$, then f attains its

A. Minimum at x = $\frac{\pi}{4}$

B. Maximum at x = $\frac{\pi}{2}$

C. Minimum at x = $\frac{\pi}{2}$

D. Maximum at x = $\sin^{-1}(\frac{1}{4})$

17. Each of a and b can take values 1 or 2 with equal probability. The probability that the equation $ax^2 + bx + 1 = 0$ has real roots, is equal to

A. 1/2

B. 1/4

C. 1/8

D. 1/16

18. There are two coins, one unbiased with probability ½ of getting heads and the other one is biased with probability ¾ of getting heads. A coin is selected at random and tossed. It shows heads up. Then the probability that the unbiased coin was selected is

A. 2/3

B. 3/5

C. 1/2

D. 2/5

19. For the variable t, the locus of the point of intersection of the lines 3tx – 2y + 6t = 0 and 3x + 2ty – 6 = 0 is

A. The ellipse $x^2/4+y^2/9=1$
B. The ellipse $x^2/9+y^2/4=1$
C. The hyperbola $x^2/4+y^2/9=1$
D. The hyperbola $x^2/9+y^2/4=1$

20. Cards are drawn one-by-one without replacement from a well shuffled pack of 52 cards. Then the probability that a face card (jack, queen or king) will appear for the first time on the third turn is equal to

A. 300/2197
B. 36/85
C. 12/85
D. 4/51

21. Lines x+y=1 and 3y=x+3 intersect the ellipse $x^2+9y^2=9$ at the points P.Q.R. they are of the triangle {QR is

A. 36/5
B. 18/5
C. 9/5
D. 1/5

22. The number of onto functions from the set {1, 2..............11} to set {1, 2.........10} is

A. $5 \times \lfloor 11$
B. $\lfloor 10$
C. $\lfloor 11/2$
D. $10 \times \lfloor 11$

23. Cos -1 A + cos-1 B =

A. Cos-1{AB+$\sqrt{(1-A^2)}$ +$\sqrt{(1-B^2)}$}
B. Sin-1{A+$\sqrt{(1-A^2)}$ +B$\sqrt{(1-B^2)}$}
C. Cos-1{2A2-1}
D. Cos-1{AB-$\sqrt{(1-A^2)}$ +$\sqrt{(1-B^2)}$}

24. Let z_1 = 2+3i and z_2 = 3+4i be two points on the complex plane. Then the set of complex numbers z satisfying $|z-z_1|^1 + |z-z_2|^2 = |z-z_2|^2$ represents

A. A straight line
B. A point
C. A circle

D. A pair of straight lines

25. This is a formula Cos-1{AB+$\sqrt{(1-A^2)}$ +$\sqrt{(1-B^2)}$} also cos-1A-cos1B=Cos-1{AB+$\sqrt{(1-A^2)}$ +$\sqrt{(1-B^2)}$}. The domain of the unction y= cos-1 x is

A. $0 \le x \le 1$
B. $-1 \le x \le 1$
C. $-1 \le x \le 2$
D. $-2 \le x \le 2$

26. Eleven apples are distributed among a girl and a boy. Then which one of the following statements is true?

A. At least one of them will receive 7 apples
B. The girl receives at least 4 apples or the boy receives at least 9 apples
C. The girl receives at least 5 apples or the boy receives at least 8 apples
D. The girl receives at least 4 apples or the boy receives at least 8 apples

27. Five numbers are in H.P. The middle term is 1 and the ratio of the second and the fourth terms is 2:1. Then the sum of the first three terms is

A. 11/2
B. 5
C. 2
D. 14/3

28. Tan^{-1}(1) =

A. $\pi/3$
B. $\pi/4$
C. $\pi/6$
D. None

29. The maximum and minimum values of $\cos^6 0 + \sin^6 0$ are respectively

A. 1 and 1/4
B. 1 and 0
C. 2 and 0
D. 1 and 1/2

30. If a, b, c is in A.P. then the straight line ax+2by+c=0 will always pass through a fixed point whose co-ordinance are

A. (1,-1)
B. (-1,1)
C. (1,-2)
D. (-4,-2)

31. If one end of a diameter of the circle $3x^2 + 3y^2-9x+6y+=0$ is (1,2)then the other end is

A. (2,1)
B. (2,4)
C. (2,-4)
D. (-4,2)

32. The value of $\cos^2 75^0 + \cos^2 45^0 + \cos^2 15^0 - \cos^2 30^0 - \cos^2 60^0$ is

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

33. Suppose z=x+iy where x and y are real numbers and $I = \sqrt{-1}$. The points (x,y) for which z-1/z-I is real, lie on

A. An ellipse
B. A circle
C. A parabola
D. A straight line

34. The value of $\sin(\cos^{-1}\sqrt{3}/2)$ is

A. 1/2
B. $1/\sqrt{2}$
C. $\sqrt{3}/2$
D. None of these

35. The equation of the circle passing through the point (1,1) and the points of intersection of $x^2+y^2-6x-8=0$ and $x^2+y^2-6=0$

