1. **Methodology**

work plan and Methodology will be adopted.

1.1 **Literature Review**

Extensive literature review will be carried out using internationally recognized scientific databases, indexed journals, standard reference books, recognized website, and other suitable internet facilities.

1.2 **Preformulation studies**

- Selection of polymers and drugs
- Characterization of drugs and polymers including drug polymer interactions
- Analytical method development
  - Spectrophotometric method of estimation for Valsartan, Irbesartan and Telmisartan will be carried out. Fourier transform infrared (FTIR) spectral studies and Differential scanning Calorimetry (DSC) studies to investigate the possible drug polymer interaction will be done.
- Standardization of the method of preparation of Solid Dispersions

**Preparation of Telmisartan-β-cyclodextrin inclusion complex**

There are various methods to prepare inclusion complex using drug and β-cyclodextrin are as follows:

1. **Preparation of cyclodextrin complex by physical mixture method.**

Drug and β-Cyclodextrin in the proportion of appropriate molar ratio (1:2 molar ratio) were mixed in a mortar for one hour.

2. **Preparation of inclusion complex by kneading method**

Drug and β-Cyclodextrin in the proportion of appropriate molar ratio (1:2 molar ratio) were mixed in a mortar for one hour with small quantities of distilled water and methanol was added intermittently to get slurry like consistency. The paste was dried in the oven at the temperature of 45°C. Dried complex were pulverized into fine powder and sifted with sieve # 80.

3. **Preparation of inclusion complex by co-evaporation method.**

Drug and β-cyclodextrin in 1:2 molar ratio were mixed and 10 ml methanolic solution of drug was added slowly to 10 ml aqueous solution of cyclodextrin followed by stirring using magnetic stirrer at 370°C.
Resulting solution were evaporated at the temperature of 45°C. Dried complex were pulverized

**Characterization of Drug-β-Cyclodextrin Complex**

1. **FT- IR Spectral Analysis**
   IR spectrual analysis of pure drug, β-cyclodextrin and telmisartan-β-cyclodextrin inclusion complex was carried out by KBr disc method.

2. **Powder X-ray diffraction analysis**
   Powder X-ray diffraction patterns of telmisartan, β-cyclodextrin and telmisartan-β-cyclodextrin inclusion complex were determined using powder X-ray diffractometer.

3. **Solubility**
   The solubility of telmisartan and telmisartan-β-cyclodextrin complex was checked in various solvent at room temperature using rotary/mechanical shaker. Solubility of drug was determined by saturation method. In 100 ml of solvent 100 mg of drug was added so 1000 g/ml of solution was prepared. Drug was saturated because of insolubility in the solvent out of that 25 ml taken into 50 ml volumetric flask with the help of mechanical shaker and after shaking was completed solution was filtered through whatman filter paper and after suitable dilution absorbance was recorded and concentration of drug in solution was determined. From this concentration amount dissolved in the solvent i.e solubility was determined.

4. **Dissolution study**
   Dissolution study of telmisartan and its complex with β-cyclodextrin was performed to evaluate drug release profile. Dissolution where performed on USP type II dissolution apparatus with 900 ml 6.8 phosphate buffer at 37oC at 50 rpm. 5ml aliquots were withdrawn at specific time interval and filtered using Whatman filter paper. Equal volume of fresh medium was replaced into dissolution medium to maintain constant volume throughout dissolution medium. Absorbance of filtered solution was checked by UV spectrophotometer at 296 nm.

5. **Determination of dug content of Telmisartan-β-cyclodextrin complex**
   Telmisartan-β-cyclodextrin complex was evaluated for the drug content. Telmisartan-β-cyclodextrin complex equivalent to 20 mg drug was stirred with 100 ml of phosphate buffer for 60 min, then the solution
was filtered and treated as stock solution containing 100 mg/ml drug. From this stock solution the concentration of 10 μg/ml was prepared and drug content was determined using calibration curve of pure Telmisartan spectrophotometrically at 296 nm using phosphate buffer as blank.

**Preparation of tablets containing complex of Telmisartan with β-cyclodextrin by direct compression method**

The amounts of complex equivalent to 20 mg of drug was taken and then mixed with directly compressible diluents and superdisintegrants in a mortar. Magnesium stearate and talc were passed through sieve no. 80, mixed and blended with initial mixture in the mortar followed by compression of the blend.

**In-vitro Dissolution studies:**

In-vitro dissolution studies for all the fabricated tablets of telmisartan were carried out using USP apparatus type II at 50 rpm. The dissolution medium used was 6.8 phosphate buffer (900 ml) maintained at 37 ± 0.5°C. Aliquots of dissolution media were withdrawn (5ml) at different intervals and content of telmisartan was measured by determining absorbance at 296 nm. 5ml aliquot was withdrawn at the 1min, 2min to be continued at the 1 min. intervals and filtered by whatman filter paper, suitably diluted and analyzed at 296 nm using UV –visible spectrophotometer. An equal volume of fresh medium, which was pre-warmed at 37°C was replaced in to the dissolution medium after each sampling to maintain the constant volume throughout the test. Absorbance was taken at 296 nm and calculate percentage release.

**Stability Study**

Stability studies of the selected formulated tablets were carried out by keeping the tablets at room temperature and at 40°C ± 2°C / 75 ± 5% RH (stability chamber) for 30days and evaluated for physical properties, drug release and drug content during the testing period. All the parameters were compared with initial