BRAINWARE UNIVERSITY

Term End Examination 2021 - 22
Programme – Diploma in Computer Science & Engineering
Course Name – Mathematics II
Course Code - DCSE204
(Semester II)

Time allotted : 1 Hrs.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)

$$\int \frac{dx}{x \log x} =$$

a) logx+c

b) log(logx)+c

c) $e^x + c$

d) None of these

(2)

$$\int \frac{3^x}{3^x + 1} dx =$$

a) $\log|3^x + 1| + c$

b) $3^x + 1 + c$

c) $\log_3^{|3^x+1|} + c$

d) $\log_{10}^{|3^x+1|} + c$

(3)

$$\int \frac{\cos 2x\, dx}{(\sin x + \cos x)^2} =$$

a) $\log|\sin x + \cos x|$

b) $\log|\sin x - \cos x|$

c) $-\log|\sin x + \cos x|$

d) None of these

(4)

$$\int \frac{dx}{\cos^2 x - \sin^2 x} =$$

a) $\log|\sec 2x + \tan 2x| + c$

b) $\log|\sec 2x - \tan 2x| + c$

c) $\frac{1}{2}\log|\sec 2x + \tan 2x| + c$

d)

$$\frac{1}{2}\log|\sec 2x - \tan 2x| + c$$

(5) $\int \frac{\sin^2 x}{\cos^4 x}dx = A\tan^3 x$ then A is

a) 3

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

c) -3

(6) $\int 2^{3x}dx =$

a) $\frac{2^{3x}}{3\log 2} + c$

b) $\frac{2^{3x+1}}{3x+1} + c$

c) $32^{3x}\log 2 + c$

d) None of these

(7) $\int \cot^2 x dx =$

a) -(cotx+x)+c

b) -(cotx-x)+c

c) -cotx+x+c

d) None of these

(8) $\int 0.dx =$

a) 0

b) x

c) dx

d) constant

(9) $\int \frac{1}{x}\left(x + \frac{1}{x}\right)dx$

a) $\left(x - \frac{1}{x}\right) + c$

b) $\left(x^2 - \frac{1}{x^2}\right) + c$

c) $\left(1 - \frac{1}{x^2}\right) + c$

d) $\left(x + \frac{1}{x}\right) + c$

(10) $\int e^{3\log x}dx =$

a) $x^3 + c$

b) logx+c

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

d) $x^4 + c$

(11) The formula $\int a^x dx = \frac{a^x}{\log a} + c$ is invalid for a=

a) 1

b) 2

c) 3

d) None of these

(12) If $\int \frac{dx}{x^2 + 25} = k\tan^{-1}\frac{x}{5}$ then k is

a) 1

b) 5

c) $\frac{1}{5}$

d) -5

(13)

If $\int \dfrac{x\cos x + \sin x}{x \sin x}\,dx = f(x) + \log \sin x + c$ then f(x) is

a) x

b) e^x

c) logx

d) None of these

(14)

$\int e^{1-\log x}\,dx =$

a) ex+c

b) elogx+c

c) xloge+c

d) None of these

(15) $\int \sec 3x \tan 3x\,dx =$

a) $3\sec 3x + c$

b) $\sec 3x + c$

c) $\dfrac{1}{3}\sec x + c$

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

(16) $\int x \sin x\,dx =$

a) xcosx-sinx+c

b) −xcosx+sinx+c

c) xsinx+secx+c

d) none of these

(17)

$\int\limits_{0}^{\frac{\pi}{2}} \cos 2x\,dx =$

a) 0

b) 1

c) 2

d) none of these

(18)

$\int\limits_{1}^{e} \dfrac{\log x}{x}\,dx =$

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

b) 2

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

d) e

(19)

$\int_{0}^{\frac{\pi}{4}} (\sec x + \tan x)\sec x\,dx =$

a) $\sqrt{3}$

b) 2

c) 1

d) $\sqrt{2}$

(20)