A. $x^2+y^2+3x-5=0$
B. $x^2+y^2+4x+2=0$
C. $x^2+y^2+6x-4=0$
D. $x^2=y^2-4y-2=0$

36. $\sin^{-1} A + \sin{-1} B =$

A. $\cos^{-1}\{AB+\sqrt{(1-A^2)} \sqrt{(1-B^2)}\}$

B. $Sin^{-1}\{A+\sqrt{(1-B^2)}+B\sqrt{(1-A^2)}\}$

C. $Cos^{-1}\{2A^2-1\}$

D. $Sin^{-1}\{A+\sqrt{(1-B^2)}-B\sqrt{(1-A^2)}\}$

37. In the set of all 3×3 real matrices a relation is defined as follows. A matrix A is related to a matrix B if and only if there is a non-singular 3×3 matrix P such that $B = P^{-1}AP$. This relation is

   A. Reflexive, symmetric but not transitive
   B. Reflexive, transitive but not symmetric
   C. Symmetric, transitive but not reflexive
   D. An equivalence relation

38. The number of lines which pass through the point (2,-3) and are at the distance 8 from the point (-1, 2) is

   A. Infinite
   B. 4
   C. 2
   D. 0

39. $Tan^{-1}(2A/1-A^2) =$

   A. $Tan^{-1}(A/2) =$
   B. $Tan^{-1}(2/A) =$
   C. $Tan^{-1} A$
   D. $2Tan^{-1} A$

40. The velocity of a particle moving along a straight line is given by $v=3t+t^2$. The acceleration of the particle after 4 seconds from the start is

   A. 4
   B. 11
   C. 26
   D. None

41. Let n be a positive even integer. The ratio of the largest coefficient and the 2nd largest coefficient in the expansion of $(1+x)^n$ is 11:10. The number of terms in the expansion of $(1+x^{n=})$ is

   A. 20
   B. 21
   C. 10
   D. 11

42. Let exp(x) denotes exponential function ex. If $f(x) = exp(x^{1/x})$,x>, then the minimum value off in the interval [2,5] is

A. $Exp(e^{1/e})$
B. $Exp(2^{1/2})$
C. $Exp(5^{1/5})$
D. $Exp(2^{1/2})$

43. The sum of the series

$$\frac{1}{1\times2}\,^{25}C_0 + \frac{1}{2\times3}\,^{25}C_1 + \frac{1}{3\times4}\,^{25}C_2 + \cdots\cdots\cdots\cdots \frac{1}{26\times27}\,^{25}C_{25}$$

A. $2^{27}-1/26\times27$
B. $2^{27}-28/26\times27$
C. $1/2(2^{26}+1/26\times27)$
D. $2^{26}-1/52$

44. Five numbers are in A.P with common difference ≠ 0. If the 1st+, 3rd and 4th terms are in G.P, then

A. The 5th term is always 0
B. The 1st term is always 0
C. The middle term Is always 0
D. The middle term is always = 2

45. The minimum value of the function f(x) =$2|x-1|+|x-2|$ is

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

46. Id P,Q rare angles of an isosceles triangle and $\angle P = \frac{\pi}{2}$, then the value of (cos P/3- isin P/3)^0 + (cosQ+cosQ)(cosR-isinR)+(cosP-isinP)(cosQ-isinQ)(cosR-isinR)

A. I
B. -i
C. 1
D. -1

47. A line passing through the point of intersection of x + y = 4 and x-y = 2 makes an angle tan^{-1} (3/4) with the x-axis. It intersects the parabola y^2= 4(x-3) at points (x_1y_1) and (x_2y_2) respectively. Then $|x_1- x_2|$ is equal to

A. 16/9
B. 32/9
C. 40/9
D. 80/9

48. Let [a] denote the greatest integer which is less than or equal to a. then the value of the integral $\int_{\pi/2}^{\pi/2} [\sin x cosc] dx$ is

   A. $\pi/2$
   B. π
   C. $-\pi$
   D. $-\pi/2$

49. If P= $\begin{pmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & -3 \end{pmatrix}$ then P^5 equals

   A. P
   B. 2p
   C. -p
   D. -2p

50. If $\sin^2 \theta + 3\cos \theta = 2$ then $\cos^3 \theta + \sec^3 \theta$ is

   A. 1
   B. 4
   C. 9
   D. 18

51. $x = 1 + \frac{1}{2 \times 1} + \frac{1}{4 \times 2} + \frac{1}{8 \times 3} +$ then the value of and y = $1 + \frac{x2}{1} + \frac{x4}{2} + \frac{x6}{3} + \ldots$

Log$_e$y is

   A. E
   B. E^2
   C. 1
   D. 1/e

52. The value of the infinite series $\frac{2+4}{3} + \frac{2+4+9}{4} + \frac{2+4+9+16}{5} \ldots$ is

   A. E
   B. 5e
   C. 5e/6 - 1/2
   D. 5e/6

53. The value of the integral $\int_{\pi/6}^{\pi/3} \frac{(\sin x - cosx)}{x(x + \sin\_)} dx$ is equal to

   A. Log$_e \left(\frac{2(\pi+3)}{2\pi+3\sqrt{3}} \right)$
   B. Log$_e \left(\frac{\pi+3}{2(2\pi+3\sqrt{3})} \right)$

C. $Log_e \left(\frac{2\pi + 3\sqrt{3}}{2(\pi + 3)} \right)$

D. $Log_e \left(\frac{2(2\pi + 3\sqrt{3})}{\pi + 3} \right)$

54. Let f(x) = x $\left(\frac{1}{x-1} + \frac{1}{x} + \frac{1}{x+1} \right)$, x>1, then

A. $F(x) \leq 1$
B. $1 < f(x) \leq 2$
C. $2 < f(x) \leq 3$
D. $F(x) > 3$

55. Let f(x) = $\int_0^x \frac{cost}{(1+2)}$ dt. $0 \leq x \leq 2\pi$. Then

A. F is increasing in $\left(\frac{\pi}{2}, \frac{3\pi}{2} \right)$ and decreasing in (o, $\pi/2$) and ($3\pi/2, 2\pi$)
B. F is increasing in (0, π) and decreasing in($\pi, 2\pi$)
C. F in increasing in ($\pi, 2\pi$) and decreasing in (0, π)
D. F is increasing in (0 , $\frac{\pi}{2}$) and ($3\frac{\pi}{2}$, 2 π) and decreasing in $\left(\frac{\pi}{2}, \frac{3\pi}{2} \right)$

