

# NUST Past Paper – Computer Sciences

Total Time: 3 Hrs

Total Question: 200

1. If  ${}^n C_r$  denotes the number of combinations of  $n$  things taken  $r$  at a time, then the expression  ${}^n C_{r+1} + {}^n C_{r-1} + 2 {}^n C_r$  equals
  - a.  ${}^{n+2} C_r$
  - b.  ${}^{n+2} C_{r+1}$
  - c.  ${}^{n+2} C_r$
  - d.  ${}^{n+2} C_{r+1}$
2. The number of integral terms in the expansion of  $(\sqrt{3} + \sqrt[3]{5})^{256}$  is
  - a. 32
  - b. 33
  - c. 34
  - d. 35
3. If  $x$  is positive, the 1<sup>st</sup> negative term in the expansion of  $(1 + X)^{27/5}$  is
  - a. 7<sup>th</sup> term
  - b. 5<sup>th</sup> term
  - c. 8<sup>th</sup> term
  - d. 6<sup>th</sup> term
4. Solution set of  $2\cos\theta + \sqrt{3} = 0$  is
  - a. Finite
  - b. Infinite
  - c.  $\emptyset$
  - d. None
5.  $\forall a, b, \epsilon \mathbb{R}, ab \in \mathbb{R}$ 
  - a. Commutative law of multiplication
  - b. Associative law of multiplication
  - c. Closure law of multiplication
  - d. Multiplicative identity
6. If in a triangle ABC  $a \cos^2(C/2) + c \cos^2(A/2) = 3b/2$ , then the sides  $a, b$  and  $c$ 
  - a. Are in A.P
  - b. Are in G.P
  - c. Are in H.P
  - d. Satisfy  $a + b = c$
7. In a triangle ABC, medians AD and BE are drawn. If  $AD = 4 \angle DAB = 6 \angle ABE = \pi/3$  then the angle of  $\Delta ABC$  is
  - a.  $8/3$
  - b.  $16/3$

- c.  $32/3$   
d.  $64/3$
8. The trigonometric equation  $\sin^{-1} x = 2 \sin^{-1} a$ , has a solution for  
a.  $\frac{1}{2} < |a| < 1/\sqrt{2}$   
b. All real values of a  
c.  $\frac{1}{2} > |a|$   
d.  $|a| \geq 1/\sqrt{2}$
9. The general solution of the equation  $1 + \cos X = 0$  is  
a.  $\pi/2 + 2n\pi$   
b.  $-\pi/2 + 2n\pi$   
c.  $\pi + 2n\pi$   
d.  $-\pi + 2n\pi$
10. Total real number x when added to its inverse gives the minimum value of the sum at x equal  
a. 2  
b. 1  
c. -1  
d. -2
11. If  $\sin x = \frac{1}{2}$ , then x =  
a.  $\pi/6, 5\pi/6$   
b.  $-\pi/6, 5\pi/6$   
c.  $-\pi/6, -5\pi/6$   
d.  $\pi/3, 2\pi/3$
12. If  $f(x) = x^n$  then the value of  $f(1) - f'(1)/1! + f''(1)/2! - f'''(1)/3! + \dots + (-1)^n f^{(n)}(1)/n!$  is  
a.  $2^n$   
b.  $2^{n-1}$   
c. 0  
d. 1
13. Domain of definition of the function  $f(x) = 3/4 - x^2 + \log_{10}(x^3 - x)$  is  
a. (1, 2)  
b. (-10) U (1, 2)  
c. (1, 2) U (2,  $\infty$ )  
d. (-1, 0) U (1, 2) U (2,  $\infty$ )
14.  $\lim_{x \rightarrow \frac{\pi}{2}} [1 - \tan(x/2)][1 - \sin x]/[1 + \tan(x/2)][\pi - 2x]^3$   
a.  $1/8$   
b. 0  
c.  $1/32$   
d.  $\infty$
15. If  $\forall a, b, c, \varepsilon \in R$   $a = b \vee b = c \rightarrow a = c$   
a. Reflexive property

- b. Symmetric property  
 c. Transitive property  
 d. Additive property
16. The equation of the normal to the circle  $x^2 + y^2 = 25$  at  $(4, 3)$  is  
 a.  $3x - 4y = 0$   
 b.  $3x - 4y = 5$   
 c.  $4x + 3y = 5$   
 d.  $4x + 3y = 25$
17. Let  $f(a) = g(a) = K$  and their  $n$ th derivatives  $f_n(a)$ ,  $g_n(a)$ , exist and are not equal for some  $n$ . further if  $\lim_{x \rightarrow a} [f(x)g(x) - f(a)g(a)] / (g(x) - f(x)) = 4$ , then the value of  $k$  is  
 a. 4  
 b. 2  
 c. 1  
 d. 0
18. The function  $f(x) = \log(x\sqrt{x^2 + 1})$  is  
 a. An even function  
 b. An odd function  
 c. An periodic function  
 d. Neither an even nor an odd function
19. If the function  $f(x) = 2x^3 + 9ax^2 + 12a^2x + 1$  where  $a > 0$ , attains its maximum and minimum at  $p$  and  $q$  respectively such that  $p^2 = q$ , then  $a$  equals  
 a. 3  
 b. 1  
 c. 2  
 d.  $\frac{1}{2}$
20. If  $f(y) = e^y$ ,  $g(y) = y$ ;  $y > 0$  and  $F(t) = \int_0^t f(t-y)g(y) dy$ , then  
 a.  $F(t) = 1 - e^{-1}(1+t)$   
 b.  $F(t) = e^t(1+t)$   
 c.  $F(t) = t e^t$   
 d.  $F(t) = t e^{-t}$
21. If  $f(a+b-x) = f(x)$ , then  $\int_a^b x f(x) dx$ , is equal to  
 a.  $a+b/2 \int_a^b f(b-x) dx$   
 b.  $a+b/2 \int_a^b f(x) dx$   
 c.  $b-a/2 \int_a^b f(x) dx$   
 d.  $a+b/2 \int_a^b f(a+b-x) dx$
22. The value of  $\lim_{x \rightarrow 0} \int_0^{x^2} \sec^2 t dt / x \sin x$   
 a. 3  
 b. 2  
 c. 1

