NEW SCHEME

ME62

USN

# Sixth Semester B.E. Degree Examination, July/August 2005

## Common to ME/IP/IM/MA/AU

# Engineering Economy

Time: 3 hrs.] [Max.Marks : 100

**Note:** *1. Use of Discrete interest factors table is allowed.*
*2. Assume any missing data suitably.*

1. (a) Explain why decisions must be based on differences between alternatives occurring in the future. (6 Marks)

   (b) Discuss the role played by intuition and analysis in decision making. (8 Marks)

   (c) Enumerate the difference between strategy and tactics giving suitable examples. (6 Marks)

2. (a) Briefly explain the interest rate from lenders and borrowers point of view. (6 Marks)

   (b) Briefly state and explain the conditions for present worth comparisons
   Also state present worth by the "72 Rule". (7 Marks)

   (c) the rights to a patent have been sold under an agreement in which annual year end payments of Rs.100,000 are to be made for the next 10 years. What is the future sum of this annuity? What is the present worth of the annuity at an interest rate of 7 percent? (7 Marks)

3. (a) A small dam and an irrigation system are expected to cost Rs.300,000,00. Annual maintenance and operating costs are expected to be Rs.400,000 for the first year and will increase at a rate of 10 percent per year. Determine the equivalent present worth of building dam and operating the system with interest of 10 percent over a 30 year life. (8 Marks)

   (b) 'Megha' electronics is considering the purchase of a new programmable circuit tester in order to improve its product quality. The equipment has a first cost of Rs.85,000 and the salvage value is predicted to be Rs.6,000 after a service life of 5 years. Maintenance and operating costs are expected to be Rs.8,000 for the first year of operation and increase by Rs.1500 per year for each additional year of use. Using an interest rate of 10%, determine what annual savings must be obtained through the use of this equipment to make it economically justifiable. (8 Marks)

   (c) Explain equivalent annual cost method by sinking fund. (4 Marks)

4. (a) An aircraft assembly fixture has a purchase price of Rs.9,00,000 and classed as a 5 year property. Use of the fixture is expected to result in an annual before tax savings of Rs.300,000 for a period of 6 years, at the end of which time it will be obsolete and virtually worthless. Applying the appropriate accelerated schedule, determine

   i) The before tax present worth of the investment at an interest rate of 40 percent.

   ii) The after tax present worth of the investment with an effective tax rate of 40 percent and an interest rate of 20 percent. (10 Marks)

Contd.... 2

(b) A food beverage company is planning expansion of its cold storage facility alternative site design proposals are being considered that uses of MAR at 10 p Plan A and B require an expenditure of Rs.35,00,000 for land which will retain it in 10 years, while plan C requires Rs.45,00,000 for land, which will also retain its Rs.24,80,000 per year. The company requires that a life of 10 years be used for an Data pertaining to the project are given below :

| | Proposal A Rs. | Proposal B Rs. | Proposal C Rs. |
|---|---|---|---|
| Building & installations | 60,00,000 | 70,00,000 | 40,00,000 |
| Compressors | 10,00,000 | 13,50,000 | 8,50,000 |
| Expected energy cost-first year | 6,50,000 | 4,80,000 | 6,50,000 |
| Energy cost-increase for each additional year | 30,000 | 20,000 | 35,000 |
| Annual maintenance cost | 2,00,000 | 1,50,000 | 5,00,000 |
| Estimated salvage value | 3,50,000 | 4,30,000 | 1,80,000 |

Evaluate which proposal to recommend using equated annual worth analysis. Rank proposal using IRR criterion.

5. (a) Briefly explain the types of depreciation. (10 M

(b) A CNC machine costs Rs.30,00,000 is estimated to serve for 8 years after which salvage value is estimated to be Rs.2,50,000. Find (6 Ma

i) Depreciation fund at the end of the 5th year by fixed percentage method and declini balance method.

ii) Book value of the machine after 4th year and 6th year by declining balance metho

(c) Explain how the selling price is fixed for a job, giving all the components of costs u an example. (8 Mari

6. (a) Discuss briefly the importance of financial management in today's business organisations Mar

(b) Explain the following terms with reference to financial statements : (4 Marks

i) Current liabilities

ii) Intangible fixed assets

iii) Operating and non operating expenses.

