BRAINWARE UNIVERSITY

Term End Examination 2023

Programme – Dip.CSE-2022/Dip.ME-2022/Diploma in Robotics & Automation-2022/Dip.EE-2022/Dip.CE-2022

Course Name – Mathematics-II

Course Code - BS202

(Semester II)

Time : 2:30 Hours

Full Marks : 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as prac cable.]

Group-A

(Mul ple Choice Type Ques on) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) After being rounded off to two places of decimals the number 8.1083 becomes which of the following option. Choose the correct answer.

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

(ii) Identify 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 .

(iii) Identify the value of $\int \frac{1}{x}\left(x+\frac{1}{x}\right)dx$

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

(iv) Identify that the general solution of the differential equation $\frac{d^2y}{dx^2}+x\frac{dy}{dx}=0$ contains

a) 1 arbitrary constant
b) 2 arbitrary constants
c) 3 arbitrary constants
d) 4 arbitrary constants

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

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

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

d) none of these

(vi) Identify the value of $\int \frac{e^x+1}{e^x}dx =$

a) $x+e^{-x}+c$

b) $-x-e^{-x}+c$

c) $x-e^{-x}+c$

d) $xe^{-x}+c$

(vii) Iden fy the value of $\int xe^x dx =$

a) xe^x+e^x+c

b) $2e^x+c$

c) xe^x-e^x+c

d) none of these

(viii) If $\frac{dy}{dx}=-1$ and y=1 at x=2 then identify the value of x is

a) logy

b) logy+1

c) logy+2

d) 2-logy

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

(ix) Identify the value of $\int \frac{e^{2\tan^{-1}x}}{1+x^2}dx =$

a) $e^{2\tan^{-1}x}$

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

c) $\frac{1}{2}e^{2\tan^{-1}x}$

d) None of these

(x) Examine the correct degree of the interpolation polynomial of a function whose values are known at 8 points is

a) 5

b) 6

c) 7

d) 8

(xi) Let A and B are two events corresponding to a random experiment E . If $P(A)=\frac{1}{4}, P(B)=\frac{2}{5}$ and $P(A+B)=\frac{1}{2}$, then identify the value of $P(AB)=$

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

b) $\frac{4}{5}$

c) $\frac{1}{6}$

d) $\frac{3}{20}$

(xii) Identify that 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)

(xiii) For a given set of values of x and f(x) , the interpolation polynomial is which of the following option.Choose the correct answer.

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

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

(xiv) 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 which of the following option.Choose the correct answer

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

(xv) Choose the degree of precision of Trapezoidal rule is

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

Group-B

(Short Answer Type Ques ons) 3 x 5=15

2. Identify the value of $\int(\frac{1}{x}+x^3+x^6)dx$ (3)

3. Two fair coins thrown. Identify the probability of getting both heads ? (3)

4. Two fair coins thrown. Identify the probability of getting one head and one tail? (3)

5. Calculate: $\frac{dy}{dx}=8x^2$ (3)

6. Calculate the mean from the data showing marks of students in a class in a test: 40, 50, 55, 78, 58. (3)

OR

Evaluate the arithmetic mean of the following distribution. (3)

Marks	20-29	30-39	40-49	50-59	60-69	70-79
No. of students	5	11	18	22	16	8

Group-C

(Long Answer Type Ques ons) 5 x 6=30

7. Two dice are rolled. Tell the probability that the sum total points on the dice will be 8 ? (5)

8. In a family there are two children. Tell the probability that both of them will have different birthdays ? (5)

9. Iden fy the solu on: $(x\frac{dy}{dx}-y)=\frac{x}{e^{\frac{y}{x}}}$ (5)

10. Write the Mean of the following distribution (5)

x:	158-161	162-165	166-169	170-173	174-177	178-181
f:	11	23	31	18	12	5

11. Evaluate the roots of the equation $2x^2 - 5x + 3 = 0$ using Newton Raphson method? (5)

12. From the following table, evaluate f(0.16) using Newton's forward interpolation formula: (5)

x:	0.1	0.2	0.3	0.4
y=f(x):	1.005	1.020	1.045	1.081

OR

Evaluate the following system by Gauss-Elimination method : (5)

$$2x_1 + 3x_2 + 2x_3 = 2,$$
$$10x_1 + 3x_2 + 4x_3 = 4,$$
$$3x_1 + 6x_2 + x_3 = -6.$$

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