- d. 0
23. The value of the integral  $\int_0^1 x(1-x)^n dx$  is
- $1/n+1$
  - $1/n+2$
  - $(1/n+1) - (1/n+2)$
  - $(1/n+1) + (1/n+2)$
24.  $\lim_{n \rightarrow \infty} (1+2^4+3^4+\dots+n^4)/n^5 - \lim_{n \rightarrow \infty} (1+2^3+3^3+\dots+n^3)/n^5$  is
- $1/30$
  - 0
  - $1/4$
  - $1/5$
25. Solution of  $1 + \cos x = 0$  is
- $\pi/2$
  - $\pi$
  - $2\pi$
  - None
26. Express as a sum or difference  $2 \sin 5\theta \cos \theta$
- $\cos 4\theta - \cos 2\theta$
  - $\sin 4\theta + \sin 2\theta$
  - $\cos 4\theta + \cos 2\theta$
  - $\sin 4\theta - \sin 2\theta$
27. Let  $f(x)$  be a function satisfying  $f'(x) = f(x)$  with  $f(0) = 1$  and  $g(x)$  be a function that satisfies  $f'(x) + g(x) = x^2$  then the value of the integral  $\int_0^1 f(x)g(x)dx$  is
- $e - e^2/2 - 5/2$
  - $e + e^2/2 - 3/2$
  - $e - e^2/2 - 3/2$
  - $e + e^2/2 + 5/2$
28. the degree and order of the differential equation of the family of all parabolas whose axis is x axis are respectively
- 2,1
  - 1,2
  - 3,2
  - 2,3
29. The solution of the differential equation  $(1+y^2) + (x-e^{\tan^{-1}y}) dy/dx = 0$  is
- $(x-2) = ke^{-\tan^{-1}y}$
  - $2xe^{2\tan^{-1}y} + k$
  - $xe^{-\tan^{-1}y} = \tan^{-1}y + k$
  - $2xe^{-2\tan^{-1}y} = e^{\tan^{-1}y} + k$

30. Locus centroid of the triangle whose vertices are  $(a \cos t, a \sin t)$ ,  $(b \sin t, -b \cos t)$ , and  $(1,0)$  where  $a$  is a parameter is
- $(3x - 1)^2 + (3y)^2 = a^2 - b^2$
  - $(3x - 1)^2 + (3y)^2 = a^2 + b^2$
  - $(3x + 1)^2 + (3y)^2 = a^2 + b^2$
  - $(3x + 1)^2 + (3y)^2 = a^2 - b^2$
31. If the pair of straight lines  $x^2 - 2qxy - y^2 = 0$  and  $x^2 - 2pxy - y^2 = 0$  bisects the angle between the other pair then  $p = q$  be such that each pair
- $p = q$
  - $p = -q$
  - $pq = 1$
  - $pq = -1$
32. A square of side  $a$  lies above the  $x$ -axis and has one vertex at the origin the side passing through the origin makes an angle  $\alpha$  ( $0 < \alpha < 45^\circ$ ) with positive direction of  $x$  axis the equation of its diagonal not passing through the origin is
- $Y(\cos \alpha - \sin \alpha) - X(\sin \alpha - \cos \alpha) = a$
  - $Y(\cos \alpha + \sin \alpha) + X(\sin \alpha - \cos \alpha) = a$
  - $Y(\cos \alpha + \sin \alpha) + X(\sin \alpha + \cos \alpha) = a$
  - $Y(\cos \alpha + \sin \alpha) + X(\sin \alpha - \cos \alpha) = a$
33. If the two circles  $(x-1)^2 + (y-3)^2 = r^2$  and  $x^2 + y^2 - 8x + 2y + 8 = 0$  intersect in two distinct points then
- $2 < r < 8$
  - $r < 2$
  - $r = 2$
  - $r > 2$
34.  $\cos x = 1/2$  has a solution
- $\pi/2$
  - $\pi/3$
  - $\pi/4$
  - $\pi/6$
35. if  $\sin x + \cos x = 0$  then  $x =$
- $\pi/4, -\pi/4$
  - $-\pi/4, -\pi/2$
  - $-\pi/4, 3\pi/4$
  - None
36. A tetrahedron has vertices at  $O(0,0,0)$ ,  $A(1,2,1)$ ,  $B(2,1,3)$  and  $C(-1, 1, 2)$  then the angle between the faces  $OAB$  and  $ABC$  will be
- $\cos^{-1}(19/35)$
  - $\cos^{-1}(17/31)$

- c.  $30^\circ$   
d.  $90^\circ$
37. The radius of the circles in which the sphere  $x^2+y^2+z^2+2x-2y-4z-19=0$  is cut by
- 1
  - 2
  - 3
  - 4
38. The equation containing at least one trigonometric function are called
- Trigonometric equation
  - algebraic equation
  - trigonometric sentence
  - algebraic sentence
39. the two lines  $x=ay+b$ ,  $z=cy+d$  and  $x=ay+b$ ,  $z=cy+d$  will be perpendicular if and only if
- $aa'+bb'+cc'+1=0$
  - $aa'+bb'+cc'=0$
  - $(a+a')(b+b')+(c+c')=0$
  - $aa'+cc'+1=0$
40. the shortest distance from the plane  $12x+4y+3z=327$  to the sphere  $x^2+y^2+z^2+4x-2y-6z=155$  is
- 26
  - $11\frac{4}{13}$
  - 13
  - 39
41.  $\text{Cosec}^{-1}x + \sec^{-1}x$
- 1
  - $\pi/6$
  - $\pi/2$
  - $3\pi/4$
42. The median of a set of 9 distinct observation is 20.5 if each of the largest 4 observation of the set is increased by 2 then the median of the new set
- Increased by 2
  - Decreased by 2
  - Is two times the original median
  - Remains the same as that of the original set
43. Division is a binary operation in
- The set of rational numbers
  - The set of real numbers
  - The set of real numbers
  - The set of  $\mathbb{R} - \{0\}$
44. The mean and variance of a random variable having a binomial distribution are 4 and 2 respectively then  $P(x=1)$  is
- $1/32$