(c) The following are the items of the profit and loss account for VOLTAS Limited for the year ended on 31st March 2003. You are required to arrange them systematically and indicate (6 Marks)

i) Profit before taxation and ii) Profit after taxation.

Contd.... 3

ME62

VOLTAS Limited.

Profit and Loss account for the year ended 31st March 2003

| | Rs.(Lakh) |
|---|---|
| operating & administrative expenses | 10,440,6 |
| Depreciation | 1,3828 |
| Provision for income tax | 210.0 |
| Interest | 2595.3 |
| Cost of sales & service | 54.773.9 |
| Sales & services | 69,552.9 |
| Provision for wealth tax | 3.5 |
| Other income | 517.6 |
| Excess provision of tax in previous years | 143.0 |
| Proposed dividend | 643.8 |



(10 Marks)

7. (a) How does the use of ratios help in financial analysis?
Explain briefly :
i) Profitability ratios ii) Activity ratios iii) Leverage ratios. (10 Marks)

(b) The total sales call credit of a firm is Rs.6,40,000. It has a gross profit margin of 15% and current ratio is 2.5. The firm's current liability is Rs.96.000. Inventories Rs.48.000 and cash at Rs.16,000

i) Determine the average inventory to be carried by the firm, if an inventory turnover of 5 times is expected.
(Assume a 360 day year).

ii) Determine the average collection period if the opening balance of debtors is intended to be Rs.80,000.
(Assume a 360 day year). (10 Marks)

8. (a) Briefly explain the objectives of profit planning (or budgeting) (6 Marks)

(b) Briefly explain the production budget and purchasing budget. (4 Marks)

(c) For the Philips India, prepare a production budget for 3 months ending 31.3.2004 for four products on the basis of following information.

| Product | Estimated stock on 1-1-2004 (units) | Estimated sales during Jan-March 2004 (units) | Desired closing stock on 31.3.2004 (units) |
|---|---|---|---|
| A | 20,000 | 1,00,000 | 30,000 |
| B | 30,000 | 1,50,000 | 50,000 |
| C | 40,000 | 1,30,000 | 30,000 |
| D | 30,000 | 1,20,000 | 20,000 |

If the cost of the product is Rs.150 per unit for A and B, mention the production units and costs during the three months period.

Also cost of product is Rs.200 per unit for product C and D, mention the production units and costs during the three month period. (10 Marks)

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NEW SCHEME

ME62

Reg. No.

# Sixth Semester B.E. Degree Examination, January/February 2006

## ME / IP / AU / MA / IM

## Engineering Economy

Time: 3 hrs.) (Max.Marks : 100

**Note:** *1. Answer any FIVE full questions.*
*2. Use of interest factor tables permitted.*

1. (a) Describe how the role of economics gained importance in engineering activities. **(6 Marks)**

   (b) Explain how the problem solving process leading ultimately to a decision is carried out. **(8 Marks)**

   (c) Explain the law of diminishing returns. **(6 Marks)**

2. (a) State and explain the reasons for charging interest. **(4 Marks)**

   (b) How much interest is earned on a principal of Rs. 750 for 5 years 9 months at 6 percent compounded monthly? **(6 Marks)**

   (c) Two holiday cottages are under consideration. Compare the present worth of the cost of 24 years service, at an interest rate of 5 percent, when neither cottage has a realizable salvage value

| | Cottage 1 | Cottage 2 |
|---|---|---|
| First cost | Rs. 4,500 | Rs. 10,000 |
| Estimated life | 12 Years | 24 years |
| Annual maintenance cost | Rs. 1,000 | Rs. 720 |

**(10 Marks)**

3. (a) What is capitalized cost for a project with infinite life? Explain. **(6 Marks)**

   (b) Two motorcycles of brand 'A' and 'B' are available on the following terms:

   i) Motorcycle 'A' - Make a down payment of Rs. 5,000 and then Rs. 6,000 at the end of each year for 7 years.

   ii) Motorcycle 'B' - Make a downpayment of Rs. 15,000 and no payment for the next 3 years. From end of the 4th year annual payments of Rs. 12,000 for the next 3 years.

