

**M. TECH.-IV (MECHANICAL CAD/CAM) (CBCS – 2015
COURSE) : SUMMER - 2018**

SUBJECT: SELF-STUDY PAPER-II: b) OPTIMIZATION TECHNIQUES

Day: Tuesday
Date: 19/06/2018

S-2018-3133

Time: 11.00 AM TO 02.00 PM
Max. Marks: 60

N.B:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Both the sections should be written in the **SEPARATE** answer books.
- 4) Use of non-programmable **CALCULATOR** is allowed.
- 5) Assume suitable data, if necessary.

SECTION-I

- Q.1** Explain following with suitable examples: (10)
- i) Objective function surfaces.
 - ii) Constraint surface.
 - iii) Design constraints.

OR

- Q.1** Discuss optimization problem classification based on the existence of the constraints and nature of the design variable. (10)

- Q.2** Explain Golden section method and derive necessary formula of it. (10)

OR

- Q.2** Write a short note on unimodality and Bracketing the minimum for one-dimensional unconstrained minimization. (10)

- Q.3** $f(x, y) = xy^2$. Use the gradient to evaluate the path of steepest ascent at (2, 2). (10)

OR

- Q.3** Why the steepest descent method is not widely used in unconstrained optimization codes? (10)

SECTION-II

- Q.4** Write a short note on stochastic geometric programming. (10)

OR

- Q.4** Write a short note on stochastic linear programming. (10)

- Q.5** Explain the genetic operators, reproduction crossover and mutation. (10)

OR

- Q.5** Write a short note on neural-network based optimization. (10)

- Q.6** Explain in brief methods of multi-objective optimization. (10)

OR

- Q.6** How to identify a single Pareto point or more? Discuss min-max Pareto solution. (10)