

**Time : 30 minutes**

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**Question 1**

Evaluates the following factors using tables :

1-  $(A/P, 10\%, 15) \approx 0.1315$

2-  $(G/F, 10\%, 15) \approx 0.00596$

3-  $(F/A, 5\%, 10) \approx 12.578$

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**Question 2**

For a nominal interest rate 15 % , what is the effective interest rate if compounding is :

1- Monthly .  $i_{\text{eff}} = (1 + (15\% \div 12))^{12} - 1 = \underline{16.075\%}$

2- Weekly .  $i_{\text{eff}} = (1 + (15\% \div 52))^{52} - 1 = \underline{16.158\%}$

3- Continuous .  $i_{\text{eff}} = e^{(15\%)} - 1 = \underline{16.183\%}$

4- Semiannually.  $i_{\text{eff}} = (1 + (15\% \div 2))^2 - 1 = \underline{15.563\%}$

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### Question 3

An individual is borrowing \$100,000 at 8 % compounded annually. The loan is to be repaid in equal annual payments over 30 years. Just after the eighth payment is made, the lender allows the borrower to double the annual payment. The borrower agrees to this payment. If the lender is still charging 8 % compounded annually on the unpaid balance of the loan, what is the balance still owed just after 12<sup>th</sup> payment is made ?

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### Question 4

The operating and maintenance expenses on a machine are expected to increase  $\frac{1}{2}\%$  per month. This month's expenses are \$2,000. For interest rate of 12 % compounded monthly :

- 1- What are the expected expenses during the 12<sup>th</sup> month ?
- 2- What are the equivalent uniform monthly expenses over the first year ?