   Draw C.F.D. for comparison and compare the alternatives on future worth basis. **(7 Marks)**



Contd.... 2

(c) Standby lighting generator is required for a shop. Two types are available

| | Type 1 | Type 2 |
|---|---|---|
| First cost | Rs. 5,000 | Rs. 3,200 |
| Salvage value | Rs. 1,000 | Nil |
| Annual operating costs | Rs. 780 | Rs. 950 |

If both generators have a life of 4 years and the interest rate is 15 percent, per year, which offers the lowest equivalent annual cost. (7 Marks)

4. (a) Explain in brief the situations for equivalent annual worth comparisons. (5 Marks)

(b) Following alternatives can perform the same function

| Alternative | First cost (Rs.) | Life(years) | Salvage value (Rs.) | Annual cost (Rs.) |
|---|---|---|---|---|
| A | 6,000 | 6 | 2,000 | 800 |
| B | 3,000 | 3 | 1,000 | 1,000 |
| C | 2,000 | 3 | Nil | 1,200 |

At an annual interest rate of 12 percent, rank the alternatives as per the equivalent annual cost. (7 Marks)

(c) A farmhouse can be purchased for Rs. 90,000 and the expected resale value after 20 years is Rs. 60,000. If the annual rental income is Rs. 11,800 and expenses Rs. 4,700, what will be the rate of return earned on this farmhouse? (8 Marks)

5. (a) List and discuss the causes for depreciation. (4 Marks)

(b) The original assets of a company are Rs. 5,80,000. The life of the plant is 9 years. If the scrap value at that time is expected to be Rs. 80,000, calculate the depreciation at the end of each year by sum of the years digit method. (8 Marks)

(c) Explain the following :

i) Factory cost ii) Fixed overheads
iii) Direct material cost iv) Administrative overheads

(8 Marks)

6. (a) Explain the following :

i) Ledger

ii) Current assets

iii) Fixed liabilities

iv) Creditor

v) Double entry system of accounting

(10 Marks)

Contd.... 3

(b) Following is the financial status of a company as on 31st March 2005.

| | |
|---|---|
| Sundry debtors | Rs. 10,000 |
| Cash in Hand | Rs. 22,000 |
| Bank loans | Rs. 40,000 |
| Bills payable | Rs. 20,000 |
| Equity shares | Rs. 1,13,000 |
| Land and building | Rs. 50,000 |
| Plant and machinery | Rs. 90,000 |
| Inventories | Rs. 15,000 |
| Creditors | Rs. 30,000 |
| Bank balance | Rs. 16,000 |

Prepare a balance sheet as on 31st March 2005. (10 Marks)



7. (a) Explain the following ratios and discuss their importance in financial analysis

I) Liquidity ratio ii) Activity ratio
iii) Profitability ratio

(9 Marks)

(b) A Company produces 30,000 units per annum. The various cost components are as follows :

Direct materials Rs. 6/- per unit
Direct labour Rs. 5/- per unit
Fixed overheads Rs. 60,000
Variable overheads Rs. 2.50 per unit
Prepare the fixed budget for the above. (6 Marks)

(c) Discuss the importance of financial analysis (5 Marks)

8. Write short notes on any FOUR:

a) Financial planning
b) Objectives of profit planning
c) Types of budgets
d) Dangers of budgeting
e) Advantages of budgetary control
f) Limitations of budgeting

(20 Marks)

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ME:23





USN

**NEW SCHEME**

# Sixth Semester B.E. Degree Examination, July 2006
## Mechanical Engineering
## Engineering Economy

Time: 3 hrs.] [Max. Marks:100

Note: *1. Answer any FIVE full questions.*
*2. Use of discrete intersect factor tables is allowed.*
*3. Assume any missing data suitably.*

1 a. Discuss why engineers have to study economics. (06 Marks)
b. Write on the roles of intution and analysis in decision making. (07 Marks)
c. Differentiate between tactics and strategy. (07 Marks)

2 a. Discuss the reasons for charging interest. (06 Marks)
b. A loan of Rs.5,000 is to be repaid in equal in equal monthly installments over $2\frac{1}{2}$ years. The nominal interest rate is 6 percent. How much is each installment? (06 Marks)
c. The following alternatives are available to accomplish an objective of 12 years duration.

| | Plan A | Plan B | Plan C |
|---|---|---|---|
| Life cycle (yrs) | 6 | 3 | 4 |
| First cost (Rs.) | 2,000 | 8,000 | 10,000 |
| Annual cost (Rs.) | 3,200 | 700 | 500 |

