## Department of Computer Systems Engineering
### University of Engineering & Technology
### Peshawar, Pakistan

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| Subject: | **Engineering Economics** |
| Exam: | **Final Term** |
| Max Marks: | **50** |
| Time Allowed: | **2 Hrs** |

## DIRECTIONS:

1. *Be clear and precise in your answers. Do NOT include unnecessary details.*
2. *Do not forget drawing the cash flows where necessary.*
3. *Bring your own calculator, no exchange allowed*
4. *Annuity Tables or anything else found in possession would be tantamount to cheating.*

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1. Find the current price of a ten-year bond paying 9% per year (payable semi-annually) that is redeemable at par value, if bought by a purchaser to yield *15%* per year. The face value of the bond is *$3000*.

2. A bond with a face value of *$7000* pays interest of 5% annually. This bond will be redeemed at par value at the end of its *15* year life, and the first interest payment is due 1.5 year from now.

   a. How much should be paid now for this bond in order to receive a yield of *15%* per year on the investment?

   b. If this bond is purchased now for *$5600*, what yield would the buyer receive?

3. A piece of new equipment has been proposed by engineers to increase the productivity of a certain manual welding operation. The investment cost is *$35000*, and the equipment will have a market value of *$7000* at the end of the five years period. Increased productivity attributable to the equipment will amount to *$9000* per year after extra operating costs have been subtracted from the revenue generated by the additional production. If the firm's MARR is *25%* per year, is this proposal a sound one? Use the PW method. Also evaluate the FW and show the relationship between FW and PW for this scenario.

4. A company has an option to purchase a tract of land that will be worth *$15000* in *5* years. If the value of the land increases at 9% each year, how much should the investor be willing to pay for this property?

5. A credit card company charges an interest rate of *1.35%* per month on the unpaid balance of all accounts. The annual interest rate is *15 (1.35%)*. What is the effective rate of interest per year being charged by that company?

6. A *$100* lump sum amount is invested for *10* years at a nominal interest rate of *8%* compounded quarterly. How much is it worth at the end of *10th* year?