U.S.N | | | | | | | | | | |

P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Sixth Semester, B.E. – Industrial and Production Engineering

Semester End Examination; June - 2016

Economics for Engineers

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer any **FIVE** full questions, selecting **ONE** full question from each unit.*

UNIT - I

1 a. What are the general questions that might encounter in an engineering design maker? Explain. 6

b. Explain interest from the point of view of a vender and borrower. 6

c. What will be the amount accumulated by each of these present investments?

i) Rs. 6750 in 20 yrs at 4% compounded semi-annually. 8

ii) Rs. 11,000 in 10 years at 12% compounded quarterly.

2 a. With a block diagram explain the problem solving process in engineering economics. 6

b. Explain tactics and strategy with an example. 8

c. Determine the effective interest rate for a nominal annual rate of 6% that is compounded : 6

i) Semi-annually ii) Quarterly.

UNIT - II

3 a. List the conditions of PW comparisons. 4

b. Machine X has a first cost of Rs. 9000/- and no salvage value at the end of 6 years of useful life and an operating cost of Rs. 5000/-. Machine Y costs Rs. 16,000/- now and has an expected resale value of Rs. 4000/- at the end of its life of 9 years, operating cost of machine Y is Rs. 4000/- per year. Compare the two alternations on the basis of their present worth at 10% annual interest use CFD for your analysis. 10

c. Two machines perform the same functions. First machine has a cost of Rs. 9500/- relatively higher operating cost of Rs. 1900 per year more than those of second machine and short life of 4 years. The second machine Rs. 25,100 and can be kept in service economically for 8 years. The scrap value from either machine at the end of its life will barely cover its removal cost. Which is preferred when the minimum attractive rate of return (MARR) is 8%? Use EAW (E and C) comparison method. 6

4 a. Explain the NPW method of PW comparison. 4

b. Auto con company is evaluating three robots for possible use in its assembly operations. Only one robot will be purchased. Data associated with these robots are as follows : 10

Contd…2

	Robot A	Robot B	Robot C
First Cost $	55,000	58,000	53,000
Operating and maintenance cost, $	3000/yr	4500/yr	4000/yr
Expected Income, $	40,000/yr	44,000/yr	38,000/yr
Estimated salvage value, $	4000	6000	4000

Assuming a technologies life of 3 years and desired interest rate of 12%, which robot seems to be preferable on the basis of PW comparison. Use CFD for your analysis.

c. Two abrasive wheel cutters A and B have both a life of 4 years and the minimum attractive rate of return is 15% which cutter has the lowest equivalent annual cost?

	Cutter A	Cutter B
First Cost	Rs. 5000	Rs. 3200
Annual Operating Cost	Rs. 780	Rs. 950
Salvage value	Rs. 1000	Rs. NIL

6

UNIT - III

5 a. Explain :

i) IRR ii) MARR 6

b. Explain the physical causes of Depreciation. 6

c. A machine cost Rs. 4.8 Lakhs and has a life of 8 years with a salvage value of Rs. 80,000. Determine ;

i) Depreciation charge using straight line method. 8

ii) Depreciation charge using double declining balance method.

iii) Book value of the machine at the end of each year using double declining balance method.

6. a. State the misconceptions of IRR. 4

b. Explain the functional causes of depreciation. 6

c. A machine was purchased for Rs. 60,000 and its estimated salvage value is Rs. 20,000 after 10 yrs of life.

Compute : 10

i) Depreciation fund after 5 years, using straight line method.

ii) Book value after three years under declining balance method.

UNIT - IV

7 a. Explain :

i) Dependent alternatives 6

ii) Independent alternatives.

b. State the consequences of inflation. 6

Contd…3

c. A machine cost Rs. 20,000/- in new condition. The anticipated operating costs and salvage value for seven years are as given below: 8

Year	1	2	3	4	5	6	7
Operating Cost (Rs)	2000	2300	2600	3000	3400	3900	4000
Resale value (Rs)	18,000	17,200	16,500	16,100	15,700	15,500	15,300

Work out when it is advisable to consider the replacement of the machine with a new one.

8 a. Explain Independent Alternatives. 4

b. What are the reasons replacements? Explain. 8

c. The maintenance cost and resale value per year of a machine whose purchase price is Rs. 7000 is given below : 8

Year	1	2	3	4	5	6	7	8
Maintenance Cost (Rs.)	900	1200	1600	2100	2800	3700	4700	5900
Resale Value (Rs)	4000	2000	1200	600	500	400	400	400

When should the machine replaced?

UNIT - V

9 a. Write the procedure for calculating the standard coding. 6

b. The market price if a machine tool is Rs. 5,00,000. The material cost is Rs. 40,000 and the labour cost is four times the material cost. If the selling and distribution cost is 25% of the factory cost, and the factory overheads are 50% of labour cost. Determine the total cost of the machine tool produced. If the company offers a discount of 20% on the selling price, find whether the company is making profit or loss. 8

c. List the advantages and limitations of BE chart. 6

10a. Briefly explain the components of cost. 6

b. With a neat sketch explain the B.E. chart. 6

c. A firm has a rated capacity to manufacture 1,00,000 Castings in a year. Presently it is making only 55,000 units for which the costs are as follows : 8

i) Fixed production cost = Rs. 13,75,000 ii) Variable production cost = Rs. 16,50,000

iii) Direct material cost = Rs. 19,25,000 iv) Direct Labour cost = Rs. 11,00,000

v) Fixed sales expenses= Rs. 5,50,000 vi) Variable sales expenses = Rs. 4,40,000

The selling price of the die casting is Rs. 155 per unit.

Find:

I) Profit / loss at present level of production

II) B.E.P.

III) Profit / Loss at rated capacity.

* * * *