ECON 311 - Intermediate Macroeconomics (Professor Gordon)
Final Examination: Winter 2017

YOUR NAME: _____

Student ID: _____

Circle the **TA session** you attend:

Bence – 3PM	Burke - 3PM	Chris - 3PM
Bence - 4PM	Burke - 4PM	Chris - 4PM

INSTRUCTIONS:
1. The exam lasts **2 hours**.
2. The exam is worth 120 points in total (plus up to 4 time points): 60 points for the multiple choice questions (Part A), 60 points for the five analytical problems (Part B).
3. **Multiple choice:** choose the **one** alternative that best completes the statement or answers the question. **Write your answers for part A (the multiple choice section) in the blanks to the right.** You won't get credit for circled answers in the multiple choice section.
4. **Place all of your answers for part B in the space provided**.
5. You must show your work for part B questions. There is no need to explain your answers for the multiple choice questions.
6. **You must turn in both the answers and the multiple-choice questions. DO NOT PULL THEM APART.**
Good luck!

PART A: Multiple Choice Problems
Answer multiple choice questions in the space provided below. **USE CAPITAL LETTERS.**

1		11		21		31		41		51	
2		12		22		32		42		52	
3		13		23		33		43		53	
4		14		24		34		44		54	
5		15		25		35		45		55	
6		16		26		36		46		56	
7		17		27		37		47		57	
8		18		28		38		48		58	
9		19		29		39		49		59	
10		20		30		40		50		60	

PART B: Analytic Problems

QUESTION 1: Chain-weighted GDP (8 points):

Take a simple economy producing only two consumption goods – bagel and salmon. In the years 2013 and 2014 prices and quantities were:

	2013	2014
Prices:		
1. Bagel	2	1
2. Salmon	7	10
Quantities:		
1. Bagel	5	8
2. Salmon	5	4

(a) Calculate **nominal GDP** for both years. *(2 point)*

	2013	2014
Nominal GDP	2*5+7*5=45	1*8+10*4=48

(b) By holding year 2013 prices fixed, calculate **expenditure in 2013 prices** for both years (hint: you know the number for one year right away). *(1 point)*

	2013	2014
Expenditure in constant 2013 prices	45	2*8+7*4=44

(c) By holding year 2014 prices fixed, calculate **expenditure in 2014 prices** for both years (hint: you know the number for one year right away). *(1 point)*

	2013	2014
Expenditure in constant 2014 prices	1*5+10*5=55	48

(d) Using (b), calculate an **index** for expenditure in 2013 prices. Normalize the index in 2013 to 1. *(1 point)*

	2013	2014
Index for expenditure in constant 2013 prices	1	44/45 = 0.9778

(e) Using (c), calculate an **index** for expenditure in 2014 prices. Normalize the index in 2013 to 1. *(1 point)*

	2013	2014
Index for expenditure in constant 2014 prices	1	48/55 = 0.8727

(f) Combine the indices you found in (d) and (e) to a single **chain-weighted index**. What's the appropriate concept of average in this case? *(1 point)*

	2013	**2014**
Chain-weighted Index	1	*Sqrt(0.9778 *0.8727) = 0.9238*

(g) Using (f), calculate **chain-weighted real GDP** in 2014 if the base year is 2013. *(1 point)*

	2013	**2014**
Chain-weighted real GDP (2013 as base year)	45	*45*0.9238=41.57*

QUESTION 2: Growth Rates (8 points)

(a) Suppose real GDP in Country A was 100 in 2012 and 120 in 2016. If real GDP grew at an annualized continuous rate of 2% from 2012 to 2014, what was the annualized growth rate from 2014 to 2016? (4 Points)

First, solve for GDP in 2014:
$$GDP_{2014} = GDP_{2012}\left(e^{0.02(2014-2012)}\right) = 100(1.0408) = 104.08$$
Next, solve for the annualized growth rate from 2014 to 2016:
$$g = \frac{\ln\frac{GDP_{2016}}{GDP_{2014}}}{2016 - 2014} = \frac{\ln\frac{120}{104.08}}{2} = 7.12\%$$

