

3E2071

Roll No. : _____

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B. Tech. (Sem. III) (Main/Back) Examination, January - 2012
Computer Engg. & Information Tech.
3IT1 & 3CS1 Mathematics III

Time : 3 Hours]

[Total Marks : 80
[Min. Passing Marks : 24**Instructions to Candidates :**

Attempt any **five questions** selecting **one question** from each **unit**. All questions carry **equal marks**. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. _____ Nil _____

2. _____ Nil _____

UNIT - I

- 1 (a) The profit earned p , by a company is function of the units produced (x) and is given by $p = 800x - 2x^2$. If the company's expenditure on interest, rent and salary of the staff be Rs. 1 lac, show that the company will always be in loss.
- (b) Find the volume of the greatest right circular cone described by the revolution of a triangle of hypotenuse c about one of its sides.

OR

- 1 (a) Consider the following optimization problem :

$$\text{Maximize } Z = -x_1 - x_2$$

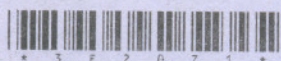
$$\text{subject to } x_1^2 + x_2^2 - 2 \geq 0$$

$$x_1 + 3x_2 - 4 \geq 0$$

$$-x_1 - x_2^4 + 30 > 0$$

Find the Lagrange multipliers.

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