



**DEGREE EXAMINATIONS**  
**JUNE 2018**

**OPERATIONS MANAGEMENT**  
**BEC214 / BEC214E**

**TIME : 2 HOURS**

**MARKS : 75**

**INTERNAL EXAMINERS**

**Mr B D Jordaan**  
**Mr H Shava**

This paper consists of 7 pages including the cover page.

**INSTRUCTIONS**

1. The examination paper comprises a total of **SEVENTY FIVE (75)** marks.
2. **SECTION A: Question 1 (25 marks), is compulsory.**
3. **SECTION B: QUESTION 2 (25 marks), is also compulsory.**
4. **SECTION C: Answer only ONE ADDITIONAL QUESTION (25 marks);**  
Either Question 3 or 4.
5. **Failure to obey the instructions** will negatively impact your results.
6. Please indicate all questions answered clearly and correctly on the answer sheet.
7. Questions could be answered in any order.

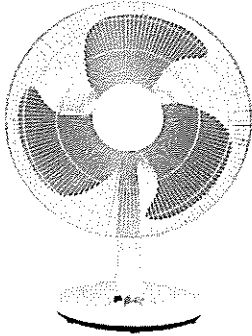
## SECTION A: (COMPULSORY) - Question 1

[25 Marks]

- 1.1 ..... has, primarily, placed greater demands on business enterprises to focus on efficient product design, manufacturing and delivery at a much higher level than before. (1)
- A. Economic change
  - B. Globalisation
  - C. The population explosion
  - D. Carbon foot print pressure
  - E. Technology
- 1.2 A **Just in time (JIT)** operations strategy implies: (1)
- A. A wide range of suppliers will be needed to meet increased demand.
  - B. Small batches of popular products are manufactured to increase efficiency.
  - C. An increase in safety time to counter for the likelihood of stock-outs.
  - D. That increased process complexity require computer based production control.
  - E. That products are pulled through the operations system aligned to customer demand.
- 1.3 A **Chase strategy** of production could include all but one of the following methods of meeting demand. Which one is not applicable? (1)
- A. Sub-contract work to other firms.
  - B. Make use of backlogs and reservations.
  - C. Produce in an earlier period and built up stock.
  - D. Work additional hours, that is overtime.
  - E. Work an additional shift.
- 1.4 The document that details the **quantity of end items to be produced within a specified period of time** is: (1)
- A. The Bill of material.
  - B. Master production schedule.
  - C. Economic production quantity.
  - D. Material requirements plan.
  - E. Periodic order quantity.
- 1.5 There are many characteristics of service quality and how it is measured. Which of the statements below describe quality in terms of **responsiveness**? (1)
- A. The willingness of the service provider to be helpful and prompt in providing the requested service.
  - B. The knowledge and courtesy of employees and their ability to inspire trust and confidence.
  - C. The neat and clean appearance of the service facility, equipment and personnel.
  - D. The ability of the service provider to render a caring and attentive service.
  - E. A pizza restaurant that provides tasty pizzas with the same ingredients every time an order is placed.

- 1.6 Which of the following *will not be a purpose of inventory holding*? (1)
- A. to decouple operations processes,
  - B. to serve as a safeguard for variations in RM delivery times,
  - C. to take advantage of economic purchase order size and discounts,
  - D. to allow for flexibility in production scheduling, and
  - E. all are objectives of controlled *inventory holding*.
- 1.7 **Servitisation** refers to ... (1)
- A. More and more enterprises are moving away from physical production to the rendering of services.
  - B. Customers forming opinions on the value of a business's output.
  - C. Modern manufacturing firms embedding services within their products.
  - D. An on-going response to a desire to improve productivity in the services sector.
  - E. Dealing with creation and diffusion of knowledge in the services sector.
- 1.8 Which of the following is **NOT** a primary characteristic of a project? (1)
- A. A well-defined goal.
  - B. Uniqueness.
  - C. A specified budget.
  - D. A set of interrelated activities.
  - E. Projects aim to maximise profit.
- 1.9 Calculate the EOQ if the following applies. Volkswagen SA has an annual demand for 225 000 motor car batteries. The average unit cost of a battery is R1 200.00. The ordering cost per order amounts to R2 400 and the carrying cost is 10% per annum. [EOQ =  $\sqrt{2AD \times S / p \times k}$ ] (3)
- 1.10 Calculate the Net Productivity Improvement outcome for each of the following examples. (2)
- A. a 7% ↑ in output accomplished with a 2% ↑ in input.
  - B. a 3% ↑ in output accomplished with a 2% ↓ in input.
- (↑ = increase; ↓ = decrease)

