I Semester B.Com. Examination, Nov./Dec. 2017
(CBCS) (2014-15 and Onwards) (F + R)
COMMERCE
1.6.b : Methods and Techniques for Business Decisions

Time : 3 Hours
Max. Marks : 70

Instruction: Answers should be either in English or Kannada.

SECTION A

Answer any 5 (five) sub-questions. Each sub-question carries 2 marks. \((5\times2=10)\)

1. a) What are rational numbers?
   b) The LCM and HCF of two numbers are 180 and 3 respectively. If one number is 27, find the other.
   c) Solve for \(x\) : \(x + 3 + x = 5\).
   d) Find the \(10^{th}\) term of a sequence 10, 12, 14 ...
   e) What is a square matrix? Give an example.
   f) If \(A = \begin{bmatrix} 2 & 4 & 5 \\ 6 & 7 & 8 \end{bmatrix} \) \(B = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \end{bmatrix}\) find \(A + B\).
   g) How much interest will be earned on \(₹ 2,000/-\) @ 8.5% simple interest in 2 years.

SECTION B

Answer any 3 (three) questions. Each question carries 6 (six) marks. \((3\times6=18)\)

2. Solve by the method of elimination:
   \[5x + 6y = 3\]
   \[2x - 5y = 16\]

3. Find the sum of the series \(99 + 101 + 103 \ldots \) to 25 terms.

4. What would be the amount of Compound Interest (CI) on \(₹ 5,000/-\) at 5% rate of interest p.a. for 3 years?
5. Show that \[
\begin{vmatrix}
3 & 4 & 7 \\
2 & 1 & 3 \\
-5 & -1 & 2
\end{vmatrix} = -40.
\]

6. Find:
   i) TD, ii) BD, iii) BG on a bill of ₹10,450 due 3 months hence @ 5% p.a.

SECTION - C

Answer any 3 (three) questions. Each question carries 14 marks. (3\times14 = 42)

7. a) Divide ₹1,600 between A, B and C, so that B may have ₹100 more than A and C ₹200 more than B.

b) The weekly wages of 30 persons consisting men and women amount to ₹3,800. Each man receives ₹140 and each woman ₹100 as wages per week. Find the number of men and women.

8. a) Solve by formula method
\[x^2 - 3x = 10.\]

b) The sum of 3 terms in G.P. is 14 and their product is 64. Find them.

9. a) If
\[
A = \begin{bmatrix}
2 & 4 & 4 \\
4 & 2 & 4 \\
4 & 4 & 2
\end{bmatrix}
\]
   prove that \[A^2 - 8A - 20I = 0.\]

b) Solve by Crammer's rule
\[
\begin{align*}
3x - y &= 6, \\
2x - 15 &= -3y.
\end{align*}
\]

10. a) If 12 pumps working 7 hours a day can lift 2,800 gallons of water in 20 days, in how many days can 20 pumps working 9 hours a day lift 3,000 gallons of water?

b) A bill for ₹14,600 drawn at 3 months was discounted on November 11th for ₹14,544. If the rate of simple interest is 4% p.a., on what date was the bill drawn?

11. a) Find the amount of annuity if payment of ₹300 is made at the end of each year for 4 years at the rate of 10% p.a. compounded yearly.

b) Find the co-factors of matrix of A.
\[
A = \begin{bmatrix}
5 & 2 & 3 \\
3 & 1 & 2 \\
1 & 2 & 1
\end{bmatrix}
\]
1. a) 3x + 9 = 30  ಎಂದು ಸಿದ್ದಿತು? 
   b) 180 ಎಕ್ಟು 3 ಎಕ್ಟು. 27 ಎಕ್ಟೂ ಎಂಬುದು ಎಂಬುದು ಹಾಗೂ ಮೂಲದ ಸೃಷ್ಟಿಯ ಪ್ರಮಾಣದ ಹಾಗೂ ಪ್ರಮಾಣದ ಹಾಗೂ ಪ್ರಮಾಣದ 
   c) 3x + 9 = 5.
   d) 10, 12, 14 ....... ಎಕ್ಟೂ 10 ಎಕ್ಟೂ ಎಂಬುದು ಎಂಬುದು ಹಾಗೂ ಎಂಬುದು ಹಾಗೂ ಎಂಬುದು ಹಾಗೂ. 
   e) 3x + 9 = 5  ಎಂಬುದು ಎಂಬುದು? 100 ಎಕ್ಟೂ ಎಂಬುದು ಹಾಗೂ.
   f) A = \begin{bmatrix} 2 & 4 & 5 \\ 6 & 7 & 8 \end{bmatrix}  B = \begin{bmatrix} 1 & 2 & 3 \\ 1 & 4 & 2 \end{bmatrix}  ಎಂಬುದು A + B ಎಂಬುದು ಎಂಬುದು ಹಾಗೂ ಎಂಬುದು ಹಾಗೂ.
   g) 2,000 ರೂ ಸಾಲು 8.5%  ಸಾಮರ್ಪಿಕವಾಗಿ 2 ರೂ. ಹಾಗೂ, ಎಂಬುದು ಎಂಬುದು ಹಾಗೂ ಎಂಬುದು ಹಾಗೂ?