56. Let f(x) = $x^{2/3}$, $x \geq 0$. Then the area of the region enclosed by the curve y = f(x) and the three lines y=x, x=1 and x=8 is

A. 63/2
B. 93/5
C. 105/7
D. 129/10

57. Let P be a point on the parabola y^2 = 4ax with focus F. let Q denote the foot of the perpendicular from P onto the directrix. Then $\frac{tan\angle PQF}{tan\angle PFQ}$ is

A. 1
B. 1/2
C. 2
D. 1/4

58. An objective type test paper has 5 questions, out of these 5 questions, 3 questions have four options each (A, B, C, D) with one option being the correct answer. The other 2 questions have two options each. Namely true and false. A candidate randomly tricks the options. Then the probability that he/she will tick the correct option in at least four questions, is

A. 5/32
B. 3/128
C. 3/256
D. 3/64

59. A family of curves is such that the length intercepted on the y-axis between the origin and the tangent at a point is three times the ordinate of the point of contact. The family of curves is

   A. $xy=c$, c is a constant
   B. $xy^2=c$, c is a constant
   C. $x^2y=c$, c is a constant
   D. $x^2y^2=c$, c is a constant

60. The solution of the differential equation $(y^2+2x)\frac{dy}{dx}=y$ satisfies x = 1, y= 1 then the solution is

   A. $x=y^2(1+\log_e y)$
   B. $y=x^2(1+\log_e x)$
   C. $x=y^2(1-\log_e y)$
   D. $y=x^2(1-\log_e x)$

61. The solution of the differential equation $y \sin(x/y) dx = (x\sin(x/y)-y) dy$ satisfying $y (\pi/4) = 1$ is

   A. $\cos x/y = -\log_e y + 1/\sqrt{2}$
   B. $\sin x/y = \log_e y + 1/\sqrt{2}$
   C. $\sin x/y = -\log_e x - 1/\sqrt{2}$
   D. $\cos x/y = -\log_e x - 1/\sqrt{2}$

62. The area of the region enclosed between parabola $y^2 = x$ and the line $y = mx$ is 1/48 then the value of m is

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

63. Consider the system of equations:

$X+y+z=0$ $ax + By+yz =0$ $a^2x+B^2y+y^2z=0$

Then the system of equations has

   A. A unique solution for all values a,b,y

   B. Only one solution if any two of a,b,y are equal

   C. A unique solution of a,b,y are distinct

D. More than one, but finite number of solutions depending on values of a,b,y

64. The equations of the circles which touché both the axes and the line 4x+3y=12 and have centers in the first quadrant.

A. $X^2+y^2-x-y+1=0$

B. $X^2+y^2-2x=0$

C. $X^2+y^2-12x-12y+36=0$

D. $X^2+y^2-6x-6y+36=0$

65. Which of the following real valued functions ia/are not even functions?

A. $F(x) = x^3 \sin x$

B. $F(x) = x^3 \cos x$

C. $F(x) = e^x x^3 \tan x$

D. $F(x) = x-[x]$, where [x] denotes the greatest integer less than or equal to x

66. Let sin a cos a be the roots of the equation $x^2-bx +c = 0$. Then which of the following statement is/ are correct?

A. $C > 5$

B. $B \leq \sqrt{2}$

C. $C > \frac{1}{2}$

D. $B > \sqrt{2}$

67. The equation of a straight line passing through the point (1,2) and inclined at 45^0 to the line

y = 2x + 1 is

   A. 5x + y = 7

   B. 3x+y=5

   C. X+y=3

   D. x-y+1=0

68. A point moves in the xy-plane such that the sum of its distance from two mutually

perpendicular lines is always equal to 5 units. The area (in square units)enclosed by the locus of

the points, is

   A. 25/4

   B. 25

   C. 50

   D. 100

69. The distance between the parallel lines given by $(x+7y)^2 + 4\sqrt{2}(x+7y) - 42 = 0$ is

   A. 4/5

   B. $4/\sqrt{2}$

   C. 2

   D. $10/\sqrt{2}$

70. If the area of the triangle formed by the pair of lines $8x^2 - 6xy + y^2 = 0$ and the lines $2x + 3y = a$ is 7 then a =

    A. 14

    B. $14/\sqrt{2}$

    C. $28/\sqrt{2}$

    D. 28

71. If the pair of lines given by $(x^2 + y^2) \cos^2 \theta = (x \cos \theta + y \sin \theta)^2$ are perpendicular to each other, then $\theta =$

    A. 0

    B. $\frac{\pi}{4}$

    C. $\frac{\pi}{3}$

    D. $\frac{3\pi}{4}$

72. A particle possesses simultaneously two velocities 10 m/s and 15 m/s in direction inclined at an angle of 60^0, then its resultant velocity is:

    A. 15 m/s

    B. $5\sqrt{(19)}$ m/s

    C. 25 m/s

    D. None

73. Consider the circle $x^2 + y^2 - 4x - 2y + c = 0$ whose center is A (2,1). If the point P (10,7) is such that the line segment PA meets the circle in Q with PQ = 5, then c =

   A. -15

   B. 20

   C. 30

   D. -20

74. If the line $x + 3y = 0$ is the tangent at (0,0) to circle of radius 1, then the center of such circle is

   A. (3,0)

   B. $\left(\frac{-1}{\sqrt{10}}, \frac{3}{\sqrt{10}}\right)$

   C. $\left(\frac{3}{\sqrt{10}}, \frac{-3}{\sqrt{10}}\right)$

   D. $\left(\frac{1}{\sqrt{10}}, \frac{3}{\sqrt{10}}\right)$

75. A circle passes through the point (3,4) and cuts the circle $x^2 + y^2 = a^2$ orthogonally; the locus of its center is a straight line.. if the distance of this straight line from the origin is 25, then $a^2 =$

   A. 250

   B. 225

   C. 100

   D. 25

76. The equation to the line joining the centers of the circles belonging to the coaxial system of circles $4x^2 + 4y^2 - 12x + 6y - 3 + \lambda(x + 2y - 6) = 0$ is

    A. 8x-4y-15=0

    B. 8x-4y+15=0

    C. 3x-4y-5=0

    D. 3x-4y+5=0

77. Let $x+y=k$ be a normal to the parabola $y^2 = 12x$. if p is length of the perpendicular from the focus of the parabola onto this normal, then $4k - 2p^2: = 0$

    A. 1

    B. 0

    C. -1

    D. 2

78. If the line 2x+5y=12 intersects the ellipse $4x^2 + 5y^2 = 20$ in two distinct points A and B, then min point of AB id

    A. (0,1)

    B. (1,2)

    C. (1,0)

    D. (2,1)

79. Equation of one of the tangents passing through (2,8) to the hypaerbola $5x^2 - y = 5$ is

A. 3x + y – 14 = 0

B. 3x - y +2 = 0

C. x + y + 3 = 0

D. x - y + 6 = 0

80. The area (in square units) of the equilateral triangle formed by the tangent at ($\sqrt{3}$, 0) to the hyperbola $x^2 - 3y^2 = 3$ with the pair of asymptotes of the hyperbola is

A. $\sqrt{2}$

B. $\sqrt{3}$

C. $1/\sqrt{3}$

D. $2\sqrt{3}$

PHYSICS

1. Choose the region of the spectrum which would be used to determine the structure of crystalline solids:

    A. Visible
    B. Infrated
    C. X-rays
    D. Ultraviolet

2. A particle of mass m is attached to a spring (of spring constant k) and has a natural angular frequency ω_0. An external force F(t) proportional to $\cos\omega t$ ($\omega \neq \omega$) is applied to the oscillator. The time displacement of the oscillator will be proportional to

    A. $\dfrac{m}{\omega 2 - \omega}$
    B. $\dfrac{1}{m(\omega 2 - \omega 2)}$
    C. $\dfrac{1}{m(\omega 2 - \omega 2)}$
    D. $\dfrac{m}{\omega 2 - \omega 2}$

3. The radioactive sample at any instant has its disintegration rate 5000 disintegration per minute. After 5 minutes. The rate is 1250 disintegrations per minute.

   A. 0.4 in 2
   B. 0.2 in 2
       a. in 2
   C. 0.8 in 2

4. A nucleus with z = 92 emits the following in a sequence;

   a,a,B,B,a,a,a,a,B,B,a,B,B,a. the z of the resulting nucleus

   A. 76
   B. 78
   C. 82
   D. 74

5. The temperature at which the domain of the ferromagnetic substances disorients is;

   A. Critical temperature
   B. Absolute temperature
   C. Curie temperature
   D. Normal temperature

6. Which of the following can not be emiited by radioactive substance during their decay?

   A. Protons
   B. Neutrinos
   C. Helium nuclei
   D. Electrons

7. A sheet of aluminum foil of negligible thickness is introduces between the plates of a capacitor. The capacitance of the capacitor

   A. Decreases
   B. Remains unchanged
   C. Becomes infinite
   D. Increases

8. The displacement of a particle varies according to the relation x = 4 (cos πt + sin πt) the amplitude of the particle is

A. -4
B. 4
C. $4\sqrt{2}$
D. 8

9. The process by which the potential barrier of the deplection region can be increased or decreased is called

A. Amplifier
B. Biasing
C. Modulation
D. Doping

10. The work done in placing a charge of $8 = 10^{-18}$ coulomb on a condenser of capacity 100 micro-farad is

A. 16×10^{-31} j
B. 3.2×10^{-26} j
C. 4×10^{-10} j
D. 32×10^{-32} j

11. During an adiabatic process, the pressure of a gas is found to be proportional to the cube of its absolute temperature. The ratio Cp/Cv for the gas is

A. 4/3
B. 2
C. 5/3
D. 3/2

12. The co-ordinates of a moving particle at any time t are given by $x = at^3$ and $y = By^3$. The speed to the particle at time t is given by

