SOA November2001Course2 PDF

November 2001Course 2Interest Theory, Economics and FinanceSociety of Actuaries/Casualty Actuarial SocietyCourse 2, November 2001 21. Ernie makes deposits of 100 at time 0, and X at time 3. The fund grows at a force ofinterest$\frac{t^2}{100}$, t > 0. The amount of interest earned from time 3 to time 6 is X. Calculate X. (A) 385(B) 485(C) 585(D) 685(E) 785Course 2, November 2001 32. The production of a good requires two inputs, labor and capital. At its current level ofdaily output, a competitive firm employs 100 machine hours of capital and 200 laborhours. The marginal product of machine hours is 10 units. The marginal product of laborhours is 5 units. The rental rate, or .price,. of capital is 20 per machine hour.If the firm minimizes its costs, what is the hourly wage rate?(A) 2.5(B) 5.0(C) 10.0(D) 20.0(E) 40.0Course 2, November 2001 43. Last year, a country's output increased 2.6%. The country.s capital stock increased 4.0% while its labor hours increased 2.0%. The labor share of total income was 70%.What was the country.s total factor productivity growth last year?(A) .0.8(B) 0.0(C) 2.3(D) 5.2(E) 6.0Course 2, November 2001 54. Consider a project lasting one year. The initial outlay is 100,000 at the beginning of theyear and the expected inflow is 120,000 at the end of the year. The opportunity cost ofcapital for the project is 20%, the borrowing rate is 8%, and the marginal tax rate is 35%.Calculate the adjusted present value if

the company borrows 54% of the project.srequired investment. (A) 800 (B) 1260 (C) 1400 (D) 3150 (E) 3500 Course 2, November 2001

65. Mike buys a perpetuity-immediate with varying annual payments. During the first 5 years, the payment is constant and equal to 10. Beginning in year 6, the payments start to increase. For year 6 and all future years, the current year.s payment is K% larger than the previous year.s payment. At an annual effective interest rate of 9.2%, the perpetuity has a present value of 167.50. Calculate K, given K (A) 4.0 (B) 4.2 (C) 4.4 (D) 4.6 (E) 4.8 Course 2, November 2001

76. A 10-year loan of 2000 is to be repaid with payments at the end of each year. It can be repaid under the following two options: (i) Equal annual payments at an annual effective rate of 8.07% . (ii) Installments of 200 each year plus interest on the unpaid balance at an annual effective rate of i . The sum of the payments under option (i) equals the sum of the payments under option (ii) . Determine i . (A) 8.75% (B) 9.00% (C) 9.25% (D) 9.50% (E) 9.75% Course 2, November 2001

87. The demand curve for Product X is steep, whereas the demand curve for Product Y is almost flat. The supply curves for the two products are identical. Equilibrium price and quantity are the same for the two products. Consider a 5% excise tax on both products. Which of the following statements about the impact of the tax is FALSE? (A) Equilibrium quantity will decrease less for Product X than for Product Y . (B) Consumers face a larger price increase for Product X than for Product Y . (C) The tax burden experienced by producers is larger for Product Y than for Product X . (D) The government collects more taxes from Product Y than from Product

X .(E) In each market, the economic incidence of the tax would be the same if the 5% excise tax were replaced by a 5% sales tax. Course 2, November 2001 98. A corporation is considering an investment in one of two potential projects. Each project requires an initial investment of 5000. Project X will produce cash flows of 300 at the end of each 6-month period. The cashflows are expected to continue forever. The first cash flow is expected 6 months after the initial investment. Project Y will have a single cash flow of Z, which will be received exactly 5 years after the initial investment. The IRR on both projects is the same. Calculate the profitability index on Project Y, using an annual effective interest rate of 10% .(A) 8.5% (B) 9.4% (C) 10.3% (D) 11.2% (E) 12.1% Course 2, November 2001 109. A loan is amortized over five years with monthly payments at a nominal interest rate of 9% compounded monthly. The first payment is 1000 and is to be paid one month from the date of the loan. Each succeeding monthly payment will be 2% lower than the prior payment. Calculate the outstanding loan balance immediately after the 40th payment is made.(A) 6751 (B) 6889 (C) 6941 (D) 7030 (E) 7344 Course 2, November 2001 110. Five self-interested colleagues are dining together at a restaurant where desserts cost 5.0 each. If dining alone, one of the colleagues would be willing to pay 3.5 for a dessert. Two of the colleagues would be willing to pay 4.5 for a dessert while the other two would be willing to pay 5.5. The restaurant will not give individual checks, so the colleagues have agreed to split the bill evenly. If the five colleagues each act out of their own self-interest, how many desserts will be ordered?(A) 0 (B)

2(C) 3(D) 4(E) 5Course 2, November 2001 12 100Test