2. 5x + 6y = 3  
   2x - 5y = 16
3. 99 + 101 + 103 .......  ಎಂಬುದು 25 ಎಂಬುದು ಎಂಬುದು ಹಾಗೂ ಹಾಗೂ.
4. 5,000 ರೂ. 6%  ಸಾಮರ್ಪಿಕವಾಗಿ 5%  ಸಾಮರ್ಪಿಕವಾಗಿ 3 ರೂ. 6%  ಸಾಮರ್ಪಿಕವಾಗಿ ಹಾಗೂ ಹಾಗೂ.
   \[
   \begin{bmatrix} 3 & 4 & 7 \\ 2 & 1 & 3 \\ -5 & -1 & 2 \end{bmatrix} = -40 
   \]
5. 10,450 ರೂ (ಸಂಸ್ಥೆ)  ಎಂಬುದು 6%  ಸಾಮರ್ಪಿಕವಾಗಿ 5%  ಸಾಮರ್ಪಿಕವಾಗಿ 3%  ಸಾಮರ್ಪಿಕವಾಗಿ ಹಾಗೂ ಹಾಗೂ.
   i) TD  ii) BD  iii) BG
7. a) ₹ 1,600 ಗಳು A, B ಮತ್ತು C ರೀತಿಯ ನಡುವಿನಲ್ಲಿ ಉತ್ಪಾದಿಸಲಾಗುತ್ತವೆ.
   'B'ಗೆ 'A' ಸ್ಥಳ 100 ರು ಆಗುತ್ತವೆ 'C' ಸ್ಥಳ 'B' ಸ್ಥಳ 200 ರು ಆಗುತ್ತವೆ.
   b) ಕಲ್ಲೆಗಳ ಮೇಲೆ ಕೂಡಿರುವ ಹಸಿರುಭಾಗದಲ್ಲಿ 30 ರು ವಿಸ್ತೀರ್ಣ ಮಾಡಲಾಗುತ್ತದೆ ₹ 3,800 ಉತ್ಪಾದಿಸಲುತ್ತದೆ.
   ಅದೇ ಕೊನೆಗೆ ನಡಿಸಲಾಗುವ 140 ರು ಹಸಿರು ಅಮಚು ಮಾಡಲಾಗುವ ಅಮಚು 100 ರು ಹಸಿರು ಕೂಡಿರುವ ಅಮಚುಗಳಲ್ಲಿ 20 ರು ಹಸಿರು ಆಗುತ್ತವೆ.
8. a) ಸಮõesಮುಖ್ಯ ಸಮಯ:
   \[ x^2 - 3x = 10 \]
   b) ರಾಜ್ಯವು ದೇಶದ ವರ್ಷದ ಹೊಂದಿರುವ 14 ಹಸಿರು ಆಗುತ್ತದೆ 64 ರು ಮತ್ತು 8 ವರ್ಷಗಳಲ್ಲಿ ಹೊಂದಿರುತ್ತದೆ.
9. a) \[ A = \begin{bmatrix} 2 & 4 & 4 \\ 4 & 2 & 4 \\ 4 & 4 & 2 \end{bmatrix} \]
   ಅದೇ A² - 8A - 20I = 0 ಸಮಾಧಾನವನ್ನು ಸಹಿಸುವ.
   b) ಕೆಲವು ಸ್ಥ್ರತ್ಕಲ್ಲುಗಳಲ್ಲಿ ಹೊಂದಿರುವ ಸಮಯ,
   \[ 3x - y = 6 \]
   \[ 2x - 15 = -3y \]
10. a) 12 ವರ್ಷಗಳಲ್ಲಿ 7 ಕಾಲೀನಿಕೆಗಳಲ್ಲಿ 20 ಹಸಿರುಗಳಿಂದ 2,800 ರು ವಿಸ್ತೀರ್ಣ ಮಾಡಲಾಗುತ್ತದೆ, 20 ಹಸಿರುಗಳಿಂದ 9 ಕಾಲೀನಿಕೆಗಳಲ್ಲಿ 3,000 ರು ವಿಸ್ತೀರ್ಣ ಮಾಡಲಾಗುತ್ತದೆ ಮತ್ತು 3 ಕಾಲೀನಿಕೆಗಳಲ್ಲಿ 6,000 ರು ವಿಸ್ತೀರ್ಣ ಮಾಡಲಾಗುತ್ತದೆ?
   b) 14,600 ರು ಗುಣಮಟ್ಟಳಲ್ಲಿ (3) ಕೋಶಿ ವಿಸ್ತೀರ್ಣ ಮಾಡಲಾಗುತ್ತದೆ 14,544 ರು ಗುಣಮಟ್ಟಳಲ್ಲಿ 11 ಅತ್ಯನ್ನೆ ವಿಸ್ತೀರ್ಣ ಮಾಡಲಾಗುತ್ತದೆ.
11. a) ಮೇಲೆ ತಾಮ್ರದಲ್ಲಿ 300 ರು ಗಳಿಂದ 4 ಹಸಿರುಗಳಿಂದ 11 ಕೋಶಿ ವಿಸ್ತೀರ್ಣ ಮಾಡಲಾಗುತ್ತದೆ, 100 ರು ಗಳಿಂದ 4 ಹಸಿರುಗಳಿಂದ 12 ಕೋಶಿ ವಿಸ್ತೀರ್ಣ ಮಾಡಲಾಗುತ್ತದೆ (compounded) ಅದೇ ಕೋಶಿ ವಿಸ್ತೀರ್ಣ ಮಾಡಲಾಗುತ್ತದೆ.
   b) \[ A = \begin{bmatrix} 5 & 2 & 3 \\ 3 & 1 & 2 \\ 1 & 2 & 1 \end{bmatrix} \]
   ಅದೇ, ಹೊಂದಿರುವ ಸಮಯವನ್ನು ಹೊಂದಿರುತ್ತದೆ.
I Semester B.Com. Examination, November/December 2016
(CBCS) (2014-15 and Onwards) (F + R)
COMMERCe
1.6 (b) : Methods and Techniques for Business Decisions

