Planning and operational Variances

Approach 1

Material variance

Planning variance

Material planning price variance = revised quantity allowed for actual production (org. price – revised price)

Material planning usage variance = org price (org. quantity for actual production – revised quantity allowed for actual production)

Operational variance

Material operational price variance = actual quantity (rev. price – actual price)

Material operational usage variance = rev. price (revised quantity allowed for actual production - actual quantity)

Labour Variances

Planning variance

Labour planning rate variance = revised hours allowed for actual production (org. rate – revised rate)

Labour planning efficiency variance = org. rate (org.hours for actual production – revised hours allowed actual production)

Operational variance

Labour operational price variance = actual labour hours (rev. rate– actual rate)

Labour l operational efficiency variance = rev. rate (revised hours allowed actual production - actual hours worked)

OR

Approach 2

Material variance

Planning variance

Material planning price variance = actual quantity used (org. price – revised price)

Material planning usage variance = org price (org. quantity for actual production – revised quantity allowed for actual production)

Operational variance

Material operational price variance = actual quantity used(rev. price – actual price)

Material operational usage variance = org. price (revised quantity allowed for actual production - actual quantity)

Labour Variances

Planning variance

Labour planning rate variance = actual hours worked (org. rate – revised rate)

Labour planning efficiency variance = org. rate (org.hours for actual production – revised hours allowed actual production)

Operational variance

Labour operational price variance = actual labour hours (rev. rate– actual rate)

Labour l operational efficiency variance = org. rate (revised hours allowed actual production - actual hours worked)

Note: both methods are acceptable by examiner but there can be some issue in MCQs so you need to remember both

Q1. 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 $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 $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. (4 marks)

(b) Analyse the above total variances into component parts for planning and operational variances in as much detail as the information allows. (8 marks)

(c) Assess the performance of the production manager. (8 marks)

Q2. Bokco is a manufacturing company. It has a small permanent workforce but it is also reliant on temporary workers, whom it hires on three-month contracts whenever production requirements increase. All buying of materials is the responsibility of the company's purchasing department and the company's policy is to hold low levels of raw materials in order to minimise inventory holding costs. Bokco uses cost plus pricing to set the selling prices for its products once an initial cost card has been drawn up. Prices are then reviewed on a quarterly basis. Detailed variance reports are produced each month for sales, material costs and labour costs. Departmental managers are then paid a monthly bonus depending on the performance of their department.

One month ago, Bokco began production of a new product. The standard cost card for one unit was drawn up to include a cost of $84 for labour, based on seven hours of labour at $12 per hour. Actual output of the product during the first month of production was 460 units and the actual time taken to manufacture the product totalled 1,860 hours at a total cost of $26,040.

After being presented with some initial variance calculations, the production manager has realised that the standard time per unit of seven hours was the time taken to produce the first unit and that a learning rate of 90% should have been anticipated for the first 1,000 units of production. He has consequently been criticised by other departmental managers who have said that, 'He has no idea of all the problems this has caused.'

Required:

(a) Calculate the labour efficiency planning variance and the labour efficiency operational variance AFTER taking account of the learning effect.

Note: The learning index for a 90% learning curve is –0·1520 (5 marks)

(b) Discuss the likely consequences arising from the production manager's failure to take into account the learning effect before production commenced. (5 marks)

(10 marks)

Q3. Truffle Co makes high quality, hand-made chocolate truffles which it sells to a local retailer. All chocolates are made in batches of 16, to fit the standard boxes supplied by the retailer. The standard cost of labour for each batch is $6·00 and the standard labour time for each batch is half an hour. In November, Truffle Co had budgeted production of 24,000 batches; actual production was only 20,500 batches. 12,000 labour hours were used to complete the work and there was no idle time. All workers were paid for their actual hours worked. The actual total labour cost for November was $136,800. The production manager at Truffle Co has no input into the budgeting process.

At the end of October, the managing director decided to hold a meeting and offer staff the choice of either accepting a 5% pay cut or facing a certain number of redundancies. All staff subsequently agreed to accept the 5% pay cut with immediate effect.