(b) Suppose Country B has a real GDP of 90 in 2012. The government in Country B wants to grow their real GDP at a continuous rate until they reach the same real GDP as County A in 2020. Assuming that real GDP in Country A grows at an annualized continuous rate of 2% after 2016, what annualized rate should the government in Country B target? *Hint: Recall from part (a) that the real GDP in country A in 2016 was 120.* (4 Points)

First, solve for GDP in country A in 2020:
$$GDP_{2020,A} = GDP_{2016,A}\left(e^{0.02(2020-2016)}\right) = 120(1.0833) = 130$$
Next, solve for the annualized growth rate of GDP in county B assuming that $GDP_{2020,A} = GDP_{2020,B}$:
$$g = \frac{\ln\frac{GDP_{2020,A}}{GDP_{2012,B}}}{2020 - 2012} = \frac{\ln\frac{130}{90}}{8} = 4.60\%$$

QUESTION 3: Open IS-LM model (15 points):

Let the following represent the structure of a **small open economy** with **perfect capital mobility.** Suppose the economy starts with a **flexible exchange rate** regime.

$C = C_a + 0.9(Y-T)$,
$C_a = 85$, $T= 50+0.1Y$, $G=60$,
$I_P = 70 – 10r$,
$NX = 90 – 0.06Y – 5e$,
$(M/P)^D = 0.4Y-4r$,
$M^S/P = 150$.

(a) Assume that initially foreign and domestic interest rates are equal so that $r = r^f$ and let the foreign exchange rate $e=3$. Find the IS and LM equations. (3 points)

k=1/(1-0.9+0.1*0.9+0.06)=1/0.25 = 4
Ap=85 - 0.9*50 + 60 +70 - 10r + 90 - 5e = 260 - 10r - 5e = 245-10r
IS: Y = 4*(245-10r)=980 – 40r
LM: 150 = 0.4Y - 4r -> Y = 375 + 10r

(b) Find the equilibrium income, interest rate and net exports. (3 points)

375 + 10r = 980 – 40r -> 50r = 605 -> r = 12.1 -> Y = 496
NX = 90 – 0.06*496 - 15 = 45.24

(c) Suppose autonomous planned investment suddenly goes up from 70 to 100.

> (c1) Write down the new IS curve, after the shift in autonomous planned investment. Keep in mind that this is a small open economy with **perfect capital mobility** and **flexible exchange rates**. *Hint: Express both Ap and Y in terms of r and e; don't solve for e* (2 points)

Ap=85 - 0.9*50 + 60 +100 - 10r + 90 - 5e = 290 - 10r - 5e
New "IS": Y=k*Ap=1160 – 20e – 40r

(c2) Use the new IS curve and the LM curve to calculate the new output and exchange rate. *Hint: because this is an open economy with perfect capital mobility, the interest rate does not change from what you calculated in part (b). Use the LM curve to calculate real GDP and from this calculate the new value of the exchange rate.* (2 points)

LM: Y = 375 + 10r -> r=12.1, Y=496
"IS": Y = 1160 – 20e – 40r = 676 – 20e = 496
20e=180 -> e=9

(d) Imagine that the central bank reacts to this by imposing abandoning the flexible exchange rate regime and fixing exchange rates at **e=3**. What is the output **Y** and interest rate **r** now? What is the new money supply? *Hint: The interest rate remains fixed at the value you calculated in part (b). Calculate the new real GDP with the original interest rate and the new exchange rate =3. Then calculate the new money supply that the central bank must set in order to maintain equilibrium in the money market.* (5 points)

e=3, r=12.1 since exchange rates are fixed in small, open economy.

Using the new IS equation, Y = 1160 – 20*3 – 40*12.1 = 616.

