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Paper / Sub Ject : Construction  
Management

Section : "A"

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Q No 1:-

-> Given Data:-

Number of communication

channels = 6

Additional stake holders = 2

-> Required data:-

Identify The number of communication channels after increasing The scope of work = ?

Sol:- As we know That;

Number of communication

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

The number of people involved in six communication channels.

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

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

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

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

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

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

$$(n-4) = 0, \quad n+3 = 0$$

$$n = 4$$

$$n = -3$$

So The number of People involved  
= 4.

As; There are additional stake  
holder's so total number of  
people are:

$$n = 4 + 2$$

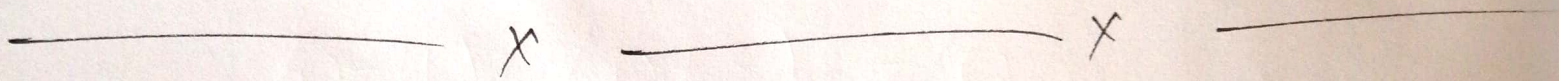
$$n = 6$$

Now, The required communication

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

$$= \frac{3 \cdot 6(6-1)}{2} = 3(5)$$

New communication channel = 15



Q2:- work package.

1) Planned value      Actual value  
\$ 100000                      \$ 120000

% Prog      Earned value

100%      ?

a)  $EV = \% \text{ of complete} \times$

Budget cost of work  
Schedule

$$= 100\% \times \$100000$$

$$EV = \$100000$$

b) cost variance

$$CV = \text{Earned value} - \text{Actual value}$$

$$= EV - AV$$

$$= \$100000 - \$120000$$

Its Negative means Project spending is more Than Planned budget.

(d) Cost Performance Index

$$\begin{aligned}CPI &= EV / AC \\ &= \frac{\$ 100000}{\$ 120000}\end{aligned}$$

$$CPI = 0.83 \quad CPI < 1$$

(So The Project is over budgeted.)

(e) Schedule Performance Index

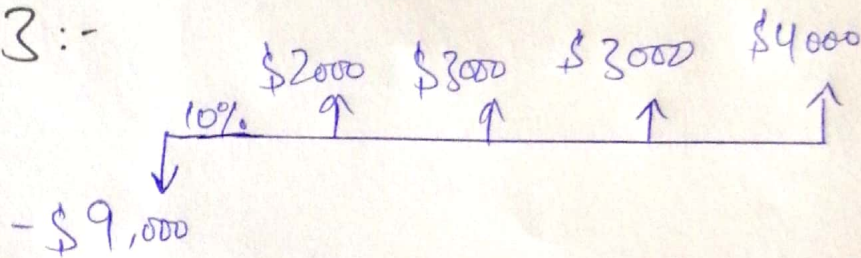
$$SPI = \frac{\text{Earned value}}{\text{Planned value}}$$

$$= \frac{\$ 100000}{\$ 100000} = 1$$

Project is behind schedule  $SPI < 1$

work Package	BCCWS Planned value (PV)	ACWP Actual cost (AC)	Progress %	BCEWP Earned value (EV)	(CV) EV - AC	CPI EV/AC	SPI EV/PV	SV EV - PV
1	\$ 100000	\$ 120000	100%	\$ 100000	\$ 20000	0.83	1.00	\$ -
2	"	\$ 110000	"	"	\$ 10000	0.91	1.00	\$ -
3	"	\$ 80000	90%	\$ 90000	"	1.13	0.90	\$ 10000
4	"	\$ 125000	80%	\$ 80000	\$ 45000	0.64	0.80	\$ 20000
5	"	\$ 75000	50%	\$ 50000	\$ 25000	0.67	0.50	\$ 50000
6	"	\$ -	0%	\$ -	\$ -	0.00	0.00	\$ 100000
7	"	\$ -	0%	\$ -	\$ -	0.00	0.00	"
8	"	\$ -	0%	\$ -	\$ -	0.00	0.00	"
9	"	\$ -	0%	\$ -	\$ -	0.00	0.00	"
10	\$ 100000	\$ -	0%	\$ -	\$ -	0.00	0.00	\$ 100000

Q 3:-



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

$$PV_0 = -C_0$$

$$PV_0 = -9000$$

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

$$PV_1 = 1818.18$$

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

$$PV_2 = 2479.34$$

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

$$PV_3 = 2253.94$$

$-C_0$  = Initial Investment  
 $C$  = Cash Flow

$r$  = Discount Rate

$T$  = Time

$C_1 = 2000$

$C_2 = 3000$

$C_3 = 3000$

$C_4 = 4000$



$$PV_4 = \frac{C_4}{(1+r)^4}$$
$$= \frac{4000}{\left(1 + \frac{10}{100}\right)^4}$$

$$PV_4 = 2732.05$$

$$NPV = -C + \frac{C_1}{1+r} + \frac{C_2}{(1+r)^2} + \frac{C_3}{(1+r)^3} + \frac{C_4}{(1+r)^4}$$
$$= -9000 + 1818.18 + 2479.34 + 2253.94 + 2732.05$$

$$NPV = \$ 283.51$$

Q 4:-

Ans: Power / Interest Matrix.

		level of interest	
		Low	High
Power	Low	A minimal effort	B Keep informed
	High	C Keep satisfied	D Key players

Power / Interest Matrix:-

→ stakeholders in group A:-

Need only minimum effort and monitoring.

→ stakeholders in group B:

Should be kept informed as they may be able to influence more powerful stakeholders.

→ stakeholders in group C: are powerful, but level of interest is low. Generally expected to be

passive, but may move into  
an issue of powerful  
interest.

→ stakeholders in group D:  
Are both powerful and their  
co-operation is of key importance  
for new strategies.

Q No 5:-

Ans:- Checklist for Risk

Management:

Stage 1:- Initiation

- Assemble Risk management resources.
- Appoint The team leader and ensure a breadth of skills/experience within the team.
- Assign Risk management responsibilities appropriate to task.

stage 2:- Proposal Familiarization

- Specify objectives and criteria.
- Assess The Proposal in relation to The Agency objective and strategies.
- Determine assessment criteria for Proposal.
- Define key elements (target 20-50 elements - items or activities) to structure risk analysis.

## Stage 3:- Risk Analysis.

- Identify risks:
  - > Prepare a comprehensive schedule of risks for each element.
  - > Describe each risk and list the main assumptions.
- Assess risk likelihoods & consequences:-
  - > Assemble data on risk and their consequences.
  - > Assess risk likelihoods.
  - > Assess risk impacts.
- Identify significant risks.
  - > Rank risks to reflect impact & likelihoods.
  - > where applicable, estimate risk factors.
  - > Discard / accept minor risks.
  - > Identify moderate risks for management measures.

→ Identify major risks for detailed risk action planning.

Stage 4 :- Risk Response planning.

⇒ Identify feasible response

→ risk prevention.

→ impact mitigation.

→ risk transfer and insurance.

→ risk acceptance.

⇒ Describe each feasible response and list main assumptions.

⇒ select the best response.

→ Evaluate the benefits & costs for each response.

→ select the preferred response.