A. $3t\sqrt{a^2+B^2}$
B. $3t^2\sqrt{a^2+B^2}$
C. $T^2\sqrt{a^2+B^2}$
D. $\sqrt{a^2+B^2}$

13. Which of the following parameters does not characterize the thermodynamic state of matter?

A. Temperature

B. Pressure

C. Work

D. Volume

14. The color of light emitted by light emitting diode depends upon:

A. Forward voltage

B. Reverse current

C. Forward current

D. Type of semiconductor

15. A spring of a spring constant 5×10^3 N/m is stretched initially by 5 cm from the upstretched position. Then the work required to stretch is further by another 5 cm is

A. 12.50 N-m

B. 18.75 N-m

C. 25.00 N-m

D. 6.25 N-m

16. A metal wire of linear mass density of a=9.8 gm is stretched with a tension of 10 kg-wt between two rigid supports 1 meter apart. The wire passes at its middle point between the poles of aper magnet and it vibrates its resonance when carrying an alternating current of frequency n of the altering source is

A. 50Hz

B. 100Hz

C. 200Hz

D. 25Hz

17. A tuning fork of known frequency 256Hz makes 5 beats per second with the vibrating string of a piano. The beat frequency decreases to 2 beats per second when the tension in the piano string is slightly increased. The frequency of the piano string before increasing the tension was

A. (256+2)Hz

B. (256-2)Hz

C. (256-5)Hz

D. (256+5)Hz

18. A body executes simple harmonic motion. The potential energy (P.E) the kinetic energy (K.E) and total energy (T.E) are measured as function of displacement x. which of the following statement is true?

A. K.E is maximum when x=0

B. T.E is zero when x=0

C. K.E is maximum then x is maximum

D. P.E is maximum when x=0

19. The combination of AND and NOT gate is called

    A. NAND gate
    B. NOR gate
    C. OR gate
    D. XOR gate

20. Which of the following atoms has the lowest ionization potential?

    A. $^{14}_{7}N$
    B. $^{133}_{55}CS$
    C. $^{40}_{18}Ar$
    D. $^{16}_{8}O$

21. The wave length involved in the spectrum of deuterium ($^{2}_{1}d$) are slightly different from that of hydrogen spectrum. Because

    A. Sizes of the two nuclei are different
    B. Nuclear forces are different in the two cases
    C. Masses of the two nuclei are different
    D. Attraction between the electron and the nucleus is different in the two cases

22. If the temperature of the black body becomes double the intensity of radiation from it will become:

    A. Double
    B. Four times
    C. Six times
    D. Sixteen times

23. If the binding energy of the electron in a hydrogen atom is 13.6 eV, the energy required to remove the electron from the first excited state of Li[**] is

A. 30.6 eV
B. 03.6 eV
C. 3.4 eV
D. 122.4 eV

24. A body is moved along a straight line by a machine delivering a constant power. The distance moved by the body in time t is proportional to

A. $t^{\frac{3}{2}}$
B. $T^{3/2}$
C. $t^{\frac{1}{4}}$
D. $t^{\frac{1}{2}}$

25. The scattering angle for which the Compton shift in wavelength is equal to Compton wavelength is:

A. $\theta = 90^0$
B. $\theta = 0^0$
C. $\theta = 45^0$
D. $\theta = 180^0$

26. To demonstrate the phenomenon of interference we required two sources which emit radiation of

A. Nearly the same frequency
B. The same frequency
C. Different wavelength
D. The same frequency and having a definite phase relationship

27. Q 220 volt, 1000 watt bulb is connected across a 110 volt main supply. The power consumed will be

A. 750 watt
B. 500 watt
C. 250 watt
D. 1000 watt

28. The image formed by an objective of a compound microscope is

A. Virtual and diminished

B. Real and diminished

C. Real and enlarged

D. Virtual and enlarged

29. Uranium – 255 decays to thorium – 231 by the process of:

A. Fission

B. Beta decay

C. Alpha radiation

D. Gamma radiation

30. To get three images of a single object, one should have two plane mirrors at an angle of

A. 60^0

B. 90^0

C. 120^0

D. 30^0

31. According to newton's law of cooling, the rate of cooling of a body is proportional to $(\Delta\theta)^n$, where $\Delta\theta$ is the difference of the temperature of the body and the surroundings, and n is equal to

A. Two

B. Three

C. Four

D. One

32. The length of a given cylindrical wire is increased by 100%. Due to the consequent decreased in diameter the change in the resistance of the wire will be

A. 200%

B. 100%

C. 50%

D. 300%

33. Which one of the following represents the correct dimensions of the coefficient of velocity?

A. $ML^{-1}T^{-2}$

B. $ML\,T^{-2}$

C. $ML^{-1}T^{-1}$

D. $ML^{-2}T^{-2}$

34. A particle moves in a straight line with retardation proportional to its displacement. Its loses of kinetic energy for any displacement x is proportional to

A. x^{-2}
B. e^{-2}
C. x
D. $\log_\theta x$

35. The uncertainty in energy of photon which is emitted from an atom radiating for 104 second is:

A. 4×10^{-7} joule
B. 4×10^{-17} ev
C. 6.6×10^{-20} ev
D. 4×10 joule

36. If A × B = B × A, then the angle between A and B is

A. π
B. $\pi/3$
C. $\pi/2$
D. $\pi/4$

37. A projectile can have the same range R for two angles of projection. If T_1 and T_2 be the time of flights in the two cases, then the product of the two times of flights is directly proportional to