Compare the present worth of the alternatives, using an interest rate of 7 percent. (08 Marks)

3 a. What are the conditions assumed for present worth comparisons? Write in brief. (05 Marks)
b. Briefly discuss the usefulness of annual-worth comparison method. (05 Marks)
c. 5 million rupees are donated to a college. 20 students are to be awarded scholarships over the next 20 years. The scholarships are each of Rs.12,000 per year the first year and increase at a rate of Rs.1,500 per year over the following 19 years. Starting with end of the third year, Rs.15,000 are to be spent for maintenance of the college building. This cost rises linearly at the rate of Rs.2,000 per, starting with year 4. Assuming 10 percent interest rate, determine how much money will be available to construct an auditorium now. (10 Marks)

4 a. A plot can be purchased for Rs.1,380,000. Company A offers a loan at 7.5 percent nominal interest to be compounded monthly, if a down payment of Rs.25,000 is paid initially. The loan is to be paid off in 15 years. Company B offers 20 year repayment period with the same down payment but the nominal interest rate is 9 percent compounded monthly. Evaluate the monthly payments for the above two alternatives. (10 Marks)
b. A crane can be taken on lease for a project for 3 years for Rs.180,000 payable now, maintenance included. It can be also purchased for Rs.240,000 and be sold at the end of 3 years for Rs.100,000. Maintenance costs are expected to be Rs.5,000 per year for the first two years and Rs.10,000 for the third year, payable at the end of each year. At what interest rates would the two alternatives be equivalent? (10 Marks)

*Contd... 2*

5 a. Define depreciation and list its causes. (06 Marks)

b. An asset cost was Rs.400 when purchased 4 years ago. A scrap value of Rs.50 was expected at the end of the 7 year useful life. Determine the depreciation charge during the coming year and the asset's current book value by
i) Straight line method of depreciation.
ii) Declining – balance depreciation (using the salvage value to determine the depreciation rate). (07 Marks)

c. Explain in brief various components of cost that are to be considered to arrive at the selling price during manufacture of a product. (07 Marks)

6 a. State and explain the relationship between Assets, Liabilities and Owner's Equity. (04 Marks)

b. Prepare a Balance Sheet for Trinity Forge Company from the following data: (08 Marks)

| | (In thousand rupees) |
|---|---|
| Debentures (unsecured) | 400 |
| Stocks | 650 |
| Cash and bank balance | 112 |
| Long borrowings | 80 |
| Long term loan from financial institutions | 220 |
| Customer's advances | 40 |
| Loans and advances | 50 |
| Land, building, plant and machinery | 2500 |
| Depreciation on the above | 300 |
| Share capital | 2500 |
| Reserves and surplus | 600 |
| Interest receivable | 8 |
| Investments | 900 |
| Creditors | 110 |
| Debtors | 250 |
| Provision for dividend | 50 |
| Provision for taxation | 170 |

c. Following are the items of the profit and loss account of ABC Company for the year ended 31st March 2004. Arrange them systematically and indicate i) Profit before taxation and ii) Profit after taxation. (08 Marks)

| | (Rs. Lakhs) |
|---|---|
| Operating and administrative expenses | 10,440.6 |
| Depreciation | 1,382.8 |
| Provision for income tax | 0.0 |
| Interest | 2,595.3 |
| Cost of sales and services | 54,773.9 |
| Sales and services | 69,552.9 |
| Provision for wealth tax | 3.5 |
| Other income | 517.6 |
| Excess provision of tax in previous years | 143.0 |
| Proposed dividend | 643.8 |

7 a. Discuss the users of financial analysis. (05 Marks)

b. What are liquidity ratios? What are their functions? Explain. (06 Marks)

c. Write short notes on:
i) Return on equity ii) Net profit margin iii) Inventory turn over ratio. (09 Marks)

8 a. Discuss the objective of profit-planning. (07 Marks)

b. What are the types of budgets? Explain. (08 Marks)

c. List and explain the advantages of budgeting. (07 Marks)

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06ME56

# Fifth Semester B.E. Degree Examination, Dec.08/Jan.09
# Engineering Economics

Time. 3 hrs. Max. Marks:100

**Note:** 1. ***Answer any FIVE full questions choosing at least two questions from each part.***
2. ***Interest factors tables permitted.***