- b.  $1/16$   
 c.  $1/8$   
 d.  $1/4$
45. Let  $R = \{(1,3), (4,2), (2,4), (2,3), (3,1)\}$  be a relation on the set  $A = \{1,2,3,4\}$ . the relation R is  
 a. A function  
 b. Reflexive  
 c. Not symmetric  
 d. Transitive
46. Two trigonometric functions are drawn taking same scale from  $-\pi$  to  $\pi$  in the following graph it represents  
 a.  $\cos x$  and  $\sec x$   
 b.  $\sin x$  and  $\csc x$   
 c.  $\cos x$  and  $\sin x$   
 d.  $-\cos x$  and  $\sin x$
47. If  $Z = (1, 2)$  then  $Z^{-1} = ?$   
 a.  $(1/5, 1/2)$   
 b.  $(-1/5, 1/2)$   
 c.  $(1/5, -1/2)$   
 d.  $(-1/5, -1/2)$
48. If  $z = x - iy$  and  $z^{1/3} = p + iq$ , then  $(x/p + y/q) / (p^2 + q^2)$  is equal to  
 a. 1  
 b. -2  
 c. 2  
 d. -1
49. If  $|z^2 - 1| = |z^2| + 1$ , then  $z$  lies on  
 a. The real axis  
 b. An ellipse  
 c. A circle  
 d. The imaginary axis
50.  $\forall Z \in \mathbb{C}, |Z|^2 = ?$   
 a.  $Z^2$   
 b.  $(|\bar{Z}|)^2$   
 c.  $Z \cdot \bar{Z}$   
 d.  $\bar{Z}$
51. Minimum number of equation for any system of equation  
 a.  $|A| \neq 0$   
 b.  $|A| = 0$   
 c.  $|A| = \infty$   
 d. none
52. if  $a_1, a_2, a_3, \dots, a_n$  are in G.P then the value of the determinant  

$$\begin{vmatrix} \log a_n & \log a_{n+1} & \log a_{n+2} \end{vmatrix}$$

$$\begin{vmatrix} \log n + 3 & \log n + 4 & \log n + 5 \\ \log n + 6 & \log n + 7 & \log n + 8 \end{vmatrix}$$

is

- a. 0
- b. -2
- c. 2
- d. 1

53. Let two numbers have arithmetic mean 9 and geometric mean 4 then these numbers are the roots of the quadratic equation

- a.  $X^2 + 18x + 16 = 0$
- b.  $X^2 - 18x - 16 = 0$
- c.  $X^2 + 18x - 16 = 0$
- d.  $X^2 - 18x + 16 = 0$

54. If  $(1-p)$  is a root of quadratic equation  $X^2 + px + (1-p) = 0$  then its roots are

- a. 0,1
- b. -1,2
- c. 0, -1
- d. -1,1

55. Let  $S(k) = 1+3+5+\dots+(2k-1) = 3+k^2$ . Then which of the following is true

- a.  $S(1)$  is correct
- b. Principle of mathematical induction can be used to prove the formula
- c.  $S(k) = S(k+1)$
- d.  $S(k) = S(k+1)$

56.  $Z + \bar{Z}$  is .....

- a. A real number
- b. Irrational number
- c. 0
- d. Complex number

57. The number of ways of distributing identical balls in 3 distinct boxes so that none of the boxes is empty is

- a. 5
- b. 8
- c. 38
- d. 21

58. If one root of the equation  $X^2 + px + 12 = 0$  is 4, while the equation  $X^2 + px + q = 0$  has equal roots then the value of  $q$  is

- a.  $49/4$
- b. 4
- c. 3
- d. 12

59. -1 in polar form can be written as



- a.  $\cos \theta + i \sin \theta$   
 b.  $\cos n/2 + i \sin n/2$   
 c.  $\cos 2\theta + i \sin 2\theta$   
 d.  $\cos 3n/2 + i \sin 3n/2$
60. The coefficient of  $x^n$  in expansion of  $(1+x)(1-x)^n$  is  
 a.  $(n-1)$   
 b.  $(-1)^n(n-1)$   
 c.  $(-1)^{n-1}(n-1)^2$   
 d.  $(-1)^{n-1}(n)$
61. If  $S_n = \sum_{r=0}^n 1/nCr$  and  $t_n = \sum_{r=0}^n r/nCr$  then  $t_n/s_n$  is equal to  
 a.  $\frac{1}{2}n$   
 b.  $\frac{1}{2}n-1$   
 c.  $N-1$   
 d.  $2n-1/2$
62. Let  $T_r$  be the  $r$ th term of A.P whose first term is  $a$  and common difference is  $d$ . if for some positive integers  $m, n, m \neq n$ ,  $T_m = 1/n$  and  $T_n = 1/m$  then  $a-d$  equal to  
 a.  $0$   
 b.  $1$   
 c.  $1/mn$   
 d.  $1/m + 1/n$
63. The sum for the first  $n$  terms of the series  $12+2.22+32.42+52.62+ \dots$  is  $n(n+1)/2$  when  $n$  is even. when  $n$  is odd the sum is  
 a.  $3n(n+1)/2$   
 b.  $N^2(n+1)/2$   
 c.  $n(n+1)^2/2$   
 d.  $[n(n+1)/2]^2$
64.  $\sin 540^\circ =$  \_\_\_\_\_  
 a.  $0$   
 b.  $1$   
 c.  $2$   
 d.  $3$
65. Let  $\alpha$  be  $\beta$  such that  $\pi < \alpha - \beta < 3\pi$  if  $\sin \alpha + \sin \beta = -21/65$  and  $\cos \alpha + \cos \beta = -27/65$  then the value of  $\cos a-b/2$  is  
 a.  $3/\sqrt{130}$   
 b.  $3/\sqrt{130}$   
 c.  $6/65$   
 d.  $-6/65$
66. If  $u = \sqrt{a^2 \cos^2 \theta + b^2 \sin^2 \theta} + \sqrt{a^2 \sin^2 \theta + b^2 \cos^2 \theta}$  then the difference between the maximum and minimum values of  $u^2$  is given by  
 a.  $2(a^2+b^2)$

