



**MAULANA ABUL KALAM AZAD UNIVERSITY OF
TECHNOLOGY, WEST BENGAL**

Paper Code : HU-501

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 alternative for *any ten* of the following:

1×10=10

(i) What is true about the relationship between AC and MC?

- (a) AC cuts MC from below
- (b) MC cuts AC from below
- (c) MC and AC do not cut each other
- (d) AC equals MC when AC is at its maximum

(ii) If Current Ratio is 2.2 and Current Liability is Rs. 80,000 then the amount of current asset will be

- (a) Rs. 1,76,000
- (b) Rs. 1,34,000
- (c) Rs. 1,60,000
- (d) Rs. 1,72,000

(iii) In replacement analysis old machines are known as

- (a) Defender
- (b) Challenger
- (c) Both (a) and (b)
- (d) None of these

(iv) At Break-even point

- (a) Total revenue = Total Cost
- (b) Total revenue = Total Fixed Cost
- (c) Total revenue = Total Variable Cost
- (d) All of the above

(v) Demand-pull inflation may be caused by

- (a) An increase in costs
- (b) A reduction in government spending
- (c) A reduction in interest rates
- (d) An outward shift in aggregate supply

(vi) Goodwill is a

- (a) Fixed asset
- (b) Current asset
- (c) Fictitious asset
- (d) Wasting asset

(vii) A large angle of incidence indicates

- (a) A low rate of profit
- (b) A high rate of profit
- (c) No profit, no loss
- (d) None of the above

(viii) A card is drawn from a deck of 52 cards. Find the probability that it is either a red king or a black queen.

- (a) $2/13$
- (b) $1/13$
- (c) $5/13$
- (d) $8/13$

(ix) IRR stands for the rate of return for which

- (a) $NPV = 0$
- (b) $NPV = 1$
- (c) $NPV = -1$
- (d) NPV is maximum

(x) The present value of ₹ 1 to be received after 3 years compounded annually at 10%

- (a) 0.909
- (b) 0.826
- (c) 0.751
- (d) None of the above

(xi) A uniform series of payment occurring at equal interval of time is called _____.

- (a) Annuity
- (b) Amortization
- (c) Depreciation
- (d) Bond

(xii) The following value(s) of the Power-Sizing Exponent (E) indicates Economies of Scale

- (a) $0 < E < 1$
- (b) $E > 1$
- (c) $E = 0$
- (d) $E = 1$

Group – B

(Short Answer Type Questions)

Answer any three of the following.

5×3=15

2. An asset purchased at Rs. 17,000 has a life time of 5 years and salvage value of Rs. 2,000. If depreciation is computed using straight line method, calculate the book value of the asset at the end of 3 years.
3. An aqueduct is needed to 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 $i = 6\%$].
4. A box contains 6 white and 4 black balls. Two balls are drawn at random one after another without replacement. Prepare the joint probability distribution table.

5. Discuss the economic problems faced by an engineer with suitable examples.
6. What is ratio analysis? Discuss any three ratios and point out their limitations, if any, for analysing the financial health of a company. 2+3=5

Group – C

(Long Answer Type Questions)

Answer any three of the following.

15×3=45

7. (a) What do you understand by replacement analysis? Explain 'Economic life' of an asset.
- (b) A firm has purchased an equipment at Rs. 20,000. When should the asset be replaced, if the following is given: (2+2)+11=15

End of year	Operation cost in (Rs.)	Maintenance cost in (Rs.)	Resale value in (Rs.)
1	2,000	200	10,000
2	3,000	300	9,000
3	4,000	400	8,000
4	5,000	500	7,000
5	6,000	600	6,000
6	7,000	700	5,000
7	8,000	800	4,000
8	9,000	900	3,000
9	10,000	1,000	2,000
10	11,000	1,100	1,000

8. ABC Toys Pvt. Ltd. is considering the addition of a new toy to its existing product line. Three alternative courses of action are available:

- (a) Work overtime to meet the demand of the new toy. Overtime expenses are estimated at Rs. 20,000 per month
- (b) Install new equipment for which fixed expenses per month are expected at Rs. 80,000
- (c) Lease (rent) a machine at the rate of Rs. 35,000 per month

Variable cost associated with the above three alternatives are Rs. 9, Rs. 7, Rs. 8 respectively. The price per unit of the toy, which is independent of the manufacturing alternative, is fixed at Rs. 15. The expected demand for the toy is given below:

10000 pieces with the probability of 0.5

20000 pieces with the probability of 0.3

50000 pieces with the probability of 0.2

Which alternative should the company adopt to manufacture the toy? Use decision tree.

9. (a) What are the causes of inflation?

(b) A company is planning to start an employee welfare fund. It needs Rs. 50,00,000 during the first year and it increases by Rs. 5,00,000 every year thereafter up to the end of the 5th year. The above figures are in terms of today's rupee value. The annual average rate of inflation is 6% for the next five years. The interest rate is 18%, compounded annually. Find the single deposit which will provide the required series of fund towards employee's welfare scheme after taking the inflation rate into account.

5+10=15

10. (a) Define Dual aspect concept in Financial Accounts.

- (b) The following is the Trial Balance of Durga Industries Ltd. as on 31st March, 2018 and other information. Prepare a Trading and Profit and Loss Account for the year ended 31st March, 2018 and a Balance Sheet as on 31st March, 2018.

Trial Balance of Durga Industries Ltd. as on 31st March, 2018

Dr			Cr
Particulars	Rs.	Particulars	Rs.
Investment	35,000	Share Capital	4,00,000
Calls on arrear	1,000	Sales	3,00,000
Land & Building	45,000	Sundry Creditors	17,000
Machinery	3,00,000	General Reserve	25,000
Furniture	15,000	Profit on consignment	13,000
Customs Duty	3,800	Loan from Bank	45,000
Wages	31,400	Dividend	3,000
Salaries	45,200		
Insurance	2,800		
Purchase	1,60,000		
Bills Receivable	21,200		
General Expenses	6,900		
Sundry Debtor	60,000		
Opening Inventory	65,000		
Cash at Bank	8,800		
Cash in hand	900		
Director's fees	1,000		
	8,03,000		8,03,000

The following further information is to be taken into consideration:

- (i) Closing Inventory Rs. 86,000
- (ii) Depreciate Machinery at 10%
- (iii) Outstanding Salary Rs. 4,000
- (iv) Transfer Rs. 5,000 to General Reserve
- (v) The authorized capital of the company is Rs. 6,00,000 divided into Equity Shares of Rs. 10 each
- (vi) Provision for income tax @ 30%

3+12=15

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

- (a) Importance of Break Even analysis
- (b) Difference between NPV and IRR
- (c) Use of price indexes in engineering economic analysis
- (d) Benefit cost ratio
- (e) Types of Inflation

5×3=15