THE INSTITUTE OF CERTIFIED PUBLIC ACCOUNTANTS OF PAKISTAN (ICPAP)

(Suggested Solution)

Stage	**Professional**	Course Code	**P-502**
Examination	**Summer-2012**	Course Name	**Advanced Performance Management**
Time Allowed	**03 Hours**	Maximum Marks	**100**

NOTES:

1) All questions are to be attempted.
2) Answers are expected to the precise, to the point and well written.
3) Neatness and style will be taken into account in marking the papers.

Question No 1:-

The 'Care For Dogs Company' (CFD) is a very profitable organization which was established in 1998. CFD offers accommodation, care and supervision for pet dogs owned by inhabitants of Barkland.

CFD provides temporary accommodation for dogs whose owners are unable to care for them due to holidays, work commitments, illness etc. As part of the service offered to dog owners, CFD collects and returns dogs at the beginning and end of all dog stays.
When CFD was formed, the directors created a mission statement which was 'to provide very high value for money to all of our clients'.

The directors have always attempted to manage CFD in a socially responsible manner. Indeed, they are now considering the creation of a 'Dog Sanctuary' for homeless dogs which would involve an allocation of 20% of the total accommodation available for dogs to the Dog Sanctuary. The Dog Sanctuary would accommodate homeless dogs until such time as a new owner was found for them. CFD would not receive any revenue whatsoever in respect of any homeless dog.

Required:

(a)   (i) Discuss the purpose, potential benefits and potential problems of mission statements;

    (ii) Advise the directors of CFD regarding the appropriateness of its mission statement.

(b) Explain the term 'critical success factor' and discuss THREE critical success factors for CFD clearly highlighting a key performance indicator for each critical success factor.

(c) Excluding the number of complaints by clients, identify and briefly explain THREE quantitative non-financial performance measures that could be used to assess the 'quality of service' provided by CFD.

Answer:-

(a) (i) A 'mission' is the purpose of an entity and its reason for existence, i.e what is it attempting to accomplish? Henry Mintzberg has stated that 'a mission describes the Organisation's basic function in society, in terms of the products and services it produces for its customers'. A large number of organisations provide a formal statement of their mission in a mission statement. Even though an entity might not have a clearly defined mission it may nevertheless have a mission statement!

A mission statement should be both memorable and succinct. It should also be 'enduring', i.e. the statement should not change unless an entity's mission changes otherwise the mission statement would serve to confuse the business community.

The mission statement should guide all employees throughout an organisation to work collectively towards the accomplishment of the corporate mission and may contain references to many stakeholder groups such as, for example, shareholders, customers, employees and the general public.

Potential benefits of mission statements include:

-   providing strategic direction to the organisation thereby assisting in the formulation of acceptable strategies
-   assisting in the resolution of potential conflict among different stakeholder groups
-   providing a framework within which managerial decisions can be made
-   assisting in the communication of key cultural values to employees
-   assisting in the presentation of a clear image of the organisation for the benefit of customers and other interested parties
-   helping to prevent potential misinterpretations of the Organisation's 'reason for being'.

Potential problems of mission statements include the following:

    - They may be unclear

    - They may be vague and therefore valueless

- They may contain 'motherhood statements'
- They may be unrealistic and not reflect reality
- There may be inconsistency between different elements
- They may be inconsistent with management action
- They may lack sufficient external focus.

(ii) Up until now it would appear that the mission statement of CFD was relevant to its central mission '….thereby providing very high value for money to all our clients'. However, the proposed opening of the Dog Sanctuary might be considered to have changed the mission of CDC. The Dog Sanctuary is a good example of the concern of the directors of CFD 37 for Corporate Social Responsibility. The concern is obviously not one solely based on profitability or continued 'value for money' for its customers. Therefore one might conclude that the mission statement no longer communicates to the business world what CFD is all about and that a change in mission can necessitate a revised mission statement.

(b) Critical success factors (CSF's) are performance requirements that must be achieved if an organisation is to be successful and outperform its competition. In the context of CFD, CSFs should be regarded as those service features that are particularly valued by dog owners.