- b.  $2\sqrt{a^2 + b^2}$   
 c.  $(a + b)^2$   
 d.  $(a - b)^2$
67. The  $i^{101}$  is equal to  
 a.  $i$   
 b.  $i^2$   
 c.  $1$   
 d.  $-1$
68. A person standing on the bank of a river observes that the angle of elevation of the top of a tree on the opposite bank of river is  $60^\circ$  when he retires 40 meters away from the tree the angle of elevation becomes  $30^\circ$  the breadth of the river is  
 a. 20m  
 b. 30m  
 c. 40m  
 d. 60m
69. If  $F:R \rightarrow S$ , defined by  $f(x) = \sin x - \sqrt{3}\cos x + 1$  is onto, then the interval of S is  
 a.  $[0,3]$   
 b.  $[-1,1]$   
 c.  $[0,1]$   
 d.  $[-1,3]$
70. The graph of the function  $y = f(x)$  is symmetrical about the line  $x=2$  then  
 a.  $f(x+2) = f(x-2)$   
 b.  $f(2+x) = f(2-x)$   
 c.  $f(x) = f(-x)$   
 d.  $f(x) = -f(-x)$
71. the domain of the function  $f(x) = \sin^{-1}(x-3)/\sqrt{9-x^2}$  is  
 a.  $[2,3]$   
 b.  $[2,3]$   
 c.  $[1,2]$   
 d.  $[1,2]$
72. If  $\lim_{x \rightarrow \infty} \left(1 + \frac{a}{x} + \frac{b}{x^2}\right)^{2x} = e^2$  then the value of a and b, are  
 a.  $a \in R, b \in R$   
 b.  $a=1, b \in R$   
 c.  $a \in R, b=2$   
 d.  $a=1, b=2$
73. let  $f(x) = 1 - \tan x/4x - \pi, x \neq \pi/4, x \in [0, \pi/2]$  if  $f(x)$  is continuous in  $[0, \pi/2]$ , then  $f(\pi/4)$  is  
 a.  $1$

- b.  $\frac{1}{2}$   
 c.  $-\frac{1}{2}$   
 d.  $-1$
74. Of  $x = e^{y+(e)}$   $x > 0$ , then  $dy/dx$  is  
 a.  $x/x+1$   
 b.  $1/x$   
 c.  $1-x/x$   
 d.  $1+x/x$
75.  $\sqrt{0.0001}$  is .....  
 a. An integer  
 b. An irrational number  
 c. Rational number  
 d. An imaginary number
76. A function  $y = f(x)$  has a second order derivative  $f''(x) = 6(x-1)$ . If its graph passes through the point  $(2,1)$  and at that point the tangent to the graph is  $y = 3x - 5$ , then the function is  
 a.  $(x-1)^2$   
 b.  $(x-1)^3$   
 c.  $(x+1)^3$   
 d.  $(x+1)^2$
77. The normal to the curve  $x = a(1 + \cos \theta)$ ,  $y = a \sin \theta$  at ' $\theta$ ' always passes through the fixed point  
 a.  $(a,0)$   
 b.  $(0,a)$   
 c.  $(0,0)$   
 d.  $(a,a)$
78. If  $2a + 3b + 6c = 0$ , then at least one root of the equation  $ax^2 + bx + c = 0$  lies in the interval  
 a.  $(0,1)$   
 b.  $(1,2)$   
 c.  $(2,3)$   
 d.  $(1,3)$
79.  $\sec x = \tan x$  is a  
 a. Equation  
 b. Trigonometric equation  
 c. Algebraic equation  
 d. Set
80. The equations containing at least one trigonometric function is called  
 a. Trigonometric equation  
 b. Algebraic equation  
 c. Trigonometric sentence  
 d. Algebraic sentence
81. Pick over the wrong statement  
 a. When an electron is shot at right angles to the electric field, it traces a parabolic path.

- b. An electron moving in the direction of the electric field gains K.E  
c. An electron at rest experiences no force in the magnetic field  
d. The gain in the K.E of the electron moving at right angles to the magnetic field is 0
82. A proton and an alpha particle are accelerated under the same potential difference. The ratio of de-Broglie wavelength of the proton and the alpha particle is
- $1/\sqrt{8}$
  - 1
  - 2
  - $\sqrt{8}$
83. Spectrum of sunlight is an example for
- Line absorption spectrum
  - Continuous emission spectrum
  - Continuous absorption spectrum
  - Band emission spectrum
84.  $\int (\mathbf{k} \times \mathbf{j})$  is equal to
- 1
  - 0
  - 1
  - 2
85. Decay constants of two radioactive samples A and B are  $15\lambda$  and  $3\lambda$  respectively. They have equal number of initial nuclei. The ratio of the number of nuclei left in A and B after time is  $1/6$  is
- $e^2$
  - $e^{-1}$
  - $e^{-2}$
  - e
86. the angle subtended at the center of a sphere by its surface area is equal to
- $4/3\pi$  radian
  - $4/3\pi$  steradian
  - $4\pi$  radian
  - $2\pi$  steradian
87. Copper and germanium are cooled from room temperature to 100K. Then the resistance
- Germanium decreased and copper decreased
  - Germanium increased and copper decreased
  - Germanium increased and copper increased
  - Germanium decreased and copper increased
88. The most stable particle in the baryon group is
- Proton
  - Lambda particle
  - Sigma particle

- d. Neutron
89. Frequency of light incident on a system of scattering particles are in the ratio 1:2. Then, the intensity of light in particular direction is \_\_\_\_\_.
- 1:2
  - 1:8
  - 1:16
  - 1:4
90. The ratio of the magnetic dipole moment to the angular momentum of the electron in the 1<sup>st</sup> orbit of hydrogen atom is
- $e/m$
  - $2m/e$
  - $m/e$
  - $e/2m$
91. milk is an example for
- foam
  - elastic gel
  - emulsion
  - in-elastic gel
92. A body of mass 'm' is travelling with a velocity 'u'. When a constant retarding force 'f' is applied it comes to rest after travelling a distance 'S1'. If the initial velocity is 2u, with the same force 'f', the distance travelled it comes to rest is 'S2'. then
- $S_2 = S_1/2$
  - $S_2 = S_1$
  - $S_2 = 4S_1$
  - $S_2 = 2S_1$
93.  $[M^0L^0T^0]$  are the dimension of
- Strain
  - Refractive index
  - Magnification
  - Diphtheria
94. A straight wire of length 2 m carries a current of 10A. if this wire is placed in a uniform magnetic field of 0.15T making an angle of  $45^\circ$  with the magnetic field, the applied force on the wire will be
- 15N
  - 3N
  - $3\sqrt{2}N$
  - $3/\sqrt{2}N$
95. Two element A and B with atomic numbers  $Z_A$  and  $Z_B$  are used to produce characteristic x-rays with frequencies of  $\nu_A$  and  $\nu_B$  respectively if  $Z_A : Z_B = 1:2$ , then  $\nu_A : \nu_B$  will be