Time : 3 Hours
Max. Marks : 70

Instruction: Answer should completely be either in English or Kannada.

SECTION – A

Answer any 5 (five) sub-questions, each sub-question carries 2 (two) marks : (5x2=10)

1. a) What are irrational numbers ?
b) Write the meaning of quadratic equation.
c) Find HCF of 36 and 54.
d) What do you mean by bankers discount ?
e) Write the meaning of a matrix.
f) Define ratio.
g) Write the meaning of geometric progression with example.

SECTION – B

Answer any 3 (three) questions, each carries 6 (six) marks : (3x6=18)

2. Find the LCM of 32 and 48 and hence find their HCF (show steps).

   \[10x - 9y = 12\]
   \[3x - 9y = 17\]

4. The sum of 3 number in GP is 35 and their product is 1,000. Find the numbers.

   \[
   \begin{pmatrix}
   0.5 & 0.5 & 0.0 & 0.0 \\
   0.3 & 0.0 & 0.2 & 0.1 \\
   1 & 0.1 & 0.2 & 0.5
   \end{pmatrix} \times \begin{pmatrix}
   10 \\
   20 \\
   3 \times 4 \\
   5 \times 1
   \end{pmatrix}
   \]

5. If \( A = \begin{pmatrix}
   0.3 & 0.0 & 0.2 & 0.1 \\
   1 & 0.1 & 0.2 & 0.5
   \end{pmatrix}, B = \begin{pmatrix}
   10 \\
   20 \\
   25 \\
   50
   \end{pmatrix}\). Find \( AB \).