Three critical success factors are as follows:

Health – All dog owners wish their pets to be healthy and therefore it is essential that staff at CFD take all necessary steps to ensure that the premises are free of disease. A key performance indicator in this regard would be the number of dogs that become ill during a stay at CFD's premises.

Safety – Dog owners are entrusting their pets to CFD who are responsible for the safety of all dogs taken into care. A key performance indicator in this regard would be the number of accidents reported during a given period.

Cleanliness – It is vital that CFD achieve the highest possible level of cleanliness throughout its entire premises. An example of a key performance indicator with regard to cleanliness would be the length of time taken to clean the dog kennels.

(c) In order to assess the quality of service provided by the CFD the following performance measures might be used:
- The percentage of repeat bookings by dog owners which is evidence of customer satisfaction and perhaps ultimately customer loyalty.

- The percentage of dog owners who were able to book a dog stay at their preferred date and time is an indication of the availability or non-availability of the service provided by CFD.
- The percentage of dogs that were collected and delivered on time from and to the homes of dog owners.

Question No 2:-

Hamza Co (HC) manufactures and sells pool cues and snooker cues. The cues both use the same type of good quality wood (ash) which can be difficult to source in sufficient quantity. The supply of ash is restricted to 5,400 kg per period. Ash costs Rs 40 per kg.

The cues are made by skilled craftsmen (highly skilled labour) who are well known for their workmanship. The skilled craftsmen take years to train and are difficult to recruit. HC's craftsmen are generally only able to work for 12,000 hours in a period. The craftsmen are paid Rs 18 per hour.

HC sells the cues to a large market. Demand for the cues is strong, and in any period, up to 15,000 pool cues and 12,000 snooker cues could be sold. The selling price for pool cues is Rs 41 and the selling price for snooker cues is Rs 69.

Manufacturing details for the two products are as follows:

	Pool cues	Snooker cues
Craftsmen time per cue	0·5 hours	0·75 hours
Ash per cue	270 g	270 g
Other variable costs per cue	Rs 1·20	Rs 4·70

HC does not keep inventory.

Required:

(a) Calculate the contribution earned from each cue.

(b) Determine the optimal production plan for a typical period assuming that HC is seeking to maximise the contribution earned. You should use a linear programming graph (using the graph paper provided), identify the feasible region and the optimal point and accurately calculate the maximum contribution that could be earned using whichever equations you need.

Some of the craftsmen have offered to work overtime, provided that they are paid double time for the extra hours over the contracted 12,000 hours. HC has estimated that up to 1,200 hours per period could be gained in this way.

(c) Advise HC whether to accept the craftsmen's' initial offer of working overtime, discussing the rate of pay requested, the quantity of hours and one other factor that HC should consider.

Hamza Co

a) **Contribution per cue**

	Pool cue	Snooker cue
	Rs	Rs
Selling price	41.00	69.00
Material cost at Rs 40/kg	(10.80)	(10.80)
Craftsmen cost at Rs 18/hr	(9.00)	(13.50)
Other Variable cost	(1.20)	(4.70)
Contribution per cue	20.00	40.00

b) **Formulation of the linear programming problem**
Variables
Let P and S be the number of pool and snooker cues made and sold in any three month period.
Let C represent the contribution earned in any three month period

Constraints:

Craftsmen:	$0.5P + 0.75S \leq 12,000$
Ash:	$0.27P + 0.27S \leq 5,400$
Demand levels – Pool cues	$P \leq 15,000$
– Snooker cues	$S \leq 12,000$
Non negativity:	$P, S \geq 0$

Objective: Hamza seeks to maximise contribution in a three month period, subject to:
$$20P + 40S = C$$

See diagram on next page

The feasible region is identified as the area inside OABCDE.

The contribution line is identified as the dotted line. Pushing the contribution line outward increases the contribution gained (theory of iso-contribution). The contribution line last leaves the feasible region at point D which is the intersect of the skilled labour line and the maximum demand line for S.