Since fixed exchange rate, central bank needs to adjust M^s/P to preserve exchange rate. From LM, 616 = 2.5(M^s/P) + 10(12.1) -> 2.5(M^s/P) = 495 -> M^s/P = 198

QUESTION 4: SP-DG Model (14 points):

Suppose that the following equations describe an economy currently at long-run equilibrium:
$$p_t = p_t^e + 0.6 \cdot \hat{Y}_t + z_t$$
$$p_t^e = 0.2 \cdot p_{t-1}^e + 0.8 \cdot p_{t-1}$$
$$\hat{Y}_0 = 0, \hat{x}_0 = 3, p_0^e = 3, p_0 = 3, z_0 = 0.$$

(a) Write down the SP and DG equations using the information above. (2 points)

SP	For the SP just plug the equation for p_t^e into the first equation: $$p_t = 0.2 \cdot p_{t-1}^e + 0.8 \cdot p_{t-1} + 0.6 \cdot \hat{Y}_t + z_t$$
DG	The DG equation is always the same: $$\hat{Y}_t = \hat{Y}_{t-1} + \hat{x}_t - p_t$$

(b) Substitute the DG equation into the numerical SP equation and solve for p_t as a function of $p_{t-1}, p_{t-1}^e, \hat{Y}_{t-1}, \hat{x}_t$, and z_t. (2 points)

Follow the instructions:
$$p_t = 0.2 \cdot p_{t-1}^e + 0.8 \cdot p_{t-1} + 0.6 \cdot \hat{Y}_t + z_t \Rightarrow$$
$$p_t = 0.2 \cdot p_{t-1}^e + 0.8 \cdot p_{t-1} + 0.6 \cdot [\hat{Y}_{t-1} + \hat{x}_t - p_t] + z_t \Rightarrow$$
$$1.6 \, p_t = 0.2 \cdot p_{t-1}^e + 0.8 \cdot p_{t-1} + 0.3 \cdot [\hat{Y}_{t-1} + \hat{x}_t - p_t] + z_t \Rightarrow$$
$$p_t = 0.125 \cdot p_{t-1}^e + 0.5 \cdot p_{t-1} + 0.375 \cdot \hat{Y}_{t-1} + 0.375 \cdot \hat{x}_t + 0.625 \cdot z_t$$

NOTE: The following two parts of the question ask you to compute the path of the system given an initial shock. In order to earn partial credit for these parts you must show your work in the space provided. By "show your work" we mean that the grader should be able to understand a) what you are computing and b) where the numbers in your computation are coming from.

(c) Starting in the long-run equilibrium described above in period 0, assume that in period t=1 we observe a temporary shock to $\hat{x}_t$. In particular, $\hat{x}_1 = 1, \hat{x}_2 = \hat{x}_3 = 3$. Fill in the following table assuming no supply shocks. (4 points)

t	p_t^e	$\hat{Y}_t$	$\hat{x}_t$	p_t	z_t
0	3	0	3	3	0
1	3	-1.25	1	2.25	0
2	2.4	-0.406	3	2.156	0

Work Area.

(d) Starting in the long-run equilibrium described above in period 0, assume that in period t=1 we observe a temporary shock to z_t. In particular, $z_1 = 2$, $z_2 = z_3 = 0$. Fill in the following table assuming that the central bank is following an accommodative policy. (6 points)

t	p_t^e	$\hat{Y}_t$	$\hat{x}_t$	p_t	z_t
0	3	0	3	3	0
1	**3**	**0**	**5**	**5**	2
2	**4.6**	**0**	**4.6**	**4.6**	0

Work Area.

Note: since the central bank is following an accommodative policy, we know $\hat{Y}_t = 0$ in each period. Since from the DG equation $\hat{Y}_t = \hat{Y}_{t-1} + \hat{x}_t - p_t$, we know that $\hat{x}_t = p_t$ in each period. We thus have

$$p_t = 0.125 \cdot p_{t-1}^e + 0.5 \cdot p_{t-1} + 0.375 \cdot \hat{Y}_{t-1} + 0.375 \cdot p_t + 0.625 \cdot z_t$$
$$0.625 p_t = 0.125 \cdot p_{t-1}^e + 0.5 \cdot p_{t-1} + 0.375 \cdot \hat{Y}_{t-1} + 0.625 \cdot z_t$$
$$p_t = 0.2 \cdot p_{t-1}^e + 0.8 \cdot p_{t-1} + 0.6 \cdot \hat{Y}_{t-1} + z_t$$

