Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(N)/CE/EE/CSE/ECE/IT/EIE/ICE/BME/CHE/FT/PWE/CT/EEE/SEM-5/HU-501/2012-13

2012

ECONOMICS FOR ENGINEERS

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : 10 × 1 = 10

i) Costs reflected in accounting system only are called

a) Cash cost b) Overhead cost

c) Book cost d) Direct cost.

ii) The opportunity cost of a good is

a) the time last in finding it

b) the quantity of other goods sacrificed to the another unit of that good

c) the expenditure on the good

d) the loss of interest in using saving ?

iii) Which one is the right Accounting Equation ?

a) Assets – Liabilities = Capital

b) Assets + Liabilities = Capital

c) Assets + Capital = Liabilities

d) none of these.

iv) Inflation makes

a) future rupees less valuable than present rupees

b) future rupees more valuable than present rupees

c) future rupees equal to present rupees

d) none of these.

v) If A and B are two independent events then $P(A \text{ and } B)$

a) $P(A) \times P(B)$ b) $P(A) + P(B)$

c) $P(A) / P(B)$ d) $P(A) - P(B)$.

vi) To compute the construction cost per square foot of a building

a) per unit model will be used

b) segmenting model will be used

c) learning curve estimation process will be used

d) none of these.

vii) Which one is fixed cost ?

a) Depreciation of fixed assets

b) Excise duty

c) Cost of advertising

d) Sales tax.

viii) Which one of the following is helpful for measuring inflation ?

a) Learing curve

b) Segmentation model

c) Consumer price index

d) MARR(Minimum attractive rate of return).

ix) In a decision tree arrows coming out of which node have probabilities

a) Decision node

b) Random node

c) Both (a) and (b)

d) none of these.

x) The present worth of an alternative is 0. What do we know about the value of the future worth ?

a) FW < 0

b) FW = 0

c) FW > 0

d) Cannot be determined without cash flows.

xi) If the inflation rate is 6% per year and the market interest rate is known to be 15% per year. What is the implied real interest rate in this inflationary eonomy ?

a) 11.45% b) 9.00%

c) 8.49% d) 8%.

xii) A machine worth Rs. 1,00,000 is purchase by paying Rs. 20,000 down payment and 12 monthly installments of Rs. 8,000 each. The book cost at time of purchase is

a) Rs. 1,00,000 b) Rs. 8,000

c) Rs. 80,000 d) Rs. 12,000.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. An aquaduct is needed *t* bring water into the city. It can be built at a reduced size now for Rs. 3 lakhs and enlarged 25 years later at Rs. 3.5 lakhs. The other option is to construct the full size aqueduct for Rs. 4 lakhs. Use Present Worth to find the better choice. [Given i = 6%].

3. a) Define Break – even point. Represent the elements diagrammatically, and derive the BEP and BEP sales algebraically.

b) The following data relates to ABC Co. for 2011 :

Fixed Factory Overhead = Rs. 30,000

Fixed Selling Overheads = Rs. 6,000

Variable Manufacturing Cost per unit = Rs. 6.00

Variable Selling Cost per unit = Rs. 1.50

Selling Price Per unit = Rs. 12.00

Calculate

i) Break even point in terms of units and BE sales in terms of rupees.

ii) Number of units that need to be sold to make a profit of Rs. 45,000.

4. What is Ratio analysis ? Discuss briefly any three ratios (including their formulae). 1 + 4

5. For the following cash for situation shown in Table 3.4, draw the cash flow diagram and solve for *P* assuming a 12% interest rate.

Year	Cash Flow (L.E)
0	+ P
1	0
2	0
3	– 400
4	0
5	– 600

6. Discuss in detail the concept of Sensitivity Analysis.

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. From the following information calcualate the annual depreciation based on historical and replacement cost respectively and show the amount of additional depreciation that should be provided in each year.

   Cost of machinery Rs. 20,000

   Estimated life 4 years

   Residual Value NIL

   Inflation factor 10% p.a

   Use straight-line method for computing depreciation.

8. a) Find the better choice by using Future Worth [Given i = 12%]

Machine	***Initial Cost***	***Return/Year***	***Life***
A	40 lakhs	8 Lakhs	4 Years
B	45 Lakhs	10 Lakhs	4 Years

b) Find the Equal Annual Worth (EAW)

Initial Cost = Rs. 40,000

Salvage Value = Rs. 5,000

Revenue/year = Rs. 10,000

Life = 10 years

i = 15%.

c) A company wants ot set up a reserve which will help it to have an annual amount equivalent ot Rs. 1,00,000 for every year for the next 20 years towards its employees welfare measure. Find the single payment that has to be made now.

[Given i = 15%] 5 + 5 + 5

9. a) What do you mean by Learing Curve method in cost estimation ?

b) Suppose that an aircraft manufacturer disires to make a preliminary estimate of the cost of building a 600-MW fossil fuel plant for the assembly of its new long distance aircraft. It is known that a 200-MW plant costs $100 million 20 years ago when the approximate cost index was 400 and that cost index in now 1200. The cost capacity factor for a fossil fuel power plant is 0.79.

c) A certain index for the cost of purchasing and installing utility boilers is keyed to 1988, where its baseline value was arbitrarily set at 100. Company XYZ installed a 50,000lb/hour boiler for $525,000 in 2000 when the index had a value of 468. This same company must install another boiler of the same size in 2007. The index in 2007 is 542. What is the approximate cost of the new boiler ? 6 + 6 + 3

10. a) What is NPV ? What are its limitations ? What are the differences between NPV and IRR ?

b) What are the two ways of defining benefit-cost ratio ?

c) The expected cash flows of a project are as follows :

Year	Cash flow
0	– 100,000
1	20,000
2	30,000
3	40,000
4	50,000
5	30,000

The cost of capital is 12%. Calculate the following :

i) net present value

ii) benefit-cost ratio

iii) internal rate of return. (1 + 2 + 2) + 4 + (2 × 3)

11. Write short notes on any *three* of the following : 3 × 5

a) Power sizing model of cost estimation

b) Minimum cost life of a new asset

c) Life cycle costing

d) Debt repayment

e) Balance Sheet.