MECHANICAL ENGINEERING DEPARTMENT

MAJOR TEST QUESTION PAPER

Subject : Value Engineering MEL-671

Attempt all questions **Time allowed : 2 hours** **Max Marks : 40**

Q 1.

a) " It is essential to establish a state of open-mindedness and positive thinking for creation as well as for evaluation of ideas for a specified function ", critically examine this statement.

b) How are the promising low cost ideas created for accomplishing various customer desired functions melded together to develop a number of functional alternatives? Explain with an example.

4+4 = 8 marks

Q 2.

a) What is the importance of constructing FAST diagram in a value analysis project?

b) What is the role of utility transformation functions in decision matrix? What functions would you propose for the following attributes and why :
   i) Product appearance
   ii) Dependence on Supplier's schedule

3+5 = 8 marks

Q 3. Differentiate between :

a) % Cost reduction **and** % Value improvement
b) DARSIRI method **and** Value Engineering Job Plan
c) Investigation Phase **and** Recommendation Phase
d) Function Cost-Weight **Matrix and** Function Cost-Worth **Matrix**

8 marks

Q 4. Complete the following statements in the most appropriate manner:

a) The overall performance score of **a** product/system can be quantified by using the technique of ——————————.
b) The primary function of a bunk house is ——————————.
c) One of the design functions of a flash light torch is ——————————.
d) Supporting functions in a FAST diagram are those which ——————————.
e) Purchase price analysis is of no use if ——————————.
f) While implementing a value analysis proposal, the items of old design which are above the cut-off point in processing are ——————————.
g) The objective of General phase of VEJP is ——————————.
h) Two main reasons for the existence of unnecessary cost in product design are —————————— 8 marks

PTO

Q 5.

A Company manufactures fire bricks. Because of rising demand, the Company could increase sales by investing in new equipment to expand output. The selling price of $10 per brick will remain unchanged if the output and sales increase. The accounting department provides the management with following cost estimates based on an annual increase in output of 1,00,000 bricks:

Cost of new equipment having an expected life of five years	$5,00,000
Equipment installation cost	20,000
Annual increase in utility expenses	40,000
Annual increase in labour cost	1,60,000
Annual additional cost for raw materials	4,00,000
Expected salvage value	nil

The sum of the years digits method will be used for calculating depreciation, and the Company is in 40% tax bracket. The company's policy is not to invest money in projects earning less than 30% rate of return. Should the proposed expansion be undertaken?

8 marks