1) Without government intervention, the free market Q will be inefficiently large.
2) General education may create benefits which “spill over” to society in general (aren’t just reflected in future pay or future job characteristics for the student), and so without government encouragement the consumption of this good may be inefficiently low.
3) Tax output of firm (this is the standard answer); charge a fee based on the level of pollution, impose pollution standards, regulate the firm...
4) MTR = Change in tax liability ÷ Change in Income; ATR = Total tax liability ÷ Total Income
5) (in thousands of $) if income = 100, liability = 500 + 20*.15 + 25*.28 + 50*.36 = 0+ 3+7+18 = $28 so ATR = 28%; for income of a million $ (= 1000 thousand $), liability = 500 + 20*.15 + 25*.28 + 950*.36 = 0+3+7+342 = 352, and so ATR =35.2%
6) Federal - personal income; State - sales (and personal income); Local - property tax
7) Sales tax on navy beans is more regressive (since those with lower income spend a larger proportion of their income on this good – and so the tax collected from this tax/income is lower for lower income people).
8) The incentive to hire tax account increases, and the tax base falls.
9) Frictional, Structural and Cyclical. Cyclical can be reduced by macro-policy. Assuming the workers were previously unemployed and looking for work: Unemployment will i) ↓ ii) ↓ iii) ↓
10) The natural rate (sometimes called the Non Accelerating Inflation Rate of Unemployment = NAIRU) is that rate of unemployment consistent with what we consider “price stability” = inflation that does not increasing. Currently economists think the natural rate is between 4% and 5% unemployment. If the natural rate of unemployment is 5% then “Full Employment” is when 95% of the labor force is working and national output (GDP) is at the Full Employment Level (Yf). Later we will say this is the point where the long run aggregate supply curve is vertical.  
11) Anticipated future inflation will cause contracts to include price and wage increases in future periods to compensate for the expected effects of inflation. Loans (and investments) will have a higher NOMINAL (= “MONEY”) interest rate (than if future expected future inflation were expected to be low or zero), in order to keep the real interest rate relatively constant. Thus, inflation that is perfectly anticipated by both lenders and borrowers will not benefit either group. In contrast, unanticipated inflation will benefit borrowers and hurt lenders, (the opposite is true if actual inflation is lower than what was expected when the contracts were made).
12) i) unit of account -- prices quoted in cigarettes. - variation on the quality and size of cigarettes could cause non-uniform prices, variable supply (red cross packages and their delivery time were erratic) could cause price fluctuations. ii) medium of exchange -- cigarettes used to buy goods and services.- supply erratic, not very durable. iii) store of value -- wealth could be in the form of cigarettes. - value varies as prices fluctuate..., subject to theft.
13) i) accept deposits, ii) make loans, iii) clear checks.
14) 1-(Savings Account), 2-(T-Bill), 3-(Seiko watch), 4-(Gold Filling)
15) M3 will increase if The Fed buys bonds from commercial banks, and it will fall if the Fed sells bonds
16) a) True, b) False, c) True
17) Three tools of the Fed are : i) discount policy (rate), ii) reserve ratio, iii) open market operations. The third is the most important and often used because it is reversible and affects M2 most rapidly and predictably.
18) a) The Fed is legally independent of the U.S. Government. Treasury Department (officially part of government and quite different from the Fed) prints bonds.
   b) Anything that satisfies the 3 functions of money. M1 = most narrow definition = currency in circulation + transactions accounts (demand deposits + “other checkable deposits”) + travelers checks. M2 = M1 + other assets (e.g. savings and time accounts less than $100,000). M3 = M2 plus even more “money-like” assets (e.g. time deposits > $100,000).
   c) medium of exchange, unit of account, store of value (see # 12 above).
   d) IF we assume commercial banks hold NO excess reserves and the amount of cash held by the public does not change (is fixed), THEN we get the simple money multiplier = 1/r and then in our model, the Fed completely determines the money supply by setting monetary base and reserve requirement r. (Commercial) banks may hold reserves as vault cash or as deposits with the FED.
   e) Asset = LOANS (to business, mortgages etc.); Liability = Deposits (e.g., checking deposits).
   f) Banks do not earn interest on deposits with the Fed or on vault cash.
19) $2 million reduction is reserves causes $20 reduction total amount of Transactions Accounts (called just Deposits in the Mankiw text). Note this equals change in Reserves times the simple multiplier = 2(1/1) = $20 million, and we vie this change in Deposits as = change in the Money Supply.
20) MV=PY this is true by definition. The simple Quantity Theory of Money considers V and Y to be constant (unaffected by changes in M), so that a x% increase in M (money supply) causes a x% increase in P (price level). Note if the price level increases from 100 to 120 over a one year period, inflation would be 20% (over a two year period, annual inflation would have been slightly less than 10% per year). “Monetarist Economists” like Milton Friedman think this is a good description of the long run. “New Classical Economists” typically think this holds in the short run (as long as the changes in M are anticipated). “Keynesian Economists” would think it inappropriate to consider velocity (V) as a constant or as changing at a constant rate – and would also think that changes in the M (or other policy) could have permanent effects on the level of national output (Y).