Since $\hat{Y}_t = 0$ in each period, we have
$$p_t = 0.2 \cdot p_{t-1}^e + 0.8 \cdot p_{t-1} + z_t$$

QUESTION 5: Solow model (15 points)

Suppose the production function of a closed economy is given by $Y = AN^{1/2}K^{1/2}$, where K is capital, N is labor and A=10 is total factor productivity.
Furthermore, suppose that capital depreciates at d=0.15, the saving rate is s=0.2, and population growth is n=0.1.

(A) Find the steady state level of capital per capita (3 points)

Y/N = A(K/N)$^{0.5}$
s* A(K/N)$^{0.5}$ = (n+d)*(K/N)   ->   K/N = (sA/(n+d))^2 = (2/0.25)^2 = 64

(B) Find the steady state level of output per capita and investment per capita (2 points)

Y/N = A(K/N)$^{0.5}$ = 80
I/N = s*Y/N = 16

(C) On a graph of the Solow growth model, show an initial equilibrium (labeled A). Show the effect of an increased depreciation rate, *d* (labeled B). Would you expect steady state consumption per capita to go up or down or is the answer ambiguous and depends on the exact change in *d*? Briefly explain your answer. (5 points)

Down.

(D) **When you solve this part, ignore part C**. On a graph of the Solow growth model, show an initial equilibrium (labeled A). Show the effect of an increased total factor productivity, A (labeled C). Would you expect steady state consumption per capita to go up or down or is the answer ambiguous and depends on the exact change in A? Briefly explain your answer. (5 points)

Up.

PART A: Multiple Choice Problems

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) Funds are channeled from savers to borrowers directly through _____ and indirectly through _____.
   A) financial intermediaries; financial markets
   B) financial markets; financial intermediaries
   C) brokers;' agents
   D) main banks; branches

2) Price bubble occurs when
   A) economy experiences prolonged and slow recovery.
   B) people can no longer afford to purchase an asset.
   C) economy enters recessionary period.
   D) price of an asset soars far above "fundamentals" like corporate earning or household income.

3) Risk Premium refers to
   A) the difference between the corporate bond rate and the risk–free rate of Treasury bonds.
   B) the average difference over a long period of the interest rate on short–term financial instruments and the interest rate on the discount rates.
   C) the average difference over a long period of the interest rate on long–term bonds and the interest rate on the short–term federal funds rate.
   D) the difference between prime rate and the discount rate.

4) In the period 1980–92, United States net national saving fell due to
   A) large budget deficits and a decrease in private saving.
   B) small budget deficits and an increase in private saving.
   C) large budget deficits and an increase in private saving.
   D) small budget deficits and a decrease in private saving.

5) The natural employment deficit _____ be used to determine the effectiveness of discretionary fiscal policy actions because _____.
   A) cannot; it excludes non–discretionary spending changes
   B) can; it excludes automatic stabilization expenditures
   C) cannot; it includes non–discretionary spending changes
   D) can; it includes non–discretionary spending changes

6) The cyclical deficit is
   A) the amount by which the actual government budget deficit exceeds the structural deficit.
   B) what the budget deficit would be if the economy were operating at the natural real GDP level.
   C) the same as the structural deficit.
   D) the amount by which structural deficit exceeds the actual budget deficit.

7) Suppose we have an economy in which G = 100, t = 0.26, Y = 3800, and YN = 4000. Then t rises to 0.28 as the same time as G rises to 1150. The overall impact of this resettling of the fiscal variables is _____ because _____.
   A) expansionary, the natural employment deficit falls
   B) contractionary, the actual deficit rises
   C) expansionary, the actual deficit rises
   D) contractionary, the natural employment deficit rises
   E) contractionary, the natural employment deficit falls

8) The "solvency condition" states that the debt–GDP ratio will rise continuously so long as
   A) the real interest rate exceeds the nominal interest rate.
   B) the real interest rate exceeds the real GDP growth rate.
   C) the nominal interest rate exceeds the cost of borrowing.
   D) the real GDP growth rate exceeds the real interest rate.

