

Question 4

Select the option which is the general solution of the recurrence relation

$$u_{r+1} = -4u_r - 4u_{r-1}$$

Options

A $u_n = A(2)^n + B(2)^n$

B $u_n = A(-2)^n + B(-2)^n$

C $u_n = A(2)^n + B(-2)^n$

D $u_n = A(2)^n + Bn(2)^n$

E $u_n = A(-2)^n + Bn(-2)^n$

F $u_n = A(2)^n + Bn(-2)^n$

G $u_n = A(-2)^n + Bn(2)^n$

Question 5

Which of the options is TRUE for the problem of calculating u_n , where n is large, using the recurrence relation

$$u_{r+1} = \frac{1}{2}u_r + \frac{3}{4}$$

with the initial condition $u_0 = 3$

Options

A The problem is absolutely and relatively well-conditioned with respect to small changes in the value of u_0 .

B The problem is absolutely well-conditioned and relatively ill-conditioned with respect to small changes in the value of u_0 .

C The problem is absolutely ill-conditioned and relatively well-conditioned with respect to small changes in the value of u_0 .

D The problem is absolutely and relatively ill-conditioned with respect to small changes in the value of u_0 .

Question 6

Using the notation and model introduced in the television programme associated with Unit 1, which of the following options models the mortgage problem in which £50 000 is borrowed, the gross repayments (before any income tax relief) are £400 per month and the interest rate is 8% per annum?

Options

A $u_0 = 50\,000$ and $u_{r+1} = 0.08u_r - 400$

B $u_0 = 50\,000$ and $u_{r+1} = 0.92u_r - 400$

C $u_0 = 50\,000$ and $u_{r+1} = 1.08u_r - 400$

D $u_0 = 50\,000$ and $u_{r+1} = 0.08u_r - 4800$

E $u_0 = 50\,000$ and $u_{r+1} = 0.92u_r - 4800$

F $u_0 = 50\,000$ and $u_{r+1} = 1.08u_r - 4800$