6. 16 men or 28 women can do a work in 40 days. In how many days will 24 men and 14 women complete the same work ?

P.T.O.
SECTION C

Answer any 3 (three) questions, each carries 14 (fourteen) marks: (3 x 14 = 42)

7. a) The income of A and B is in the ratio of 4 : 3 and their expenditure is in the ratio of 3 : 2. If both of them save ₹ 6,000 at the end of each month find their respective monthly income.

   b) Calculate the amount and interest on ₹ 100 for 20 years allowing the compound interest at 5% p.a.

8. a) Solve by formula method \( \frac{1}{x-2} + \frac{2}{x-1} = \frac{5}{x} \).

   b) Divide 110 into two parts so that 5 times of one part together with 6 times of the other part will be equal to ₹ 610.

9. a) Labour cost ₹ 20 per hour per unit, material cost is ₹ 5 and one unit of sub-contracted work costs ₹ 10. Find the total cost of manufacturing 3,000, 2,000 and 1,000 vehicles of type A, B and C respectively, given that

<table>
<thead>
<tr>
<th>Vehicles</th>
<th>Labour hours</th>
<th>Material used</th>
<th>Sub-contracted work</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>40 hrs.</td>
<td>100 units</td>
<td>50 units</td>
</tr>
<tr>
<td>B</td>
<td>80 hrs.</td>
<td>150</td>
<td>80</td>
</tr>
<tr>
<td>C</td>
<td>100 hrs.</td>
<td>250</td>
<td>100</td>
</tr>
</tbody>
</table>

Solve by matrix method.

b) Solve the following equations by Cramer's rule.
\[ 10x + 5y = 125 \]
\[ 9x + 12y = 150 \]

10. a) Find the sum of all integers between 100 and 400 which are divisible by 7 (seven).

   b) A class consists of member of boys whose ages are in AP. The common difference being 4 months. If the youngest boy of the class be only 8 years old and the sum of all the ages of all the boys in the class be 168. Find the number of boys.

11. a) Calculate the present value of an annuity of ₹ 5,000 per annum for 12 years the interest being 4% p.a. compounded annually.

   b) Find the Adj of \( \begin{pmatrix} -5 & 7 \\ -2 & 3 \end{pmatrix} \) and hence show that \( A(\text{Adj} A) = |A|I \).
(CBCS) (2014-15 and Onwards) (F + R)
COMMERCE
1.6. b : Methods and Techniques for Business Decisions

Time : 3 Hours
Max. Marks : 70

Instruction : Answer should completely be either in English or Kannada.

SECTION – A

Answer any five sub-questions, each sub-question carries 2 marks. (5x2=10)

1. a) What do you mean by prime number?
   b) Give the meaning of linear equation.
   c) What is a Diagonal Matrix?
   d) Write the meaning of immediate annuity.
   e) What do you mean by True Discount?

f) If $\frac{7}{2}, 4, \frac{9}{2} \ldots \ldots \ldots \ldots \text{are in AP, find the 8th term.}$

 g) Write the duplicate ratio of 3 : 4.

SECTION – B

Answer any three questions, each question carries six marks. (3x6=18)

2. Solve for $x$,  
   \[
   \frac{7x + 5}{5} - \frac{x - 11}{14} = \frac{3(x - 25)}{7} + 35
   \]

3. Find the inverse of the matrix $A = \begin{bmatrix} 2 & -1 \\ 3 & -2 \end{bmatrix}$.

4. If 3rd and 7th terms of an AP are 15 and 39 respectively, find AP.

5. A car covers a distance of 102 kms in 2 hours and another car covers a distance of 85 kms in $2\frac{1}{2}$ hours. Compare the speed of two cars.

6. Calculate the amount of an annuity of ₹ 5,000 for 15 years, @ 12% p.a. interest.

P.T.O.
SECTION - C

Answer any three questions, each question carries fourteen marks. (3x14=42)

7. a) If 15 men working 12 hours per day perform a job in 16 days, how long will it take 21 men working 10 hours daily to do the same task?

b) A company needs ₹ 10,00,000 at the end of 5 years. It would like to set aside an equal amount each year out of its profits. If the present rate of interest is 16%, how much should annual amount be invested?