9) To raise economic growth, a tighter fiscal policy should be accompanied by a _____ money supply in order to keep the _____ from falling.

   A) smaller, output ratio
   B) larger, real interest rate
   C) larger, output ratio
   D) smaller, real interest rate

10) Which of the following is considered to be an invention of the second industrial revolution?
   A) locomotive
   B) steam ship
   C) air conditioning
   D) electronic calculator

11) Which of the following is considered to be an invention of the third industrial revolution?
   A) commercial jet aircraft
   B) memory typewriter
   C) television
   D) interstate highway system

12) Which of the following made the greatest contribution to the slowdown in GDP growth from the 1970s-1980s to the interval 2004-2016?
   A) labor force participation rate
   B) unemployment rate
   C) rate of productivity growth
   D) share of investment in GDP

13) Direct investment in the stock market by the Social Security trust fund
   A) does not require that new money be brought into the system.
   B) would cause the government indirectly to own substantial parts of American companies.
   C) would be more cost–effective than creating private accounts for each person in the Social Security system.
   D) All of the above.

14) If the United States imports another good in exchange for assets transferred from an American bank to a foreign bank, in the U.S. balance of payments table

   A) the current account deficit rises and so the balance of payments deficit rises.
   B) the current and capital account deficits both rise and so the balance of payments deficit rises.
   C) the current account deficit rises by as much as the capital account surplus rises and the balance of payments is unaffected.
   D) the current and capital account deficits both fall and so the balance of payments deficit falls.
   E) the current and capital account deficits both rise and so the balance of payments is unaffected.

15) The three policies which cannot be maintained simultaneously by a nation (sometimes referred to as the "trilemma") do NOT include

   A) fixed exchange rates.
   B) independent control of fiscal policy.
   C) free flow of capital.
   D) independent control of the money supply.

16) If the Federal Reserve intervenes in the foreign–exchange markets by selling foreign currencies
   A) the U.S. money supply falls and foreign currencies depreciate.
   B) the U.S. money supply rises and foreign currencies depreciate.
   C) the U.S. money supply rises and foreign currencies appreciate.
   D) the U.S. money supply falls and foreign currencies appreciate.

17) Suppose the price of the dollar falls from 150 to 120 yen. As a result, Japanese purchases of $35,000 Cadillacs rise from 2,000 to 2,100 per year. This is the kind of event underlying the reason for drawing

   A) a downward–sloping supply curve of yen.
   B) a downward–sloping demand curve for yen.
   C) an upward–sloping supply curve of yen.
   D) an upward–sloping demand curve for yen.

18) In a fixed exchange rate system such as the Bretton Woods system, a country would be forced to "devalue" its currency if persistent balance of payments _____ cause it to _____ foreign exchange reserves.

   A) surpluses, run dangerously short of
   B) surpluses, amass dangerous amounts of
   C) deficits, amass dangerous amounts of
   D) deficits, run dangerously short of

19) A rise in the nominal money supply will
   A) shift the AD curve and raise the equilibrium price level.
   B) shift the IS curve and shift the AD curve.
   C) shift the AD curve and raise the equilibrium level of nominal GDP.
   D) All of the above are correct.

20) If the marginal leakage rate is small, then the AD is
   A) flatter.
   B) perfectly vertical.
   C) steeper.
   D) perfectly horizontal.

21) If labor unions negotiate an increase in the nominal wage rate the SAS curve will shift
   A) downward to the left and output will decrease.
   B) upward to the left and output will decrease.
   C) upward to the right and output will increase.
   D) downward to the right and output will increase.

22) The long-run buildup of an economy's capital stock _____ the marginal product of labor thus shifting the labor demand curve to the _____, which then causes _____.

