

SARASWAT VIDYALAYA'S
SRIDORA CACULO COLLEGE OF COMMERCE & MGT.M.STUDIES
Khorlim, Mapusa-Goa.
B.COM SECOND SEMESTER END EXAMINATION APRIL, 2018
W.E.F-2017-18(C.B.C.S)

Duration:-2 Hours Sub:- Commercial Arithmetic MAX MARKS:-80

- N.B:-1.All questions are compulsory however main question wise choice to available
2.Use of Calculator is strictly prohibited.
3.Each main question carries 20 marks and every sub question 5 marks.
4.Log/table graph paper can be had on request.
5.You may answer randomly but every main question attempted should be answered serially/ alphabetically.

Q.1.Attempt the following.(4×5=20)

- a) Find x if A=(1,-2) and b=(4,x) and d(AB)=5 units.
- b) If $f(x) = \frac{16x+7}{5x-16}$, prove that $f(f(x))=x$
- c) Differentiate the following w.r.t.x
 - i)(x^2+4).logx ii) $3x^2+6x+9$
- d) If $z=x^4y-2x^2-xy^4-y^5$, show that $\frac{x\partial z}{\partial x} + \frac{y\partial z}{\partial y} = 5z$

OR

Q.I.Attempt the following.(4×5=20)

1. Find the co-ordinates of the points of the trisection of seg PQ where P=(3,4) and Q=(-2,5)
2. If $f(x) = 3x+k$ and $f(1) = 7$, find k and f(4).
3. If M.R.=40 ,A.R =60, find price elasticity of demand.
4. If $f(x,y) = x^3+y^3$, verify that $x^2.f_{xx} + 2xy.f_{xy} + y^2.f_{yy} = 6.f(x,y)$

Q.2.Attempt the following (4×5=20)

- a) The demand function of a commodity is given by $p=18+D-D^2$.Find the rate at which price is changing when the demand is 2.
- b) Find the co-ordinates of point P which divides seg AB externally in the ratio m:n where A=(2,4) , b=(-3-5) & m:n =3:5.
- c) Discuss the continuity of a function f where
$$F(x)=x^2+x+2, 0 \leq x \leq 2$$
$$=4x+3, 2 < x \leq 4, \text{ at } x = 2$$

- d) The demand law is $p=85-4x-x^2$. Find the consumers surplus when $x=5$

OR

Q.II. Attempt the Following (4×5=20)

1. The demand function for a commodity is given by $p=20-2D^2$. Find the total revenue function and marginal revenue function when $D=2$.
2. Find the equation of a line whose x-intercept is 4 and which is perpendicular to the line $x-2y+4=0$
3. Discuss the continuity of function f where
$$F(x)=2x+3, 0 \leq x < 1$$
$$=3x+2, 1 \leq x < 2, \text{ at } x=1$$

4. Evaluate

$$\lim_{x \rightarrow 3} \frac{1}{x-3} - \frac{9x}{x^3-27}$$

Q.3. Attempt the following (4×5=20)

- a) The students in three classes are in the ratio 2:3:5. If 20 students are increased in each class, the ratio changes to 4:5:7. What is the total number of students in the three classes before the increase.
- b) If $x=25-3p-p^2$ is the demand function, find the price elasticity of demand when $p=3$
- c) Find the equation of a line passing through (3,-7) and perpendicular to the line $3x+4y-9=0$
- d) Integrate the following w.r.t. x
i) $x^4+3x^2-2x-5e^x+7$ ii) $(x^2+7)(x+4)$

OR

Q.III. Attempt the following (4×5=20)

1. Find the mean proportional between 5 and 45
2. If the revenue R is given by $R=12D-D^2$. When D is the quantity demanded, find the demand function (That is price in terms of D). Also find A.R when M.R.=0
3. Find the distance between the parallel lines $3x+4y-6=0$, and $6x+8y-17=0$
4. If $\int_1^2 (3x^2+2x+k) dx=8$, find k

Q.4. Attempt the following (4×5=20)

- a) The price of a commodity is p , the demand D and the supply S are given by $D = \frac{12P}{P-1}$ and $S = P^2$. Find the equilibrium price. Also find the rate of change of demand at the equilibrium price.
- b) The supply function of a commodity is $p = 7 + 2x^2$, find the producers surplus when the price is Rs.39/ unit.
- c) The population of a town has increased from 20,000 to 24,000. Find the increase per cent.
- d) Maximize $z = x + y$ subject to

$$x + 2y \leq 8$$

$$3x + 2y \leq 12, x \geq 0, y \geq 0$$

OR

O.IV. Attempt the following (4×5=20)

1. The total cost of x items of a commodity is given by $C = 9 + 20x - x^2$. Find x when $M.C = 14$. Also find AC at this value of x .
2. Find f_x and f_y for the function f where
 $(f(x,y) = e^{x+y} - \log(x^2 - y^2))$
3. By selling a motorcycle for Rs.22600 a person gains 13%. What was his gain?
4. Minimize $z = 2x + 4y$ subject to

$$2x + y \geq 2$$

$$x + 3y \geq 3$$

$$3x + 4y \geq 6, x \geq 0, y \geq 0$$