- a.  $1:\sqrt{2}$   
b. 1:8  
c. 4:1  
d. 1:4
96. The de Broglie wavelength of an electron moving with a velocity of  $C/2$  ( $C$ =velocity of light in vacuum) is equal to the wavelength of a photon. The ratio of K.E. of electrons and photons is  
a. 1:4  
b. 1:2  
c. 1:1  
d. 2:1
97. Two infinite parallel metal planes, contain electric charges with charge densities  $+\sigma$  and  $-\sigma$  respectively and they are separated by a small distance in air. if the permittivity of air is  $\epsilon_0$  then the magnitude of the field between the two planes with its direction will be  
a.  $\sigma/\epsilon_0$  toward the +ively charged plane  
b.  $\sigma/\epsilon_0$  toward the -ively charged plane  
c.  $\sigma/(2\epsilon_0)$  toward the +ively charged plane  
d. 0 and toward any direction
98. Heat is produced at a rate given by;  $H$  in a resistor when it is connected across a supply of voltage  $v$ . if now the resistance of the resistor is doubled and the supply voltage is made  $V/3$  then the rate of production of heat in the resistor will be  
a.  $H/18$   
b.  $H/9$   
c.  $6H$   
d.  $18H$
99. The magnitude of the resultant of 2 forces is  $2F$ . if the magnitude fo each force is  $F$ , then the angle between these forces is  
a.  $0^\circ$   
b.  $90^\circ$   
c.  $120^\circ$   
d.  $180^\circ$
100. A box of mass 2 kg is placed on the roof of a car. The box would remain stationary until the car attains a maximum acceleration. Coefficient of static friction between the box and the roof of the car is 0.2 and  $g=10\text{ms}^{-2}$  this maximum acceleration of the car , for the box to remain stationary , is  
a.  $8\text{ms}^{-2}$   
b.  $6\text{ms}^{-2}$   
c.  $4\text{ms}^{-2}$   
d.  $2\text{ms}^{-2}$
101. The decimal number equivalent to a binary number 1011001 is  
a. 13  
b. 17

- c. 89  
d. 178
102. The frequency of the first overtone of a closed pipe of length  $l_1$  is equal to that of the first overtone of an open of length  $l_2$  the ratio of their lengths ( $l_1: l_2$ ) is
- a. 2:3  
b. 4:5  
c. 3:5  
d. 3:4
103. In a slide calipers,  $(m+1)$  number of veneer divisions is equal to  $m$  number of smallest main scale division, if  $d$  unit is the magnitude of the smallest main scale division, then the magnitude of the veneer constant is
- a.  $d/(m+1)$  unit  
b.  $d/m$  unit  
c.  $md/(m+1)$  unit  
d.  $(m+1)/m$  unit
104. A wheat stone bridge has the resistances 10ohm, 10ohm, 10ohm, and 30ohm in its four arms. What resistance joined in parallel to the 30 ohm resistance will bring it to the balanced condition?
- a. 2 ohm  
b. 5 ohm  
c. 10 ohm  
d. 15 ohm
105. An electric bulb marked as 50 w-200v is connected across a 100V supply the present power of the bulb is
- a. 37.5w  
b. 25W  
c. 12.5W  
d. 10w
106. In a mercury thermometer the ice point (lower fixed point) is marked as  $10^{\circ}$  and the steam point (upper fixed point) is marked as  $130^{\circ}$ . at  $40^{\circ}$  C temperature what will this thermometer read
- a.  $78^{\circ}$   
b.  $66^{\circ}$   
c.  $62^{\circ}$   
d.  $58^{\circ}$
107. Three vectors of equal magnitude are acting on the three sides of an equilateral triangle. The magnitude of their resultant is
- a. 0  
b. 3  
c.  $\sqrt{3}$   
d. 1.73

108. From the top of a tower, 80 m high from the ground a stone is thrown in the horizontal direction with a velocity of  $8\text{ms}^{-1}$  the stone reaches the ground after a time 't' and falls at a distance of 'd' from the foot of the tower. Assuming  $g = 10\text{ms}^{-2}$ , time t and distance d are given respectively by
- 6s,64m
  - 6s,48m
  - 4s,32m
  - 4s,16m
109. Water is flowing through a very narrow tube. The velocity of water below which the flow remains a streamline flow is known as
- Relative velocity
  - Terminal velocity
  - Critical velocity
  - Particle velocity
110. If the velocity of light in vacuum is  $3 \times 10^8\text{ m/s}$ , the time taken (in Nano second) to travel through a glass plate of thickness 10 cm and refractive index 1.5 is
- 0.5
  - 1.0
  - 2.0
  - 3.0
111. The physical quantity which produces angular acceleration in the body is
- Force
  - Moment of inertia
  - Impulse
  - Torque
112. The dimension of angular momentum is
- $[M^0L^1T^{-1}]$
  - $[M^1L^2T^{-2}]$
  - $[M^1L^2T^{-1}]$
  - $[M^2L^1T^{-2}]$
113. If  $A=B+C$  and A,B,C have scalar magnitudes of 5,4,3 units respectively then the angle between A and C is
- $\text{Cos}^{-1}(3/5)$
  - $\text{Cos}^{-1}(4/5)$
  - $\pi/2$
  - $\text{sin}^{-1}(3/4)$
114. A particle is travelling along a straight line OX. The distance C (in meters) of the particle from O at a time t is given by  $x=37+27t-t^3$  where t is time in seconds. The distance of the particle from O when it comes to rest is
- 81m
  - 91m



