



25802551

QP CODE: 25802551		Reg No	:	
		Name	:	

INTEGRATED MSC DEGREE EXAMINATION, MAY 2025

Fourth Semester

CORE - ICSC4CR5 - BASICS OF ARTIFICIAL INTELLIGENCE

INTEGRATED MSC COMPUTER SCIENCE-ARTIFICIAL INTELLIGENCE AND MACHINE
LEARNING, INTEGRATED MSC COMPUTER SCIENCE-DATA SCIENCE

2020 Admission Onwards

1EB93BD5

Time: 3 Hours

Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

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| 1. | What is Commutative Production Systems? |
| 2. | State the reason why the hill climbing algorithm often gets stuck? |
| 3. | What is Skolemization? |
| 4. | List the components of a script. |
| 5. | What is gradient descent? |
| 6. | Why do we need backpropagation? |
| 7. | Discuss generating function for a sequence. |
| 8. | Differentiate homogenous and non-homogenous recurrence relation. |
| 9. | How is the relationship between the independent variable and dependent variable modeled in regression analysis? |
| 10. | How can Bayesian classification be evaluated and validated, and what are some common metrics used for this purpose? |

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

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| 11. | What is the role of problem formulation in AI? Explain the steps involved in the problem formulation. |
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12.	Explain the map coloring using backtracking with an example.
13.	Write short note on types of Knowledge representation.
14.	Find the derivative of $y=4-x^2$ using the equation of derivative.
15.	Find df/dx , df/dy , d^2f/dx^2 , d^2f/dy^2 of $f(x,y)=xy^2+xy+x^2-y^2$
16.	Explain various asymptotic notations.
17.	The probability of a student passing in science is $\frac{1}{5}$ and the of the student passing in both science and maths is $\frac{1}{2}$. What is the probability of that student passing in maths knowing that he passed in science?
18.	Calculate standard deviation for the following dataset of 10 test scores from a statistics class:{68, 75, 82, 59, 73, 89, 94, 78, 81, 90}
(6×2=12 weightage)	
Part C (Essay Type Questions)	
Answer any two questions.	
Weight 5 each.	
19.	Explain in detail about Informed and Uninformed Searching algorithms.
20.	Find jacobian and scaling factor of $f(x,y,z) = \frac{y \sin z}{x^3 - xz}$ 1) $x=x,y,z$ and $f(x,y,z) = \frac{3x}{3x + xy}$ $f(x,y) = \frac{x^2 - y^2}{2xy}$ 2) $x=x,y$ and $f(x,y) = \frac{x^2 - y^2}{2xy}$
21.	a) Solve $y_{n+2}-y_{n+1}-2y_n=n^2$ b) Solve $a_n+2+2a_{n+1}-15a_n=6n+10$ with initial value $a_0=1,a_1=-1/2$
22.	If a fair coin is tossed 5 times using binomial distribution find the probability for the following i) Exactly 2 heads ii) At least 4 heads iii) Not getting head
(2×5=10 weightage)	

