Question: 01

A manufacturing unit engaged in the production of automobile parts is considering a proposal of purchasing one of the two plants, details of which are given below:

Particulars	Plant A	Plant B
Cost	₹ 20,00,000	₹38,00,000
Installation charges	₹ 4,00,000	₹ 2,00,000
Life	20 years	15 years
Scrap value after full life	₹ 4,00,000	₹ 4,00,000
Output per minute (units)	200	400

The annual costs of the two plants are as follows:

Particulars	Plant A	Plant B
Running hours per annum	2,500	2,500
Costs:	(In ₹)	(In ₹)
Wages	1,00,000	1,40,000
Indirect materials	4,80,000	6,00,000
Repairs	80,000	1,00,000
Power	2,40,000	2,80,000
Fixed Costs	60,000	80,000

Will it be advantageous to buy Plant A or Plant B? Substantiate your answer with the help of comparative unit cost of the plants. Assume interest on capital at 10 percent. Make other relevant assumptions:

Note: 10 percent interest tables

	20 Years	15 Years
Present value of ₹ 1	0.1486	0.2394
Annuity of ₹ 1 (capital recovery factor with 10% interest)	0.1175	0.1315

Calculation of Capital charge p.u.

	A	B
Cost	2400000	4000000
(-) P.V. of Salvage	(400000 × 0.1486) (59440)	(400000 × 0.2394) (95760)
Cost	2340560	3904240
(x) Capital Recovery	0.1175	0.1315
Capital charge p.a	275016	513468
(+) Operational Exp	960000	1200000
Total cost	1235016	1713408
÷ No. of units	3000000	6000000
Cost per unit	0.04117	0.02856

15 YEARS

Project
200 Cr.

Equity ₹50 Cr.

Loan @ 15% ₹150 Cr.

Revenue : ₹50 Cr.
Exp. = ₹10 Cr.

Question: 02

XYZ Ltd., an infrastructure company is evaluating a proposal to build, operate and transfer a section of 35 kms. of road at a project cost of ₹ 200 crores to be financed as follows:

Equity Shares Capital ₹ 50 crores, loans at the rate of interest of 15% p.a. from financial institutions ₹ 150 crores. The Project after completion will be opened to traffic and a toll will be collected for a period of 15 years from the vehicles using the road. The company is also required to maintain the road during the above 15 years and after the completion of that period, it will be handed over to the Highway authorities at zero value. It is estimated that the toll revenue will be ₹ 50 crores per annum and the annual toll collection expenses including maintenance of the roads will amount to 5% of the project cost. The company decides to write off the total cost of the project in 15 years on a straight line basis. For Corporate Incometax purposes, the company is allowed to take depreciation @ 10% on WDV basis. The financial institutions are agreeable for the repayment of the loan in 15 equal annual installments - consisting of principal and interest.

Calculate Project IRR and Equity IRR. Ignore Corporate taxation.

Explain the difference in Project IRR and Equity IRR.

Calculation of CFAT

Revenue	=	₹50 cr.
(-) Exp.	=	₹10 cr.
CFAT		₹40 cr.

Project cost = ₹200 cr.

① Calculation of project IRR

At IRR, NPV = 0

Let assume disc. Rate 10%

$$NPV = (40 \times 7.606) - 200 = 104.24$$

15%

$$NPV = (40 \times 5.847) - 200 = 33.88$$

20%

$$NPV = (40 \times 4.675) - 200 = (13)$$

Interpolation

15%	33.88	33.88
20%	(13)	46.88
5%		

$$\text{project IRR} = 15 + \left(\frac{5}{46.88} \times 33.88\right)$$

$$= 18.61\%$$

② Calculation of Equity IRR

$$\text{Equal Annual Installment} = \frac{\text{Loan Amt}}{\text{PVAf (Rate of Int)}}$$

$$= \frac{₹150 \text{ Cr.}}{\text{PAAF}(15\%, 15\text{yrs})}$$

$$= \frac{₹150}{5.847} = ₹25.654$$

Cash Flow for Equity

CFAT	40 Cr.
(-) Repayment of debt	₹25.65
CF for Equity	14.35 Cr.