BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2023)

CLASS: B. TECH. **SEMESTER: VII**
BRANCH: ALL **SESSION: MO/2023**

SUBJECT: PE211 ENGINEERING ECONOMY

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Identify the following as cash inflows or outflows to commercial air carriers: fuel cost, pension plan contributions, fares, maintenance, freight revenue, cargo revenue, extra-bag charges, water and sodas, advertising, landing fees, and seat preference fees.	[2]	1	2
Q.1(b)	What do you mean by the term 'cash flow diagram'? With a suitable example explain the concept of a cash flow diagram from the borrower and lender viewpoint.	[3]	1	2
Q.2(a)	Western Hydra Systems makes a panel milling machine with a 2.7-m-diameter milling head that emits low vibration and processes stress-relieved aluminum panels measuring up to 6,000 mm long. The company wants to borrow money for a new production/warehouse facility. If the company offers to repay the loan with $60,000 in year 1 and amounts increase by $10,000 each year through year 5, how much can the company borrow at an interest rate of 10% per year?	[5]	1	3
Q.3(a)	An electric switch manufacturing company has to choose one of three different assembly methods. Method A will have a first cost of $40,000, an annual operating cost of $9000, and a service life of 2 years. Method B will cost $80,000 to buy and will have an annual operating cost of $6000 over its 4-year service life. Method C will cost $130,000 initially with an annual operating cost of $4000 over its 8-year life. Methods A and B will have no salvage value, but method C will have some equipment worth an estimated $12,000. Which method should be selected? Use present worth analysis at an interest rate of 10% per year.	[5]	2	3
Q.4(a)	A philanthropic foundation is considering a gift to a city to build a park and to maintain it forever. Suppose that the annual interest rate that can be earned in perpetuity is 10% and the annual maintenance cost is expected to be $16,000 per year for the first 15 years and increase to $25,000 per year after 15 years. What is the amount of the gift received at present that will be required to ensure continuing maintenance of the park?	[2]	2	3
Q.4(b)	A retail shopping center developer signed a contract to build a $100 million high-end shopping center in the City Center. The city and county governments agreed to sales and tax rebates totaling $18.7 million over 10 years. The contract called for the developer to raze existing buildings 2 years from the date the contract was signed and to have the shopping center built by the end of year 3. However, due to a real estate–induced recession in the United States, the developer sought and was granted a new contract. The new contract required the developer to raze the existing buildings at the end of year 1, but the shopping center would not have to be completed for 7 years from the date the contract was signed. Assume that the cost for razing the existing buildings is $1.3 million and the developer does not build the shopping center until 7 years from now (at a cost of $100 million). Determine the future worth cost difference in year 7 of the two contracts at an interest rate of 10% per year.	[3]	2	3

PTO

Q.5(a)	What are the various factors that are responsible for replacing equipment?	[2]	3	2
Q.5(b)	An existing piece of equipment has a market value of Rs. 10,000, a maintenance cost is Rs 1000 per year, and a life of 10 years and no salvage value. The interest rate is 10%. The proposed equipment has an installed cost of Rs. 100,000, a maintenance cost of Rs. 800 per year, a life of 50 years, and a salvage value of Rs. 15,000. Using the total life average method, suggest whether the proposed equipment should be purchased or not.	[3]	3	3

:::::27/09/2023 M:::::