        A) decreases, left, movement down the SAS curve
        B) decreases, right, SAS to shift to the left
        C) increases, right, movement up the SAS curve
        D) increases, right, SAS to shift to the right
        E) increases, left, SAS to shift to the left

Figure 7-5
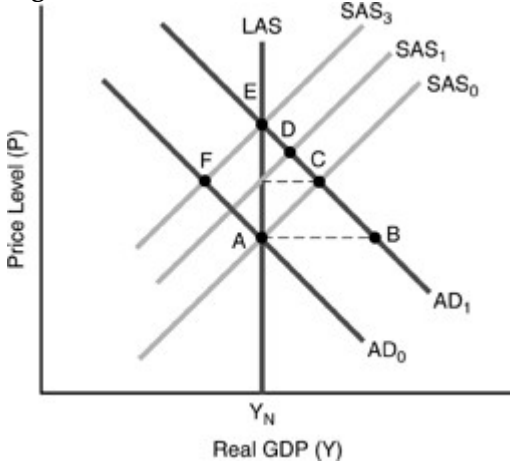
23) In Figure 7-5 above, from an initial long-run equilibrium the net tax rate rises with no initial change in the nominal wage. We would show this as a movement from points

        A) A to B.
        B) A to F.
        C) E to B.
        D) E to F.
        E) B to E.

24) Rising inequality has which effect on the measured growth rate?
        A) reduces growth in output per capita relative to output per hour
        B) reduces growth rate in disposable real income compared to real personal income
        C) reduces growth in consumption relative to growth of income
        D) reduces growth in median income per capita relative to growth of average income per capita

25) According to an article read in lecture, which of the following has the most trouble turning a door handle?
        A) CEOs
        B) union leaders
   C) politicians
        D) robots

26) According to the book on innovation summarized in the course packet, which of the following have corporate CEOs
        not been doing?
        A) make risky investments in new technology
        B) hoard cash
        C) buy back shares of stock
        D) merge with rivals

27) Suppose that members of Congress and the President believe that the natural rate of unemployment is 2% but in fact it is 6%, and employing fiscal policy they increase AD each time unemployment rises above 2%. The underestimation of the natural rate combined with adaptive expectations will

        A) lead to a continuous inflation by a shift in only SAS.
        B) lead to continuous increases in output and unemployment.
        C) lead to a continuous inflation by a shift in only AD.
        D) lead to continuous inflation by shifts in both AD and SAS.

Figure 8–6
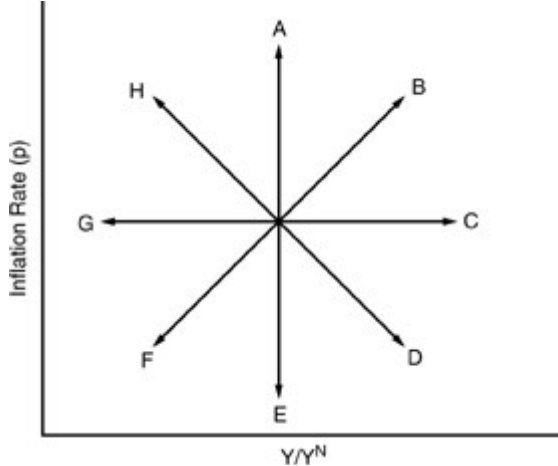
28) 1974–75 and 1980–81 saw the U.S. economy traveling along path _____ in Figure 8-6.
    A) F
    B) D
    C) B
    D) H

29) The flatter the SP curve
        A) the greater will be the shift in the SP.
        B) the greater will be the change in real GDP and the smaller will be the change in inflation for any given change in nominal GDP growth.
        C) the greater will be the change in inflation and the smaller will be the change in real GDP for any given change in nominal GDP growth.
        D) the greater will be the growth of nominal GDP.

30) Suppose than successive AD/SAS equilibrium points run up a vertical line to the right of the LAS curve. It must be the case that inflation is _____ the average expected inflation figured into the wage contracts in force, which allows output to _____ the natural GDP.
        A) greater than, remain above
        B) equal to, be maintained at
        C) less than, remain below
        D) greater than, remain below
        E) less than, remain above

31) The slope of the SP curve depends on
        A) the percentage of GDP that is sold on auction markets.
        B) whether the expansionary force in the economy is coming through monetary policy or fiscal policy.
        C) how business changes its markups when output varies.
        D) both A and C.

