

## FIRST SEMESTER B.Com. DEGREE EXAMINATION, 2014

Business Mathematics

(Old)

Time : Three Hours

Maximum : 80 Marks

**Instructions to Candidates:**

- 1) Mathematical tables will be supplied on request.
- 2) Simple calculator is allowed.

**Section A****I. Answer any ten of the following.****(10×2=20)**

- 1) State various ways to represent a set.
- 2) Define equality of sets with an example.
- 3) Define symmetric relation.
- 4) Which term of the series  $99+92+85+\dots$  is 15 ?
- 5) Find  $x$  if  $-1+2x$ , 5 and  $5+x$  are in AP.
- 6) Which term of the series  $1,2,4,8, \dots$  is 256?
- 7) Define inverse proportion with an example.
- 8) Divide 81 in the ratio of 2:7.
- 9) Show that  $\log 1 + \log 2 + \log 3 = \log 6$ .
- 10) Simplify  $\frac{a^{m+2n} \times a^{3m-8n}}{a^{5m-6n}}$
- 11) Find the slope and y-intercept of the equation  $4x-3y = 9$
- 12) Find the slope of the line joining the points A(1,3) and B(2,7)

**Section B****II. Answer any three of the following.****(3×5=15)**

- 13) If  $A = \{1,2\}$ ,  $B = \{0,1\}$  and  $U = \{0,1,2,3,4,5\}$ , find
  - i)  $P(B)$
  - ii)  $A-B$
  - iii)  $A' \cup B'$
- 14) Find the AP of 6 terms if the first term is  $2/3$  and last term is  $22/3$ .
- 15) Sum to  $n$  terms  $9+99+999+\dots$

16) Prove that  $\left(\frac{x^a}{x^b}\right)^{a^2+ab+b^2} \times \left(\frac{x^b}{x^c}\right)^{b^2+bc+c^2} \times \left(\frac{x^c}{x^a}\right)^{c^2+ac+a^2} = 1$

- 17) The ratio of yearly income and expenditure of A and B are respectively 4:3 and 3:2. If each of them saves Rs. 1000 annually. What are their annual schemes?
- 18) Find the points of trisection of the line joining the points A(5,2) and B(10,6)

### Section - C

III. Answer any **three** of the following (3×15=45)

- 19) a) In a certain professional examination 75% passed in group A and 82% in group B and 15% fail in both groups. What percentage are passed in the examination? (8)

- b) In a class of 250 students, 120 students have taken Economics, 80 have taken economics but not History. (7)

Find i) number of students who have taken Economics and History.

ii) Number of students who have taken History but not Economics.

- 20) a) Find 4 numbers in AP such that their sum is 32 and the product of extreme is to the product of means as 7:15 (8)

- b) A person pays Rs. 9750 in monthly installments, each installment be less than the preceeding installment by Rs. 50, the amount of first installment is Rs. 1000. In what time will be the entire amount to be paid? (7)

- 21) a) Find the last term and the sum of following GP (8)  
128, 64, 32, .... upto 8 terms.

- b) A person borrows Rs. 8190 without interest and repays the loan in 12 monthly installments, each installment being twice preceeding one find the first and the last installments. (7)

- 22) a) A machine which has an estimated life of 10 years costs Rs. 1,00,000. Calculate the value at the end of its life, depreciation on the reducing instalment system being changed at 10% p.a. (8)

- b) If  $a^x = b^y = c^z = d^w$  then show that (7)

$$\log_a (bcd) = x \left( \frac{1}{y} + \frac{1}{z} + \frac{1}{w} \right)$$

- 23) a) The incomes of A, B and C are in the ratio of 7:9:12 and their spending are 8:9:15. If A saves  $\frac{1}{4}$ th of his income, find the ratio of their savings. (8)



- b) The present ages of two brothers are in the ratio of 3:4. 5 years back, their ages were in the ratio of 5:7. Find their present ages. (7)
- 24) a) Find the equation of the line passing through the points A(2,5) and B(-3,2) (8)
- b) Find the equation of a straight line which cuts off intercepts in the ratio 2:3 which passes through (4,-3). (7)

Time: 1 hour

Maximum: 80 Marks

Instructions to Candidates:

- 1) Mathematical tables are allowed on request.
- 2) Simple calculator is allowed.

#### Section A

- 1) In any two of the following, prove that:
- 11)  $\sin^2 \theta + \cos^2 \theta = 1$
- 12) The sum of angles of a triangle is  $180^\circ$ .
- 13) The sum of angles of a quadrilateral is  $360^\circ$ .
- 14) The sum of angles of a polygon is  $(n-2) \times 180^\circ$ .
- 15) The sum of angles of a circle is  $360^\circ$ .
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- 17) The sum of angles of a quadrilateral is  $360^\circ$ .
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- 31) The sum of angles of a circle is  $360^\circ$ .
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- 96) The sum of angles of a triangle is  $180^\circ$ .
- 97) The sum of angles of a quadrilateral is  $360^\circ$ .
- 98) The sum of angles of a polygon is  $(n-2) \times 180^\circ$ .
- 99) The sum of angles of a circle is  $360^\circ$ .
- 100) The sum of angles of a triangle is  $180^\circ$ .

#### Section B

- Answer any three of the following:
11. If A = (1, 2), B = (3, 4), and C = (5, 6), find

12. Find the AP of a series if the first term is 2/3 and last term is 7/3.

13. Find the sum of the series 9+99+999+...

- 23) Find the sum of the series 1+2+3+...+n and find the ratio of the sum of the first n terms to the sum of the first 2n terms.

24) Find the AP of a series if the first term is 2/3 and last term is 7/3.

25) Sum to n terms 9+99+999+...