- c. 101m  
d. 111m
115. A particle is projected from the ground with a kinetic energy  $E$  at an angle of  $60^\circ$  with the horizontal. Its K.E at the highest point of its motion will be
- a.  $E/\sqrt{2}$   
b.  $E/2$   
c.  $E/4$   
d.  $E/8$
116. A bullet on penetrating 30 cm into its target loss its velocity by 50% what additional distance will it penetrate into the target before it comes to rest?
- a. 30cm  
b. 20cm  
c. 10 cm  
d. 5 cm
117. When a spring is stretched by 10 cm the potential energy stored is  $E$ . when spring stretched by 10 cm more the potential energy stored in spring becomes
- a.  $2E$   
b.  $4E$   
c.  $6E$   
d.  $10E$
118. Average distance of the earth from the sun is  $L_1$ . if one year of the earth =  $D$  days one year of another planet whose average distance from the sun is  $L_2$  will be
- a.  $D(L_2/L_1)^{1/2}$  days  
b.  $D(L_2/L_1)^{3/2}$  days  
c.  $D(L_2/L_1)^{2/3}$  days  
d.  $D(L_2/L_1)$  days
119. The point at which an applied forces produces linear motion but no rotatory motion is
- a. Mid-point  
b. Center of gravity  
c. Optical center  
d. Pole
120. When a certain metal surface is illuminated with light of frequency  $V$ , the stopping potential for photoelectric current is  $v_0$ . When the same surface is illuminated by light of frequency  $v/2$ , the stopping potential is  $v_0/4$ . The threshold frequency for photoelectric emission is
- a.  $v/6$   
b.  $v/3$   
c.  $2v/3$   
d.  $4v/3$

121. Let  $l$  be the length and  $d$  be the diameter of cross section of a wire wires of the same material with different  $L$  and  $d$  are subjected to the same tension along the length of a the wire. In which of the following cases the extension of wire will be the maximum?
- $L=200\text{cm}, d=0.5\text{mm}$
  - $L=300\text{cm}, d=1.0\text{mm}$
  - $L=50\text{cm}, d=0.05\text{mm}$
  - $L=100\text{cm}, d=0.2\text{mm}$
122. An object placed in front of a concave mirror at a distance of  $x$  cm from the pole gives a 3times magnified real image. If it is moved to a distance of  $(x+5)$ cm, the magnification to the image becomes 2 the focal length of the mirror  $l$  s
- 15cm
  - 20cm
  - 25cm
  - 30cm
123. 22320 cal heat is supplied to 100g of ice at  $0^\circ\text{C}$ . if the latent heat of fusion of ice is  $80\text{cal/g}$  and latent heat of vaporization of water is  $540\text{ cal/g}$  the final amount of water thus obtained and its temperature respectively are
- 8g,  $100^\circ\text{c}$
  - 100g,  $90^\circ\text{c}$
  - 92g,  $100^\circ\text{c}$
  - 82g,  $100^\circ\text{c}$
124. A progressive wave moving along  $x$  axis is represented by  $y=A\sin [2\pi/\lambda (vt-x)]$ . The  $\lambda$  wavelength at which the max. particle velocity is 3 times the wave velocity is
- $A/3$
  - $2A/3\pi$
  - $(3/4)\pi A$
  - $(2/3)\pi A$
125. Two radioactive substances A and B have decay constants  $5\lambda$  and  $\lambda$  respectively. At  $t=0$ , they have the same no.s of nuclei. the ratio of number of nuclei of A to that of B will be  $(i/e)^2$  after a time interval of
- $1/\lambda$
  - $1/2\lambda$
  - $1/3\lambda$
  - $1/4\lambda$
126. A magnetic needle is placed in uniform magnetic field and is aligned with the field. the needle is now rotated by an angel of  $60^\circ$  and the work done is  $W$ . the torque on magnetic needle at this position is
- $2\sqrt{3}w$
  - $\sqrt{3}w$
  - $\frac{\sqrt{3}}{2}w$

- d.  $\frac{\sqrt{3}}{4} w$
127. A body when fully immersed in a liquid of specific gravity 1.2 weights 44gwt. The same body when fully immersed in water weights 50 gwt. The mass of body is
- 36g
  - 48g
  - 64g
  - 80g
128. The equation of state of a gas is given by  $(p + a/V^5)(v-b^2) = cT$ , where P,V,T are pressure. Volume and temperature respectively and a, b, c are constants. The dimensions of a and b are respectively
- $ML^8T^{-2}$  and  $L^{3/2}$
  - $ML^8T^{-2}$  and  $L^3$
  - $ML^5T^{-2}$  and  $L^6$
  - $ML^6T^{-2}$  and  $L^{3/2}$
129. The R.M.S speed of the molecules of a gas at  $100^\circ C$  is  $v$ . the temperature at which the R.M.S. speed will be  $\sqrt{3}v$  is
- $546^\circ C$
  - $646^\circ C$
  - $746^\circ C$
  - $846^\circ C$
130. A frictionless piston-cylinder based enclosure contains some amount of gas at a pressure of 400kPa. Then heat is transferred to the gas at constant pressure in a quasi-static process. The piston moves up slowly through a height of 10 cm. if the piston has a cross section area of  $0.3 \text{ m}^2$ , the work done by the gas in this process is
- 6kj
  - 12kj
  - 75kj
  - 24kj
131. An electric cell of e.m.f  $E$  is connected across a copper wire of diameter  $d$  and length  $L$ . the drift velocity of electrons in the wire is  $v_0$  of the length of the wire is changed to  $2L$  the new drift velocity of electrons in the copper wire will be
- $v_0$
  - $2v_0$
  - $v_0\sqrt{2}$
  - $v_0\sqrt{4}$
132. A bar magnet has a magnetic moment of  $200 \text{ A.m}^2$ . the magnet is suspended in a magnetic field of  $0.3 \text{ N/Am}$ . The torque required to rotate the magnet from its equilibrium position through an angle of  $30^\circ$  will be
- 30Nm
  - $30\sqrt{3} \text{ Nm}$