Solving at point D:

Maximum demand	$S = 12,000$ (1)
Craftsmen	$0.5P + 0.75S = 12,000$ (2)

Substituting S = 12,000 in equation (2)

$$0.5P + (0.75 \times 12,000) = 12,000$$
$$0.5P + 9,000 = 12,000$$
$$0.5P = 12,000 - 9,000$$
$$0.5P = 3,000$$
$$P = 6,000$$

Therefore the maximum contribution is earned when 6,000 pool cues and 12,000 snooker cues are made and sold in a three month period.
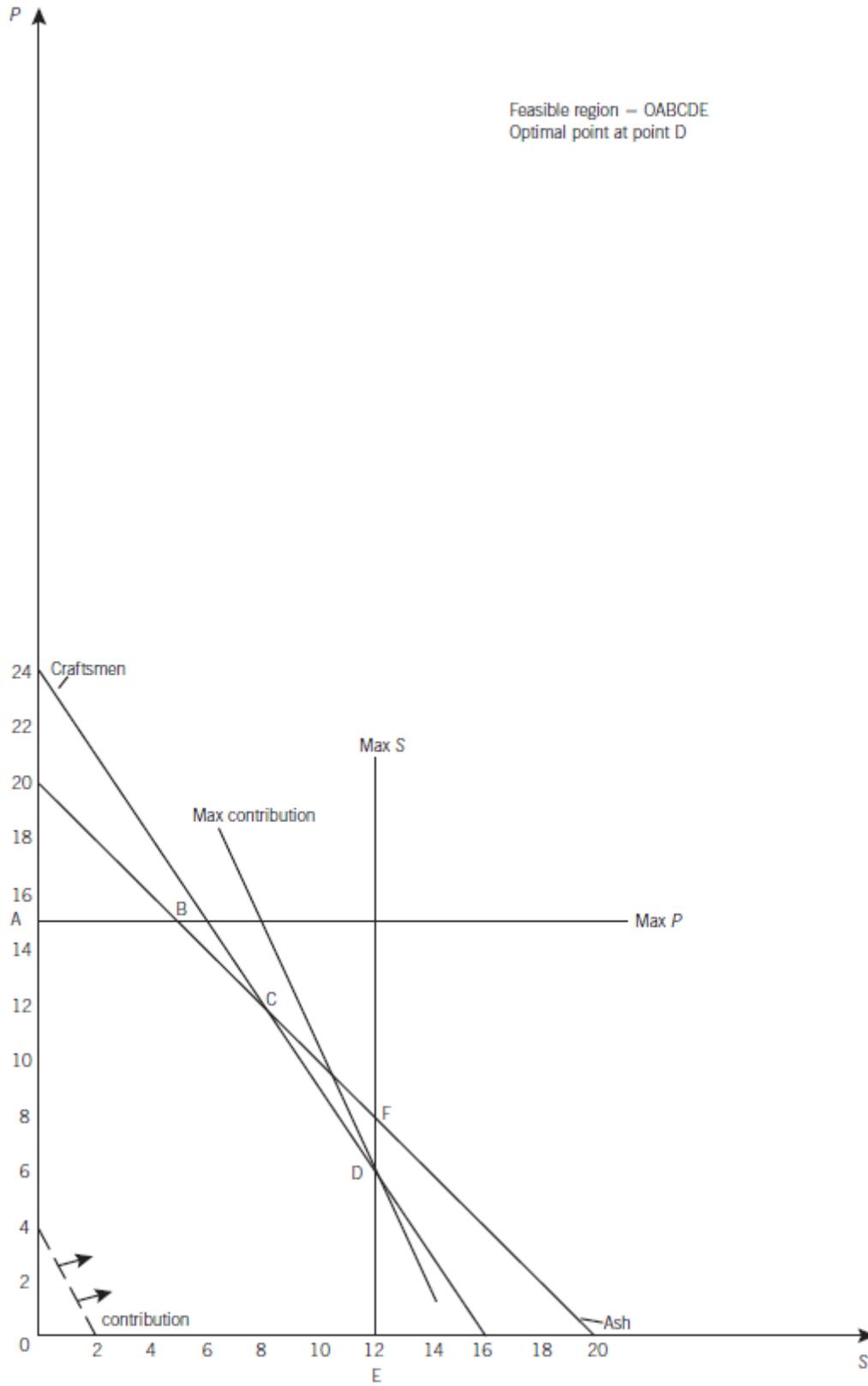
The contribution earned is
$$C = (20 \times 6,000) + (40 \times 12,000)$$
$$C = 120,000 + 480,000$$
$$C = Rs\ 600,000$$

