

Sl. No. 320

BCOM 1201

No. of Printed Pages : 05

Following Paper ID and Roll No. to be filled in your Answer Book.

PAPER ID : 27807

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No.

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## B Com (Hons) Examination 2016-2017

(Second Semester)

### BUSINESS MATHEMATICS

*Time : 3 Hours]*

*[Maximum Marks : 60*

- Note :-** (i) The question paper consists of three sections A, B and C.  
(ii) All sections are compulsory.  
(iii) Students are allowed to bring and use the simple calculator during the examination.

#### SECTION - A

1. Attempt all parts of the following :  $8 \times 1 = 8$
- Find the ratio between  $7/8$  and  $11/12$ .
  - Define geometric mean between any two numbers.
  - Find the simple interest on Rs. 1,000 for 5 years at the rate of 4% per annum.
  - Define deferred annuity.

*[ P. T. O.*

- (e) If  ${}^n P_r = 720$  and  ${}^n C_r = 120$ , find  $r$ .
- (f) Write the set  $A =$  set of all factor of 12.
- (g) Evaluate  $\int \sqrt{x} \, dx$
- (h) What do you mean by a feasible solution and optimal solution in reference of linear programming?

## SECTION - B

$$2 \times 6 = 12$$

2. Attempt any two parts of the following :

- (a) If  $n^{\text{th}}$  term of A. P. series is  $1/n$  and  $m^{\text{th}}$  term is  $1/n$  then prove that  $T_{mn} = 1$ .
- (b) Rs. 61,000 is borrowed at 5% compound interest and paid back in two equal instalments. Find the value of each instalment.
- (c) Define Cartesian Product of two sets. If  $P$ ,  $Q$  and  $R$  be three non empty sets then prove that :  

$$P \times (Q \cup R) = (P \times Q) \cup (P \times R)$$
- (d) Solve the linear programming problem through simplex :  
 Maximize  $Z = 5x_1 + 3x_2$

$$\text{Subject to constraint } x_1 + x_2 \leq 2$$

$$5x_1 + 2x_2 \leq 10$$

$$3x_1 + 8x_2 \leq 12$$

$$\text{and } x_1, x_2 \geq 0$$

## SECTION - C

$$5 \times 8 = 40$$

**Note :-** Attempt any two parts from each question.

3. (a) A bag contains one rupee, 50 paise and 10 paise coins. 1 rupee and 50 paise coins are in the ratio of 2 : 5 and 50 paise and 10 paise coins are in the ratio of 4 : 9. If the total amount is Rs. 1,125, find the number of coins of each type.

- (b) What do you mean by profit and loss. A cloth merchant on selling 33 meters of cloth obtains a profit equal to the selling price of 11 meters of the same cloth. Find his profit percentage.

- (c) Find the sum of the series  
 $0.7 + 0.77 + 0.777 + \dots$   $n$  terms.

4. (a) 1/3rd of the A's capital is invested at 4%, 1/4 at 3% and the remainder at 5%. If A's annual interest is Rs. 500. Find his capital.

(b) Find the present value of an annuity of Rs. 2,000 payable half yearly for 15 years at the rate of 4% compound interest per annum.

(c) Explain the following terms :

Interest, Time, Rate and Principal Amount.

5. (a) In a certain city, there are 5,000 people. Out of them 1,200 do not drink coffee or tea, 2,700 drink coffee and 1,800 drink tea. Find how many drink both? Show that data by Venn diagram.

(b) Prove that

$${}^n P_r = {}^{n-1} P_r + r \cdot {}^{n-1} P_{r-1}$$

(c) In how many ways can a cricket team be selected from a group of 25 players containing 10 batsman, 8 bowlers, 5 all-rounders and 2 wicket keepers? Assume that the team of 11 players requires 5 batsman, 3 all-rounders, 2 bowlers and 1 wicket keeper.

6. (a) Differentiate  $\log \left( \sqrt{x} + \frac{1}{\sqrt{x}} \right)$  with respect to x.

(b) Solve the linear programming problem by graphical method :

$$\text{Maximize : } Z = 40x + 35y$$

$$\text{Subject to constraint : } 2x + 3y \leq 60$$

$$4x + 3y \leq 96$$

$$4x + 3.5y \leq 105$$

$$\text{and } x \geq 0, y \geq 0$$

(c) Evaluate

$$\int \frac{\sin x}{1 + \cos^2 x} dx$$

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