32) With a "cold turkey" disinflationary policy of reducing GDP growth, the assumption of adaptive expectations causes
      A) an immediate full reduction in inflation with no temporary recession.
      B) inflation to not decrease in the long–run.
      C) a permanently lower level of output at the long–run rate of inflation.
      D) a temporary recession en route to the final long–run equilibrium.

33) Lucas's idea of information barriers as applied to the formation of inflation expectations is an example of
      A) backward–looking expectations.
      B) forward–looking expectations.
      C) adaptive expectations.
      D) irrational expectations.

34) If there is a permanent adverse supply shock
      A) a policy of accommodation at the original natural level of real GDP is not possible without an acceleration of inflation.
      B) the rate of inflation can be held constant if real wages are kept from falling.
      C) the level of employment at the natural level of real GDP will remain constant only if the labor supply curve is upward sloping to the right.
      D) an extinguishing policy will produce an acceleration of inflation.

35) Inflation has no effect on an economy's well–being if
      A) the nominal rate of interest for both savers and borrowers rises by an amount just equal to the rate of inflation.
      B) relative prices are unaffected.
      C) it is universally and accurately anticipated.
      D) all of these

36) From the quantity equation we find that the rate of inflation is equal by definition to the growth rate of nominal GDP _____ the growth rate of real GDP.
      A) multiplied by
      B) divided by
      C) minus
      D) plus

37) An article describes research that attributed the sixfold increase in the productivity of shipping from 1600 to 1850 as due to what?
      A) invention of the steamship
      B) increased size of ships
      C) suppression of piracy
      D) revolutionary improvement in the design of sails

38) The article comparing India vs. China lists all but one of the following as factors in China's higher level of development. Which one?
      A) share of agriculture in GDP
      B) expenditure on education
      C) provision of health care services
      D) Achievement of literacy

39) The article explaining the low level of per-capita income in the Middle East cites which factors as causes?
    A) lack of entrepreneurship
    B) lack of partnerships
    C) lack of corporations
    D) A) and B)
    E) A) and C)

40) The classic loser from an unanticipated inflation is
    A) the saver who earns more real interest than expected, and so should have saved more.
    B) the saver who earns less real interest than expected.
    C) the borrower who pays less nominal interest than expected.
    D) the borrower who pays more nominal interest than expected.

41) A legitimate objection to the government issuance of "indexed" bonds is that they
    A) are more of a drain on the Treasury than conventional bonds.
    B) discourage saving when inflation is reduced.
    C) can encourage inflation and weaken policy resistance to it.
    D) further discourage the use of money and thus increase shoe–leather costs.

42) Suppose the U.S. public holds $1 trillion in government bonds, all with an 8 percent nominal interest rate. If the Federal Reserve can hold that nominal rate constant, what inflation rate would make the government's net interest expense exactly zero?
    A) –8 percent
    B) 16 percent
    C) 0 percent
    D) 8 percent

43) Higher inflation is particularly damaging to the real value of
    A) physical assets.
    B) wages.
    C) government tax revenues.
    D) financial assets.

44) Unemployment due to the normal processes of quitting and searching for jobs is called _____ unemployment.
    A) mismatch
    B) natural
    C) cyclical
    D) turnover

45) The principle of compound interest insures that
    A) a small difference in the per capita GDP between countries in one year will grow to a large difference in the long run.
    B) a small difference in the per capita GDP growth rate between countries in one year will grow to a large difference in the long run.
    C) U.S. interests are compounded by the interests of all other countries.
    D) U.S. interests are compounded by the interests of Great Britain and Germany.

46) When we study economic growth, we are most concerned about changes in
    A) the level of natural real output.
    B) the output ratio.
    C) the absolute difference between natural and actual real output.
    D) None of these.