8. a) Solve $9x^2 - 3x - 2 = 0$ by using the formula method.

b) Monthly income of two persons is in the ratio 4:5 and their monthly expenses are in 7:9; if each saves ₹ 500 a month, find the monthly income of two persons.

9. a) If $A = \begin{bmatrix} 1 & 2 \\ 2 & 4 \\ 5 & 6 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & -2 & 5 \\ 2 & 4 & -6 \end{bmatrix}$ show that $(AB)' = B'A'$.

b) If $2x + 3y - 1 = 0$, $3x - y + 2 = 0$ solve by Crammer's rule.

10. a) A person buys every year Bank's cash certificates of value exceeding the last year's purchase by ₹250. After 20 years, he finds that the total value of the certificates purchased by him is ₹72,500. Find the value of the certificates purchased by him a) in the first year b) in the 13th year.

b) The sum of the first eight elements of GP is five times the sum of the first four terms. Find the common ratio.

11. a) Ashok lent two equal sum of money to Rahul and Laxman. While Rahul agreed to pay interest @ 5% p.a., Laxman agreed to pay interest @ 6% p.a. At the end of 10 years Ashok received ₹ 1,000 more from Laxman towards interest. How much did Ashok lend to Rahul and Laxman each? Interest charged being simple interest.

b) A bill was drawn on April 1, 2014 for ₹ 15,000 due in 6 months and discounted on July 23, 2015 @ 6% p.a. Find:
   1) Banker's Discount
   2) True Discount
   3) Discounted value of the bill
   4) Banker's Gain.
(New Syllabus) (Repeaters) (2012-13 and Onwards)

COMMERCIAL STUDIES

1.6 (b): Methods and Techniques for Business Decisions

Time: 3 Hours
Max. Marks: 100

**Instruction**: Answers should be completely in English or Kannada.

**SECTION – A**

1. Answer any 10 questions. Each sub-question carries 2 marks. (10×2=20)
   a) What are real numbers?
   b) What is L.C.M.?
   c) What do you mean by Quadratic Equations?
   d) Solve for ‘x’
      
   \[ 2x^2 - 32 = 0. \]
   e) What is a sequence?
   f) What is square matrix?
   g) Mention any two properties of matrix addition.
   h) What is simple interest?
   i) Find 200% of 30.
   j) What is Banker’s gain?
   k) Divide ₹ 800 between A and B in 1:3 ratio.
   l) Find the 6th term of the sequence 3, 6, 12, ...

**SECTION – B**

2. Answer any four questions. Each question carries 8 marks. (4×8=32)

2. Find the H.C.F. of 12 and 28 and then find their L.C.M.

3. Solve for ‘x’:

   \[ \frac{x - 3}{3} + \frac{x - 5}{5} = \frac{x - 8}{4}. \]

4. If \( A = \begin{bmatrix} 0 & 2 & 3 \\ 2 & 1 & 4 \end{bmatrix} \) and \( B = \begin{bmatrix} 7 & 6 & 3 \\ 1 & 4 & 5 \end{bmatrix} \)

   Find:
   a) \( 2A + 4B \)
   b) \( 5B - 3A \).

5. Find the simple interest on ₹ 15,300 for 3 years, 7 months and 73 days at the rate of 5% p.a.

6. Which term of the A.P. 7, 10, 13, ... is 160?
SECTION – C

Answer any 3 questions. Each question carries 16 marks. (3×16=48)

7. a) Solve by Elimination method
   \[ 3x + 4y = 14 \]
   \[ 5x + 7y = 24 \]
   b) Solve by formula method
   \[ 2x^2 - 7x + 3 = 0 \]

8. a) If \( A = \begin{bmatrix} 4 & 2 \\ 6 & 4 \end{bmatrix} \) and \( B = \begin{bmatrix} 8 & 4 \\ 6 & 2 \end{bmatrix} \) show \( (AB)' = B'A' \).
   b) Solve by Cramer’s Rule
   \[ 3x + 5y = 8 \]
   \[ 6x + 5y = 11 \]

9. a) A bill for \( ₹2,000 \) was drawn on 1-4-2014 at 6 months date. It was discounted on 11-5-2014 at 12% per year. Calculate
   i) Banker’s discount
   ii) Present worth
   iii) True discount
   iv) Banker’s gain.
   b) Solve \( x + \frac{1}{x} = 2 \frac{9}{10} \).