**Part A**

1 a. Explain with suitable / relevant examples different engineering economic problems an engineer confronts with, in day-to-day life. **(05 Marks)**

b. An engineering economist solves problems and takes appropriate decisions using time honoured scientific method. Explain with a suitable diagram. **(05 Marks)**

c. Explain how cash flow diagrams (CFD) are helpful to the decision maker to understand and solve engineering economic problems. Draw neat sketches of different versions of cash flow diagrams, and give borrower's and lender's perspectives for cash flow diagrams. **(10 Marks)**

2 a. A person takes a loan of Rs.12000/- from a bank at an interest of 18% P.A. Find the amount if the interest is compounded, i) Annually ii) Half-yearly (Semi-Annually) iii) Quarterly and iv) Monthly. **(12 Marks)**

b. Calculate the effective interest rate "ieff" of a nominal compound interest rate of 18% P.A., when compounded i) Half yearly and ii) Monthly. **(08 Marks)**

3 a. List and explain the conditions for present worth comparisons. **(10 Marks)**

b. Two devices are available to perform a necessary function for 3 years. The initial cost (negative) for each device at time 0 and subsequent annual savings (positive) are shown in the following table. Compare the net present worth of these two devices when the required interest rate is 8%. Draw the cash flow diagram. **(10 Marks)**

| | YEAR | | | |
|---|---|---|---|---|
| | 0 | 1 | 2 | 3 |
| Device A | 12000 | 5500 | 5500 | 5500 |
| Device B | 15000 | 6000 | 6000 | 8000 |

(P/A, 8, 3) = 2.5771; (P/A, 8, 2) = 1.78326; (P/F, 8, 3) = 0.79383

4 a. With examples give definitions of Asset life. Why land prices do not get depreciated? **(10 Marks)**

b. Explain the concept and philosophy of use of a sinking fund. **(10 Marks)**

**Part B**

5 a. What do you understand by Minimum Acceptable Rate of Return (MARR) and Internal Rate of Return (IRR). **(10 Marks)**

b. Explain with examples the various causes of depreciation. **(10 Marks)**

6 a. With a neat sketch explain the composition of costs traditionally used in accounting for the price of a manufactured product. **(10 Marks)**

b. Explain life cycle costing with a neat sketch. **(10 Marks)**

7 a. Write the balance sheet equation. Following is the year end details of a company:

| | |
|---|---|
| Equity | 200000 |
| Bank Balance | 10000 |
| Dividend payable | 72000 |
| Provision for tax | 40000 |
| Preference shares | 135000 |
| Land and building | 200000 |
| Debtors | 265000 |
| Bills payable | 20000 |
| Plant and equipment | 80000 |
| Bills receivable | 20000 |
| General reserves | 40000 |
| Cash in hand | 15000 |
| Stock | 77000 |
| Creditors | 160000 |

Prepare the Balance sheet. **(10 Marks)**

b. Define the following with suitable equations: i) current ratio ii) acid test ratio iii) debt equity ratio iv) Gross profit ratio v) Net profit margin ratio. **(10 Marks)**

8 Write short notes on any four of the following:

a. Intuition an analysis.
b. Present worth by the "72 rule".
c. Annuity contract for guaranteed income.
d. Tactics and strategy.
e. Comparisons of assets having unequal lives
f. Sales budget OR Production budget. **(20 Marks)**

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ME62

NEW SCHEME

# Sixth Semester B.E. Degree Examination, July 2007
## Mechanical Engineering
## Engineering Economy

Time: 3 hrs.] [Max. Marks:100

**Note :1.** ***Answer any FIVE full questions.***
**2.** ***Use of discrete interest factors table allowed.***

1 a. Engineering efficiency is commendable when it approaches 100 percent, but financial efficiency must exceed 100 percent before it is considered adequate. Explain. **(10 Marks)**

b. Explain tactics and strategy with illustration. **(10 Marks)**

2 a. Deduce an expression for equal payment series sinking fund factor. **(08 Marks)**

b. Determine the effective interest rate in the following cases :
i) Nominal rate of 12% compounded monthly with time interval of one year.
ii) Nominal rate of 18% compounded weekly with a time interval of one year.
iii) Nominal rate of 13% compounded monthly with a time interval of two years.
iv) Nominal rate of 9% compounded semiannually with a time interval of two years. **(12 Marks)**