$\int\limits_{0}^{\frac{\pi}{4}} \tan^2 x\,dx =$

a) $1 - \dfrac{\pi}{4}$

b) $1 + \dfrac{\pi}{4}$

c) $-\dfrac{\pi}{4}$

d) $\dfrac{\pi}{4}$

(21) $\int_{0}^{1} \frac{dx}{1+x^2} =$

a) $\frac{\pi}{4}$

b) $\frac{\pi}{2}$

c) $\frac{2\pi}{3}$

d) none of these

(22) $\int_{0}^{\frac{\pi}{2}} \sin^2 x\, dx =$

a) 0

b) 1

c) 2

d) $\frac{\pi}{4}$

(23) The order and degree of the differential equation $\left(\frac{dy}{dx}\right)^2 - 2\frac{dy}{dx} = 3x$ are

a) 2,1

b) 2,2

c) 1,1

d) 1,2

(24) The order and degree of the differential equation $\left(\frac{d^2y}{dx^2}\right) = \left(1+\frac{dy}{dx}\right)^{\frac{2}{3}}$ are

a) 2,3

b) 3,2

c) 1,3

d) None of these

(25) The differential equation whose general solutions are y=Asinx+Bcosx is

a) $\frac{d^2y}{dx^2} = y$

b) $\frac{d^2y}{dx^2} = -y$

c) $\frac{d^2y}{dx^2} = 0$

d) none of these

(26) The differential equation whose general equation is y=kx+6 is

a) $y = x\frac{dy}{dx}$

b) $y = \frac{dy}{dx} + 6$

c) $y = x\frac{dy}{dx} + 6$

d) none of these .

(27) The differential equation whose general solutions are y=Asinmx+Bcosmx is

a) $\frac{d^2y}{dx^2} + m^2y = 0$

b) $\frac{d^2y}{dx^2} + y = 0$

c) $\frac{d^2y}{dx^2} + m^2 = 0$

d) none of these

(28) The general solution of xdy-ydx=0 is

a) $y^2 + x^2 = c^2$

b) $y^2 = Ax^2$

c) $y^2 = Ax$

d) $y^2 = -x$

(29) The general solution of xdx+ydy=0 is

a) $x^2 - y^2 = c^2$

b) $x^2 + y^2 = c^2$

c) $x^2y^2=c^2$ d) none of these

(30) If $\dfrac{dy}{dx}=2x$ and y=0 at x=0 then y=

a) x   b) 2x

c) $3x^2$ d) x^2

(31) If $\dfrac{dy}{dx}=-y$ and y=1 at x=2 then x=

a) logy   b) logy+1

c) logy+2   d) 2-logy

(32) The general solution of the differential equation $\dfrac{dy}{dx}=\dfrac{1+y^2}{1+x^2}$ is

a) $y=\tan^{-1}x+c$ b) $x=\tan^{-1}y+c$

c) $\tan(xy)=c$ d) y-x=c(1+xy)

(33) Integrating factor of $\left(x^2+y^2+x\right)dx+xydy=0$ is

a) x   b) y

c) x^2 d) y^2

(34) Solution of $\dfrac{ydx-xdy}{y^2}+\sin xdx+dy=0$

a) $\dfrac{x}{y}-\cos x+y=C$ b) $\dfrac{x}{y}+\cos x+y=C$

c) $\dfrac{x}{y}-\cos x-y=C$ d) none of these

(35) The integrating factor of the equation $\dfrac{dx}{dy}+\dfrac{x}{1+y^2}=\dfrac{e^{-\tan^{-1}y}}{1+y^2}$ is

a) $\tan^{-1}y$ b) $e^{\tan y}$

c) $e^{\sin^{-1}y}$ d) $e^{\tan^{-1}y}$

(36) The integrating factor of the equation $\dfrac{dy}{dx}+2xy=x^3$ is

a) e^x b) x^2

c) e^{x^2} d) e^{x^3}

(37) $\dfrac{1}{D}\left(x^{\frac{5}{2}}\right)=$

a) $\dfrac{7}{2}x^{\frac{7}{2}}$ b) $\dfrac{2}{7}x^{\frac{7}{2}}$

c) $x^{\frac{7}{2}}$ d) $x^{\frac{7}{2}}$

(38)

