Question Paper Code : 1782

BBA (MS) (Semester-II) Examination, 2018

FINANCIAL MATHEMATICS

[BMS-206]

Time : Three Hours] **[Maximum Marks : 70**

Note : Answer **five** questions in all. Question **No.1** is **compulsory.** Besides this, **one** question is to be attempted from each Unit. Use of tables and simple calculator is permitted.

1. Answer the following : [3x10=30]

   (a) What is the annual effective interest rate corresponding to a nominal interest rate of 13% p.a., interest payable every 4 months.

   (b) Find out the present value of Rs. 10,000 payable after 10 years at 15% p.a.

   (c) Find the compound interest for a sum of Rs. 18,000 invested for 10 years at 8% compounded semi-annually

   (d) Calculate the future value of an annuity of Rs. 12,000 received for 12 years, if the compound rate of interest is 10% p.a.

(e) Find out the amount of monthly payments necessary to pay off a loan of Rs. 50,000 at 10% p.a. compounded semi-annually in 5 years.

(f) In return of promise to pay Rs. 500 at the end of 10 years a person agrees to pay Rs. 100 now, Rs. 200 at the end of 6 years and a final payment at the end of 12 years. If the rate of interest is 8% p.a. effective, what should be the final payment?

(g) What is Nominal Rate of Interest ?

(h) What is Deferred Annuity ?

(i) Find the present value of an annuity of Rs. 4000 payable at the begining of each year for 5 years, if money is worth 5% effective ?

(j) What is a Sinking Fund ?

UNIT-I

2. (a) Mr. Arun puts a sum of Rs. 6000 with a bank which pays interest @ 8% p.a. effective. Find the sum Mr. Arun is entitled to receive from the bank after 5 years from now. [5]

(b) Mr. Ajay wants to make an investment of Rs. 50,000 in one of the two banks that fetch the returns after 6 years. 'Bank X' offers 8% interest compounded semi-annually and 'Bank Y' offers 7.5% compounded quarterly. Decide which bank will give maximum returns to Mr. Ajay ? [5]

3. Mr. Raman deposited Rs. 15,000 in a bank. The bank calculates the interest at 8% p.a. compounded semi-annually. After 5 years he again deposits an amount of Rs. 10,000 in his account. The bank has increased the rate of interest from 8% to 10% at the end of 8th year. If he withdraws the total amount at the end of 10 years, what will be the total amount in his account ? [10]

UNIT-II

4. Compute the present value of Rs. 20,000 payable after 7 years on the basis of each of the following interest rates : [10]

(a) Effective Interest rate at 8% p.a.

(b) Nominal Interest rate at 8% payable half yearly.

5. Find out the present value of investment required to obtain Rs. 1,00,000 after 8 years at 6% per annum, if the interest is compounded : [10]

(a) Annually

(b) Half yearly

(c) Quarterly

(d) Continuously

UNIT-III

6. A 10 year savings annuity of Rs. 2,000 per year is begining at the end of current year. The payment of retirement annuity is to begin 16 years from now (the first payment is to be received at the end of year 16) and will continue to provide at 20 year payment annuity. If this plan is arranged through a savings bank, that pays interest @ 7% per year on the deposited funds, what is the size of the yearly retirement annuity that will result ? [10]

7. Mr. Ali deposited Rs. 10,000 at the end of every six months in a savings account which pays interest at the rate of 7% p.a. compounded semi-annually. The first deposit was made when Ali's son was 10 years old and the last deposit was made when son was 30 years old. The money remained in the account and was presented to the son on his 30th birthday. Determine the amount he received. [10]

UNIT-IV

8. A plant expansion of Rs. 20,00,000 has to be financed. 15% will be paid as down payment and the balance will be borrowed at an interest of 9%. The loan is to be repaid in 8 equal annual instalments begining 4 years from now. Find the amount of the required annual loan payments. [10]

9. A company purchases a machine for Rs. 7,00,000 and estimates its value will depreciate each year by 8%, depreciation being calculated on diminishing value method. The estimated life of the machine is 10 years. After 10 years, the machine will be sold out at its scrap value and replaced by a new machine which is expected to cost 20% higher than the cost of present one. Assume that the proceeds from sale of scrap would be used for meeting the cost of new machine. Find what amount the company should set aside at the end of every year towards a sinking fund created for the purpose of purchasing the new machine, if every payment earns interest at 10% compounded annually. [10]

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