A. $1/R^2$
B. $1/R$
C. R
D. R^2

38. If an atom exist in the excited state n = 5, the maximum number of transition takes place is:

A. 6
B. 4
C. 10
D. 3

39. An auto mobile travelling with speed of 60 km/h can brake to stop within a distance of 20 cm. if the car is going twice as fast, i.e. 120 km/h, the stopping distance will be

A. 20 m

B. 40 m

C. 60 m

D. 80 m

40. When the voltage of the target in the X-ray tube increases then the:

    A. Penetrating power of x-ray increases
    B. Intensity of x-ray increases
    C. Wavelength of x-ray increases
    D. All of these

41. A uniform chain of length 2 m is kept on a table from the edge of the table. The total mass of the chain in 4 kg. What is the work done in pulling the entire chain on the table?

    A. 7.2 j
    B. 3.6 j
    C. 120 j
    D. 1200 j

42. The frequency of light having wavelength 3×10^{-3}

    A. 1×10^6
    B. 3.0×10^7
    C. 10×10^{10}
    D. 1×10^{13}

43. A force F = (5i+3j+2k) is applied over a particle which displaces it from its origin to the point r = (2i-j) m. the work done on the particle in joules is

    A. 7
    B. +
    C. +10
    D. +13

44. A body of mass m, accelerates uniformly from rest to v_1 in time t_1. The instantaneous power delivered to the body as a function of time t is:

    A. Mv_1t / t_1
    B. Mv^2t / T^2
    C. Mv_1t^2 / t_1
    D. Mv^2t / t_1

45. The situation in which then excited state i.e metastable state contains more number of electrons than the ground is called

   A. Ionized state
   B. Stimulations
   C. Population inversion
   D. All of these

46. A solid sphere is rotating in free space. If the radius of the sphere is increased keeping mass same which one of the following will not be affected?

   A. Moment of inertia
   B. Angular momentum
   C. Angular velocity
   D. Rotational kinetic energy

47. A ball is thrown from a point with a speed v_0 at an angle of projection θ. From the same point and at the same instant person starts running with a constant speed $v_0/2$ to catch the ball. Will the person be able to catch the call? If yes, what should be the angle of projection?

   A. Yes, 60^0
   B. Yes, 30^0
   C. No
   D. Yes, 45^0

48. One solid sphere A and another hollow sphere B are of same mass and same outer radii. Their moment of inertia about their diameters are respectively 1_A and 1_a such that

   A. $1_A = 1_B$
   B. $1_A > 1_B$
   C. $1_A < 1_B$
   D. $1_A/1_B = d_A/d_B$

   Where d_A and d_B are their densities

49. When a radioactive atom decays and its mass number decreases by 4 and charge number decreases by 2 the atom will emit

   A. A radiation
   B. B radiation
   C. Y radiation

D. X – radiation

50. The time period of an earth satellite in circular orbit is independent of

A. The mass of the satellite
B. Radius of its orbit
C. Both the mass and radius of the orbit
D. Neither the mass of the satellite nor the radius of its orbit.

51. If g is the acceleration due to gravity on the earth's surface the gain in the potential energy of object of mass m raised from the surface of the earth to a height equal to the radius R of the earth is

A. 2 mgR
B. ½ mgR
C. ¼ mgR
D. mgR

52. Suppose the gravitational force varies inversely as the nth power of distance. Then the time period planet in circular orbit of adius R around the sun will be proportional to

A. R(n+1 / 2)
B. R(n-1 / 2)
C. Rn
D. R(n-2 / 2)

53. A wire fixed at the upper end stretches by length by applying a force F. the work done in stretching is

A. F/2/
B. f/
C. 2f/
D. f/2

54. Spherical balls of radius R are falling in a viscous n with a velocity v. the retarding viscous force acting on the spherical ball is

A. Directly proportional to R but inversely proportional to V
B. Directly proportional to both radius R and velocity V
C. Inversely proportional to both radius R and velocity V
D. Inversely proportional to R but inversely proportional to velocity V

55. If two soap bubbles of different radii are connected by a tube

   A. Air flows from the bigger bubble to the smaller bubble till the sizes are interchanged
   B. Air flows from bigger bubble to the smaller bubble till the sizes are interchanged
   C. Air flows from the smaller bubble to the bigger
   D. There is no flow of air

56. The bob of a simple pendulum executes simple harmonic motion in water with a period while the period of oscillation of the bob is t_0 in air. Neglecting frictional force of water an give that the density of the bob is

$(4/3) \times 1000$ kg/m^3

What relationship between t and t_0 is true?

   A. $T = t_0$
   B. $T = t_0/2$
   C. $T = 2t_0$
   D. $T = 4t_0$

57. A particle at the end of a spring executes simple harmonic motion with a period t_1 while the corresponding period for another spring is t_2. If the period of oscillation with two springs in series is t_2 then

   A. $T = t_1 + t_2$
   B. $T^2 = t_1^2 + t_2^2$
   C. $T^1 = t_1^1 + t_2^1$
   D. $T^2 = t_1^2 + t_2^2$

58. The total energy of particle, executing simple harmonic motion is

   A. $\propto x$
   B. $\propto x^2$
   C. Independent of x
   D. $\propto x^{1/2}$

59. The displacement y of a particle in a medium can be an expressed as y = 10^{-6} sin $(110t + 20 x + \frac{\pi}{4})$ m.