Production schedule

Feasible region – OABCDE
Optimal point at point D

c) Shadow prices

A shadow price is the value assigned to changes in the quantity of a scarce resource available, normally measured in terms of contribution. If more critical scarce resource becomes available then the feasible region would tend to expand and this means that the optimal point would tend to move outward away from the origin thus earning more contribution. It is this increase in the contribution that is the shadow price measured on a per unit of scarce resource basis. Willing to pay for more scarce resource over and above the normal price subject to any non-financial issues that may be present.

If the availability of a non-critical scarce resource increased then the feasible region would not tend to expand and therefore no more contribution could be earned. In this case extra non-critical scarce resource has no value and a nil shadow price.

Calculation of shadow prices:

Ash: This is a non-critical scarce resource and as such it has a shadow price of nil. Put simply we have slack (spare material) of ash and therefore have no desire to pay more to get more of it. Craftsmen: This is a critical scarce resource and if more became available then the feasible region would expand and the optimal point would move outward thus earning more contribution. Assuming that just one more hour becomes available it is necessary to find the new optimal point and measure the increase in contribution earned.
At point D, we re-solve based on the available craftsmen hours being one more than previously.

$$S = 12,000 \ (3)$$
$$0.5P + 0.75S = 12,001 \ (4)$$
$$\text{Substituting } S = 12,000 \text{ in equation (4)}$$
$$0.5P + 0.75(12,000) = 12,001$$
$$0.5P + 9,000 = 12,001$$
$$0.5P = 3,001$$
$$P = 6,002$$

The new optimal solution would be where 12,000 snooker cues and 6,002 pool cues are made. This would earn an extra Rs 40 (2 x Rs 20) in contribution.
The shadow price is therefore Rs 40 per extra hour of craftsmen time.

d) Acceptability of the craftmens' offer.

Rate of pay
The rate of pay requested (double time) is on the face of it less than the shadow price and is therefore affordable by Hamza Co. The business would be better off by accepting the offer.
However, it is common for overtime to be paid at time and a half (Rs 27 per hour) and Hamza would be well advised to negotiate on this point. Hamza takes the commercial risks in this business and would therefore be justified in keeping the majority of the rewards that come with it. Equally it is a dangerous precedent to accept the first offer and pay such a high rate for overtime, Hamza would have to ask itself what would happen next time an overtime situation arose. It is also possible that double time, being so generous, encourages slow working in normal time so as to gain the offer of overtime.

How many hours to buy?

The problem here is that as Hamza buys more craftsmen time, the craftsmen constraint line will move outward, changing the shape of the feasible region. Once the craftsmen line reaches point F (see diagram) then there would be little point buying any more hours since Hamza would then not have the materials (ash) to make more cues.

We need therefore to calculate the number of hours needed at point F.

At F

Maximum demand for S	$S = 12,000$ (5)	
Ash	$0.27P + 0.27S = 5,400$ (6)	

Substituting $S = 12,000$ in equation (6)

$$0.27P + 0.27(12,000) = 5,400$$
$$0.27P + 3,240 = 5,400$$
$$0.27P = 2,160$$
$$P = 8,000$$

Point F falls where $S = 12,000$ and $P = 8,000$

The craftsmen hours needed at this point would be given by putting the above P and S values in the craftsmen constraint formula.

Craftsmen hours = $(0.5 \times 8,000) + (0.75 \times 12,000)$
Craftsmen hours = 13,000 hours

Therefore Hamza should only buy 1,000 hours (13,000 – 12,000).