- c. 60Nm  
d. 604Nm
133. A ball is thrown vertically upward with a velocity of 98 m/s if it takes 10 seconds to reach the highest point then the acceleration of the ball is
- 9.8m/s<sup>2</sup>
  - 980m/s<sup>2</sup>
  - 98m/s<sup>2</sup>
  - 9.8m/s<sup>2</sup>
134. The velocity of a car travelling on a straight road is 36 km/h at an instant of time. Now travelling with uniform acceleration for 10s. the velocity becomes exactly double if the wheel radius of the car is 25cm then which of the following numbers is the closest to the number of revolutions that the wheel makes during this 10s?
- 84
  - 95
  - 126
  - 135
135. Two glass prisms P1 and P2 are to be combined together to produce dispersion without deviation. The angle of the prisms P1 and P2 are selected as 4° and 3° respectively. If the refractive index of prism P1 is 1.54, then that of P2 will be
- 1.48
  - 1.58
  - 1.62
  - 1.72
136. A man throws a ball vertically upward in compartment of an accelerated train. The ball will fall
- In front of him
  - In his hand
  - Behind him
  - Beside him
137. Water is flowing in stream line motion through a horizontal tube. The pressure at a point in the tube is P where the velocity of flow is v. At another point, where the pressure is P/2, the velocity of flow is [density of water = ρ]
- $\sqrt{V^2 + \rho/P}$
  - $\sqrt{V^2 - \rho/P}$
  - $\sqrt{V^2 + 2\rho/P}$
  - $\sqrt{V^2 - 2\rho/P}$
138. A wire of initial length L and radius r is stretched by a length l. another wire of same material but with initial length 2L and radius 2r is stretched by length 2l. the ratio of the stored elastic energy per unit volume in the first and second wire is
- 1:4

- b. 1:2
  - c. 2:1
  - d. 1:1
139. A current of 1A is flowing along positive x-axis through a straight wire of length 0.5m placed in a region of magnetic field given by  $B = (2\hat{i} + 2\hat{j})$  T. The magnitude and the direction of the force experienced by the wire respectively are
- a.  $\sqrt{18}N$ , along positive z-axis
  - b.  $\sqrt{20}N$ , along positive x-axis
  - c. 2N, along positive z-axis
  - d. 4N, along positive x-axis
140. A bomber drop a bomb, when it is vertically above the target. it missed the target because of :
- a. Vertical component of the velocity of bomber
  - b. Force of gravity
  - c. Acceleration of the bomber
  - d. Horizontal component of the velocity of bomber
141. In which of the following generation of the computer the transistor were used?
- a. First
  - b. Second
  - c. 3<sup>rd</sup>
  - d. 4<sup>th</sup>
142. Which of the following is a type of computer language
- a. High level
  - b. Low level
  - c. Both a and b
  - d. None
143. How much type of computer are
- a. 2
  - b. 4
  - c. 3
  - d. 6
144. C is which of the following languages
- a. High level language
  - b. Low level language
  - c. Machine language
  - d. None
145. Which of the following computer hard ware is divided?
- a. Input unit
  - b. Output unit
  - c. System unit

- d. All of above
146. How many type of software
- 2
  - 4
  - 6
  - 8
147. In computer control unit is part of which of the following
- CPU
  - ALU
  - Both a and b
  - None
148. A light pen is which of the following
- Input device
  - Output device
  - Software
  - None
149. Which of the following is impact printer
- Line printer
  - Plotter printer
  - Laser printer
  - Ink jet printer
150. Which of the following is volatile memory
- Ram
  - Rom
  - Both a and b
  - None
151. Which of the following is type of ROM
- EEPROM
  - EFROM
  - EPSROM
  - EEPSROM
152. HARDISK is which of the following?
- Primary storage
  - Secondary storage
  - Both a and b
  - None
153. Which of the following number system use only two digit 0 and 1 to represent a quantity
- Decimal
  - Binary
  - Hexa

- d. Octal
154. In computer how many basic types of ports are
- 2
  - 6
  - 3
  - 8
155. In computers which of the following carries the address information
- Address bus
  - Data bus
  - Control bus
  - All of these
156. Which of the following in Boolean algebra
- Algebra of logic
  - Algebra of math's
  - Both a and b
  - None
157. Boolean algebra has same structure which of the following
- Propositional calculus
  - Propositional math
  - Propositional science
  - Propositional physics
158. In Boolean algebra which of the following is used for combining two Proposition to make a new proposition
- AND ,OR
  - IF,... THEN
  - NEITHER, NOR
  - IF ....THEN.....ELSE
159. IN Boolean algebra which of the following axioms should be satisfied for operation
- Close
  - Commutative
  - Associative
  - All of above
160. For evaluating boolean expression which of the following is a step of the procedure
- Evaluate all the complement operation
  - Evaluate all the division operation
  - Both a and b
  - None of these
161. How many theorem of Boolean algebra are?
- 2
  - 4

- c. 5  
d. 6
162. In boolean algebra theorem 5 is also known as  
a. DE Morgan law  
b. Absorption law  
c. Idempotent law  
d. None of these
163. In Boolean algebra any result deduced from axioms of Boolean algebra remains valid if which of the following step is performed?  
a. All 0's in the result are changed to 1 and vice versa  
b. The x in the original result is changed to + and vice versa  
c. Both a and b  
d. None of these
164. Which of the following is used to simplify a boolean function  
a. K-map algorithm  
b. L-map algorithm  
c. K-map derivation  
d. L-map derivation
165. Which of the following is not a disadvantage of using Boolean algebra?  
a. Is very difficult to write a computer program using boolean laws  
b. This may not give the best simplified solution  
c. For the process of boolean function is needed but in most engineering application we don't have it but truth table  
d. It is very difficult to run a computer program using boolean algebra
166. In Boolean algebra max terms is also called which of the following?  
a. Standard product  
b. Standard sum  
c. Both a and b  
d. None
167. In Boolean algebra the logical statements can be translated in which of the following by using Boolean algebra?  
a. Symbols  
b. Picture  
c. Both a and b  
d. None
168. In boolean algebra k map is also known as which of the following  
a. Karnaugh map  
b. Picto gram  
c. Boolean map  
d. None
169. Boolean algebra is different from ordinary algebra in which way?



