

Daisy English Higher Secondary School

Khairahani-6,Parsa

Class:-12

F.M:-100

Subject:-Business Maths

P.M:-35

Group 'A'

(10*2*3=60)

Attempt all the questions

1.a) If $x=-5$ and $y=4$, verify that $|x+y| \leq |x|+|y|$

b) If $A=\{1,2,3\}$ and $B=\{a,b\}$, show that $A \times B \neq B \times A$

2.a) Small town where population was 18395, ten years ago has lost 270 inhabitants each year since then what is the present population of small town?

b) Insert 3 geometric means between $2\frac{1}{4}$ and $\frac{4}{9}$.

3.a) How many license plates consisting of 3 different digits can be made out of given integers 1,2,3,4,5,6?

b) If $A = \begin{pmatrix} 1 & 2 \\ 3 & 1 \end{pmatrix}$, show that $A^2 - 2A - 5I = 0$

4.a) Construct a 2×2 matrix whose elements are given by $a_{ij} = 3i - 2j$

b) If the slope of the line joining the points $(x,5)$ and $(-1,2)$ is $\frac{3}{4}$. Find the value of x also determine distance between them.

5.a) Find the slope, x-intercept and y-intercept of the line whose equation is

$$3x - 4y = 6$$

b) Find the value of r

$$\log\left(1 - \frac{r}{100}\right) = \frac{\log 3843 - \log 5555}{20}$$

6.a) Find the limit of $\lim_{x \rightarrow 5} \frac{x-5}{\sqrt{4x+5}-5}$

b) Examine the continuity and discontinuity of:

$$f(x) = \left. \begin{array}{l} 2x - 1, \text{ when } x < 1 \\ = x, \text{ when } x \geq 1 \end{array} \right\} \text{ at } x=1$$

7.a) Find the derivative of $\frac{1}{\sqrt{x+a}-\sqrt{x+b}}$

b) Find $\frac{dy}{dx}$ of given function:- $(x^2+5x)(3x^2-x)$

8.a) Find indefinite integrals of $\int \frac{3x+1}{(x-2)} dx$

b) The marginal revenue function is given by $MR=3-2x-x^2$, x being the output. Find the total revenue function and demand function

9.a) Calculate the mean deviation taken from the median of the data
35,40,45,50,55,60,65

b) For two events A and B if $P(A)=0.40$, $P(B)=0.35$ and $P(A \cup B)=0.61$, find $P(A \cap B)$

10.a) A road 300m long was constructed by 45 men in 27 days working 8 hours a day. How many men be required to construct 1 km of same road in 20 days. If they work 9 hours a day.

b) An article was sold at its marked price Rs.6200 and discount of 15% was allowed. The dealer still made a profit of 20%. Find the cost price.

Group 'B'

(8*5=40)

11. Solve the following equation using Cramer's rule

$$x+y-2z=1, 2x-7z=3, x+y-z=5$$

12. Find from first principle, the derivatives of (x^2-2x)

13.If the revenue function is $R=Q-3Q^2$ and cost function $C=Q^2-2Q$. Find the value of maximum profit.

14.Maximize and minimize the objective function $f=2x+y$ subject to the constraints.

$$x+y \geq 2, 2x-y \leq 4, y \leq$$

15.Calculate the mean and standard deviation of the following data

Marks	0-10	10-20	20-30	30-40	40-50
No. of observation	7	12	24	10	7

16.A,B and C enter into a partnership. A putting Rs.2000 for the whole year, B putting Rs.3000 at first an increasing it to Rs.4000 at the end of 4 months while C puts in at first Rs.4000 but withdraws Rs.1000 at the ends of 9 months. How should they share profit at the ends of the year divide a profit of Rs.8475?

17.A machine, the life of which is estimated to be 10 years, cost Rs.10000. Calculate its scrap value at the end of its life depreciation on the reducing installment system being charged at 10% per annum.

18. Find the amount of an immediate annuity of Rs.700 a year for 4 years at 5% per annum.