B.B.A. (Sem. II) (CBCS) Examination

April / May – 2015

Business Mathematics : Paper-II

Faculty Code : 010

Subject Code : 001207

Time : $2\frac{1}{2}$ Hours]   [Total Marks : **70**

1   M.C.Q. :   **20**

(1)   Simple interest and compound interest are _____ for
1st year.

(A)   >   (B)   <

(C)   ≠   (D)   =

(2)   If Rs. 1000 is deposited for 2 years at 10% interest.
What is the difference between simple interest and
compound interest.

(A)   10   (B)   200

(C)   210   (D)   none

(3)   Find the effective rate of interest for 10%. If interest is
calculated monthely.

(A)   10%   (B)   10.43%

(C)   10.34%   (D)   none

(4)   Mr. X deposited Rs. 21000 in Bank. If rate of compound
interest is 8%. What ammount he will received after
5 years.

(A)   30855.3   (B)   28000

(C)   32001   (D)   none

(5) If $y = \log 20$ then $\dfrac{dy}{dx} = $ _____.

(A) $\dfrac{1}{20}$

(B) $\log 20$

(C) $-\dfrac{1}{20}$

(D) 0

(6) If $y = a^x$ then $\dfrac{dy}{dx} = $ _____

(A) $a^x \cdot \log a$

(B) $\dfrac{a^x}{\log a}$

(C) a^x

(D) none

(7) If $y = \sqrt[3]{3}$ then $y' = $ _____

(A) $\sqrt{3}$

(B) 0

(C) $\dfrac{1}{3}(3)^{-\frac{2}{3}}$

(D) none

(8) If $y(x) = x^3 - 2x - 5$, find $f''(2)$

(A) 12

(B) 10

(C) 0

(D) none

(9) $\int \dfrac{1}{x^2}\,dx$

(A) $\log x^2 + c$ (B) $-\dfrac{2}{x^3} + c$

(C) $-\dfrac{1}{x} + c$ (D) none

(10) $\int \left(x + \dfrac{1}{x} \right) dx$

(A) $1 - \dfrac{1}{x^2} + c$ (B) $\dfrac{x^2}{2} + c$

(C) $\dfrac{x^2}{2} + \log x + c$ (D) none

(11) $\int \left(\dfrac{a}{b} + \dfrac{b}{a} \right) dx$ (a, b are constant)

(A) 0 (B) $\left(\dfrac{2a + 2b}{ab} \right) x + c$

(C) $\left(\dfrac{a^2 + b^2}{ab} \right) x + c$ (D) none

(12) $\int \dfrac{1}{ax+b} dx = $ _____

    (A) $\log(ax+b)+c$ (B) $\log(ax)+c$

    (C) $\dfrac{\log(ax+b)}{a}+c$ (D)   none

(13) If $z = x^2 + 4xy + y^2$, then $\dfrac{\partial^2 z}{\partial y^2} = $ _____

    (A) $4x+2y$ (B)   0

    (C) $2x+4y$ (D)   none

(14) If $f(x) = 5x^4 - 2x^{-2} + 3x + 1$, find $f''(-1)$

    (A)   45   (B)   54

    (C)   66   (D)   none

(15) If $z = e^{-(x+y)}$ then $\dfrac{\partial z}{\partial x} = $ _____

    (A) e^{-x+y} (B) $e^{-x-y}(-1)$

    (C) $-e^{x+y}$ (D)   none

(16) $Z = x^3 + 2x^2y + 4xy^2 + 5y^3$ is a homogeneous function of degree _____.

(A) 2

(B) 3

(C) 4

(D) 1

(17) If $\begin{vmatrix} x+2 & -3 \\ 4x & 2 \end{vmatrix} = 30$ then $x =$ _____

(A) 2

(B) -2.8

(C) 28

(D) none

(18) The determinant of unit matrix is

(A) 1

(B) -1

(C) 0

(D) none

(19) If matrix A with order 4×3 and matrix. B with order 3×2 then order of $(AB)^t$ is

(A) 2×4

(B) 4×2

(C) 4×4

(D) none

(20) $(AB)^{-1} =$ _____

(A) $B^{-1} \cdot A^{-1}$

(B) $A^{-1}B^{-1}$

(C) AB

(D) none

2 Explain : **10**

(1) Annuity

(2) Effective rate of interest

(3) Present value

OR

2 (a) At the end of each quater Rs. 500 is deposited in a **5**
saving account with 8% compounded quarterly. Find
balance after 3 years.

(b) How much money should be invested at 10%. **5**
So as to get Rs. 5000 after 5 years, when the interest
is compounded (i) yearly (ii) half yearly.

3 (a) Write a properties of determinants. **5**

(b) Prove that $\begin{vmatrix} (x-1)^2 & x^2+1 & x \\ (y-1)^2 & y^2+1 & y \\ (z-1)^2 & z^2+1 & z \end{vmatrix} = 0$. **5**

OR

3 (a) If $AB = \begin{bmatrix} 2 & 4 \\ 3 & 5 \end{bmatrix}$ and $ABC = \begin{bmatrix} 2 & -1 \\ 3 & 0 \end{bmatrix}$ find matrix C. **5**

(b) If $2A - B = \begin{bmatrix} 8 & 11 \\ 8 & 7 \end{bmatrix}$ and $3A - B = \begin{bmatrix} 3 & -2 \\ 7 & -4 \end{bmatrix}$. **5**

Find matrix $4A - 3B$.

4 Differentiate w.r.t. x (any two)   **10**

(1) $y = \dfrac{(x-2)(3x+4)}{(x+5)(x-7)}$

(2) $y = x^{\log x}$

(3) $x = t + \dfrac{1}{t}$ and $y = t - \dfrac{1}{t}$ find $\dfrac{dy}{dx}$

(4) $y = \log\left[\sqrt{x+a} - \sqrt{x+b}\right]$

5 Attempt any two :   **10**

(1) $\displaystyle\int\left(\dfrac{1}{2\sqrt{x}} + \dfrac{1}{x} - 3^x + 2e^{2x}\right)dx$

(2) $\displaystyle\int\dfrac{x^3}{x-1}dx$

(3) $\displaystyle\int(x+2)\cdot\sqrt{x^2+4x-1}\ dx.$

(4) $\displaystyle\int\dfrac{x+4}{x^2-13x+42}dx$

6 Any two : **10**

(1) If $y = -x^2 \log x$, prove that $2x^2 - x\dfrac{dy}{dx} + x^2\dfrac{d^2 y}{dx^2} = 0$.

(2) If $f(x, y) = x^3 + x^2 y + xy^2 + y^3$ find $\dfrac{\partial^2 f}{\partial x \partial y}, \dfrac{\partial^2 f}{\partial y \partial x}$.

(3) If $z = \log\left(\dfrac{x^2 + y^2}{x + y}\right)$ find $x\dfrac{\partial z}{\partial x} + y\dfrac{\partial z}{\partial y}$.

(4) Find maximum and minimum value of $y = x^3 - 6x^2 + 9x + 5$.

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