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SUBJECT = Construction engineering

Q No: 02

Given data :-

Number of communication channels = 6

Additional stake holders = 2

Req data :-

Identify the number of communication channel after increasing the scope of work = ?

Solution :-

As we know that

$$\text{Number of communication channel} = \frac{n(n-1)}{2}$$

The number of people involved in six communication channels  $\Rightarrow$

$$6 = \frac{n(n-1)}{2}$$

$$12 = n(n-1) = n^2 - n$$

$$n^2 - n - 12 = 0$$

$$n^2 - 4n + 3n - 12 = 0$$

$$n(n-4) + 3(n-4) = 0$$

$$(n-4)(n+3) = 0$$

P.T.O  $\rightarrow$

⑤

$$n-4 = 0$$

$$n = 4$$

$$n+3 = 0$$

$$n = -3$$

So the number of people involved = 4

As; There are additional stake holders

So that total number of people are:

$$n = 4 + 2$$

$$n = 6$$

Now the required communication channel =  $\frac{3 \times 6(6-1)}{1 \times 2}$

$$= 3(9)$$

New communication channel = 15 Ans

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QUESTION NO # 020

SOLUTION :-

$$\textcircled{1} \text{ EV} = 100000 \times \frac{100}{100} = 100000$$

$$\textcircled{2} = 100000 \times \frac{100}{100} = 100000$$

$$\textcircled{3} = 100000 \times \frac{90}{100} = 90000$$

$$\textcircled{4} = 100000 \times \frac{80}{100} = 80000$$

$$\textcircled{5} = 100000 \times \frac{75}{100} = 75000$$

COST VARIANCE

$$\text{CV} = 100000 - 120000 = -20000$$

$$\text{CV} = 100000 - 110000 = -10000$$

$$\text{CV} = 100000 - 80000 = 20000$$

P.T.O →

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$$CV = 100000 - 125000 = -25000$$

