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SUBJECT : BUSSINESS MATHAMATICS

MID TERM EXAMS

QUESTION 1

A. IMPORTANCE OF BUSSINESS MATHAMATICS

It helps you know the financial formulas, fractions; measurements involved in interest calculation, hire rates, salary calculation, tax calculation etc. which help complete **business** tasks efficiently. **Business mathematics** also includes statistics and provides solution to **business** problems and in this field we hv to work in market with brands so for that we need to know basics of business mathamatics.

b. DEFINE WITH EXAMPLES

a. equal set

Equal Sets. Two **sets** are **equal**, if they have exactly the same elements. **Example**: {a, c, t} = {c, a, t} = {t, a, c}, but {a, c, t} ≠ {a, c, t, o, r}. **Example**: {x : x is a letter in the word "book"} = {b, o, k}, but {b, o, k} ≠ {b, o, t}.

b. finite and infinite set

finite set

Here, all the P, Q, R are the **finite sets** because the elements are **finite** and countable. R \subset P, i.e R is a Subset of P because all the elements of **set** R are present in P. So, the subset of a **finite set** is always **finite**. P U Q is { 1, 2, 3, 4, 6, 8}, so the union of two **sets** is also **finite**.

. Infinite set

The number of elements of a **finite set** is a natural number (a non-negative integer) and is called the cardinality of the **set**. A **set** that is not **finite** is called **infinite set**

c. subset

If A is a **subset** of B (A ⊆ B), but A is not equal to B, then we say A is a proper **subset** of B, written as A ⊂ B or A ⊊ B. **Example**: X = {1, 3, 5}, Y = {2, 3, 4, 5, 6}.

QUESTION 2

a. SOLUTION

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Simplifying
8(x + -1) + 17(x + -3) = 4(4x + -9) + 4

Reorder the terms:
8(-1 + x) + 17(x + -3) = 4(4x + -9) + 4
(-1 * 8 + x * 8) + 17(x + -3) = 4(4x + -9) + 4
(-8 + 8x) + 17(x + -3) = 4(4x + -9) + 4

Reorder the terms:
-8 + 8x + 17(-3 + x) = 4(4x + -9) + 4
-8 + 8x + (-3 * 17 + x * 17) = 4(4x + -9) + 4
-8 + 8x + (-51 + 17x) = 4(4x + -9) + 4

Reorder the terms:
-8 + -51 + 8x + 17x = 4(4x + -9) + 4
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Combine like terms: -8 + -51 = -59
-59 + 8x + 17x = 4(4x + -9) + 4

Combine like terms: 8x + 17x = 25x
-59 + 25x = 4(4x + -9) + 4


Reorder the terms:
-59 + 25x = 4(-9 + 4x) + 4
-59 + 25x = (-9 * 4 + 4x * 4) + 4
-59 + 25x = (-36 + 16x) + 4


Reorder the terms:
-59 + 25x = -36 + 4 + 16x


Combine like terms: -36 + 4 = -32
-59 + 25x = -32 + 16x


Solving
-59 + 25x = -32 + 16x


Solving for variable 'x'.


Move all terms containing x to the left, all other terms to
the right.


Add '-16x' to each side of the equation.
-59 + 25x + -16x = -32 + 16x + -16x
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Combine like terms: 25x + -16x = 9x
-59 + 9x = -32 + 16x + -16x

