#### BBA 1st Semester (Hons.) Examination, 2020-21 BACHELOR OF BUSINESS ADMINISTRATION 212 Course Code: BBA-CC-02

# Course ID: 13212

## **Course Title: Business Mathematics**

# Full Marks: 80

**Time: 3 Hours** 

The figures in the right hand margin indicate full marks. Candidates are required to give their answers in their own words as far as practicable. Illustrate the answers wherever necessary.

#### **GROUP-A**

### (1) Answer all the questions:

i) The value of  $10c_5$  is

- a) 250
- b) 252
- c) 251
- d) 253
- e) None of these
- ii) The value of  $\begin{vmatrix} 15 & -3 & 21 \\ 5 & -1 & 7 \\ 2 & -3 & 8 \end{vmatrix}$  is a) 273 b) 0 c) -273 d) 275 e) None of these
- iii) The distance between the point (-2,4) and (4,-5) is a) 0 units b) 117 units c) $\sqrt{116}$  Units d) $\sqrt{117}units$ e) None of these iv) If f(x) =2<sup>x</sup>,find f(-2) a) 1/4 b)1 c) 1/9 d) 0
  - e) None of these

1x10=10

- v) Find  $\frac{d}{dx}(e^{-5x})$ a)  $5e^{-5x}$ b) $e^{-5x}$ c)  $-5e^{-5x}$ d) $e^{5x}$ d) None of these
- vi) Find  $\int \frac{1}{1+x^2} dx$ a) sin<sup>-1</sup>x+c b) cos<sup>-1</sup>x+c c) sec<sup>-1</sup>x+c d) tan<sup>-1</sup>x+c e) None of these

vii) The equation  $x^2+4x+6y+9=0$  is

- a) Circle
- b) parabola
- c) Ellipse
- d) Hyperbola
- e) None of these

# viii) The sum of the G.P series of

1+2+4+8+ ----+64 is

- a) 63
- b) 255
- c) 127
- d) 227
- e) None of these
- ix) The value of  $\log_2 [\log_2 {\log_2^{16}}]$  is
- a) 0
- b) 1
- c) -1
- d) 2
- e) None of these

x) The value of 
$$\lim_{x\to 0} \frac{tanx}{x}$$
 is  
a) 0 b) 1  
c) -1 d) 2  
e) None of these

#### Group-B

#### 2) Answer any ten questions:

2 X 10 = 20

- a) Define 'Unit Matrix' and 'Null Matrix'
- b) If  $n_{c7} = n_{C11}$ , then find  $21_{cn}$
- c) Solve :  $2^{2x+1} + 2^9 = 2^{10}$
- d) If A+I= $\begin{pmatrix} 1 & 3 \\ -1 & 2 \end{pmatrix}$ , then find (A+I) (A-I)
- e) If f(x) = x + |x 5|, find f (-2)

f) Find 
$$\frac{dy}{dx}$$
 if y= e<sup>2x</sup> sinx

- g) Difference between  $\lim_{n \to a} f(x)$  and f(a)
- h) Find the slope of the line 5x+3y+ 7=0

i) Find 
$$\int_{0}^{\pi} (3x + 5) dx$$

- j) Find the logarithm of 0.000001 to the base 0.01
- k) Varify that the points (3, -4), (1, 2) and (2, -1) are collinear or not.
- If f(x) = 1/2 -x when 0<x <1/2</li>
  =1/2 when x=1/2

= 3/2 - x when  $\frac{1}{2} < x < 1$ 

Show that f(x) is discontinuous at x=1/2

- m) If  $p^a=q^b=r^c$  and pqr=1, find the value of 1/a+ 1/b+1/c
- n) If m and n be the roots of  $x^2-px+q=0$ , then find the value of  $(m^2+n^2)$
- o)  $(5^5 + 0.01)^2 + (5^5 0.01)^2 = 5^{x_r}$  then x=?

#### **GROUP-C**

#### 3. Answer any four questions:

a) Show that  $\begin{vmatrix} 1 & a & a^2 \\ a^2 & 1 & a \\ a & a^2 & 1 \end{vmatrix} = (a^3 - 1)^2$ 

b) Solve the system of the equation by matrix method:

C) If a, b, c be the roots of the equation  $x^3-px^2+qx-r=0$ , form the equation whose roots are ab +1/c, bc+1/a, ca+1/b

D) If math term of a G.P is n and nth term is m, find (2m – n)th term of the G.P

E) If 
$$y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x \dots to infinity}}}$$
, show that  $\frac{dy}{dx} = \frac{\cos x}{2y-1}$ .  
F) Show that  $(yz)^{\log \frac{y}{x}} \times (zx)^{\log \frac{z}{x}} \times (xy)^{\log \frac{x}{y}} = 1$ .

#### **GROUP-D**

#### 4) Answer any three questions.

# 1) a) Apply Descart's rule of sign to examine the nature f the roots of the equation $x^4 + 2x^2 + 3x - 1 = 0$ .

b)Find the center and radius of the circle  $3(x^2 + y^2) = 5x + 6y - 4$ . (5 + 5) = 10

2) a) If  $2n + 1_{P_{n-1}}: 2n - 1_{P_n} = 3:5$ , then find the value of n.

b) How many words can be formed from the letters of the word 'TRIANGLE'? How many of these will begin with T and end with E? (5 + 5 = 10)

3) Show that the function f(x) defined by f(x) = 3 + 2x for  $-\frac{3}{2} < x \le 0$  and 3 - 2x for  $0 < x \le \frac{3}{2}$  is continuous but not differentiable at x = 0. 4) a) If  $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ , then show that  $A^2 = 5A + 2I$ , where I is the identity matrix of order 2 and hence find  $A^{-1}$ .

 $10 \times 3 = 30$ 

b) Prove that 
$$\begin{vmatrix} b - c & c - a & a - b \\ c - a & a - b & b - c \\ a - b & b - c & c - a \end{vmatrix} = 0.$$
 5 + 5 = 10

5) a) If  $5^{th}$  term of an A.P. is 30 and  $12^{th}$  term is 65, find the sum of first 20 terms. b) Find the sum to n terms of the series 4+44+444+... 5+5=10

6) a) Evaluate 
$$\int \frac{x+1}{\sqrt{4+8x-5x^2}} dx.$$
  
b) Show that 
$$\int_0^{\frac{\pi}{2}} \frac{\sqrt{\sin x}}{\sqrt{\sin x} + \sqrt{\cos x}} dx = \frac{\pi}{4}.$$
 5 + 5 = 10