In general terms Hamza need only buy the number of hours that the business can use to make and sell more products. If more ash can also be bought then more labour hours may be desirable.

Quality of work

Hamza should consider the quality of work. Overtime hours can force tiredness on craftsmen that have already worked a full day. Tired people often produce sub-standard work. If quality is important then this could damage the reputation of the business.

Any other feasible points would be accepted

Question No 3:-

Suzuki Haulage (SH) is considering changing some of the vans it uses to transport crates for customers. The new vans come in three sizes; small, medium and large. SH is unsure about which type to buy. The capacity is 100 crates for the small van, 150 for the medium van and 200 for the large van.

Demand for crates varies and can be either 120 or 190 crates per period, with the probability of the higher demand figure being 0.6.

The sale price per crate is Rs10 and the variable cost Rs4 per crate for all van sizes subject to the fact that if the capacity of the van is greater than the demand for crates in

a period then the variable cost will be lower by 10% to allow for the fact that the vans will be partly empty when transporting crates.

SH is concerned that if the demand for crates exceeds the capacity of the vans then customers will have to be turned away. SH estimates that in this case goodwill of Rs100 would be charged against profits per period to allow for lost future sales regardless of the number of customers that are turned away.

Depreciation charged would be Rs200 per period for the small, Rs300 for the medium and Rs400 for the large van.

SH has in the past been very aggressive in its decision-making, pressing ahead with rapid growth strategies. However, its managers have recently grown more cautious as the business has become more competitive.

Required:

(a) Explain the principles behind the Maximax, Maximin and expected value criteria that are sometimes used to make decisions in uncertain situations.

(b) Prepare a profits table showing the SIX possible profit figures per period.

Answer:-

a) Maximax stands for maximising the maximum return an investor might expect. An investor that subscribes to the maximax philosophy would generally select the strategy that could give him the best possible return. He will ignore all other possible returns and only focus on the biggest; hence this type of investor is often accused of being an optimist or a risk-taker.

Maximin stands for maximising the minimum return an investor might expect. This type of investor will focus only on the potential minimum returns and seek to select the strategy that will give the best worst case result. This type of investor could be said to be being cautious or pessimistic in his outlook and a risk-avoider.

Expected value averages all possible returns in a weighted average calculation.

For example if an investor could expect Rs100 with a 0.3 probability and Rs300 with a 0.7 probabilities then on averages the return would be:

$(0.3 \times Rs100) + (0.7 \times Rs300) = Rs240$

This figure would then be used as a basis of the investment decision. The principle here is that if this decision was repeated again and again, then the investor would get the EV as a return. Its use is more questionable for use on one-off decisions.

(Note: you were not asked for a critique of this method.)

b) Profit calculations

	Small Van	Medium Van	Large Van
Capacity	100	150	200
Low Demand (120)	300w1	468w3	368w5
High Demand (190)	300w2	500w4	816w6

Working

	W1	**W2**	**W3**	**W4**	**W5**	**W6**
Sales	1,000	1,000	1,200	1,500	1,200	1,900
VC	(400)	(400)	(480)	(600)	(480)	(760)
Goodwill	(100)	(100)	(100)			
VC adjustment			48		48	76
Depreciation	(200)	(200)	(300)	(300)	(400)	(400)
Profit	300	300	468	500	368	816

c) Which type of van to buy?

This depends on the risk attitude of the investor. If they are optimistic about the future then the maximax criteria would suggest that they choose the large van as this has the potentially greatest profit.

If they are more pessimistic, then they would focus on the minimum expected returns and choose the medium van as the worst possible result is Rs468, which is better than the other options. We are also told that the business managers are becoming more cautious and so a maximin criterion may be preferred by them.

Expected values could be calculated thus:

Small van		Rs300

Medium van (Rs468 x 0.4) + (Rs500 x 0.6) = Rs487

Large van (Rs368 x 0.4) + (Rs816 x 0.6)   = Rs637

Given SH is considering replacing a number of vans you could argue that an EV approach has merit (not being a one-off decision – assuming individual booking sizes are independent of each other).