3 a. Explain the conditions for present worth comparison. **(10 Marks)**

b. An investor can make three end-of-year payments of Rs.15000, which are expected to generate receipts of Rs.10000 at the end of year 4 that will increase annually by Rs.2500 for the following 4 years. If the investor can earn a rate of return of 10 percent on other 8 year investments, is this alternative attractive? **(10 Marks)**

4 a. Define the following with respect to life of an asset:
i) Ownership life.
ii) Accounting life.
iii) Economic life. **(10 Marks)**

b. Two models of small machines perform the same function. Type 1 machine has a low initial cost of Rs.9500, relatively high operating costs of Rs.1900 per year more than those of the type 2 machine, and a short life of 4 years. The more expensive type 2 machine costs Rs.25100 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 is 8%? **(10 Marks)**

5 a. Define depreciation. What are the causes of depreciation? **(10 Marks)**

b. Explain the importance of estimating and costing. State the various components of cost. **(10 Marks)**

6 a. What are the sources of finance and financial information? **(10 Marks)**

b. Explain with suitable examples profit and loss statement and balance sheet. **(10 Marks)**

7 a. Explain different types of financial ratios. **(12 Marks)**

b. What are the essentials of profit planning in financial planning? **(08 Marks)**

8 Write short notes on the following:
a. Types of budget.
b. Corporate income tax.
c. Dangers of budgeting.
d. IRR misconceptions. **(20 Marks)**

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06ME56

# Fifth Semester B.E. Degree Examination, June-July 2009
## Engineering Economics

Time: 3 hrs. Max. Marks:100

**Note:** *1. Answer any FIVE full questions, choosing at least two from each part.*
*2. Use of "Compounding Interest factors" tables are permitted.*

### PART – A

1 a. Define "Problem Solving" and "Decision making" with examples. **(05 Marks)**

b. A company 3 years ago borrowed Rs.40,000/- to pay for a new machine tool, agreeing to repay the loan in 100 monthly payments at an annual nominal interest rate of 12% compounded monthly. The company now wants to pay off the loan. How much would this payment be, assuming no penalty costs for early payout? **(15 Marks)**

2 a. State and explain any five conditions for present worth comparisons. **(10 Marks)**

b. An investor can make three end of year payments of Rs.15,000/- which are expected to generate receipts of Rs.10,000/- at the end of year 4 that will increase annually by Rs.2500/- for the following 4 years. If the investor can earn a rate of return of 10% on other 8 year investments, is this alternative attractive? **(10 Marks)**

3 a. Define and explain the terms
i) Service life; ii) Accounting life; iii) Economic life. **(09 Marks)**

b. Two models of small machines perform the same functions. Type 1 machine has a low initial cost of Rs.9500/-, relatively high operating costs of Rs.1900/- per year more than that of type 2 machine, and a short life of 4 years. The more expensive type 2 machine costs Rs.25,100/- and can be kept in service economically for 8 years. The scrap value from either machine of its life will barely cover its removal cost. Which is preferred when minimum rate or return is 8%? **(11 Marks)**

4 a. Define Depreciation and explain any one method of calculating depreciation. **(05 Marks)**

b. Explain in brief the three types of rates of return. **(06 Marks)**

c. Computers purchased by a public utility cost Rs.7000/- each. Past records indicate that they have useful life of 5 years, after which, they will be disposed of, with no salvage value. The company currently has a cost capital of 7%. Determine the following by using straight line method.
i) Depreciation charge during year 1 and 2.
ii) Depreciation reserve accumulated at the end of year 3.
iii) The Book value of computers at the end of year 3. **(09 Marks)**

### PART – B

5 a. Explain in brief Direct Material cost, Direct labour cost, Marginal cost. **(06 Marks)**

b. Explain in brief Administrative over Heads and Selling over heads. **(04 Marks)**

c. A small firm is producing 100 pens/day. The direct material cost is found to be Rs.160, direct labour cost is Rs.200 and factory overheads chargeable are Rs.250. If the selling on cost is 40% of factory cost, what must be the selling price of each pen to realize a profit of 14.6% of selling price? **(10 Marks)**

