| Reg. No. | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|

| Question Paper Code | 13027 |
|---|---|

**M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024**

Third Semester

**M.E. - Computer Science and Engineering**

**20PCSEL309 - BIO-INSPIRED COMPUTING**

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

**PART - A (10 × 2 = 20 Marks)**

Answer ALL Questions

| | | Marks | K – Level | CO |
|---|---|---|---|---|
| 1. | What is meant by Optimization algorithms? | 2 | K1 | CO1 |
| 2. | List down the two major components of any Meta heuristic algorithms. | 2 | K1 | CO1 |
| 3. | Differentiate unimodal and multimodal Search. | 2 | K2 | CO2 |
| 4. | Difference between discrete and continuous random variables. | 2 | K2 | CO2 |
| 5. | How to formulate the fitness function? | 2 | K1 | CO3 |
| 6. | List the variants of BAT algorithm. | 2 | K1 | CO3 |
| 7. | State the advantages of Firefly Algorithm. | 2 | K1 | CO4 |
| 8. | State the equation for PSO. | 2 | K1 | CO4 |
| 9. | Compare bio-inspired algorithms with traditional algorithms. | 2 | K2 | CO5 |
| 10. | What is meant by Multi objective Optimization? | 2 | K1 | CO5 |

**PART - B (5 × 13 = 65 Marks)**

Answer ALL Questions

| | | | | | |
|---|---|---|---|---|---|
| 11. | a) i) | Explain No-Free Lunch theorem. | 7 | K2 | CO1 |
| | ii) | Illustrate in detail about Gradient descent algorithms. | 6 | K2 | CO1 |
| | | **OR** | | | |
| | b) i) | Explain Parameter Tuning in detail. | 7 | K2 | CO1 |
| | ii) | Illustrate any two Nature-inspired algorithms. | 6 | K2 | CO1 |
| 12. | a) | Describe in detail Simulated Annealing and the importance of Randomization. | 13 | K2 | CO2 |
| | | **OR** | | | |
| | b) | Describe how Optimization is done using Markov Chain. | 13 | K2 | CO2 |
| 13. | a) | Describe about Schema theorem in detail. | 13 | K2 | CO3 |
| | | **OR** | | | |
| | b) | Illustrate in detail about Differential Evolution and its algorithm. | 13 | K2 | CO3 |

*K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create*

14. a) Explain PSO and the Convergence analysis of PSO in detail. *13 K2 CO4*

**OR**

b) Describe in detail about Ant Colony Optimization towards feature selection. *13 K2 CO4*

15. a) Build Ground Glass Opacity Nodules Detection and Segmentation using Snake Model. *13 K3 CO5*

**OR**

b) Construct Fine-Tuning Enhanced Probabilistic Neural Networks Using Meta heuristic-driven Optimization. *13 K3 CO5*

**PART - C (1 × 15 = 15 Marks)**

16. a) Choose an appropriate algorithm and discuss the algorithm for Image Contrast Enhancement. *15 K6 CO6*

**OR**

b) Design a Mobile Object Tracking Using Cuckoo Search algorithm**.** *15 K6 CO6*