BRAINWARE UNIVERSITY

Term End Examination 2021 - 22
Programme – Bachelor of Computer Applications
Course Name – Basic Mathematics
Course Code - GEBS101
(Semester I)

Time : 1 Hr.15 Min.   **Full Marks : 60**

[The figure in the margin indicates full marks.]

Group-A
(Multiple Choice Type Question)   1 x 60=60

Choose the correct alternative from the following :

(1) The set O of odd positive integers less than 10 can be expressed by _____

a) {1, 2, 3}   b) {1, 3, 5, 7, 9}

c) {1, 2, 5, 9}   d) {1, 5, 7, 9, 11}

(2) The set of positive integers is _____

a) Infinite   b) Finite

c) Subset   d) Empty

(3) Which set is equivalent to the set {2, 3, 5, 7, 11}?

a) {x: x is an odd number lying between 1 and 13}   b) {21, 23, 25}

c) {x: x is a prime number less than 12}   d) None of these

(4) The number of elements in the power set of power sets of the empty set is

a) 0   b) 1

c) 2   d) 4

(5) Indicate which one of the following is not true.

a) Identity matrix is diagonal matrix   b) Identity matrix is upper triangular matrix

c) Identity matrix is scalar matrix   d) Identity matrix is skew-symmetric matrix

(6) The mode of the observations 2,1,1,2,3,5,2,1,2,6,4,4,21,3 is

a) 3   b) 4

c) 2   d) 1

(7) The standard deviation of the datas 5,1,7,2,6,3 is

a) 4.66   b) 2.16

c) 1.47   d) none of these.

(8) The standard deviation of 4,8,10,12,16 is

a) 1

b) 2

c) 3

d) 4

(9) The mode of the frequency distribution

x_i : 0   1   2   3   4

f_i : 23   24   21   25   20

a) 3

b) 0

c) 1

d) 2

(10) Median from the data : 10,5,9,4,8,7,6 is...

a) 5

b) 6

c) 8

d) 7

(11) The probability that Sukrit passes is 0.9 and Debayan passes is 0.8. The probability that at least one of them is passes is

a) 0.96

b) 0.91

c) 0.98

d) None of these

(12)
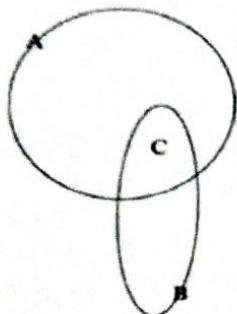
$A = \{3, 4, 5, 6, 7\}$, $B = \{5, 6, 7, 8, 9\}$, $C = ?$

a) $\{3, 4, 5, 6, 7, 8, 9\}$

b) $\{5, 6, 7\}$

c) $\{3, 4, 8, 9\}$

d) none of these

(13)

Determine the number of subsets of the following set: $\{h, i, j\}$

a) 128

b) 64

c) 32

d) 16

(14) Which of these sets are equal:

$A = \{r, t, s\}$, $B = \{s, t, r\}$, $C = \{t, s, r\}$, $D = \{r, s, t\}$

a) A and B

b) A and C

c) B and D

d) all are equal.

(15) Which one of the following is not true?

a) $(A \cup B)' = A' \cup B'$

b) $(A \cap B)' = A' \cup B'$

c) $(A')' = A$

d) $A - B = A \cap B'$

(16) If $A \cup B = B$ holds for all sets B, then

a) $A = \phi$

b) $A = B$

c) $A = \phi$ & $A = B$

d) None of these

(17) Which one of the following is true?

a) $A \cup \phi = \phi$

b) $A \cap \phi = \phi$

c) $A \cup A = \phi$

d) $A \cap A = \phi$

(18) The number of elements in the Power set P(S) of the set $S = \{\phi, \{\phi\}, \{\phi, \{\phi\}\}\}$ is

a) 2

b) 4

c) 8

d) None of these

(19)

If $A = \{a, b, c, d, e, f, g\}$ and $B = \{k, q, l, d, e, f, g\}$, then $A \cap$

a) $\{d, e, f, g\}$

b) $\{a, g, k\}$

c) $\{a, b, c\}$

d) None of these

(20)

