INTRODUCTION
A certain amount of fat is always present in the tissue of a normal, healthy, living individual which is somewhat more in women than in men. A person having excess of fat is considered obese and the one with small quantity of fat is considered thin. High degree of obesity is easy to detect by sight; apparent absence of fat indicates malnutrition. However, moderate degree of obesity cannot be detected by sight. Fat is located mostly in the subcutaneous tissue, mesenteries, greater and lesser omenta, extraperitoneal tissues, medullary cavities of long bones and around some internal organs such as the kidneys and when in excess deposit of fat occurs even in the heart.

After body growth has ceased, a gain in weight can be due to deposit of fat, increase in the size of the muscle fibres (by exercise), or increase in the extracellular fluid. Although details are not available, it appears that the deposit of subcutaneous fat occurs pari passu with deposit of fat in the mesenteries, omenta and around the organs mentioned above. It is not possible to estimate the quantity of internal fat in a living individual but the fat in the subcutaneous tissue has been estimated by various methods including
measuring of skinfold thickness by calipers, determining the subcutaneous tissues by using radiographic techniques and estimating body density by weighing subjects in air and underwater.

Estimation of body fat by measuring surface area and skinfold thickness was introduced by Matiegka (1921). Radiographic technique for studying fat thickness in subcutaneous tissue was standardized by Stuart, Hill and Shaw (1940). Direct method to study fat contents in cadavers and animals by extracting fat with solvents like ether was used to judge the reliability of the other methods (Rathbun and Pace, 1945). A good correlation has been found to exist between fat estimated by skinfold method and that calculated by estimating body density (Brozek and Keys, 1951; Pascale, Grossman, Sloane and Frankel, 1956; Durnin 1967). Similarly, skinfold method has been found to be as accurate as the radiographic technique (Garn and Gorman, 1956). Estimation of body fat by the skinfold method has been adopted by various workers because of the ease with which this could be carried out.

Racial differences in subcutaneous fat by the
The triceps skinfold was found to be larger in European adolescents than in the Africans (Eveleth and Tanner, 1976). Even Euro-American adolescents have larger triceps skinfolds than the Afro-Americans living in the same city while the subscapular skinfold is comparable in the Africans and the Europeans (Garn and Clark, 1976; Malina, 1966). Medial calf skinfold thickness was considerably smaller in the Afro-American adolescents than in the Euro-Americans (Falkner and Tanner, 1978). Suprailiac and midaxillary skinfolds were also smaller in the Blacks than in the Whites (Falkner and Tanner, 1978).

Two types of obesity are recognised (Vague, 1956), the android type and the gynoid type. In the android type fat accumulates on the upper part of the body (the "apple" type) i.e. shoulders, upper limbs, thorax and abdomen while in the gynoid type the lower parts of the body including the hips and lower limbs are involved (the "pear" type). Vague (1956) found that people with android type of obesity were more prone to diabetes and atherosclerosis than the gynoid type. According to Müller (1982) in adolescence and third decade of life redistribution of body fat from the
extremities occurs towards the trunk which is a musculinising process. A longitudinal study conducted by Larson, Svardsudd, Welin, Witholmsen, Bjorntorp and Tibblin (1984) showed that cardiovascular diseases were more common in men with higher ratio between waist and hip circumferences. Similar results were found in another longitudinal study on the females in Sweden (Lapidus, Bengtsson, Larson, Pennert, Rybo and Sjostron, 1984). Wadden, Stunkard, Johnston, Wang, Pierson, Van Itallie, Costello and Peña (1988) noted that in U.S.A. the upper body fat showed larger reduction than the lower body fat during weight loss.

The above mentioned introduction shows:
1. Estimation of fat by skinfold method may give fairly accurate idea of the total body fat in an individual.
2. Racial variations exist in the skinfold thickness.