47) Net investment is
    A) savings less replacement savings.
    B) total investment less replacement investment.
    C) investment net of savings.
    D) replacement investment.

48) Using the textbook's production function, if two percent more labor working with two percent more capital produces two percent more real GDP, then "multifactor productivity" has
    A) risen by four percent.
    B) fallen by two percent.
    C) remained unchanged.
    D) fallen by one percent.
    E) risen by two percent.

49) "Given the long run implication of Solow's growth model with respect to the rate of savings, the low savings rate in the United States is not a problem." This statement overlooks that over time it appears that
    A) total factor productivity and the growth rate of capital per person are positively related.
    B) savings rates and per capita growth rates are inversely related.
    C) total factor productivity and the growth rate of capital per person are inversely related.
    D) total factor productivity and the difference between the growth rates of capital per capita and population are not related a and k – n are not related.

50) The neoclassical growth theory implies that
    A) the rate of return on capital is low in poor countries.
    B) there should be large flows of capital from rich countries to poor countries.
    C) the marginal product of capital is low in poor countries.
    D) all of the above.

51) The article comparing the human toll of joblessness cited all but one of the following as features of the German system. Which one?
    A) benefits a higher share of previous income
    B) benefits last longer
    C) shorter recessions
    D) government-funded medical insurance

52) Several articles on labor markets reported a shortage of suitable job applicants. Which industries were described as having labor shortages?
    A) retail trade
    B) construction
    C) manufacturing
    D) A) and B)
    E) B) and C)

53) Which provides the best estimate of expected inflation?
    A) the corporate Baa bond rate minus the 10-year Treasury bond rate
    B) the TIPS bond rate minus the federal funds rate
    C) the 10-year Treasury bond rate minus the TIPS bond rate
    D) the 10-year Treasury bond rate minus the federal funds rate

54) In the formula used to measure the growth rate of multifactor productivity, the contribution of labor is represented by
	A) y – bk.
	B) bk – bn.
	C) (1 – b)n.
	D) bn.

55) If labor's share of national income is to remain constant, then _____.
	A) labor productivity must grow faster than the real wage
	B) the real wage must grow at the same rate as labor productivity
	C) the real wage must grow faster than labor productivity
	D) the combined growth rates of labor productivity and the real wage must equal the growth rate of national income

56) Which of the following is a method by which a poor country might import technological change without having to incur the heavy expense of research and development (not to mention human and physical capital formation) out of its own saving?
	A) Obtain investment by foreign firms.
	B) Purchase imported machinery that embodies the latest technology.
	C) Copy modern products made in rich countries.
	D) All of the above.

57) In calculating multifactor productivity growth, the elasticity of output to changes in capital (given as "b" in the textbook) is assumed to be
	A) the depreciation rate.
	B) one minus the population growth rate.
	C) the share of capital income in GDP.

58) The labor market in 2016 was characterized by
	A) job openings greater than hires
	B) labor force participation rate has risen
	C) number of discouraged workers has risen
	D) A) and B)
	E) A) and C)

59) The article "Donald Trump's 42% Unemployment Rate" showed that the unemployment rate would be 40 percent if you treated all but one of the following groups as unemployed. Which one?
	A) retired people
	B) children under the age of 16
	C) college students
	D) people on disability
	E) parents staying home to care for children

60) When the government shut down in 2013, what was the most common way that government employees copied with the drop in their income?
	A) delayed paying bills
	B) ran up credit card balances
	C) reduced saving
	D) obtained bank loans

1) B
2) D
3) A
4) A
5) B
6) A
7) E
8) B
9) C
10) C
11) B
12) A
13) D
14) C
15) B
16) A
17) A
18) D
19) D
20) A
21) B
22) D
23) D
24) D
25) D
26) A
27) D
28) D
29) B
30) A
31) D
32) D
33) B
34) A
35) D
36) C
37) C
38) A
39) E
40) B
41) C
42) D
43) D
44) D
45) A
46) A
47) B
48) C
49) A
50) B
51) C
52) E

53) C
54) C
55) B
56) D
57) C
58) D
59) B
60) A