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Mach I –

a. Net cash flow of Mach I project – Assuming, question is asking cash flows at year 0, also calculating discounted cash flows at year 0

Year	**0**	**1**	**2**	**3**	**4**	**5**
After tax operating Cash flows	-200	110	159	295	185	0
Discounted cash flows	-200.00	91.67	110.42	170.72	89.22	0.00
Net Cash Flow	**549**					
Net Discounted Cash Flows	**-262.02**					

b. NPV of Mach I project – **70.48**

NET PRESENT VALUE						
Year	**0**	**1**	**2**	**3**	**4**	**5**
After tax operating Cash flows	-200	110	159	295	185	0
Discounted cash flows	-200.00	91.67	110.42	170.72	89.22	0.00
PV(cash flows)	**262.02**					
PV(capital expenditure)	-250					
Increase in Working Capital	0	50	100	100.00	-125	-125
Working Capital at Year 0	0.00	41.67	69.44	57.87	-60.28	-50.23
PV (Working Capital)	58.47					
NPV	**70.48**					
Cost of Capital	20%					

c. 1. PV of cash flows is negative, so if working capital is not assured as assumed Blitz should not invest.

2. However, Blitz should invest – if expected working capital is most likely to be achieved and future risk remains same, then NPV becomes positive at 70.48, hence it should invest

Mach II –

a. Of what kind is the option to invest in Mach II – **It's a call option, because its option to invest further**

b. Assuming Double of mach I ie. – R&D cost and capital expenditure both would double by year 3 - 200x2 – 250x2

Underlying asset price, S_0= 900/(1.1^3) = 676.2
Exercise Price, K = 800/(1.1^3) = 601

c. Calculating by Black Scholes Model -
Value of option = S_0 N(d1) – Ke $^{-rT}$ N(d2)

S_0, underlying asset price
K, exercise price
Sigma (standard deviation) = 35%
r, risk free rate of Interest = 10%
T, is the time to expiration of the option in years = ?

Where,
N(d1) = .3739
N(d2) = .1767

Therefore,
d1 = -0.3215416
d2 = -0.9280146

d2 = d1 – sigma x sqrt(T)
-0.9280146 = -0.3215416 – .35 sqrt(T)
-.35 sqrt(T) = -0.606473
T = 3 Years

Therefore, substituting in black Scholes model –

Value of option to invest = S_0 x .3739 – K x e $^{(-.1x3)}$ .1767
= **S_0 x .3739** – **K x** 0.74081822 x **.1767**
= **S_0 x .3739** – **K x** 0.1309
= **174.1**

d. As per calculations, we can afford to invest 174 or less, if it clears the uncertainty over future cash flows of Mach II
But, capital expenditure required in Mach I is 250, so I won't invest in Mach I as it is much more than value we are getting, ie. 174 out of that investment