

Reg. No.									
----------	--	--	--	--	--	--	--	--	--



**MANIPAL INSTITUTE OF TECHNOLOGY**  
MANIPAL

**V SEMESTER B.TECH. (COMMON TO ALL)**

**END SEMESTER MAKE-UP EXAMINATIONS- FEB 2022**  
**(PROCTORED ONLINE EXAMINATION)**

**SUBJECT: ENGINEERING ECONOMICS AND FINANCIAL**  
**MANAGEMENT [HUM 3151]**

**REVISED CREDIT SYSTEM**

Time: 75 minutes

MAX. MARKS: 20

**Instructions to Candidates:**

- ❖ Answer **ALL** the questions.
- ❖ Missing data may be suitably assumed.

- 1A.** A special-purpose machine is to be purchased at a cost of \$15,000. The following table **(04)** shows the expected Annual operating and maintenance cost and the salvage values for each year of the machine's service.

Years of Service	O&M Costs	Market Value
1	\$2,500	\$12,800
2	\$3,200	\$8,100
3	\$5,300	\$5,200
4	\$6,500	\$3,500
5	\$7,800	\$0

If the interest rate is 12%, what is the economic service life for this machine?

- 1B.** A 50 HP motor is required to drive a pump to remove water from a tunnel. The unit will **(04)** be needed for a period of 4 years. Two alternatives are under consideration.

**Alternative A** calls for the construction of a power line and purchase of the electric motor at a total cost of \$4,900. The salvage value of this equipment after 4 years is estimated to be \$700. The cost of the current per hour of the operation is estimated to be \$2.94 and the maintenance is estimated as \$420 per year.

**Alternative B** calls for purchase of diesel engine pump set at a cost of \$1,925 and it will have no salvage value at the end of 4 years period. The cost of diesel per hour of operation is estimated at \$1.47 maintenance is estimated at \$0.53 per hour operation and the cost of wages chargeable when the engine runs is \$2.8 per hour.

How many hours per year the two machines have to run so that the two alternatives incur equal costs. If the no. of hours of operation is estimated at 100 hours which alternative is more economical? Assume interest rate at 10% per year.

- 1C.** Based on a 6-year analysis period that equals the useful life of the alternative, one alternative has a net present worth of \$420 in a present worth analysis of portable hazardous material photoionization monitor. **(02)**

The alternative device will be replaced at the end of the 6 years by a similar item with the same cost, benefits, and useful life. Calculate the net present value of the alternative equipment for the 12-year analysis period using 10% interest rate.

- 2.** Find the balance sheet of Skanda Industries Ltd. as on 31st March 2021.

Liabilities	Amount (in Rs.)	Assets	Amount (in Rs)
Equity share capital	10,000	Fixed Assets (less depreciation Rs.10,000)	26,000
7% Preference share capital	2,000		
Reserves and Surplus	8,000	<u>Current Assets:</u>	
6% Mortgage Debentures	14,000	Cash	1,000
<u>Current Liabilities:</u>		Investments (10%)	3,000
Creditors	1,200	Sundry debtors	4,000
Bills payable	2,000	Stock	6,000
Outstanding expenses	200		
Tax provisions	2,600		

**Other information:**

- Net Sales Rs.60,000
- Cost of goods sold Rs.51,600
- Net Income before Tax Rs.4,000
- Net Income after tax Rs.2,000

- 2A.** Calculate Turnover ratios viz. Stock Turnover ratios and Debtors Turnover ratio (Refer Q.2 above). **(03)**

- 2B.** Calculate the other key ratios given below (Refer Q.2 above): **(03)**
- Debt-Equity ratio
  - Interest Coverage ratio
  - Gross Profit Ratio
  - Current ratio