THU-301-B 171 Printed Pages : 4

Roll No. to be filled in your Answer Book

Roll No. ____________________________

FOR ECE and EEE

Semester: III

B. Tech End Semester Examination Dec 2014

ENGINEERING ECONOMICS

Time : Three Hours] [Max. Marks : 75

Note: Attempt all questions, the marks assigned to each question is indicated at question itself.

Q1. Attempt any four (all questions carry equal marks) (15)

a) Explain the concept of cash flow by elaborating various components of cash flow with the help of an example.

b) Explain the concept of effective annual interest rate.

c) What is capitalized cost, how is it used for comparing two projects.

d) Explain Cost-Benefit analysis and its importance.

e) What do you mean by straight line depreciation? How does it impact the profitability of the firm?

f) What do you mean by book value? What is the procedure of calculating the book value?

Q2. Attempt any four (all questions carry equal marks) (15)

a) How much should be put in an investment with a 10% effective annual rate today to have $10,000 in five years?

b) An asset is purchased that costs $9000. It has a 10-year life and a salvage value of $200. Find the straight-line depreciation and ACRS depreciation for 3 years.
c) An asset is purchased that costs $6000. It has a 10-year life and a salvage value of $150. What is the book value of the asset in the previous example after 3 years using straight-line depreciation? Using ACRS depreciation?

d) Explain the various misconceptions regarding internal rate of return (IRR) method.


f) Write down the various cost reduction and cost control techniques a firm can use to reduce cost various projects.

Q3. Attempt any two (2x7.5)

a) Investment A cost $10,000 today and payback $11,500 two years from now. Investment B costs $8000 today and pays back $4500 each year for two years. If interest rate of 5% is used identify which alternative is superior.

b) What do you mean by Break-even analysis? Explain the linear and non-linear models of break even analysis.

c) Critically analyze the various methods of comparing the projects undertaken by a company.

Q4. Attempt any two (2x7.5)

a) Which of the following alternatives is superior over a 30-year period if the interest rate is 7%?

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Type</th>
<th>Life</th>
<th>Initial Cost</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alternative A</td>
<td>Brick</td>
<td>30 Yr</td>
<td>$1800</td>
<td>$5/Year</td>
</tr>
<tr>
<td>Alternative B</td>
<td>Wood</td>
<td>10 Yr</td>
<td>$450</td>
<td>$20/year</td>
</tr>
</tbody>
</table>
b) A project has a total up-front cost of $435.44. The cash flows are $100 in the first year, $200 in the second year, and $300 in the third year. What's the IRR? If we require an 18 per cent return, should we take this investment?

c) It costs $1000 for hand tools and $1.50 labor per unit to manufacture a product. Another alternative is to manufacture the product by an automated process that costs $15,000, with a $0.50 per-unit cost. With an annual production rate of 5000 units, how long will it take to reach the break-even point?

Q5. Attempt any two \( (2 \times 7.5) \)

a) A corporation that pays 53% of its profit in income taxes invest $10,000 in an asset that will produce $3000 annual revenue for 8 years. If the annual expenses are $700, Salvage after 8 years is $500, and 9% interest is used, what is the after tax net worth? Disregard depreciation.

b) Suppose you have the opportunity to make an investment in a real estate venture that expects to pay investors $750 at the end of each month for the next eight years. You believe that a reasonable return on your investment should be 17 percent compounded monthly. How much should you pay for the investment? What will be the total sum of cash you will receive over the next eight years?
c) A company is considering the purchase of either machine A or machine B.

<table>
<thead>
<tr>
<th></th>
<th>Machine A</th>
<th>Machine B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial cost</td>
<td>$80,000</td>
<td>$100,000</td>
</tr>
<tr>
<td>Estimated life</td>
<td>20 years</td>
<td>25 years</td>
</tr>
<tr>
<td>Salvage value</td>
<td>$20,000</td>
<td>$25,000</td>
</tr>
<tr>
<td>Other costs</td>
<td>$18,000 per year</td>
<td>$15,000/year [for the first 15 yrs] &amp; $20,000 per year for the next 10 yrs</td>
</tr>
</tbody>
</table>

How much money would have to be placed in a sinking fund each year to replace machine B at the end of 20 years if the fund yields 10% annual compound interest and if the first cost of the machine is assumed to increase at a 6% annual compound rate? (Assume the salvage value does not change.)