At the same time, the retailer requested that the truffles be made slightly softer. This change was implemented immediately and made the chocolates more difficult to shape. When recipe changes such as these are made, it takes time before the workers become used to working with the new ingredient mix, making the process 20% slower for at least the first month of the new operation.

The standard costing system is only updated once a year in June and no changes are ever made to the system outside of this.

Required:

(a) Calculate the total labour rate and total labour efficiency variances for November, based on the standard cost provided above. (4 marks)

(b) Analyse the total labour rate and total labour efficiency variances into component parts for planning and operational variances in as much detail as the information allows. (8 marks)

(c) Assess the performance of the production manager for the month of November. (8 marks)

Q4. Bedco manufactures bed sheets and pillowcases which it supplies to a major hotel chain. It uses a just-in-time system and holds no inventories.

The standard cost for the cotton which is used to make the bed sheets and pillowcases is $5 per m2. Each bed sheet uses 2 m^2 of cotton and each pillowcase uses 0·5 m^2. Production levels for bed sheets and pillowcases for November were as follows:

	Budgeted production levels (units)	Actual production levels (units)
Bed sheets	120,000	120,000
Pillowcases	190,000	180,000

The actual cost of the cotton in November was $5·80 per m^2. 248,000 m^2 of cotton was used to make the bed sheets and 95,000 m^2 was used to make the pillowcases.

The world commodity prices for cotton increased by 20% in the month of November. At the beginning of the month, the hotel chain made an unexpected request for an immediate design change to the pillowcases. The new design required 10% more cotton than previously. It also resulted in production delays and therefore a shortfall in production of 10,000 pillowcases in total that month.

The production manager at Bedco is responsible for all buying and any production issues which occur, although he is not responsible for the setting of standard costs.

Required:

(a) Calculate the following variances for the month of November, for both bed sheets and pillow cases, and in total:

(i) Material price planning variance; (3 marks)

(ii) Material price operational variance; (3 marks)

(iii) Material usage planning variance; (3 marks)

(iv) Material usage operational variance. (3 marks)

(b) Assess the performance of the production manager for the month of November. **(8 marks)**

(20 marks)

Q5. Glove Co makes high quality, hand-made gloves which it sells for an average of $180 per pair. The standard cost of labour for each pair is $42 and the standard labour time for each pair is three hours. In the last quarter, Glove Co had budgeted production of 12,000 pairs, although actual production was 12,600 pairs in order to meet demand. 37,000 hours were used to complete the work and there was no idle time. The total labour cost for the quarter was $531,930. At the beginning of the last quarter, the design of the gloves was changed slightly. The new design required workers to sew the company's logo on to the back of every glove made and the estimated time to do this was 15 minutes for each pair. However, no-one told the accountant responsible for updating standard costs that the standard time per pair of gloves needed to be changed. Similarly, although all workers were given a 2% pay rise at the beginning of the last quarter, the accountant was not told about this either. Consequently, the standard was not updated to reflect these changes. When overtime is required, workers are paid 25% more than their usual hourly rate.

Required:

(a) Calculate the total labour rate and total labour efficiency variances for the last quarter. (2 marks)

(b) Analyse the above total variances into component parts for planning and operational variances in as much detail as the information allows. (6 marks)

(c) Assess the performance of the production manager for the last quarter. (7 marks)

(15 marks)

