Question Paper

Exam Date & Time: 14-Jun-2023 (09:30 AM - 12:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES
END SEMESTER THEORY EXAMINATION-MAY 2023
IV SEMESTER B.Sc.(APPLIED SCIENCES) IN ENGG.

ENGINEERING ECONOMICS AND MANAGEMENT [IHS 241]

Marks: 50 **Duration: 180 mins.**

Answer all the questions.

Instructions:
(i) Assume values for missing data, if applicable and mention the same in your answer
(ii) cash flow diagram carries marks
(iii) Interest factor table for 10% is given alongside question.

1) Find the Future worth of each of the following cash flows (4)

A) (i) Deposit of ₹10,000 per quarter at an interest rate of 12% per year, compounded quarterly, for 3 years
(ii) Deposit of ₹5000 per month at an interest rate 12% per year, compounded monthly, for 2 years
(iii) Deposit of ₹7000 per year at an interest rate 12% per year, compounded annually, for 5 years
(iv) Deposit of ₹2000 per week at an interest rate 12% per year, compounded weekly, for 1 year

B) An industrial firm is considering purchasing several programmable controllers and automating the company's manufacturing operations. It is estimated that the equipment will initially cost $110,000 and the labour to install it will cost $30,000. A service contract to maintain the equipment will cost $5,500 per year. Trained service personnel will have to be hired at an annual salary of $25,000. Also estimated is an approximate $10,000 annual income-tax savings (cash inflow). How much will this investment in equipment and services have to increase the annual revenues after taxes in order to break even? The equipment is estimated to have an operating life of 10 years, with no salvage value because of obsolescence. The firm's MARR is 10%. (3)

C) An individual deposits annual bonus into a savings account that pays 10% interest compounded annually. The size of the bonus increases by $2,000 each year, and the initial bonus amount was $5,000. Determine how much (3)

will be in the account immediately after the fifth deposit.

2) What is the equal payment series for 12 years that is equivalent to a payment series of $15,000 at the end of the first year, decreasing by $1,000 each year over 12 years? Interest is 10% compounded annually. (3)

A)

B) Suppose you deposit $2,000 in an individual retirement account (IRA) that pays interest at 6% compounded monthly for the first two years and 9% compounded monthly for the next three years. Determine the balance at the end of five years. (3)

C) Two machines are being considered for a manufacturing process. Machine A has a first cost of $75,200, and its salvage value at the end of six years of estimated service life is $21,000. The operating costs of this machine are estimated to be $6,800 per year. Extra income taxes are estimated at $2,400 per year. Machine B has a first cost of $44,000, and its salvage value at the end of six years' service is estimated to be negligible. The annual operating costs will be $11,500. Compare these two mutually exclusive alternatives by the present-worth method at i = 10% (4)

Interest factor table for 10%

	Single Payment		Equal Payment Series				Gradient Series	
N	Compound Amount Factor (F/P,i,N)	Present Worth Factor (P/F,i,N)	Compound Amount Factor (F/A,i,N)	Sinking Fund Factor (A/F,i,N)	Present Worth Factor (P/A,i,N)	Capital Recovery Factor (A/P,i,N)	Gradient Uniform Series (A/G,i,N)	Gradient Present Worth (P/G,i,N)
1	1.1000	0.9091	1.0000	1.0000	0.9091	1.1000	0.0000	0.0000
2	1.2100	0.8264	2.1000	0.4762	1.7355	0.5762	0.4762	0.8264
3	1.3310	0.7513	3.3100	0.3021	2.4869	0.4021	0.9366	2.3291
4	1.4641	0.6830	4.6410	0.2155	3.1699	0.3155	1.3812	4.3781
5	1.6105	0.6209	6.1051	0.1638	3.7908	0.2638	1.8101	6.8618
6	1.7716	0.5645	7.7156	0.1296	4.3553	0.2296	2.2236	9.6842
7	1.9487	0.5132	9.4872	0.1054	4.8684	0.2054	2.6216	12.7631
8	2.1436	0.4665	11.4359	0.0874	5.3349	0.1874	3.0045	16.0287
9	2.3579	0.4241	13.5795	0.0736	5.7590	0.1736	3.3724	19.4215
10	2.5937	0.3855	15.9374	0.0627	6.1446	0.1627	3.7255	22.8913
11	2.8531	0.3505	18.5312	0.0540	6.4951	0.1540	4.0641	26.3963
12	3.1384	0.3186	21.3843	0.0468	6.8137	0.1468	4.3884	29.9012

3) State the differences between Micro economics and Macro economics. (5)

A)

B) Explain the significance of Unity of Command and Unity of Directions according to Henri Fayol's principles. How is equality different from equity, explain with relevant corporate examples. (3)

C) As per Henry Mintzberg's model, what are the four decisional roles portrayed by a manager, elaborate with examples. (2)

4) Explain planning as a managerial function. Elaborate on the hierarchy of plans. (4)

A)

B) Explain the Growth-Share Matrix developed by Boston Consulting Group (BCG) in 1970s. Also elaborate on the implication for the SBUs that fall into each of the category. (3)

C) With a neat block diagram explain the 4 steps involved in delegation. (3)