Let A be a set with 3 elements and B be a set contains exact others elements then the number of elements in $A \cup B$ is

a) 5

b) 2

c) 3

d) 1

(21) If $\sec\theta = \dfrac{17}{8}$ and θ lies in first quadrant then $\csc\theta =$

a) $\dfrac{17}{15}$

b) $-\dfrac{17}{15}$

c) $\dfrac{15}{17}$

d) None of these

(22) If $\cos(90° - \theta) = \dfrac{1}{2}$, then the value of θ is

a) $15°$

b) $40°$

c) $30°$

d) $0°$

(23) The value of $\sec(-945°)$ is

a) $\sqrt{2}$

b) $-\dfrac{1}{\sqrt{2}}$

c) $-\sqrt{2}$

d)

$$\frac{1}{\sqrt{2}}$$

(24)

If $\tan 35° = 0.7$, then the value of $\tan(-665°)$ is

a) 0.7

b) -0.7

c) 0

d) None of these

(25) If $\tan A = 2$, $\tan B = 3$, then $A + B =$

a) 135°

b) 45°

c) 60°

d) 90°

(26)

The value of $\dfrac{\sqrt{3}}{2\cos 10°} - \dfrac{1}{2\sin 10°}$ is

a) -2

b) 2

c) -1

d) 1

(27) The value of $\sin 15° \sin 75°$ is

a) ¼

b) ½

c) 1/3

d) None of these

(28) If $\tan\theta = 3$, then the value of $\cos 2\theta$ is

a) $-\dfrac{4}{5}$

b) $\dfrac{4}{3}$

c) $\dfrac{1}{3}$

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

(29)

If $\dfrac{\pi}{2} < \theta < \dfrac{3\pi}{4}$ and $\tan 2\theta = \dfrac{3}{4}$, then the value of $\tan\theta$ is

a) 3

b) -3

c) -2

d) 2

(30)

If $0 \le \theta \le \dfrac{\pi}{4}$ and $\sin 2\theta = \dfrac{4}{5}$, then the value of $\tan\theta$ is

a) 2

b) $\dfrac{1}{2}$

c) $-\dfrac{1}{2}$

d) -2

(31) If $\cos x + \sin x - 1 = 0$, then $\sin 2x =$

a) 0

b) 1

c) -1

d) 2

(32)

If $f(x) = \log e^x + e^{\log x}$, then $f'(x) =$

a) 1

b) 2

c) 3

d) 4

(33) $\dfrac{d}{dx}(x \sin x) =$

a) $\sin x + \cos x$

b) $\sin x + x \cos x$

c) $x \sin x + \cos x$

d) none of these.

(34) $\dfrac{d}{dx}(x^2 \cos x) =$

a) $x(2\cos x - x \sin x)$

b) $x^2(2\cos x - x \sin x)$

c) $x^2(2\cos x - x^2 \sin x)$

d) None of these.

(35) If, $y = \dfrac{x^2 - 3x + 4}{x + 3}$ then $\dfrac{dy}{dx} =$

a) $\dfrac{x^2 + 5x - 13}{(x+3)^2}$

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

c) $\dfrac{x^2 + 6x - 13}{(x+3)^2}$

d) None of these.

(36) If, $y = 2x^3 - 15x^2 + 36x + 8$ then $\dfrac{dy}{dx} =$

a) $5x^2 - 30x + 36$

b) $\dfrac{1}{1+x^2}$

c) $6x^2 - 30x + 36$

d) none of these.

(37) If $y = e^{\sin x}$, then $\dfrac{dy}{dx} =$.

a) $\cos x e^{\sin x}$

b) $\sin x e^{\sin x}$

c) $-\dfrac{1}{1+x^2}$

d) $\dfrac{1}{1+x^2}$

(38) If $x^2 + 2xy = y^2$, then $\dfrac{dy}{dx} =$

a) $\dfrac{x+y}{y-x}$

b) $2x+2y$

c) $x+y$

d) $-x$

(39) $y = \sqrt{\dfrac{1 + \cos 2x}{1 - \cos 2x}}$, then $\dfrac{dy}{dx} =$

a) $-\cos ec^2 x$

b) $\sec^2 x$

c) $\tan^2 x$

d) $\cot^2 x$

(40)

If $x = a\sec^2\theta$, $y = b\tan^2\theta$, then $\dfrac{dy}{dx} =$

a) $\dfrac{a}{b}$

b) a

c) ab

d) $\dfrac{b}{a}$

(41)

If $e^x - x^y = 0$, then $\dfrac{dy}{dx}$ is

a) x^2

b) $\dfrac{\log x - 1}{\log x}$

c) $\dfrac{\log x - 1}{(\log x)^2}$

d) None of these

(42)