10. a) Given:
    Debtors \( ₹50,000 \) Cash \( ₹5,000 \)
    Inventory \( ₹75,000 \) Creditors \( ₹55,000 \)
    B/R \( ₹30,000 \) Short-term loans \( ₹25,000 \)
    Calculate:
    i) Current Ratio
    ii) Liquid Ratio
    iii) Absolute Liquid Ratio
    b) The 2nd term of a geometric progression is 16 and the 5th term is 128. Find the 9th term.
1 Semester B.Com. Examination, Nov./Dec. 2014  
(Fresh) (CBCS) (2014-15 and Onwards)  
COMMERCE  
1.6 (b) : Methods and Techniques for Business Decisions  

Time : 3 Hours  
Max. Marks : 70  

*Instruction*: Answers should be completely in English or Kannada.  

SECTION – A  

1. Answer any 5 questions. Each question carries 2 marks.  

a) Form an equation whose roots are 2 and –5.  
b) What is arithmetic progression?  
c) What is Scalar matrix? Give an example.  
d) Find the compound interest on ₹ 3,000 for 3 yrs at 4% p.a.  
e) If x : 3 = 50 : 2, find ‘x’.  
f) What is banker’s gain?  
g) Find the 6th term of G.P. 2, 6, 18 .......  

SECTION – B  

Answer any three questions. Each question carries 6 marks.  

2. Solve for ‘x’  
\[ \frac{1}{x+1} + \frac{3}{x+4} = \frac{4}{x+3}. \]  

3. The 4th and 8th terms of a G.P. are 24 and 384 respectively. Find the 5th term.  

4. If  
\[
A = \begin{bmatrix} 1 & 5 & 6 \\ 7 & 8 & 9 \\ 0 & 1 & 2 \end{bmatrix}, \quad B = \begin{bmatrix} 4 & -2 & 3 \\ 0 & 1 & 2 \\ 3 & 4 & 5 \end{bmatrix}
\]

Find  
i) A + 2B  
ii) 2A – B  

5. Find the banker’s discount and bankers gain on ₹ 3,030 for 73 days at 5% p.a.  

6. A man spends 20% of his income for rent, 75% of the remainder for other expenses. If he saves ₹ 1,600 per month, find his monthly income.  

P.T.O.
SECTION C

Answer any three questions. Each question carries 14 marks. \[ (3 \times 14 = 42) \]

7. a) Find the inverse of \( A = \begin{bmatrix} 3 & 5 \\ 2 & 1 \end{bmatrix} \).

\[ \begin{bmatrix} 4 & 3 \\ 6 & -2 \end{bmatrix} \]

b) \( 2A + B = \begin{bmatrix} 4 & 3 \\ 6 & -2 \end{bmatrix} \quad 3A + 2B = \begin{bmatrix} 3 & -2 \\ -6 & 1 \end{bmatrix} \) Solve for ‘\( A \)’ and ‘\( B \)’ matrix.

8. a) The sum of 3 numbers in AP is 9 and their product is 15. Find them.

b) The sum of 3 numbers in GP is -21 and their product is 125. Find them.

9. a) Solve by formula method \( 6x + \frac{15}{x} = 19 \).

\( x = \frac{15}{6} \)

b) Find the compound interest on \( \text{₹} \ 20,000 \) for 4 years at the rate of 4% p.a. payable half yearly.

10. a) On a bill of \( \text{₹} \ 10,900 \) due in 9 months at 5% p.a. find

1) Present value
2) True discount
3) Banker’s discount
4) Banker’s gain.

b) If \( A = \begin{bmatrix} 7 & 4 & 2 \\ 3 & 2 & 1 \end{bmatrix} \quad B = \begin{bmatrix} 6 & 2 \\ 3 & 4 \\ 1 & 3 \end{bmatrix} \) show that \( (AB)^T = B^T A^T \).

11. a) The last term of a series in AP is 40 and the sum of their series is 952. The common difference is -2. Find the first term and the number of terms in the series.

b) The age of the father is 4 times that of his son, 5 yrs ago the age of the father was 7 times that of his son. Find their present ages.