Proteins especially those from eukaryotes which are produced in ralatively low amount can be expressed in large quantity while retaining their biological activities using the knowledge and techniques of molecular bioengineering. By doing genetic manipulation and uptaking the plasmid DNA into cells of suitable host organisms, cells from several organisms were used as host systems to produce desired bioengineered proteins. However, each system have advantages and disadvantages, there is no existing expression system suitable for production of all kinds of proteins by present molecular biology techniques. Heterologous gene expression in *S. cerevisiae* for production of pharmaceutical agents, antigens for vaccines or industrial enzymes, is one of the systems oftenly used. This project aimed at studying the heterologous gene expression in yeast (*Saccharomyces cerevisiae*) using Dengue viral gene encoded envelope protein for Dengue virus serotype 2 as a model gene for the expression. Since Dengue viral infection is still one of the major public health problems in Thailand and much current knowledge of molecular biology of Dengue virus was known. Two kinds of promoter were chosen and used in modified expression vectors respectively: one was regulated promoter from *PHO84* (the gene encodes P_i transporter) and the other was constitutive promoter from *PGK* (the gene encodes phosphoglyceratekinase). cDNA encodes envelope protein of Dengue virus serotype 2 viral protein (Den2E) was cloned into these modified yeast expression vectors (pYC301 and pYC304). The recombinant plasmids were then transformed into cells of *S. cerevisiae* (strain 12T7C and JEL-1). Western blot was used for screening the expression of dengue viral gene from crude protein lysates prepared from cells of the yeast transformants. The lysates from cells of transformant 12T7C[pYC301/Den2E] grown in low-P_i condition (0.22 mM KH_2PO_4) were successfully detected the expressed protein though in very low amount. However, the lysates from those of the transformants JEL-1[pYC301/Den2E] and 12T7C [pYC304/Den2E] failed to be detected. The expressed protein of 12T7C[pYC301/Den2E] has relatively same size of approximately 55 kDa as that expressed from *E. coli* system (as positive control). The expressed protein could react with pooled convalescent sera (PCS) from dengue infected patient but not with the specific monoclonal antibody (3H5). Using immuno affinity method, Ni-NTA agarose could capture the expressed protein whose N-terminal contains six copies of histidine residues which could react to Ni^{++}. Several possible factors caused the low expression level were discussed. From this study, the system utilized inorganic phosphate controlled heterologous gene expression in *S. cerevisiae* was developed. The system still need further studies on the cause(s) of the low expression. In order to further improve the yield of expression. This study could serve as a basis for production of other high value protein using this expression system.