



UNIVERSITY  
OF  
JOHANNESBURG

**FACULTY OF ENGINEERING AND THE BUILT ENVIRONMENT  
SSA EXAM**

**DEPARTMENT** : QUALITY AND OPERATIONS MANAGEMENT  
**MODULE** : OPERATIONS MANAGEMENT 2B  
**CODE** : BPJ22B2  
**DATE** : SUMMER SSA EXAMINATION 2015  
7 DECEMBER 2015  
**DURATION** : (SESSION 2) 11:30 - 14:30  
**TOTAL MARKS** : 100

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**EXAMINER** : MS K MUSHAVHANAMADI  
**INTERNAL MODERATOR** : DR P KHOLOPANE  
**NUMBER OF PAGES** : 6 PAGES  
**REQUIREMENTS** : SCANNER SHEETS

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**INSTRUCTIONS TO CANDIDATES:**

- Answer ALL questions.
- This is a closed book assessment.
- Leave margins and spaces between the questions.
- Show all your calculations.
- Unless otherwise indicated, express your answers correctly to two (2) decimal places.
- Where appropriate, indicate the units of your answer. (e.g. Hour, R )
- Write neatly and legibly
- NOTE: Marks will be awarded for theoretical knowledge, application of the theory and use of relevant examples.
- The general University of Johannesburg policies, procedures and rules pertaining to written assessments apply to this examination.

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**SECTION A: MULTIPLE CHOICE**

**20 MARKS**

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1. A computer-based information system designed to handle ordering and scheduling of dependent-demand inventories is:
  - A) computer aided manufacturing (CAM)
  - B) computer integrated manufacturing (CIM)
  - C) economic order quantity (EOQ)
  - D) material requirements planning (MRP)
  - E) economic run size (ERS)
2. The output of MRP is:
  - A) gross requirements
  - B) net requirements
  - C) a schedule of requirements for all parts and end items
  - D) inventory reorder points
  - E) economic order quantities and reorder points
3. Which one of the following is not an input in an MRP system?
  - A) planned-order schedules
  - B) bill of materials
  - C) master production schedule
  - D) inventory records
  - E) All are inputs.
4. The MRP input stating which end items are to be produced, when they are needed, and what quantities are needed, is the:
  - A) master schedule
  - B) bill-of-materials
  - C) inventory-records
  - D) assembly-time chart
  - E) net-requirements chart
5. The MRP input listing the assemblies, subassemblies, parts, and raw materials needed to produce one unit of finished product is the:
  - A) master production schedule
  - B) bill-of-materials
  - C) inventory-records
  - D) assembly-time chart
  - E) net-requirements chart
6. A visual depiction of the subassemblies and components that are needed to produce and/or assemble a product is called a(n):
  - A) assembly time chart
  - B) product structure tree
  - C) MRP II
  - D) pegging
  - E) Gantt chart

## Operations Management II (BPJ22B2)

7. Which one of the following most closely describes net material requirements?
- A) gross requirements - amount on-hand - scheduled receipts
  - B) gross requirements - planned receipts
  - C) gross requirements - order releases + amount on-hand
  - D) gross requirements - planned order releases
  - E) gross requirements - amount on-hand + planned order releases
8. In MRP, "scheduled receipts" are:
- A) identical to "planned-order receipts"
  - B) identical to "planned-order releases"
  - C) open orders (that is, ordered before the first time bucket, but not delivered yet)
  - D) "net requirements"
  - E) available to promise inventory
- 9) Dependent demand and independent demand items differ in that
- A) for any product, all components are dependent-demand items
  - B) the need for independent-demand items is forecast
  - C) the need for dependent-demand items is calculated
  - D) All of the above are true.
  - E) None of the above is true.
- 10) Demand for a given item is said to be dependent if
- A) it originates from the external customer
  - B) there is a deep bill of material
  - C) the finished products are mostly services (rather than goods)
  - D) there is a clearly identifiable parent
  - E) the item has several children

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**SECTION B: TRUE/FALSE**

**10 MARKS**

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1. Low level coding represents items less than R18 per unit.
2. Independent demand tends to be more 'lumpy' than dependent demand meaning that we need large quantities followed by periods of no demand.
3. The master production schedule states which end items are to be produced both when and how many.
4. Net requirements equal gross requirements minus safety stock.
5. The bill of materials indicates how much material will be needed to produce the quantities on a given master production schedule.
6. A bill of materials contains a listing of all the assemblies, parts, and materials needed to produce one unit of an end item.
7. The bill of materials contains information on lead times and current inventory position on every component required to produce the end item.
8. The gross requirements at one level of an MRP plan determine the gross requirements at the next lower level continuing on down to the lowest levels shown on the bill of material.
- 9) The master production schedule is a forecast of demand for families of products.
- 10) A dependent demand item is so called because its demand is dependent on customer preferences.

**SECTION C: CAPACITY PLANNING**

**10 MARKS**

1) What is the fundamental distinction between design capacity and effective capacity? Provide a brief example. (10)

**SECTION D: SCHEDULING**

**50 MARKS**

1) Consider the arrival of patients into a public health clinic. Some patients are ill; some are injured; some are elderly; and some are very young. Some cases may be life-threatening, while others are inconsequential. How do the basic dispatch rules fall short in this situation? (10)

2) The costs to do each of the three jobs on three alternate pieces of equipment are given below. Determine the job-equipment combination that will minimize total cost. (20)

		Equipment	
	A	B	C
CREW1	R28	R20	R18
2	R26	R22	R14
3	R43	R35	R30

3) Determine the processing sequence for the six jobs shown below using Johnson's Rule. Chart total throughput time. Can total time be reduced by splitting the latest job? If so, by how much? (20)

Job	Processing Time (hrs.)	
	Station 1	Station 2
a	4	6
b	9	8
c	10	5
d	6	9
e	9	7
f	12	10

**SECTION E: MRP AND ERP****10 MARKS**

1) Consider the following bill of material. Fifty units of Product A are needed. Assuming no on-hand inventory, explode the bill of material. (10)

