

F.Y.B.COM SEMESTER END EXAMINATION

APRIL 2018-19 REGULAR / REPEAT

Sub: Commercial Arithmetics – II (As Per CBCS)

Semester: II

M. Marks: 80

M. Time: 2 hrs.

- Instructions:** 1. All questions are compulsory however internal choice is available.  
2. Use of calculator is strictly forbidden.  
3. Figures to the right indicate marks allotted.  
4. There are 4 main questions each carrying 20 marks.  
5. You may answer randomly but every main question attempted should be answered serially.

**Q.1) Attempt the following:**

(4 x 5 = 20)

- a) Find the length of all sides of quadrilateral ABCD where A = (-2, 1), B = (2, -3), C = (4, 0) and D = (5, -3).  
b) Let A = {0, 1, 2, 3, 4}, B = {0, 1, 2, ..., 20} and let R be a relation from A to B such that R = {(0,2), (1, 3), (2, 6), (3, 11), (4, 18)}. State the type of correspondence. Is R a function? If yes, into or onto function?  
c) Find  $\frac{dy}{dx}$  for following functions: (i)  $y = x^{-3} - e^x + \sqrt[5]{x}$  (ii)  $y = (x^2 + x)(7x - 3)$   
d) If  $z = x^3 - xy^2 + y^4$ , find  $\frac{\partial z}{\partial x}$  and  $\frac{\partial z}{\partial y}$ .

OR

**Q.1) Attempt the following:**

(4 x 5 = 20)

- p) If A = (3, 5), B = (-4, 1) and C = (7, -2), then show that ABC is isosceles triangle.  
q) Find  $y(0)$ ,  $y'(1)$  and  $y''(0)$ , where  $y = 7x^2 - 2e^x + 4$ .  
r) State whether the following function is even function, odd function or neither of those  
(i)  $f(x) = 5x - 2$  (ii)  $g(x) = 5x^2 + 4$   
s) If  $u = 7x - 4x^2y - y^3$ , find  $\left(x \frac{\partial u}{\partial x}\right) - \left(y \frac{\partial u}{\partial y}\right)$ .

**Q.2) Attempt the following:**

(4 x 5 = 20)

- a) Find equation of line parallel to BC, where B = (2, -3) & C = (1, 0) and passing through (2, 2).  
b) Find  $\lim_{x \rightarrow 2} \left( \frac{x^2 + 6x - 16}{2x^3 - 7x - 2} \right)$ .  
c) Find average cost, and marginal cost for the total cost function  $C = x^3 + 4x - 4$ . What is the marginal cost when  $x = 3$ ?  
d) Present ages of Ramesh and Suresh are in the ratio 5 : 6. 8 years before their age were in the ratio 4 : 5. Find their present ages.

OR

**Q.II) Attempt the following:****(4 x 5 = 20)**

p) If the lines  $4x - ky + 2 = 0$  and  $3x + 2y - 1 = 0$  are parallel to each other, find the value of  $k$ .

q) Check whether the function  $f(x)$  is continuous at  $x = 3$ , where  $f(x) = \begin{cases} \frac{x^2 - 4x + 3}{x - 3}, & x \neq 3 \\ 2, & x = 3 \end{cases}$

r) If the demand function is  $D = p^2 - 2p + 1$ , find the marginal demand at  $p = 3$ .

s) The total salary of two employees is Rs. 345. Their salaries are in the ratio 7 : 8. Find the salary of each employee.

**Q.3) Attempt the following:****(4 x 5 = 20)**

a) Solve the following LPP by graphical method.

$$\text{Maximize } z = 5x + 3y$$

$$\text{subject to } 2x + y \geq 9$$

$$3x + 2y \geq 16$$

$$x \geq 0, y \geq 0.$$

b) Find  $y''(2)$  where  $y = 3 \log(x) - \sqrt[4]{x^3} + x^2$ .

c) Integrate the following functions with respect to  $x$  (i)  $(x^3 + 7x - 1)$

(ii)  $x^4 \cdot \sqrt[3]{x}$ .

d) Find the following: (i) 15% of 1 kg 150 gms  
(ii) the number whose 19% is 399.

**OR****Q.III) Attempt the following:****(4 x 5 = 20)**

p) Solve the following LPP by graphical method.

$$\text{Minimize } z = 4x + 5y$$

$$\text{subject to } 5x + y \geq 10$$

$$x + y \geq 6$$

$$x + 4y \geq 12$$

$$x \geq 0, y \geq 0.$$

q) If  $f(x) = (x + 2)(x - e^x)$ , then find  $f(-1)$  and  $f'(2)$ .

r) Find  $\int (3x - 2)(x^3 + 4x - 1) dx$ .

s) The price of photocopy of a paper increases from Rs. 1.25 to Rs. 2.25. Find the percentage increase in price of photocopying.

**Q.4) Attempt the following:****(4 x 5 = 20)**

a) If A is  $(-3, 5)$  and B is  $(-7, 2)$ , find mid-point of AB and slope of AB.

b) Find  $\frac{d}{dx} [x^4 \cdot \log(x)]$ .

c) Find  $\int_1^2 (3x^4 - 2x + 2) dx$ .

d) A manufacturer sold a watch for a net selling price of Rs. 9025 after giving a 5% discount on the list price. What was the list price?

OR

Q.IV) Attempt the following:

(4 x 5 = 20)

p) Find the equation of a line passing through (3, -3) and mid-point of AB where A = (2, 2) & B = (6, -6).

q) Find  $\frac{d}{dx} (\sqrt[3]{x} \cdot 4^x)$ .

r) Integrate the function f(x) between -1 and 2 where  $f(x) = \frac{x^4 - 5}{x^2}$ .

s) A shopkeeper sold an article with Rs. 20000 as the list price, at 20% discount. Find the net selling price.

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ALL THE BEST

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