$$CV = 100000 - 75000 = 25000$$

$$CV = 100000 - 0 = 100000$$

$$CV = 100000 - 0 = 100000$$

SCHEDULE VALUE

$$SV = EV - PV$$

$$\textcircled{1} = 100000 - 100000 = 0$$

$$\textcircled{2} = 100000 - 100000 = 0$$

$$\textcircled{3} = 90000 - 100000 = -10000$$

$$\textcircled{4} = 80000 - 100000 = -20000$$

$$\textcircled{5} = 75000 - 100000 = -25000$$

$$\textcircled{6} = 0 - 100000 = -100000$$

$$\textcircled{7} = 0 - 100000 = -100000$$

$$\textcircled{8} = 0 - 100000 = -100000$$

$$\textcircled{9} = 0 - 100000 = -100000$$

$$\textcircled{10} = 0 - 100000 = -100000$$

## COST PERFORMANCE INDEX

$$CPI = EV/AC$$

$$① = 100000/120000 = 0.83$$

$$② = 100000/110000 = 0.90$$

$$③ = 90000/80000 = 1.125$$

$$④ = 80000/125000 = 0.64$$

$$⑤ = 750000/750000 = 1$$

$$⑥ = 0/0 = 0$$

$$⑦ = 0/0 = 0$$

$$⑧ = 0/0 = 0$$

$$⑨ = 0/0 = 0$$

$$⑩ = 0/0 = 0$$

## SCHEDULE PERFORMANCE

$$① SPI = 100000/100000 = 1$$

$$② SPI = 100000/100000 = 1$$

$$③ SPI = 90000/100000 = 0.9$$

$$④ SPI = 80000/100000 = 0.8$$

$$⑤ SPI = 750000/100000 = 7.5$$

$$⑥ SPI = 0/100000 = 0$$

$$⑦ SPI = 0/100000 = 0$$

$$⑧ SPI = 0/100000 = 0$$

$$⑨ SPI = 0/100000 = 0$$

$$⑩ SPI = 0/100000 = 0$$

⑦

⑥ ESTIMATE COMPLETION

$$= BAC / CPI$$

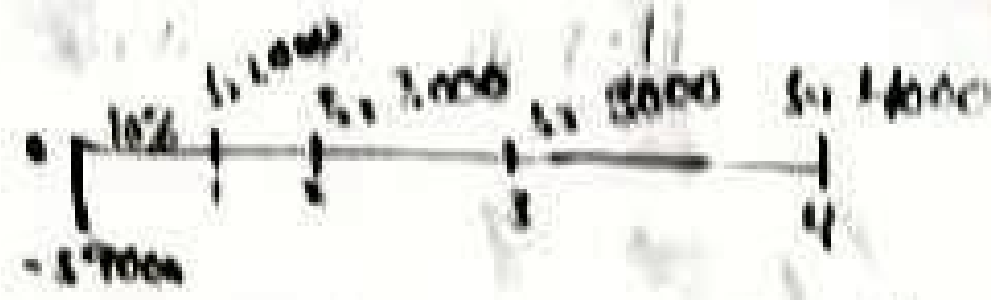
$$= 100000 / 4.495 = 2224674$$

⑦ = 2224674 / 4.45

$$= 499923 / 55$$

$$= 908$$

Q.10



SOLUTION :-

$$NPV = -C_0 + \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \dots + \frac{C_T}{(1+r)^T}$$

$$PV_0 = -C_0$$
$$PV_0 = -9000$$

$$PV_1 = \frac{C_1}{1+r} = \left( \frac{2000}{1 + \frac{10}{100}} \right)$$

$$PV_1 = 1818.18$$

$$PV_2 = \frac{C_2}{(1+r)^2} = \frac{3000}{\left(1 + \frac{10}{100}\right)^2}$$

$$PV_2 = 2479.34$$

$$PV_3 = \frac{C_3}{(1+r)^3} = \frac{3000}{\left(1 + \frac{10}{100}\right)^3}$$

$$PV_3 = 2253.94$$

$$PV_4 = \frac{C_4}{(1+r)^4} = \frac{11000}{\left(1 + \frac{10}{100}\right)^4}$$

$$PV_4 = 2732.05$$

$$NPV = -C_0 + \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \frac{C_4}{(1+r)^4}$$

$$NPV = -9000 + 1818.18 + 2479.34 + 2253.94 + 2732.05$$

$$NPV = \$ 293.51$$

P.T.O →



(2)

Net present value = Present <sup>cumulative</sup> combine of all cash  
= Initial cash flow

Investment = 9000 \$ , time = 4 years

<u>Year</u>	<u>Inflow</u>	<u>Discounted Rate</u>	<u>Cumulative</u>
1	2000	1800	1800
2	3000	2700	4500
3	3000	2700	7200
4	4000	3600	10800

$$\text{NPV} = 10800 - 9000$$
$$= 1800$$

NPV  $\geq$  0, Accept the investment.

6)

QUESTION NO 1104

ANSWER :-

Being a project manager the following power/interest matrix

The following rules should be considered

STAKE HOLDER IN GROUP A :-

Need only minimum effort an monitoring.

STAKE HOLDER IN GROUP B :-

Should be kept inform as they may be able to influence more powerful stake holder.

STAKE HOLDER IN GROUP C :-

Are powerful, but level of interest is low. Generally expected to be

(ii) passive, but may move into group D on an issue of particular interest.

STAKE HOLDER IN GROUP D :-

Are both powerful and interested. Their co-operation is of key importance for new strategies.

QUESTION NO # 05

ANSWER

This involve the risk management group becoming familiar with

The nature and scope of the proposal, it key objectives

The relationship between these and the agency's objective and strategies.

This step link risk management into the agency's main strategies plans, including

- Its services
- Capital investment
- Asset maintenance
- Disposal strategies
- Agency's procurement
- Operating, maintenance and disposal procedure.