[1] How to define an efficient market?

It is a market where current prices reflect/incorporate all available information.

[2] Describe the 3 forms of efficient market hypothesis.

[a] Weak-form: Prices already reflect all information contained in the past history of prices.
[b] Semi-strong form: Prices not only reflect the history of prices but all publicly available information.
[c] Strong form: Prices reflect all available information, regardless of them being public or private/insider.

[3] Does market efficiency mean you can randomly pick stocks from a stock exchange to form your portfolio?

As I said in class, all that the market efficiency hypothesis implies is that prices should be correct signals because it has already incorporated all available information. But that does not mean your preference is totally irrelevant in making your investment decision. You may have specific situation to deal with. It may be your family issue, your age, your inherent risk preference, your career, etc. Thus, there is a need to optimize your portfolio so that you maximize your happiness. A simplified version of such a complicated optimization decision suggests you pick a risk-level that you would be willing to bear. What accounts for a risk-level then? It is the systematic risk that you are willing to be exposed to. That means diversifying away non-systematic risk is a must. Randomly picking stocks neither guarantee you an appropriate portfolio risk-level you want to bear, nor guarantee you a well-diversified portfolio. The list of reasons to support portfolio management is long. Try to think of more.

[4] What does it mean by the price you pay for a stock is fair?

That means the prices has already incorporated all available information.

[5] List some of the implications of efficient market hypothesis.

Again, the list of implications here is not confined to what you have learnt in this course. You should try to think of more implications. Among many of the implications, some are more obvious. For example,
prices movement should be unpredictable because prices should only reflect relevant new information. Professional investors may not systematically outperform other investors. It is close to impossible for you to figure out a “sure-win” trading strategy just by looking at past price histories (or charts). Etc.

[6] If securities markets are efficient, what is the NPV of any security, regardless of its risk?

NPV = 0, because “what you pay should be what you are expected to get” in an efficient market.

[7] The efficient market hypothesis implies that abnormal returns are expected to be zero. Yet in order for markets to be efficient, arbitrageurs must be able to force prices back into equilibrium. If they earn profits in doing so, is this fact inconsistent with market efficiency?

There is nothing in the efficient market hypothesis that implies arbitrageurs cannot make profits. But it is important to look at their net economic profits rather than their accounting profits. By economic profits I mean we have to subtract the opportunity costs from the gross profits. Costs include the cost of gathering information and a fair rate of return on physical and human capital. Also, it is important to distinguish between net expected economic profits. Efficient market hypothesis expect, at the margin, the net expected economic profits is zero. If an arbitrageurs were able to make net positive economic profits in a consistent basis for a long period of time, more individuals would have entered the arbitrage business until such situation become close to impossible to happen again.

[8] Given the following situations, determine in each case whether or not the hypothesis of an efficient capital market (semi-strong form) is violated.

a) Through the introduction of an advanced computer software into the analysis of past stock price movements, a brokerage firm is able to predict price movements well enough to earn a consistent 2% profit, adjusted for risk, above normal market returns.

This question requires you to distinguish net versus gross profits. As a rational investor, you should ask the cost of acquiring needed information. If the computer costs exceed the excess 2 percent profits from the stocks, the firm is actually earning worse than normal returns. If the total cost including computer costs plus brokerage fee and all other transaction costs is less than 2 percent, then semi-strong form market efficiency hypothesis may be rejected.

b) On average, investors in the stock market this year are expected to earn a positive return (profit) on their investment. Some investors will earn considerably more than others.
On average the stock market provides a positive return. This does not contradict with the market being efficient or not. This is considered a normal return. The fact that ended up some investors did better than others just merely reflect the result of uncertainty in stock returns. Given any probability distribution, some observations will lie above the mean and some will lie below. The expected returns do not have to coincide with the actual realized returns all the time. If it were coincident all the time, we would not have uncertainty to deal with at all.

c) You have discovered that the square root of any given stock price multiplied by the day of the month provides an indication of the direction in price movement of that particular stock with a probability of 75%

This violates the semi-strong form market efficiency hypothesis.

d) An Ontario Securities Commission (OSC) suit was filed against ATI in 2003. ATI’s founder and chairman Mr. Kwok Yuen Ho and his wife Betty Ho were accused of avoiding almost $CAD 7 million in losses and maximizing charitable tax benefits by selling or donating ATI shares ahead of a May 2000 profit warning.

The semi-strong form of market efficiency hypothesis assumes publicly available information is instantaneously incorporated into prices. Thus benefits from insider information are possible. In the above example, strong-form is rejected but not semi-strong form.

[9] You just got hired by an investment advisory firm. After a successful trading day, you go for a drink with your boss. At the pub, you argue strongly for the strong form of the efficient market hypothesis. Your boss’s eyes narrow, and you begin to get nervous. What is the issue here?

Because expressing your opinion right in front of him is of no difference from bluntly telling him that he has no value. And the fact that he hired you was also damn stupid. You also implicitly say that all that he has achieved so far was purely based on luck. If strong-form market efficiency hypothesis holds, those who acquire insider information quickly act on it and force the prices to reflect the information. Hence efforts to seek out insider information are futile. The process of seeking ways to beat the market is also futile. Professional investors have little value.

[10] The law strictly forbids insider trading. There has been regular prosecution against individuals who have traded with insider information about their own firms. What conclusion can you draw from this,
and how does this information affect which form of the market efficiency hypothesis you might adopt?

That may imply the strong-form market efficiency hypothesis probably does not hold.

[11] If the weak-form market efficiency hypothesis is valid, what do the security prices reflect?

All information you can acquire from the history.

[12] Assume the computer technology is so advanced that the market, as confirmed by numerous unbiased studies, have been shown to be efficient. Investment firms therefore have decided to retire all the portfolio managers and financial analysts and let random choice govern the security selection process. What mistake is implicit in this action?

The mistake is the omission that the efficiency of market is actually based upon the continuing services of the analysts to actively scout the market. If there is no analyst left, the prices will definitely not reflect all the available information.

[13] What would happen to market efficiency if all investors follow a passive buy-and-hold investment strategy?

Sooner or later prices will fail to reflect new information. At this point there are profit/arbitrage opportunities for active investors who uncover mispriced securities.

[14] Suppose you observed that companies' CEOs make abnormally high returns on investments in their own company's stock. Would this invalidate the weak-form efficiency market hypothesis? Would this invalidate the strong-form efficiency market hypothesis?

High-level managers might well have insider information about their own firms. Their ability to realize profits based on their insider information is not surprising. It does not violate the weak-form market efficiency hypothesis, but it does violate the strong-form.


Strong-form EMH implies semi-strong form and weak form holds. Semi-strong form holds also implies weak-form holds, but not the reverse. To understand these relationship, we should be able to tell the
entire sets of information used in the strong-form also includes the set of information used in semi-strong form and weak-form. But the set of information used in weak-form does not include the entire sets of information for either the semi-strong form or the strong-form.

[16] Suppose Wal-Mart announced today morning that its profit from last quarter has dropped 15% compared to the previous quarter, Wal-Mart's closing price today was up 2% from yesterday. Is this evidence against the efficiency market hypothesis?

It is not. There are two reasons. First, the 15% drop may be a positive news if the general public expected a worse drop before the announcement. Second, except for the piece of news, there may be some other news simultaneously affecting Wal-Mart's future performance, e.g., consumer confidence becoming stronger, etc. So it is hard to isolate one single event's effect on the stock price.