6 a. Explain in brief the systems of Book-keeping. **(10 Marks)**

b. Explain the importance of Balance sheet and prepare a balance sheet showing different accounts (Balance sheet model). **(10 Marks)**

7 a. Define and explain liquidity Ratio and leverage Ratio. **(10 Marks)**

b. Calculate the current assets of a firm with the following data:
Stock turnover Ratio = 5 times; Stock at the end = 5000 more than stock in beginning
Sales = 2,00,000; Gross Profit Ratio = 20%
Current liabilities = Rs.60,000/-; Quick Ratio = 0.75. **(10 Marks)**

8 a. Enumerate and explain objectives of Profit planning. **(10 Marks)**

b. Define Budget and give a brief classification of budget. **(10 Marks)**

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06ME56

# Fifth Semester B.E. Degree Examination, Dec.09/Jan.10
# Engineering Economics

Time: 3 hrs. Max. Marks:100

**Note:** ***1. Answer any FIVE full questions, selecting at least TWO questions from each part.***
***2. Use of discrete interest factors table is allowed.***

## PART – A

1 a. Discuss why engineers have to be more concerned, with economics now-a-days. **(06 Marks)**
b. Explain how the problem solving process, leading ultimately to decision making, is carried out, with a neat block diagram. **(08 Marks)**
c. Explain the concept of law of supply and demand. **(06 Marks)**

2 a. Briefly explain the time value of money. **(05 Marks)**
b. If you deposit Rs. 25,000 today, what equal amounts can you withdraw at the end of each quarter for the next 4 years, when the nominal interest rate is 10%? **(05 Marks)**
c. Deduce an expression for equal payment series sinking fund factor, with the necessary cash flow diagram. **(10 Marks)**

3 a. Explain the conditions for present worth comparisons. **(10 Marks)**
b. An investor can make three end-of-year payments of Rs. 15,000, which are expected to generate receipts of Rs. 10,000 at the end of year 4 that will increase annually by Rs. 2,500 for the following 4 years. If the investor can earn a rate of returns of 10% on other 8 year investments, is this alternative attractive? **(10 Marks)**

4 a. Define the following with respect to life of an asset :
i) Ownership life ii) Accounting life iii) Economic life. **(10 Marks)**
b. Two models of small machines perform the same function. Type 1 machine has a low initial cost of Rs. 9,500, relatively high operating costs of Rs. 1,900 per year more than those of the type 2 machine, and short life of 4 years. The more expensive, type 2 machine costs 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 minimum attractive rate of return is 8%? **(10 Marks)**

## PART – B

5 a. What is depreciation? List and discuss the causes of depreciation. **(06 Marks)**
b. A CNC machine costs Rs. 30,000,000 and is estimated to serve for 8 years after which its salvage value is estimated to be Rs. 2,50,000. Find :
i) Depreciation fund at the end of the $5^{th}$ year by straight-line method and declining balance method.
ii) Book value of the machine after $4^{th}$ year and $6^{th}$ year, by declining balance method. **(10 Marks)**
c. Explain how the selling price is fixed for a job, giving all the components of costs, using an example. **(04 Marks)**

6 a. What are the sources of finance and financial information? **(10 Marks)**
b. Explain with a suitable examples, profit and loss statement and balance sheet. **(10 Marks)**

7 a. List and explain the different types of financial ratios. **(10 Marks)**
b. What are the types of budgets? Explain. **(10 Marks)**

8 Write short notes on :
a. Corporate income tax c. Profit planning
b. Cash flow diagram d. IRR misconceptions. **(20 Marks)**

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Important Note : 1. On completing your answe compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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06ME56

# Fifth Semester B.E. Degree Examination, May/June 2010
## Engineering Economics

Time: 3 hrs. Max. Marks:100

**Note:1.** ***Answer any FIVE full questions, selecting at least TWO questions from each part.***
***2. Use of interest factor tables is allowed.***



### PART – A

1 a. Discuss briefly the relationship of engineering economics with engineering and economics. **(10 Marks)**

b. State and explain the law of diminishing returns, with examples. **(10 Marks)**