Q6. Spike Co manufactures and sells good quality leather bound diaries. Each year it budgets for its profits, including detailed budgets for sales, materials and labour. If appropriate, the departmental managers are allowed to revise their budgets for planning errors.
In recent months, the managing director has become concerned about the frequency of budget revisions. At a recent board meeting he said 'There seems little point budgeting any more. Every time we have a problem the budgets are revised to leave me looking at a favourable operational variance report and at the same time a lot less profit than promised.'
Required:
(a) Describe the circumstances when a budget revision should be allowed and when it should be refused. (
5 marks)
Two specific situations have recently arisen, for which budget revisions were sought:
Materials
A local material supplier was forced into liquidation. Spike Co's buyer managed to find another supplier, 150 miles away at short notice. This second supplier charged more for the material and a supplementary delivery charge on top. The buyer agreed to both the price and the delivery charge without negotiation. 'I had no choice', the buyer said, 'the production manager was pushing me very hard to find any solution possible!' Two months later, another, more competitive, local supplier was found.
A budget revision is being sought for the two months where higher prices had to be paid.
Labour
During the early part of the year, problems had been experienced with the quality of work being produced by the support staff in the labour force. The departmental manager had complained in his board report that his team were 'unreliable, inflexible and just not up to the job'.
It was therefore decided, after discussion of the board report, that something had to be done. The company changed its policy so as to recruit only top graduates from good quality universities. This has had the effect of pushing up the costs involved but increasing productivity in relation to that element of the labour force.
The support staff departmental manager has requested a budget revision to cover the extra costs involved following the change of policy.
Required:
(b) Discuss each request for a budget revision, putting what you see as both sides of the argument and reach a conclusion as to whether a budget revision should be allowed. (8 marks)

The market for leather bound diaries has been shrinking as the electronic versions become more widely available and
easier to use. Spike Co has produced the following data relating to leather bound diary sales for the year to date:
Budget

Sales volume	180,000 units
Sales price	$17·00 per unit
Standard contribution	$7·00 per unit

The total market for diaries in this period was estimated in the budget to be 1·8m units. In fact, the actual total market shrank to 1·6m units for the period under review.
Actual results for the same period

Sales volume	176,000 units
Sales price	$16·40 per unit

Required:
(c) Calculate the total sales price and total sales volume variance. (4 marks)
(d) Analyse the total sales volume variance into components for market size and market share. (4 marks)
(e) Comment on the sales performance of the business. (4 marks)
(25 marks)

Answer of spike limited

(a) A budget forms the basis of many performance management systems. Once set, it can be compared to the actual results of an organisation to assess performance. A change to the budget can be allowed in some circumstances but these must be carefully controlled if abuse is to be prevented.

Allow budget revisions when something has happened that is beyond the control of the organisation which renders the original budget inappropriate for use as a performance management tool.

These adjustments should be approved by senior management who should attempt to take an objective and independent view.

Disallow budget revisions for operational issues. Any item that is within the operational control of an organisation should not be adjusted.

(b) Materials

Arguments in favour of allowing a revision

– The nature of the problem is outside the control of the organisation. The supplier went in to liquidation; it is doubtful that Spike Limited could have expected this or prevented it from happening.

– The buyer, knowing that budget revisions are common, is likely to see the liquidation as outside his control and hence expect a revision to be allowed. He may see it as unjust if this is not the case and this can be demoralising.

Arguments against allowing a budget revision

– There is evidence that the buyer panicked a little in response to the liquidation. He may have accepted the first offer that became available (without negotiation) and therefore incurred more cost than was necessary.

– A cheaper, more local supplier may well have been available, so it could be argued that the extra delivery cost need not have been incurred. This could be said to have been an operational error.

Conclusion

The cause of this problem (liquidation) is outside the control of the organisation and this is the prime cause of the overspend. Urgent problems need urgent solutions and a buyer should not be penalised in this case. A budget revision should be allowed.

Labour

Arguments in favour of allowing a revision

– The board made this decision, not the departmental manager. It could be argued that the extra cost on the department's budget is outside their control.

Arguments against allowing a budget revision

– This decision is entirely within the control of the organisation as a whole. As such, it would fall under the definition of an operational decision. It is not usual to allow a revision in these circumstances.

– It is stated in the question that the departmental manager complained in his board report that the staff level needed improving. It appears that he got his wish and the board could be said to have merely approved the change.

– The department will have benefited from the productivity increases that may have resulted in the change of policy. If the department takes the benefit then perhaps they should take the increased costs as well.

Conclusion

This is primarily an operational decision that the departmental manager agreed with and indeed suggested in his board report. No budget revision should be allowed.

An alternative view is that the board made the final decision and as such the policy change was outside the direct control of the departmental manager. In this case a budget revision would be allowed.

Q. The School Uniform Company (SU Co) manufactures school uniforms. One of its largest contracts is with the Girls' Private School Trust (GPST), which has 35 schools across the country, all with the same school uniform.