1.11 In composing its MRP plan, suppose the Operations Management (OM) receives an order for 1 000, 3-blade fans. A fan is composed of 4 major components, namely:



- A fan motor
- A pedestal
- A 4 - switch assembly and 2m electric cord.
- A safety fan guard

OM has the following items in stock: Fully assemble fans: 120  
 Fan motors: 90; 4-switch assemblies: 70; pedestals: 80;  
 safety fan guards: 150; Electric cords 240m.

Do the following Gross to Net Calculations:

- a) The Net Requirements for fan motors: (2)  
 b) The Net Requirements for 4-switch assemblies: (2)  
 c) The Net Requirements for electric cord in meters are: (3)

[7]

1.12 Given the following list of sales data for a local fast food restaurant for the week ending 9 June 2018. Prepare a sales forecast for Combo meals for Saturday using the TWO approaches below:

Day	Combo Meals	Weights
Monday, 4	500	
Tuesday, 5	540	0.1
Wednesday, 6	550	0.2
Thursday, 7	580	0.2
Friday, 8	640	0.5
Saturday, 9	?	---

- a) A *weighted* moving average. 2)  
 b) An *exponential* smoothing approach, using a smoothing factor of 0.6. 3) (5)  
 (Assume the forecast for Friday was 620 combo meals.)

## **SECTION B: QUESTION 2 (COMPULSORY)**

**[25 marks]**

**Read the passage below and answer the questions that follow**

### **CASE STUDY EasyJet: Low cost air travel**

Although EasyJet only undertook its first flight in 1995, when it only operated two routes (London Luton to Glasgow and Edinburgh), ten years later the budget airline offered 212 routes to 64 European airports and transported over 29 million passengers in 2005.

Over the past 22 years EasyJet has built Europe's leading short-haul airline and have a strong platform to continue on their growth journey. EasyJet now carries more passengers within Europe than British Airways. Analysts expect EasyJet and its Irish-based rival Ryanair, to both overtake all traditional airlines to become the largest short-haul operators in Europe by the end of the decade. The Luton-based airline is continuing to expand, recently announcing the purchase of a further 20 Airbus A319 planes to service the ever increasing number of routes it operates. In 2005 EasyJet carried nearly 30 million passengers, up from 25.7 million in 2004, making it a £1.3 billion business. Despite record high fuel costs, profits were up around 10 per cent to £68 million. Passenger numbers rose 21 per cent to 29.6 million and the load factor, indicating how many seats are filled, was 85.2 per cent, reflecting the airline's popularity. The low cost lines like EasyJet have revolutionised the airline industry in Europe. Modelled on South-West Airlines in the USA, these airlines have not only helped create a whole new market of cost-conscious travellers but have taken market share from established operators like British Airways and become the most profitable airlines in Europe. To be profitable, these airlines have to achieve low costs to match the low fares, which are the main attraction to their passengers. With its head office as a large tin shed adjacent to the main taxiway at unfashionable Luton Airport, all of EasyJet's operations are aimed at minimising costs. This is done in a number of ways:

