Any data not given is to be assumed

## PROBLEM NO 1

a - It is required to expand the Load shown in Fig. 1 in a double Fourier Series Form

$$P(x,y) = \sum_{m=1}^{\infty} \sum_{n=1}^{\infty} q_{mn} \sin \frac{m\pi x}{a} \sin \frac{n\pi y}{b}$$

b – It is required to determine the Type of the Surface and the Normal Curvature  $k_n$  for the Position Vector

 $r = x \underline{i} + y \underline{j} + z (x, y) \underline{k}$ ,  $z (x, y) = c (x^2 - y^2)$ , c = constant

PROBLEM NO 2

It is required to design a Reinforced Concrete Elliptic Paraboloid Shell Roof System to cover a Square Area of 26 x 26 ms

(  $f_x~=~5.0~ms$  ,  $~f_y~=~5.0~ms$  , Slab thickness 10 cm , Cover =  $~50~kg/m^2$  and Live Load =  $100~kg/m^2$  )

Choose one of the following problems

## PROBLEM NO 3

It is required to design a Reinforced Concrete Hyperbolic Paraboloid Shell Roof System to cover the Area shown in Fig. 2

## PROBLEM NO 4

It is required to design a One Bay Reinforced Concrete Circular Cylindrical Shell Roof System having the Cross-Section shown in Fig. 3 to cover a Rectangular Area of 5 x 24 ms