Combine like terms: 16x + -16x = 0
-59 + 9x = -32 + 0
-59 + 9x = -32

Add '59' to each side of the equation.
-59 + 59 + 9x = -32 + 59

Combine like terms: -59 + 59 = 0
0 + 9x = -32 + 59
9x = -32 + 59

Combine like terms: -32 + 59 = 27
9x = 27

Divide each side by '9'.
x = 3

Simplifying
```

x = 3

B. 3x+y=9
   5x+4y=22
   SOLUTION

There is more than one way to choose, and one way may look easier than another.

$3x+y=9$ ---> $(4)\cdot(3x+y)=(4)\cdot 9$ ---> $12x+12y=36$

$5x+4y=22$ ---> $(-1)\cdot(5x+4y)=(-1)\cdot 22$ ---> $-5x-4y=-22$

Add together left sides and right sides

$$\begin{array}{rrcr} +12x & +12y & = & 36 \\ -5x & -4y & = & -22 \\ 7x & +0y & = & 14 \end{array}$$

That "eliminated" y **because we ended up with**

$7x=14$

Solve for the variable not eliminated.

$7x=14$ ---> $x=\frac{14}{7}$ ---> $\boxed{x=2}$

Substitute the value found for the variable in one of the equations.

Which one?

Again, there are choices, and one way may look easier than another.

$3x+y=9$ **looks better to me, because there is no coefficient in front of the** y

.

$\begin{cases} 3x+y=9 \\ x=2 \end{cases}$ ---> $3\cdot 2+y=9$ ---> $6+y=9$

STEP 5:

Solve for the originally "eliminated" variable.

$6+y=9$ ---> $y=9-6$ ---> $\boxed{y=3}$

QUESTION 3

a. Ratio and proportion with examples

A **proportion** is an equation with a **ratio** on each side. It is a statement that two **ratios** are equal. 3/4 = 6/8 is an **example** of a **proportion**. When one of the four numbers in a **proportion** is unknown, cross products may be used to find the unknown number. A **ratio** is a relationship between two numbers that defines the quantity of the first in comparison to the second. For example, for most mammals, the **ratio** of legs to noses is 4 : 1 4:1 4:1, but for humans, the **ratio** of legs to noses is 2 : 1 2:1 2:1.

PROPERTIES OF PROPORTION WITH EXAPMES

(i) The numbers a, b, c and d are in proportional if the ratio of the first two quantities is equal to the ratio of the last two quantities, i.e., a : b : : c : d and is read as 'a is to b is as c is to d'. The symbol ' : : ' stands for 'is as'. (ii) Each quantity in a **proportion** is called its term or its proportional.

(ii) **Example: Rope**

(iii) 40m of that rope weighs 2kg.

(iv) 200m of that rope weighs 10kg.

b. `CONCEPT OF TIME VALUE MONEY`

The time value of money (TVM) is the concept that money you have now is worth more than the identical sum in the future due to its potential earning capacity. This core principle of finance holds that provided money can earn interest, any amount of money is worth more the sooner it is received. TVM is also sometimes referred to as present discounted value.

Time Value of Money Formula

Depending on the exact situation in question, the time value of money formula may change slightly. For example, in the case of annuity or perpetuity payments, the generalized formula has additional or less factors. But in general, the most fundamental TVM formula takes into account the following variables:

- FV = Future value of money
- PV = Present value of money
- i = interest rate
- n = number of compounding periods per year
- t = number of years

Based on these variables, the formula for TVM is:

$FV = PV \times [1 + (i / n)]^{(n \times t)}$

Time Value of Money Examples

Assume a sum of $10,000 is invested for one year at 10% interest. The future value of that money is:

FV = $10,000 x (1 + (10% / 1) ^ (1 x 1) = $11,000

The formula can also be rearranged to find the value of the future sum in present day dollars. For example, the value of $5,000 one year from today, compounded at 7% interest, is:

PV = $5,000 / (1 + (7% / 1) ^ (1 x 1) = $4,673

Effect of Compounding Periods on Future Value

The number of compounding periods can have a drastic effect on the TVM calculations. Taking the $10,000 example above, if the number of compounding periods is increased to quarterly, monthly, or daily, the ending future value calculations are:

- Quarterly Compounding: FV = $10,000 x (1 + (10% / 4) ^ (4 x 1) = $11,038
- Monthly Compounding: FV = $10,000 x (1 + (10% / 12) ^ (12 x 1) = $11,047
- Daily Compounding: FV = $10,000 x (1 + (10% / 365) ^ (365 x 1) = $11,052

This shows TVM depends not only on interest rate and time horizon, but also on how many times the compounding calculations are computed each year.