The final decision lies with the managers, but, given what we know about their cautiousness, a medium sized van would seem the logical choice. The small van could never be the correct choice.

d) Methods of uncertainty reduction:

- Market research. This can be desk-based (secondary) or field-based (primary). Desk-based is cheap but can lack focus. Field-based research is better in that you can target your customers and your product area, but can be time consuming and expensive. The internet is bringing down the cost and speeding up this type of research, email is being used to gather information quickly on the promise of free gifts etc.
- Simulation. Computer models can be built to simulate real life scenarios. The model will predict what range of returns an investor could expect from a given decision without having risked any actual cash. The models use random number tables to generate possible values for the uncertainty the business is subject to. Again, computer technology is assisting in bringing down the cost of such risk analysis.
- Sensitivity analysis. This can be used to assess the range of values that would still give the investor a positive return. The uncertainty may still be there, but the affect that it has on the investor's returns will be better understood. Sensitivity calculates the % change required in individual values before a change of decision results. If only a (say) 2% change is required in selling price before losses result an investor may think twice before proceeding. Risk is therefore better understood.
- Calculation of worst and best case figures. An investor will often be interested in range. It enables a better understanding of risk. An accountant could calculate the worst case scenario, including poor demand and high costs whilst being sensible about it. He could also calculate best case scenarios including good sales and minimum running costs. This analysis can often reassure an investor. The production of a probability distribution to show an investor the range of possible results is also useful to explain risks involved. A calculation of standard deviation is also possible.

Question No 4:-

Secure Net (SN) manufacture security cards that restrict access to government owned buildings around the world.

The standard cost for the plastic that goes into making a card is Rs 4 per kg and each card uses 40g of plastic after an allowance for waste. In November 100,000 cards were produced and sold by SN and this was well above the budgeted sales of 60,000 cards.
The actual cost of the plastic was Rs 5.25 per kg and the production manager (who is responsible for all buying and production issues) was asked to explain the increase. He said 'World oil price increases pushed up plastic prices by 20% compared to our budget and I also decided to use a different supplier who promised better quality and increased reliability for a slightly higher price. I know we have overspent but not all the increase in plastic prices is my fault'

The actual usage of plastic per card was 35g per card and again the production manager had an explanation. He said 'The world-wide standard size for security cards increased by 5% due to a change in the card reader technology, however, our new supplier provided much better quality of plastic and this helped to cut down on the waste.'
SN operates a just in time (JIT) system and hence carries very little inventory.

Required:
(a) Calculate the total material price and total material usage variances ignoring any possible planning error in the figures.

(b) Assess the performance of the production manager.

Answer:-
a) The total variances are as follows:
    Total price variance = (Rs 5.25 – Rs 4)3,500kg = Rs 4,375 Adverse
    Total usage variance = (3,500 – 4,000)4 = Rs 2,000 Favourable
    This makes a total of Rs 2,375 Adverse
b) The planning variances are calculated by comparing the original budget and the revised standards after adjustment for factors outside the control of the organisation.
    On this basis the revised standards would be a price of Rs 4·80 per kg with revised usage at 42g per card.

Planning price variance = (Rs 4.80 – Rs 4)4,200 = Rs 3,360 Adverse

Planning Usage variance = (4,200 – 4,000) Rs 4 = Rs 800 Adverse

The total planning error (variance) is Rs 4,160 Adverse

The operational variances compare the actual spend with the revised budget figures.

Operational price variance = (Rs 5.25 – Rs 4.80)3,500kg = Rs 1,575 Adverse

Operational usage variance = (3,500 – 4,200) Rs 4.80 = Rs 3,360 Favourable

The total operational variance is Rs 1,785 Favourable

The method above is in line with the article previously written by the examiner and published in the ACCA student newsletter.

Other methods applied consistently would score full marks.

c) The production manager is subject to external pressures which appear beyond his control. The size of the security card has to fit the reader of that card and if the industry specification changes there is nothing that he can do about that. This is, then, a 'planning' error and should not form part of any assessment of his performance.

Equally if world-wide oil prices increase (and hence plastic prices) then the production manager cannot control that. This would be allocated as a planning error and ignored in an assessment of his performance.

