(1)   FYBFM   Business mathematics
QP 19212

Q 1> A> Choose correct alternative

1>	B
2>	B
3>	C
4>	A
5>	A
6>	B
7>	B
8>	A
9>	D
10>	B

Q 1> B> State True or False

1>	True
2>	False
3>	True
4>	False
5>	False
6>	True
7>	False
8>	True
9>	True
10>	False

Q 2> A> Commission on 1st 5000 $= \frac{3}{100}$ × 5000 = Rs 150

Commission on next 8000 $= \frac{5}{100}$ × 8000 = Rs 400

Commission on next 10000 $= \frac{8}{100}$ × 10000 = Rs 800

Balance = 32000-5000-8000-10000= Rs 9000

Commission on balance $= \frac{11}{100}$ × 9000 = Rs 990

Commission as sales crossed 30000 $= \frac{1/4}{100}$ × 32000 = Rs 80

Total Commission = 150+400+800+990+80 =Rs 2420

Q.2 B> Let B denotes number of bulls

D denotes number of days

H denotes number of hectors

The number of hectors increases with number of days as well as number of bulls

Hence H is jointly varies as B and D

H α BD

H = kBD

13 = K *10*7

K = 13/ 10*7

Now H = 117 and D = 35

117 = K * B* 35

117 = (13/10*7)*B*35

Therefore B = 18

Hence 18 bulls are required

Q 2>D> Net amount realized= sale value of assess-payments of the other liabilities- realization expenses

=1960000-835000-5000 = Rs 1120000

This amount will be distributed in proportion 2:4:1.

Therefore P's share in the final settlement=$\frac{2}{2+4+1}$ × 11,20,000 = Rs 3,20,000

Q's share in the final settlement=$\frac{4}{2+4+1}$ × 11,20,000 = Rs 6,40,000

R's share in the final settlement=$\frac{1}{2+4+1}$ × 11,20,000 = Rs 1,60,000

Hence P's, Q's and R's final settlement is Rs 3,20,000 , Rs 6,40,000 and Rs 1,60,000 respectively.

Q 2>C> Trade discount = $\frac{40}{100}$ × 7530 = 3012

I.P = 7530-3012= Rs 4518

Cash discount = $\frac{2}{100}$ × 4518 = Rs 90.36

N S P = I.P. – C.D. = 4518 – 90.36 = 4427.64

N S P =$\left(\frac{100+profit}{100}\right)$ × CP

4427.64 = $\frac{110-691}{100}$ × CP

$\frac{110-691}{100}$ × CP = 4427.64

CP = 4427.64 × $\frac{100}{110-691}$

CP = Rs 4000

Sol 3. A) $n_1 = 3$ years

$A_1 = 119790$

$A_1 = P\left(1 + \dfrac{r}{100}\right)^{n_1}$

$119790 = P\left(1 + \dfrac{r}{100}\right)^3$ — (1)

$n_2 = 5$ years

$A_2 = 144945.90$

$A_2 = P\left(1 + \dfrac{r}{100}\right)^{n_2}$

$144945.90 = P\left(1 + \dfrac{r}{100}\right)^5$ — (2)

Dividing (2) by (1), we get

$144945.90/119790 = \left(1 + \dfrac{r}{100}\right)^2$

$1.21 = \left(1 + \dfrac{r}{100}\right)^2$

$1.1 = (1 + r/100)$

$1.1 - 1 = r/100$

$0.1 \times 100 = r$

$r = 10\%$

$119790 = P\left(1 + \dfrac{10}{100}\right)^3$

$119790 = P\left(\dfrac{11}{10}\right)^3$

$P = 119790 \times 1000/1331$

$P = Rs.\ 90,000$

B)

Year	Cash flow (Rs.)	DF = $1/(1.13)^n$	PV = CF X DF
0	-70,000	1	-70000
1	15,000	0.88495575	13274.34
2	17,000	0.78314668	13313.49
3	20,000	0.69305016	13861.00
4	22,000	0.61338877	13493.01
5	25,000	0.54275993	13568.99

NPV = -2489.17

Since, NPV is less than zero, therefore, the project is rejected.