   Where t is in seconds and x in meter

   The speed of the wave is

A. 2000 m/c

B. 5 m/s

C. 20 m/s

D. 5π m/s

60. One disintegration per second is equal to

A. One curie

B. One Becquerel

C. One half life

D. All of these

Computer science

1. The world pad, world document can be saved with which of the following file?

A. *.doc

B. *.htm

C. *.html

D. *.rtf

2. For going to one screen up. Which of the following key is used or pressed?

A. Up arrow

B. Ctrl+ arrow

C. PgiJp

D. Alt+arrow

3. Which of the following is not a primary output device:

A. Monitor

B. Cathode Ray Tune

C. Flats screens

D. Printers

4. Which of the following shortcut key is used for renaming a file or folder?

    A. F2

    B. F3

    C. F4

    D. F5

5. Printers job is to save data on

    A. Floppy disk

    B. Hard disk

    C. Paper

    D. Compact disk

6. Printers come in a variety of

    A. Brand

    B. Types

    C. Kinds

    D. All of these

7. Dot-matrix is a type of:

    A. Tape

    B. Printer

    C. Disk

    D. Bus

8. CAM stand for:

    A. Common-aided manufacturing

    B. Common-architecture manufacturing

    C. Computer-aided manufacturing

D. Computer-architecture manufacturing

9. In order to open the "Insert" menu in the world menu bar,which of the following shortcut key is used:

    A. ALT+N

    B. ALT+S

    C. ALT+I

    D. ALT+T

10. Toolbar when staked under the menu bar are termed under:

    A. Floating

    B. Anchored

    C. Pre-designed

    D. End note

11. For protection of world document the password can be up to:

    A. 5 characters long

    B. 10 characters long

    C. 15 characters long

    D. 20 characters long

12. The location of the text insertion is indicated by a

    A. Busy cursor

    B. Biking cursor

    C. Simple cursor

    D. None of above

13. Which of the following tab option ware present in the Find Fount window?

    A. Font

B. Character spacing

C. Text affects

D. All of these

14. You can see the applied formatting style for text in a document by clicking

    A. F1

    B. ALT+F1

    C. Ctrl+F1

    D. Shift+F1

15. Ctrl + Home is used for which of the following purpose?

    A. Going to top of the screen

    B. Going to bottom of the screen

    C. Going to the top of the file

    D. Going to the bottom of the file

16. How many document style are present in the drop down list of the word, which has defined rules for detracting grammatical errors?

    A. Four

    B. Five

    C. Six

    D. Seven

17. In word rows of the table are:

    A. 30

    B. User choice

    C. 25

    D. 40

18. Drawing objects are created with world's built-in tools, and include which of the following:

A. Auto-shapes

B. Curves

C. Lines

D. All of these

19. The bottom 'shrinks to file' at thl print preview toolbar is used for which of the following purpose:

A. Display or hide the horizontal and vertical ruler

B. Shrink our document to fit on one or less of the pages of the last page of your documents contains only a few lincs of text

C. Display a ll11i screen display of document in print preview

D. Close print preview and returns to your document

20. A collection of related worksheets in a single file is called

A. Book

B. Dictionary

C. Work dictionary

D. Work book

21. In order to open the 'Window' menu in the Excel menu ba, which of the following shortcut key is used:

A. Alt +W

B. Ctrl+W

C. Alt + ctrl + W

D. ALT +O

22. If u want to remove to other open workbook, which of the following shortcut key is pressed to the keyboard?

A. Ctrl + Shift

B. Ctrl + Tab

C. Shift + Tab

D. Shift + F1

23. When any rectangular is filled with data, the Excel is known as

A. Cell

B. Square

C. Spot

D. Region

24. Ctrl + O is used for which of the following purpose:

A. Save the current book

B. Launch the open dialogue box

C. Close the current workbook

D. Create a new workbook

25. In order to exist excel, asking you to save if required, which of the following key is pressed on the key board

A. Alt+ F2

B. Alt + F4

C. Ctrl + F2

D. Ctrl + F4

26. Ctrl + G is pressed for which of the following purpose

A. To go to the formula bar 1

B. Go back to A1

C. To make active the cell

D. To make desekcted the cell

27. To open the clipart gallery, clipart picture -› clip art on which of the following menu in the Microsoft excel?

    A. Insert menu

    B. Edit menu

    C. Format menu

    D. Tools menu

28. IDE stand for

    A. Integrated duplicate environment

    B. Integrated double environment

    C. Integrated development environment

    D. Integrated dual environment

29. Which type of printer can print 2000 lines per minute?

    A. Line

    B. Chain

    C. Daisy wheel

    D. Dot matrix

30. When you select a cell in the excel, in order to done the copy. Which if the following thing appear around the cell or selection?