- a. Boolean algebra can be represented more than 1 discrete level between 0 to 1  
b. Boolean algebra has only 2 discrete levels between 0 to 1  
c. Boolean algebra can describe up to 31 level logic levels  
d. They are actually the same
170. For a three inputs (A, B, C) OR gate, what inputs are needed if output=0?  
a. A=0, B=0, C=1  
b. A=0, B=1, C=0  
c. A=1, B=1, C=1  
d. A=0, B=0, C=0
171. Rubina likes \_\_\_ violin and her sister plays ---- guitar.  
a. A, the  
b. A, a  
c. The, the  
d. The, a
172. Ibrahim crossed \_\_\_ Atlantic ocean many times last year  
a. An  
b. A  
c. The  
d. None
173. Saqib got an opportunity to have fellowship at \_\_\_ School of medicine in Lahore.  
a. The  
b. A  
c. The  
d. A
174. Pakistan is a country \_\_\_\_\_ exports mango all over the world  
a. Who  
b. Which  
c. Whom  
d. That
175. They worked on the project for its in time completion  
a. Which is famous  
b. What is famous  
c. Who is famous  
d. Is famous

**Read the Passage and answer the question given at the end of Passage**

Educational planning should aim at meeting the educational needs of the entire population of all age groups. While traditional structure of education as a three layer hierarchy from the primary stage to the university represents the core, we should not overlook the periphery which is equally important. Under modern conditions, workers need to rekindle or renew their enthusiasm, or strike out in a new

direction or improve their skills as much as any university professor. The retired and the aged have their needs as well educational planning in their words should take care of the needs of every one

Our structures of education have been built up on the assumption that there is a terminal point of education this basic defect has become all the more harmful today. A UNESCO report entitled 'Learning to be' prepared by Edgar Faure and other in 1973 asserts that the education of children must prepare the future adult for various forms of self-learning. A viable education system of the future should consist of modules with different kinds of functions serving a diversity of constituents and performance not the period of study, should be the basis for credentials. The writing is already on the wall

In view of the fact that the significance of a commitment of lifelong learning and lifetime education is being discussed only in recent years even in educationally advanced countries, the possibility of the idea becoming an integral part of educational thinking seems to be a far cry. For to move in that direction means such more than some simple rearrangement of the present organization of education. But a good beginning can be made by developing Open University programs for older learners of different categories and introducing extension services in the conventional colleges and schools. Also these institutions should learn to cooperate with the numerous community. Organizations such as libraries, museums, municipal recreational programs, health services etc.

176. According to the author what measures should open university adopt to meet modern condition's
- Develop various programs for adult learners.
  - Open more colleges on traditional lines
  - Cater to the needs of those who represent core
  - Primary education should be under the control open universities
177. According to the author, what should be the basis for awarding credentials
- Duration of the course
  - Competence of the course teacher
  - Diversity of the topics covered
  - Real grasp of matter or skill
178. Which of the following is not true in context of the given passage?
- Lifelong learning is a recent concept
  - Workers knowledge and skills also need to be updated constantly
  - 'Learning to Be' defends that there is a terminal point to education
  - School and colleges should open extension services.
179. According to the author, the concept of 'lifetime education is '
- As old as traditional education
  - Still in formative stage
  - In vogue in advanced countries
  - Not practical
180. Integrating the concept of lifelong learning with the educational structure would imply
- Closing down conventional school and colleges

- b. Longer durations for all formal courses  
c. Simple rearrangement of present educational organization  
d. More weight for actual performance than real understanding
181. Affluent : lucky (analogy)  
a. Greedy : money  
b. Charitable : stingy  
c. Unsuccessful : lazy  
d. Rely : retort
182. Fooder : steer (analogy)  
a. Goddess : valentine  
b. Pesticide : beetle  
c. Slop : hog  
d. Roe : cupid
183. Act : stage (analogy)  
a. swim : pool  
b. whale : river  
c. cat : dog  
d. fish : trout
184. pilfer : rob (analogy)  
a. doctor : treatment  
b. taste : eat  
c. affirm : intimate  
d. innuendo : desperado
185. archipelago : island (analogy)  
a. peninsula : strait  
b. cluster : star  
c. border : desert  
d. sun : planet
186. extinct (synonym)  
a. dull  
b. wonderful  
c. no longer in existence  
d. still in existence
187. deterrent (synonym)  
a. cleansing substance  
b. defense  
c. restraint of action  
d. warning
188. profusion (antonym)  
a. penetration  
b. abundance

- c. scarcity  
d. ordinance
189. sybarite (antonym)  
a. childless  
b. vascular  
c. ascetic  
d. imposter
190. tear (antonym)  
a. rectify  
b. lacerate  
c. rupture  
d. lancelets
191. Augustan age refers to the reign of the emperor Augustus 27BC to 14BC in  
a. Latin literature  
b. atomic age  
c. dark age  
d. bronze age
192. Who was elected as the interim president of Central African Republic (CAR)?  
a. Mahamath isseine abdoulaye  
b. Catherine samba panza  
c. Desore kolinba  
d. Sam Ouandja
193. Pakistan women cricket team out classed their \_\_\_\_\_ counter parts by seven wickets in the PCB Qatar women's T-20 tri series final  
a. Kenya  
b. South African  
c. Somalia  
d. Sudan
194. Which Pakistan feature film won the special jury award at the losing ceremony of the Jaipur international film festival 2014?  
a. Zinda bhag  
b. Operation 021  
c. Waar  
d. None
195. Pakistan, Turkey and Afghanistan held their \_\_\_\_\_ trilateral summit at Ankara.  
a. 5<sup>th</sup>  
b. 6<sup>th</sup>  
c. 7<sup>th</sup>  
d. 8<sup>th</sup>
196. Where the headquarter of ALIF AILANN is located?  
a. Lahore

- b. Multan
  - c. Quetta
  - d. Islamabad
197. Which Pakistani journalist has got GR-8 women award 2014
- a. Sidra Iqbal
  - b. Mehar bukhari
  - c. Ketrina Hussain
  - d. Jasmin manzoor
198. Which university of observed world spay day to create awareness about controlling the increasing population of dogs
- a. University of Punjab
  - b. Bahauddin zakariya university
  - c. University of veterinary and animal sciences (UVAS)
  - d. International Islamic university
199. Who is current chairman of ICC?
- a. Percy sonn
  - b. David Morgan
  - c. Srinivasan
  - d. Sharad pawar
200. Who was elected as speaker of Balochistan assembly?
- a. Mir Jaan Jamali
  - b. Asad Qaisar
  - c. Arshad Khan
  - d. None of these

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