

Total No. of Questions : 6]

SEAT No. :

PA-656

[Total No. of Pages : 2

[5928]-100

**M.E. (Computer Engineering)**  
**ARTIFICIAL INTELLIGENCE AND DATA SCIENCE**  
**Research Methodology**  
**(2017 Pattern) (Semester - I) (510101)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) All questions are compulsory.*
- 2) Figures to the right indicate full marks.*
- 3) Draw neat diagrams wherever necessary.*

**Q1)** a) What is significance of Research? Enlist Research paradigms? What is meaning of the research objectives and research outcomes? **[9]**

OR

b) What is the significance of the code of ethics in research? What are various types of research? State generic research process? **[9]**

**Q2)** a) What is a research plan? What are generic elements to be included in Research Proposal? **[8]**

OR

b) What is the significance of following in literature survey. **[8]**

- i) Shodhganga
- ii) Bibliometrics
- iii) ResearchGate
- iv) Paraphrasing

**Q3)** a) What is the hypothesis and the Null hypothesis? How statistical analysis helps in testing of hypothesis? **[8]**

**P.T.O.**

OR

- b) State the use of the following tools : [8]
- i) NOST - Dataplot
  - ii) T-test
  - iii) ANOVA
  - iv) CAT

- Q4)** a) Differentiate between Two-Parameter Optimization and Multi-Parameter Optimization? State steps of Monte Carlo Optimization Method? [8]

OR

- b) State the simplex optimization steps? What are constraints and cost function? State the similarity and differences in simplex and gradient methods of optimization? [8]

- Q5)** a) How respondents in surveys are identified? Elaborate in brief about Survey Statements, Survey Delivery, Survey Timelines, Statistical analysis in surveys? [8]

OR

- b) When to use surveys in research? State general survey guidelines? What are ergonomic as well as human factors affecting surveys? [8]

- Q6)** a) What are various reports used for compiling research findings? Discuss the thesis organization with the significance of the appendix in the thesis? [9]

OR

- b) Elaborate following research outcomes and when which publication is to be attempted. [9]
- i) InPASS (Indian Patents Advanced Search System)
  - ii) Copyright
  - iii) Research Paper



Total No. of Questions : 7]

SEAT No. :

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[5928]-101

**M.E. (Computer Engineering)**  
**BIO-INSPIRED OPTIMIZATION ALGORITHMS**  
**(2017 Pattern) (Semester - I) (510102)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) Solve any 5 from Q.No. 1 to Q.No. 7.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*
- 4) Assume suitable data, if necessary.*

**Q1)** a) Illustrate with examples, when natural computing should be used. [5]

b) Discuss scope of Artificial Immune System. [5]

**Q2)** a) List applications of genetic algorithm. Elaborate any one application in Details. [5]

b) Discuss philosophy of natural computing. [5]

**Q3)** a) Discuss selection and mutation of Evolutionary Programming. [5]

b) Define swarm intelligence. List down basic principles of swarm Intelligence. [5]

**Q4)** a) Discuss self tuning framework and self tuning of firefly algorithm.[5]

b) Discuss idealized rules of Cuckoo search algorithm. [5]

**Q5)** a) Write pseudocode of Bat algorithm. [5]

b) Discuss idealized rules of flower pollination algorithm. [5]

**P.T.O.**

- Q6)** a) Explain important for the development of a clonal selection algorithm. [5]  
b) Write Pseudo code for Forrest's clonal selection algorithm. [5]
- Q7)** a) Describe procedure to implement the censoring phase of the real-valued negative selection algorithm. [5]  
b) Summarize aiNet learning algorithm. [5]



Total No. of Questions : 8]

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[5928]-102

**M.E. (Computer Engineering)**  
**SOFTWARE DEVELOPMENT AND VERSION CONTROL**  
**(2017 Pattern) (Semester - I) (510103)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*
- 4) Assume suitable data, if necessary.*

**Q1)** What is prototyping? Explain the advantages of prototyping in software development. **[9]**

OR

**Q2)** How evolutionary model helps in software development? Discuss its significance with an evolutionary process model. **[9]**

**Q3)** Explain the data centered architecture with advantages and Limitations. **[9]**

OR

**Q4)** Give the types of hierarchical architecture and explain. **[9]**

- Q5)** a) What is the importance of Software architecture? How it is used in development of software? **[8]**
- b) How do you document software architecture? Explain with example. **[8]**

OR

**P.T.O.**

**Q6)** a) Explain build Engineering and its importance in Software configuration management. [8]

b) Explain any four source code management core concepts. [8]

**Q7)** a) Differentiate between centralized and distributed version control systems. [8]

b) Give any four version control operations. [8]

OR

**Q8)** a) Write short note on : [8]

i) CVS

ii) Github

b) Explain SVN version control tool [8]



Total No. of Questions : 12]

SEAT No. :

PA-659

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**[5928]-103**

**M.E. (Computer Engineering)**

**EMBEDDED AND REAL TIME OPERATING SYSTEM**

**(2017 Pattern) (510104) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates :*

- 1) Solve Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*
- 4) Assume suitable data, if necessary.*

- Q1)** a) Explain the software tools used for embedded system development. [5]  
b) Give the characteristics of embedded systems. [3]

OR

- Q2)** a) What are the challenges in the design of embedded system? [5]  
b) What is the use of watchdog timer in embedded system? [3]

- Q3)** a) What are the advantages offered by an ASIP in the design of an embedded system? [4]  
b) What are the common structural units in most of the processors? [4]

OR

- Q4)** a) Brief write about the ARM processor & its features. [4]  
b) What factors have to be considered while selecting processor for an application? [4]

- Q5)** a) Describe serial communication devices and protocols. [5]  
b) Give the brief description of SPI and SCI. [4]

OR

- Q6)** a) Explain any two Mobile System protocols. [5]  
b) Enlist the differences between ISA and PCI buses. [4]

*P.T.O.*

- Q7)** a) Define the Release time, deadline timing constraints in Real time systems. [4]  
b) Compare EDF and LST algorithms. [4]

OR

- Q8)** a) Define the Temporal parameters of real-time process. [4]  
b) What is precedence graph and task graph? Give details. [4]

- Q9)** Explain the steps in priority inheritance algorithm with example. [9]

OR

- Q10)** Explain various ways of Inter-process communication-semaphores, message queues, mailboxes and pipes. [9]

- Q11)** Explain different architecture for inter process communication. [8]

OR

- Q12)** Write short notes on any two: [8]

- a) Windows CE
- b) RTLinux
- c) Embedded software development tools.