    A. Stars

    B. Marquee

    C. Circle

    D. None of these

English

Fill in the blanks with appropriate word/ phrase (1-5)

1. He bought a three _____ suits.

    A. Hundred-dollars

    B. Hundred-dollar

    C. Hundreds-dollar

    D. Hundreds-dollars

2. She liked her student's _____ for her class.

    A. To arrive prompt

    B. To arrive promptly

    C. To arrive prompt

    D. To arrive prompt

3. In this the bus _____ goes to sadar bazar.

    A. That

    B. Which

    C. Who

    D. To arrive prompt

4. Take your air conditioner back to _____ sold it to you

    A. Man who

    B. Man that

    C. Man whom

    D. Man which

5. Where can one find the leather shop _____ sells school bags at price?

    A. Which

    B. That

    C. Who

    D. Whom

6. FRAGILE: BREAK:: (Analogy)

    A. flexible: bend

    B. vital: differentiated

    C. hostile: invite

    D. vivid: grow

7. INTRIGUE: STRAIGHTFORWARS:: (Analogy)

    A. bisection: ruler

    B. Exertion: devious

    C. espionage: secretive

    D. guile: candid

8. FLABBY: FIRMNESS:: (Analogy)

    A. Brittle: fracture

    B. humble: arrogance

    C. solvent: wealth

    D. delicate: fragile

9. ERROR: EXPERIENCE:: (Analogy)

    A. training: skill

    B. skill: mistake

    C. sharp: clever

D. success: victory

10. GARNET: RED:: (analogy)

    A. Pearl: round

    B. diamond: solid

    C. emerald: green

    D. Ivory: living

11. INEFFABLE (synonym)

    A. without effect

    B. not feeble

    C. that cannot be effaced

    D. too great of words

12. NUMISMATIC (Synonym)

    A. a branch of mathematics

    B. of wind or air

    C. of numbers

    D. of coins or coinage

13. FASTIDIOUS (Antonym)

    A. New-fangled

    B. tedious

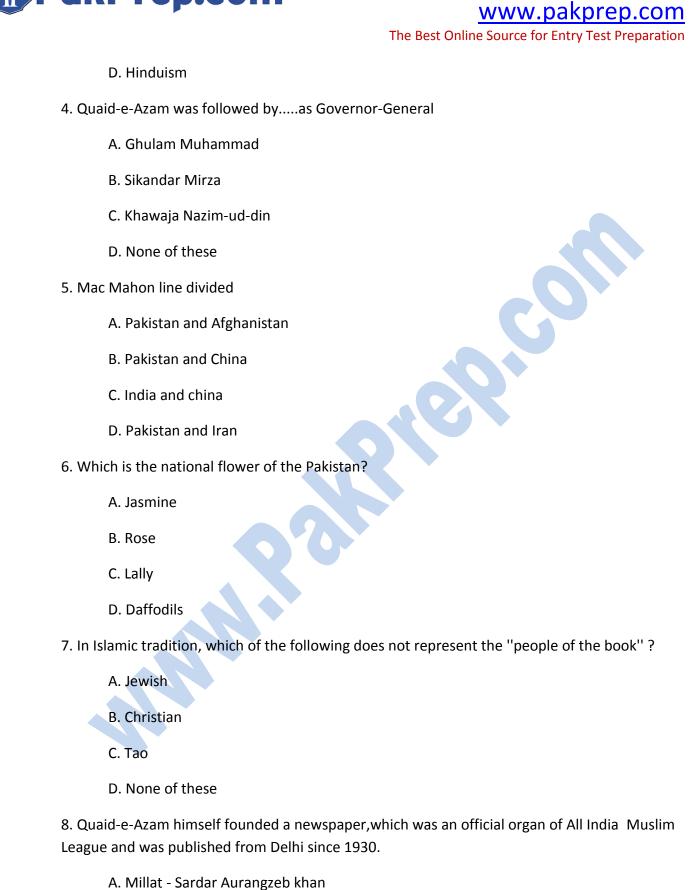   C. obese

    D. coarse

14. DISBURSE (antonym)

    A. fence

    B. pocket

C. inter

D. lubricate

15. PROFLIGATE (Antonym)

A. assumed

B. virtuous

C. uneducated

D. routine

Intelligence and general knowledge

1. "Lusaka" is the capital of

A. Uganda

B. Zambia

C. Senegal

D. Kenya

2. Which is the smallest continent in the world?

A. South America

B. Antarctica

C. Australia

D. Europe

3. Before Islam the religion of the majority of the Arabs was

A. Shanto mat

B. Jewish

C. Idolatrous

D. Hinduism

4. Quaid-e-Azam was followed by.....as Governor-General

    A. Ghulam Muhammad

    B. Sikandar Mirza

    C. Khawaja Nazim-ud-din

    D. None of these

5. Mac Mahon line divided

    A. Pakistan and Afghanistan

    B. Pakistan and China

    C. India and china

    D. Pakistan and Iran

6. Which is the national flower of the Pakistan?

    A. Jasmine

    B. Rose

    C. Lally

    D. Daffodils

7. In Islamic tradition, which of the following does not represent the ''people of the book'' ?

    A. Jewish

    B. Christian

    C. Tao

    D. None of these

8. Quaid-e-Azam himself founded a newspaper,which was an official organ of All India Muslim League and was published from Delhi since 1930.

    A. Millat - Sardar Aurangzeb khan

B. Al- Amn- Mulana Mazharuddin

C. Manshoor- Syed Hasan Raiz

D. Hilal-e-Pakistan- Munshi Abdul Shakoor

9. Indian Muslims launched the "The Khilafat movement" in early 20th centaury in order to

A. To obey the injections of Turkish Sultan Abdul Hamid being the Caliph of Muslim world

B. Establish the institution of Khilafat in India

C. Put the pressure on the British Government to grant Independence to their country

D. Show their support and reverence for the institution of Khilafat.

10. Which of the country has the lowest population growth rate?

A. North America

B. Europe

C. Africa

D. Asia