2 a. A loan of Rs. 10000 is made today under an agreement that Rs. 14000 will be received in payment sometime in future. When should the payment be received, if the loan is to earn interest at a rate of 8% compounded quarterly (interpolate if necessary). **(10 Marks)**

b. A storage facility is being leased under a contract of Rs. 2,00,000 per year with annual increases of Rs. 15,000 for 8 years. Payments are to be made at the end of each year, starting one year from now. If the prevailing interest rate is 7%, what lump sum paid today would be equivalent to the 8 years lease payment plan? **(10 Marks)**

3 a. The first cost for equipments and tooling modifications for an investment is expected to be Rs. 18,50,000. Increase in annual maintenance cost and operating costs due to this investment is expected to be a constant Rs. 80,000 per year. Potential inventory reductions are estimated to be Rs. 3,20,000 for the first year with further arithmetic gradient reductions of Rs. 40000 per year for the following 4 years (the life of the project). Also production rates are expected to increase with Rs. 20000 increase per year in each of the 4 years. If an interest rate of 10% is used, should this investment be considered? (Use net present worth model) **(10 Marks)**

b. Two assets $A_1$ and $A_2$ have the ability to perform a function satisfactorily. Asset $A_2$ has an initial cost of Rs. 32000, and an expected salvage value of Rs. 4000 at the end of its 4 year service life. Asset $A_1$ costs Rs. 9000 less than $A_2$, but has an economic life one year shorter than $A_2$. Also asset $A_1$ has no salvage value and its annual operating costs exceed those of $A_2$ by Rs. 2500. If the required rate of return is 15%, which asset is to be preferred? (Apply repeated project method under net present worth model) **(10 Marks)**

4 a. A firm is proposing to provide a training programme for the clerks. The program lasts one year and costs Rs. 20000 per month. It is expected to produce savings of Rs. 8000 for the first month which increases by Rs. 4000 per month for the rest of the year. Its operational cost is expected to be Rs. 12000 for the first month, which declines at the rate of Rs. 1000 per month. If the required rate of return is 12 percent compounded monthly, should this program be preferred? (Use equivalent annual worth method) **(10 Marks)**

b. A supplier of laboratory equipment estimates that profit from sales should increase by Rs. 2,00,000 per year, if a mobile demonstration unit is built. A large unit with sleeping accommodations for the driver will cost Rs. 9,70,000 while a smaller unit without this facility will cost Rs. 6,30,000. Salvage values for the large and small units after 5 years of use will be Rs. 97000 and Rs. 35000 respectively. Lodging costs saved by the larger unit amounts to Rs. 1,10,000 annually, but its yearly transportation costs will exceed those of smaller unit by Rs. 31000. If the interest rate is 9%, should a mobile demonstration unit be built? If so, which size? (Use equivalent annual worth method) **(10 Marks)**

## PART – B

5 a. Estimate receipts and disbursements of two plans for the 30 years life of a building to be renovated are as given below:

| | Plan 1 | Plan 2 |
|---|---|---|
| First cost of renovation | Rs. 34,00,000 | Rs. 49,00,000 |
| Increase in salvage value from renovation | Rs. 12,00,000 | Rs. 19,00,000 |
| Annual receipts | Rs. 21,20,000 | Rs. 25,12,000 |
| Annual disbursements | Rs. 5,91,000 | Rs. 8,80,000 |
| Present value of the building | Rs. 48,50,000 | Rs. 48,50,000 |
| Expected salvage value after 30 years | Rs. 26,60,000 | Rs. 26,60,000 |

If the required rate of return is 12%, which plan is preferable going by the IRR criterion? (10 Marks)

b. An asset has a first cost of Rs. 70,000, 5 years useful life and no salvage value. Show the depreciation schedule using straight line depreciation and declining balance method with depreciation rate 0.4. Also show when the switch occurs, from declining balance to straight line method. (10 Marks)

6 a. Briefly discuss the following cost classification : (10 Mar
   i) First cost
   ii) Operation and maintenance cost
   iii) Marginal cost

b. Explain any five basic concepts underlying financial accounting. (10 Marks)

7 a. Briefly discuss the various account categories found in a balance sheet. (10 Marks)

b. Explain how the accounting income diverges from economic income. (10 Marks)

8 a. List and briefly discuss the various liquidity ratios and leverage ratios. (10 Marks)

b. Discuss the elements of the following types of budgets :
   i) Production budget
   ii) Materials and purchases budget. (10 Marks)

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