Considerable amount of work on the subject has already been conducted abroad (Matiegka, 1921; Brozek and Keys, 1951; Edwards, Hammod, Healy, Tanner and Whitehouse, 1955; Garn and Gorman, 1956; Pascale et al., 1956; Perikova, 1961 a; Damon and Goldman,
1964; Perizkova and Goldstein, 1970; Johnston, Hamill and Lameshow, 1974; Johnston, Dechow and Macvean, 1975; Tanner and Whitehouse, 1975; Müller and Stallones, 1980; Larson et al., 1984). However, very little work on fat patterning has been done in India, the only available literature on this subject is by Berry, 1968, 1971; Raghbir, 1967; Sharma and Kaul, 1970; Satwanti, Bhardwaj and Singh, 1977, 1978; Sidhu and Kansal, 1977; Satwanti, Singh and Bhardwaj, 1980; ICMR, 1984. In Chandigarh, Berry (1968, 1971) conducted a study on boys between the ages of 18 and 27 years but his study was limited to three skinfolds of the body namely the triceps, infrascapular and suprailiac. Neither he extended his study to the females nor to the lower limbs. Sharma and Kaul (1970) have measured 4 skinfolds (triceps, subscapular, suprailiac and calf) in boys of 5-17 years of age belonging to lower-middle and lower socioeconomic status. Other studies are from Delhi, Raghbir (1967) compared the roentgenogrammetric and somatometric methods (circumference and diameter of the upper arm, skinfold thicknesses at biceps and triceps) for assessing subcutaneous fat and muscle
thickness in the left upper arm in males of 20-52 years of age. Raja and Raghbir (1978) assessed body composition (body fat and lean body mass) by anthropometric methods (body density and a battery of 61 anthropometric measurements comprising of lengths, diameters, girths and skinfold thicknesses) in the females of 20-25 years. Satwanti, Bhardwaj and Singh (1977) estimated body density in women by taking various anthropometric measurements (applying prediction equation as found in the European women) and compared them with actual body density calculated by densitometric technique. The same authors (1980) also correlated "body composition" estimated by densitometric and anthropometric methods.

A review of literature shows that most of the workers in India have estimated body fat by skinfold method only in a small number of subjects. Raghbir (1967), Raja and Raghbir (1978), Satwanti, Bhardwaj and Singh (1977) and Satwanti, Singh and Bhardwaj (1980 b) examined less than 100 subjects. Sharma and Kaul (1970) and Satwanti, Singh and Bhardwaj (1980 a) examined 325 and 230 subjects respectively. Berry (1971) however, published results on 1000 male subjects.

None of the Indian workers compared the skinfold thickness in the two sexes in various age-group of the
same population. Either they have taken only the males (Ragbir, 1967; Sharma and Kaul, 1970 and Berry, 1971) or female subjects (Satwanti et al., 1977; Raja and Ragbir, 1978; Satwanti et al., 1980 a and Satwanti et al. 1980 b).

Most of the workers including Satwanti et al. (1977, 1980 a, 1980 b) in India have ignored the socioeconomic status of the subjects while estimating fat by skinfold methods. Sharma and Kaul (1970) however, did note the occupation, number of family members, educational background of parents and type of school of children but they did not specify as to how their criteria affected their classification. Sharma and Kaul (1970) differentiated the lower-middle and lower socioeconomic groups on the basis of the income of the parents. Parents with income between Rs. 200/- and Rs. 500/- per month were placed in lower-middle socioeconomic group and those between Rs. 100/- and Rs. 200/- per month in the lower socioeconomic groups. They did not take into consideration the upper and middle socioeconomic groups. Berry (1971) divided subjects into four groups, the socioeconomic status of which was based entirely on the income of the family irrespective of the number of mouths to be fed by its earning member.
Whether a particular person is properly nourished or not can be found out from the amount of fat deposited under the skin, which can be estimated by measuring the skinfold thickness. Socioeconomic status of a given population will affect the nourishment of the individual which in turn will show the amount of fat deposited under the skin. It is, therefore, necessary to know the socioeconomic status of a given population before one can arrive at norms. After the norms have been established, only then one can find whether a particular person is undernourished or overnourished (obese).

It appears that following lacunae exist in the previous studies on fat patterning in India.

1. Sexual differences have not been identified in the same age-groups.
2. Identification of the various socioeconomic status is based entirely on the income of the earning member. This does not look logical. One must take into consideration the number of mouths to be fed and their educational status.
3. Difference in skinfold thickness of the subjects belonging to higher and lower socioeconomic status have not been studied.
4. Racial variations have not been discussed.
In this thesis attempt will be made to overcome the lacunae mentioned above.

Objectives

1. To describe the patterns obtained by height, weight, skinfold thicknesses and circumferences in adolescent and adult males and females of Chandigarh zone (North-West India).
2. To compare the patterns of height, weight, skinfold thicknesses and circumferences between the two sexes.
3. To compare the patterns of height, weight, skinfold thicknesses and circumferences between upper and lower socioeconomic groups.
4. To study the relationship of height, weight, skinfold thicknesses and circumferences.