OR

(C) rate (r) = 10% p.a

Time (n) = 4 years

Simple interest (S.I) $= \frac{Prn}{100}$

8000 = (P X 10 X 4)/100

P = 800000/40

P = Rs. 20,000

For compound interest,

$A = P\left(1 + \frac{r}{100}\right)^n$

$A = 20,000\left(1 + \frac{10}{100}\right)^4$

$A = 20,000\left(\frac{11}{10}\right)^4$

A = Rs. 29,282

C.I = A – P

= Rs. 9,282

D) Let I = 0.08 and m = 4.

Effective rate = $(1 + i/m)^m - 1$

= $(1 + 0.08/4)^4 - 1$

$$= (1 + 0.02)^4 - 1$$

$$= 1.08243216 - 1$$

$$= 0.08243216$$

Accumulated value $= c\left[\dfrac{(1+i)^n - 1}{i}\right]$, here I is effective rate

$$= 8000\left[\dfrac{(1+0.082432)^5 - 1}{0.082432}\right]$$

$$= Rs.\ 47160.9084$$

Sol 4. A) Let the amount to be invested be Rs. X.

For company A,

Face value = Rs. 10, market price = Rs. 220, Dividend 25%

No. of shares = x/220

Dividend = 10 X 25% X x/220 = 2.5x/220 = 0.0114x

For company B,

Face value = Rs. 10, market price = Rs. 190, Dividend 15%

No. of shares = x/190

Dividend = 10 X 15% X x/190 = 1.5x/190 = 0.0079x

As dividend for company A is more than the dividend for company B, it is more profitable to invest in company A.

B) Entry load per unit = 2.25% of 43.378 = 0.976

So, purchase price per unit = 43.378 + 0.976 = 44.354

No. of unit purchased = 12000/44.354 = 270.055

Let NAV on 27th October be x

Exit load per unit = 1% of x = 0.01x

Redemption price per unit = x − 0.01x = 0.99x

Amount received after redemption = 0.99x X 270.055 = 267.354x

Total gain = Amount received − Amount invested

So, 875.15 = 267.354x – 12000

X = (875.15 + 12000)/267.354 = 48.158

So, NAV on 27th October was Rs. 48.158

OR

C) Cost of purchase for 1 share = 85 + 0.2% of 85 = 85 + 0.17 = 85.17

No. of shares = 34068/85.17 = 400

Total dividend = rate X face value X no. of shares

= 5% X 100 X 400 = Rs. 2000

For sales,

Selling price = 82 + 0.1% of 82 = 82 + 0.082 = 82.082

Total sales = 400 X 82.082 = Rs. 32,832.8

Net gain = Total sales + Total dividend – Total investment

= 32,832.8 + 2000 – 34,068 = Rs. 764.8

Percent gain = (764.8 X 100)/34,068 = 2.2449

So, percentage gain = 2.2449%

D) No. of units = Amount invested / NAV

= 25,000/1,073.2568 = 23.294

Amount received after redemption = Redemption price X No. of units

= 1,349.6395 X 23.294

= 31,438.50

Gain = Amount received – Amount invested

= 31,438.50 – 25,000 = Rs. 6,438.50

Rate of return $= \dfrac{Redemption\ NAV - Purchase\ NAV}{Purchase\ NAV} X100$

$= \dfrac{1,349.6395 - 1,073.2568}{1,073.2568} X100$ = 25.75%

Proportion and its types :

Proportion , is a statement stating the equality of two ratios.

Types :

1. Three quantities of the same kind are said to be in **continued proportion** when the ratio of first to the second is equal to the ratio of second to the third.
2. When two given quantities are so related to each other that if one of them is multiplied (divided) by any number , the other is also multiplied (divided) by the same number , then the quantities are in **direct proportion.**
3. When two given quantities are so related to each other that if one of them is multiplied by any number , the other is also divided by the same number and vice versa , then the quantities are in **Inverse proportion.**

Load on mutual funds :

It is a charge paid by the investor while dealing in mutual funds , and represents the intial expenses like marketing etc . if charges are paid while purchasing the units , it is called entry load . if charges are paid while selling the units , it is called exit load .

Dividend Re - investment options in mutual funds

It provides investment of dividend amount , without any entry load , into the same scheme , which increases the total no. of units in the scheme.

No. of units reinvested = total dividend amount /ex – dividend NAV

Total units = pre dividend units + reinvested units.