After a recent review of the uniform at the GPST schools, the school's spring/summer dress has been re-designed to incorporate a dropped waistband. Each new dress now requires 2·2 metres of material, which is 10% more material than the previous style of dress required. However, a new material has also been chosen by the GPST which costs only $2·85 per metre which is 5% cheaper than the material used on the previous dresses. In February, the total amount of material used and purchased at this price was 54,560 metres.

The design of the new dresses has meant that a complicated new sewing technique needed to be used. Consequently, all staff required training before they could begin production. The manager of the sewing department expected each of the new dresses to take 10 minutes to make as compared to 8 minutes per dress for the old style. SU Co has 24 staff, each of whom works 160 hours per month and is paid a wage of $12 per hour. All staff worked all of their contracted hours in February on production of the GPST dresses and there was no idle time. No labour rate variance arose in February.

Activity levels for February were as follows:

Budgeted production and sales (units)	30,000
Actual production and sales (units)	24,000

The production manager at SU Co is responsible for all purchasing and production issues which occur. SU Co uses standard costing and usually, every time a design change takes place, the standard cost card is updated prior to production commencing. However, the company accountant responsible for updating the standards has been off sick for the last two months. Consequently, the standard cost card for the new dress has not yet been updated.

Required:

(a) Calculate the material variances in as much detail as the information allows for the month of February. (7 marks)

(b) Calculate the labour efficiency variances in as much detail as the information allows for the month of February. (5 marks)

(c) Assess the performance of the production manager for the month of February. (8 marks)

(20 marks)

The following scenario relates to questions 26–30

Marcus manages the production and sales departments for product MN at Grayshott Co. Marcus has been asked to attend a meeting with Grayshott Co's finance director to explain the results for product MN in the last quarter.

Budgeted and actual results for product MN were as follows:

	Budget	Actual
Sales volume (units)	40,000	38,000
	$'000	$'000
Revenue ($65 per unit)	2,600	2,394
Material (5·2 kg at $4 per kg)	(832)	(836)
Labour (2 hours at $8 per hour)	(640)	(798)
Variable overheads (2 hours at $4 per hour)	(320)	(399)
Fixed overheads	(220)	(220)
Profit	588	141

There was no opening and closing inventory in the last quarter. Grayshott Co operates a marginal costing system.

Marcus is angry about having to attend the meeting as he has no involvement in setting the original budget and he believes that the adverse results are due to the following circumstances which were beyond his control:

(1) A decision by Grayshott Co's board to increase wages meant that the actual labour rate per hour was 25% higher than budgeted. This decision was made in response to a request by the production department to enable it to meet a large, one-off customer order in the last quarter.
(2) Due to the closure of a key supplier, Grayshott Co agreed to a contract with an alternative supplier to pay 6% more per kg than the budgeted price for material. The actual cost per kg of material was $4·40.
(3) Difficult economic conditions meant that market demand for product MN was lower by 10%.

At present Grayshott Co does not operate a system of planning and operational variances and Marcus believes it should do so.

26 What was the market share variance for product MN for the last quarter?

A $40,400 Favourable
B $80,800 Adverse
C $29,400 Favourable
D $38,000 Adverse

27 What was the adverse materials price planning variance for product MN for the last quarter?

A $30,400
B $76,000
C $45,600
D $49,920

28 What was the labour rate operational variance for product MN for the last quarter?

A $159,600 Favourable
B $159,600 Adverse
C $160,000 Favourable
D $160,000 Adverse

29 Which of the following would explain a labour efficiency planning variance?

(1) A change in employment legislation requiring staff to take longer rest periods
(2) Customers demanding higher quality products leading to a change in product design
(3) The learning effect for labour being estimated incorrectly in the production budget

A 1 and 2 only
B 2 and 3 only
C 3 only
D 1, 2 and 3

30 Which of the following statements regarding the problems of introducing a system of planning and operational variances is/are true?

(1) Operational managers may argue that variances are due to the original budget being unrealistic
(2) Operational managers may seek to blame uncontrollable external factors for the variances

A 1 only
B 2 only
C Both 1 and 2
D Neither 1 nor 2