BRAINWARE UNIVERSITY

Term End Examination 2021 - 22
Programme – Diploma in Electrical Engineering
Course Name – Mathematics II
Course Code - DEE204
(Semester II)

Time allotted : 1 Hrs.25 Min. **Full Marks : 70**

[The figure in the margin indicates full marks.]

Group-A

(Multiple Choice Type Question) 1 x 70=70

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 $\int \frac{x\cos x + \sin x}{x\sin x} dx = f(x) + \log\sin x + c$ 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) $\frac{1}{3}\sec x + c$
d) $\frac{1}{3}\sec 3x + c$

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

a) xcosx-sinx+c
b) $-$xcosx+sinx+c
c) xsinx+secx+c
d) none of these

(17) $\int_0^{\frac{\pi}{2}} \cos 2x dx =$

a) 0
b) 1
c) 2
d) none of these

(18) $\int_1^e \frac{\log x}{x}dx =$

a) $\frac{1}{2}$
b) 2
c) $\frac{1}{e}$
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) $\int_0^{\frac{\pi}{4}} \tan^2 x dx =$

a) $1-\frac{\pi}{4}$
b) $1+\frac{\pi}{4}$
c) $-\frac{\pi}{4}$
d) $\frac{\pi}{4}$

(21) $\int_0^1 \frac{dx}{1+x^2} =$

a)
b)

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 $\frac{dy}{dx} = 2x$ and y=0 at x=0 then y=

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

(31) If $\frac{dy}{dx} = -y$ 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 $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$ 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 $(x^2 + y^2 + x)\,dx + xy\,dy = 0$ is

a) x
b) y
c) x^2
d) y^2

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

a) $\frac{x}{y} - \cos x + y = C$
b) $\frac{x}{y} + \cos x + y = C$
c) $\frac{x}{y} - \cos x - y = C$
d) none of these

(35) The integrating factor of the equation $\frac{dx}{dy} + \frac{x}{1+y^2} = \frac{e^{-\tan^{-1} y}}{1+y^2}$ 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 $\frac{dy}{dx} + 2xy = x^3$ is

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

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

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

(38) If $P(A+B) = \frac{2}{7}$ then the probability of $P(\bar{A}.\bar{B})$ 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) $\mathbf{P(A \cap B) = P(A).P(B)}$

b) $\mathbf{P(A \cap B) = 1}$

c) $\mathbf{P(A \cap B) = 0}$

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) $\frac{2}{3}$

d) none of these

(47)

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

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 replace ment. Probability of one ball white and one black is

a) $\frac{1}{24}$
b) $\frac{4}{15}$
c) $\frac{8}{15}$
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) $\frac{16}{7}$
c) $\frac{1}{2}$
d) $\frac{7}{16}$

(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 σ_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

(61) The number of significant digit in the number 3.0056 is

a) 3
b) 4
c) 5
d) 2

(62)

$\Delta^2(e^x)$ (taking h=1) is equal to

a) $(e-1)e^x$
b) $(e-1)^2e^{2x}$
c) $(e-1)^2e^x$
d) e^x

(63)

The value of $\Delta^2(ax^2+bx+c)$ is

a) ah^2
b) 2a
c) a
d) $2ah^2$

(64)

Taking $h=\pi, \Delta(x+\cos x)$

a) $\pi+2\cos x$
b) x-sinx
c) $\pi-2\cos x$
d) 1-sinx

(65) Newton' s forward interpolation formula is use to interpolate

a) near end
b) near central position
c) near beginning
d) none of these

(66) Lagrange's interpolation formula deals with

a) Equispaced arguments only
b) Unquispaced arguments only
c) both (a) and (b)
d) none of these

(67) For a given set of values of x and f(x) , the interpolation polynomial is

a) Unique
b) not unique
c) *has degree* ≥ 3
d) none of these

(68)

In Trapezoidal rule for evaluating the approximate value of $\int_a^b f(x)dx$; the area given by this integral is approximated by the sum of area of some

a) rectangle
b) sectorial figure
c) trapezium
d) none of these

(69) The degree of precision of Trapezoidal rule is

a) 1
b) 2
c) 3
d) 5

(70) After being rounded off to two places of decimals the number 8.1083 becomes

a) 8.10
b) 0.11
c) 8.11
d) none of these