$\lim\limits_{x \to 0} \dfrac{\sin 2x}{3x}$ is equal to

a) $\dfrac{2}{3}$

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

c) $\dfrac{1}{3}$

d) $\dfrac{1}{2}$

(43)

$\lim\limits_{x \to 0}(1 + 2x)^{\frac{1}{x}}$ is equal to

a) e

b) $2e$

c) $\sqrt{e}$

d) e^2

(44)

If $f(x)$ is continuous in [0,4] and if $\lim\limits_{x \to 1} f(x) = \dfrac{1}{2}$ then $f($

a) 1

b) $\dfrac{1}{2}$

c) 2

d) none of these

(45) $\int \sin^2 x \cos x\, dx = ?$

a) $\dfrac{1}{2}\cos^2 x + c$

b) $\dfrac{1}{3}\cos^3 x + c$

c) $\dfrac{1}{2}\sin^2 x + c$

d) $\dfrac{1}{3}\sin^3 x + c$

(46) Which of the following is correct?

a) $\int \sec^2 x\,dx = \cot x + c$　　　　　　b) $\int \sec^2 x\,dx = \tan x + c$

c) $\int \sec^2 x\,dx = -\tan x + c$　　　　　d) d. $\int \sec^2 x\,dx = -\cot x + c$

(47) $\int \sin 3x\,dx = k\cos 3x$ then k is equal to

a) 3

b) $\frac{1}{3}$

c) $-\frac{1}{3}$

d) None of these

(48) $\int e^{3\log x}\,dx$ is equal to

a) $x^3 + c$

b) $\log x + c$

c) $\frac{x^4}{4} + c$

d) $x^4 + c$

(49) $\int x^2 e^x\,dx =$ is equal to

a) $e^x(x^2 - 2x + 2) + c$

b) $e^x(x^2 + 2x + 2) + c$

c) $e^x(x^2 - 2x - 2) + c$

d) None of these

(50) $\int \tan^2 x\,dx$ is equal to

a) $x - \tan x + c$

b) $\tan x - x + c$

c) $x + \tan x + c$

d) None of these

(51) $\int x^n\,dx = \frac{x^{n+1}}{n+1}$ is not true when n =

a) 1

b) - 1

c) 0

d) any fraction

(52)

For the differential equation $f(x, y)\frac{dy}{dx} + g(x, y) = 0$ to be

a) $\frac{\partial f}{\partial y} = \frac{\partial g}{\partial x}$

b) $\frac{\partial f}{\partial x} = \frac{\partial g}{\partial y}$

c) $\frac{\partial^2 f}{\partial y^2} = \frac{\partial^2 g}{\partial x^2}$

d) $\frac{\partial^2 f}{\partial x^2} = \frac{\partial^2 g}{\partial y^2}$

(53)

The value of the integration $\int_{-1}^{1} x^3\,dx$ is

a) 0

b) 1

c) 2/3

d) -2/3

(54)

The value of $\int_0^1 e^x dx$ is

a) 0

b) e

c) e-1

d) None of these

(55) The value of $\lim_{x \to 2} \frac{x^3 - 8}{x^2 - 4} =$

a) 4

b) 3

c) -1

d) None of these

(56)

value of the determinant $\begin{vmatrix} 11 & 12 & 13 \\ 13 & 14 & 15 \\ 12 & 13 & 14 \end{vmatrix}$ is

a) 1

b) 0

c) -1

d) 67

(57)

Co-factor of -3 in the determinant $\begin{vmatrix} 2 & -3 & 4 \\ 1 & 0 & 1 \\ 0 & -1 & 4 \end{vmatrix}$ is

a) 4

b) -4

c) 0

d) None of these

(58)

The value of the determinant $\begin{vmatrix} 41 & 42 & 43 \\ 47 & 48 & 49 \\ 44 & 45 & 46 \end{vmatrix}$ is

a) 4

b) 1

c) 0

d) None of these.

(59) $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{vmatrix}$ the minor and co-factor of 3 are respectively

a) 3, -3

b) -3, 3

c) -3, -3

d) None of these.

(60)

The value of $\begin{vmatrix} 1 & -2 & 3 \\ 2 & -1 & 4 \\ -2 & 3 & 1 \end{vmatrix}$ is

a) 0

b) 13

c) 19

d) none of these.