If $P(A+B) = \frac{2}{7}$ then the probability of $P(\overline{A}.\overline{B})$ is

a) $\frac{1}{7}$

b) $\frac{2}{7}$

c) $\frac{5}{7}$

d) None of these

(39) The probability of any event A satisfies

a) $P(A) \geq 1$

b) $P(A) < 0$

c) $0 \leq P(A) \leq 1$

d) None of these

(40) Two events A and B are mutually exclusive if

a) $P(A \cap B) = P(A).P(B)$

b) $P(A \cap B) = 1$

c) $P(A \cap B) = 0$

d) none of these

(41)

If $P(A \cup B) = \frac{7}{8}, P(A \cap B) = \frac{1}{4}, P(A^c) = \frac{5}{8}$ then P(B)=

a) $\frac{3}{8}$

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

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

d) $\frac{1}{4}$

(42) Probability of an impossible event is

a) $-\infty$

b) 1

c) 0

d) none of these

(43) One card is drawn from a standard pack of 52. The probability which is either king or a queen is

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

b) $\frac{2}{13}$

c) $\frac{3}{13}$

d) none of these

(44) Two unbiased coins are tossed. Then the probability of obtaining at least one tail is

a) $\frac{4}{3}$

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

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

d) none of these

(45) Two unbiased coins are tossed one after another , the probability that one is head and other is tail is

a) $\frac{1}{4}$

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

c) $\frac{3}{4}$

d) none of these

(46) An unbiased die is rolled , the probability that an odd point or a six will appear on the top of the die is

a) $\frac{1}{2}$

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

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

d) none of these

(47) Let A and B be two events and $P\left(\bar{A}\right)=0.3, P(B)=0.4, P\left(\overline{AB}\right)=0.5;$ then $P\left(\overline{A+B}\right)=$

a) 0.5

b) 0.8

c) 1

d) none of these

(48) An urn contains 4 white and 6 black balls. Two balls are drawn one after another without replacement. Probability of one ball white and one black is

a) $\dfrac{1}{24}$

b) $\dfrac{4}{15}$

c) $\dfrac{8}{15}$

d) none of these

(49) Median of the frequency distribution

x_i :3   2   5   1
f_i :2   1   1   3

a) 5

b) $\dfrac{16}{7}$

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

d) $\dfrac{7}{16}$

(50) The A.M OF x-2, 10, x+3 , 7 is 9 . The value of x is

a) 10

b) 9

c) 0

d) 11

(51) The A.M of the datas 13,15,17,19,23,30 is

a) 19

b) 19.5

c) 20.5

d) none of these

(52) If y=3x-100 and $\bar{x}$=50 then the value of $\bar{y}$

a) 60

b) 30

c) 100

d) 50

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

a) 5

b) 7

c) 6

d) 8

(54) For a distribution having single mode , the mean is 42.58, median is 42.1 , mode is

a) 41.14

b) 38

c) 40

d) none of these

(55) The mode of the frequency distribution

x_i :0   1   2   3   4
f_i :23   24   21   25   20

a) 0

b) 1

c) 2

d) 3

(56)

$2x+y=3$ is the relation between two variables x and y . If $\sigma_x = 3$ then $\sigma_y =$

a) 3

b) 4

c) 6

d) none of these

(57) Two variables x and y are related by y=10-3x . If the SD of x is 4 then SD of y is

a) 10

b) 11

c) 12

d) 20

(58) Mean and Median of 3,6,24,18,0 are

a) 10.2 , 3

b) 10.2,6

c) 20.25 , 6

d) none of these

(59) If var(x)=5 and y=5x+6 then var(y) =

a) 125

b) 150

c) 6

d) none of these

(60) Which are the following digits are not significant of the number 0.025

a) 0

b) 2

c) 5

d) none of these