The performance of the production manager should be based on the operational variances (and any relevant qualitative factors). The decision to use a new supplier 'cost' an extra Rs 1,575 in price terms. On the face of it this is, at least potentially, a poor performance. However, the manager seems to have agreed to the higher price on the promise of better quality and reliability. If this promise was delivered then this could be seen as a good decision (and performance). The savings in waste (partly represented by the usage variance) amount to Rs 3,360 favourable. This would seem to suggest better quality. The fact that the production level jumped from 60,000 to 100,000 also suggests that suppliers' reliability was good (in that they were able to deliver so much). The net variance position is relevant at a saving of Rs 1,785.

It is also possible that such a large increase in volume of sales and production should have yielded a volume based discount from suppliers. This should also be reflected in any performance assessment in that if this has not been secured it could be seen as a poor performance.

This is backed up by the lack of obvious quality problems since we are told that 100,000 cards were produced and sold in the period, a huge increase on budget. The ability of a production manager to react and be flexible can often form a part of a performance assessment.

In conclusion the manager could be said to have performed well.

Question No 5:-

Franchising 4 You Ltd (F4U) markets a range of franchises which it makes available to its customers, the franchisees. F4U supplies the franchisee with information of the mode of operation, detailed operation schedules and back-up advice (by telephone, internet) and undertakes national advertising. Each franchisee must arrange for its own premises, equipment and undertake local marketing.

F4U is considering the introduction of a Dance and Drama franchise which would have an expected life of six years. From this project, the only income F4U will receive from franchisees comes from the initial franchise fee.

The following estimates have been made relating to the cash outflows and inflows for F4U in order that F4U can evaluate the financial viability of the Dance and Drama franchise proposal:

1. Initial investment of Rs6m. This will include a substantial element relating to the 'intellectual capital' requirement of the proposal.

2. Development/improvement costs of Rs1m per year at the end of each of years two and three.

3. 300 franchises will be sold each year at a fee of Rs20,000 per franchisee.

4. Variable costs, payable in full on the issue of each franchise, are estimated at Rs6,000 per franchise.

5. Directly attributable fixed costs of Rs0·6m per year in each of years one to six. No further fixed costs will be payable by F4U after this period.

6. Corporation tax at the rate of 30%, payable in the year in which cash flow occurs. Tax allowances are not available on the initial investment or development/improvement costs payable by F4U.

7. All cash flows are stated in current prices and with the exception of the initial investment will occur at the end of each year.

8. The money cost of capital is 15·44%. Annual inflation during the period is estimated at 4%.

Required:

(a) Calculate the net present value (NPV) of the Dance and Drama franchise proposal and recommend whether it should be undertaken by F4U.

(b) Discuss the elements to be considered as 'intellectual capital' and issues associated with its valuation for inclusion in the initial investment of Rs6m.

(c) Discuss ways in which reliance solely on financial performance measures can detract from the effectiveness of the performance management system within an organization.

F4U has identified key variables as follows:

1. The number of franchises taken up each year. It is estimated that a flexible pricing policy will result in the following outcomes:

Fee per franchise	Number of franchises
Rs	sold each year
22,000	270
20,000	300
18,000	355

2. The variable cost per franchise may be Rs7, 000, Rs6, 000 or Rs5, 000.

The NINE possible outcomes of a spreadsheet model used in calculating the NPV and incorporating the variables 1 and 2 above, have been identified as follows:

Payoff Matrix: NPV values

Fee per franchise (Rs000)

		18	20	22
Variable cost	5	4,348,226	4,007,630	4,274,183
Per franchise	6	3,296,822	3,119,120	3,474,524
(Rs000)	7	2,245,419	2,230,610	2,674,865

Required:

(d) State the franchise fee pricing strategy (Rs per franchise) which will result from the operation of each of the following decision rules:

(i) Maximax;

(ii) Maximin;

(iii) Minimax regret.

Your answer should explain the basis of operation of each of the three decision rules.

Answer:-

See Study Notes page 62

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