- **Use of the Internet to reduce distribution costs.** EasyJet sells around 95 per cent of all seats over the Internet. Its online booking system uses a variable pricing system to try to maximize load factors. (Prices start very low - sometimes free, and rise as seats are filled.) The fuller the aircraft the lower the unit cost of travel.
- **Ticketless travel.** Passengers are emailed with their travel details and booking reference. This helps reduce significantly the cost of issuing, distributing, processing and reconciling millions of tickets each year. Neither does EasyJet pre-assign seats on-board. Passengers sit where they like. This eliminates an unnecessary complexity and speeds up passenger boarding.
- **No free on-board catering.** Eliminating free catering on-board reduces cost and unnecessary bureaucracy. Passengers can purchase food and refreshments on-board.
- **Efficient use of airports.** EasyJet flies to the less crowded airports of smaller European cities and prefers the secondary airports in the major cities. These also have lower landing charges and normally offer faster turnarounds as there are fewer air movements. EasyJet's efficient ground operations enable it to achieve turnarounds of less than 30 minutes. This means EasyJet can achieve extra rotations on the high-frequency routes, maximizing the utilization of aircraft. EasyJet's ability to offer point-to-point travel means that it does not have to worry about onward connections for passengers and their baggage, further simplifying its operations.
- **Paperless operations.** EasyJet has embraced the concept of the paperless office, with all its management and administration undertaken entirely on IT systems. These can be accessed through secure servers from anywhere in the world thereby enhancing flexibility in the running of the airline.

*(Source material [www.EasyJet.com](http://www.EasyJet.com) and [www.bbc.co.uk](http://www.bbc.co.uk))*

- 2.1 Mention and discuss the measures implemented by EasyJet to achieve low cost and lean operations. Do these measures agree favourably with operations strategy? (10)
- 2.2 What evidence from the case study reveals that European travellers are responding favourably to the measures taken by EasyJet? (5)
- 2.3 Sight and describe the benefits derived by EasyJet from the introduction of the above-mentioned cost saving measures. (5)
- 2.4 Economies of scale play a significant role in EasyJet's operations. Discuss this principle at the hand of a practical example. (3)
- 2.5 Mention 2 airlines in South Africa that follow/implement a similar strategy. (2)

[25 marks]

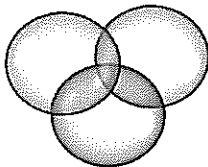
### **SECTION C: ANSWER ONLY ONE QUESTION FROM THIS SECTION**

#### **QUESTION 3 (OPTIONAL)**

[25 marks]

- 3.1 What *value* does *supply chain metrics* add to the management of the supply chain? Sight and describe any *TWO examples* of supply chain metrics. [5]
- 3.2 Contrast the *Perpetual and the Periodic* Inventory Control Systems. [6]
- 3.3 Describe the *FOUR major Tasks* of the *Operations Manager*. [8]

3.4



Describe the fundamentals of the *THREE Quality Spheres*.

[6]

**OR**

#### QUESTION 4 (OPTIONAL)

[25 marks]

4.1 Provide a concise exposition of the *Social and Economic Challenges* faced by operations managers and offer some suggestions for the successful management of these.

[15]

4.2 Jackson Civil Contractor CC has been appointed to build 500 HOP houses in the new Green fountain development in Alice. The contractor has to utilise a 50% local employee contingent which need to receive on the job training. The major project activities are:

- A. Groundwork and levelling
- B. Recruitment and basic training sessions of local employees.
- C. Foundation digging, sewerage & water connections, laying of concrete floors.
- D. Completing the brickwork to roof level.
- E. Securing roof thrushes on walls
- F. Fitment of corrugated roof
- G. Fitment of doors and windows
- H. Bathroom fitment, tiling, geyser installation, cupboards installation, lights fitment and final finishing.

Do the following:

- a) Calculate the **expected times in nearest full weeks** for activities D and H. (2)
- b) Draw a **PERT network** for the project. (4)
- c) Determine the **Critical path**. (2)
- d) Determine the **Earliest completion time** in weeks for the project. (2) [10]

<b>ACTIVITY</b>	<b>EXPECTED TIME</b>	<b>PRECEDING ACTIVIT(Y)(IES)</b>	<b>OPTIMISTIC TIME EST</b>	<b>MOST LIKELY TIME EST</b>	<b>PESIMISTIC TIME EST</b>
<b>A</b>	8	---	4	9	<b>10</b>
<b>B</b>	9	---	7	8	<b>15</b>
<b>C</b>	10	A & B	8	9	<b>15</b>
<b>D</b>		C	11	12	<b>19</b>
<b>E</b>	9	D	7	8	<b>13</b>
<b>F</b>	10	E	8	9	<b>15</b>
<b>G</b>	7	E	5	7	<b>9</b>
<b>H</b>		F & G	9	13	<b>19</b>