### B.TECH / ME /7<sup>TH</sup> SEM/ MECH 4143/2017 **QUANTITY PRODUCTION METHODS** (MECH 4143)

Time Allotted : 3 hrs

Full Marks : 70

 $10 \times 1 = 10$ 

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

# Candidates are required to give answer in their own words as far as practicable. Group - A (Multiple Choice Type Questions)

- 1. Choose the correct alternative for the following:
  - (i) The facility where ships are built can be classified as (a) lob shop (b) Batch production shop (c) Quantity production shop (d) Mass production shop.
  - T-joints used in piping work is usually made by the process of (ii) (a) Casting (b) Explosive forming (d) Magnetic pulse forming. (c) Bulging
  - Final operation in the track of a ball bearing inner race is (iii) (c) Super finishing (a) Rolling (b) Turning (d) Grinding.
  - Final operation in the bore of a cylinder block is (iv) (a) Turning (b) Fine boring (d) Grinding. (c) Honing
  - Type of chuck used in bar fed automatic lathe is (v) (a) Collet (b) 3-jaw (c) 4-iaw (d)Floating centre.
  - Feed rate in turning operation is expressed by (vi) (a) mm/rev (b) mm/stroke (c) mm/min (d) none of the above.
  - Grouping of different parts having similar geometric shapes and size (vii) is done based on concept of
    - (a) quantity production technology
    - (b) total productivity management
    - (c) statistical quality control
    - (d) group technology.

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- (viii) Rapid prototyping is a
  - (a) joining process
    - (d) finishing process. (c) regenerative manufacturing process
- (ix) Material removal in Electron Beam Machining happens due to
  - (a) sputtering due to high energy electron
  - (b) chemical etching by high energy electrons
  - (c) mechanical erosion due to high energy electrons
  - (d) melting & vaporization due to thermal effects of impingement of high energy electrons.
- (x) Material removal takes place in Abrasive Jet Machining due to
  - (a) Electrochemical action (b) Mechanical impact (d) Thermal impact.
  - (c) Fatigue failure of the material

# Group - B

- 2. (a) Desribe the characteristics of
  - (i) Flow Production
  - (ii) Just-In-Time production.
  - (b) What are the advantages & disadvantages of those?

(3+3)+6=12

(b) removal process

Write short notes on spinning and bulging processes, giving necessary 3. sketches. Name at least one component made by the processes.

5 + 5 + 2 = 12

# Group - C

- 4. (a) Indicate the advantages and disadvantages of gear cutting by Forming and Generation processes.
  - (b) For production of spur gears by "Gear Hobbing", explain the following with sketches :
    - (i) the shape of the cutting tool
    - (ii) relative position of cutter and gear blank (show angle between axis of cutter and axis of gear blank)
    - (iii) relative motions of the cutter and the job.

4 + (2 + 3 + 3) = 12

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- 5. (a) Describe with neat sketches the steps of production of 'Connecting Rod' from raw material.
  - (b) Briefly explain with sketches the steps for production of 'Inner Race' of a ball bearing.

6 + 6 = 12

## Group - D

6. (a) What is a machine cell?

- (b) What is a drilling jig? Explain with a sketch.
- (c) What is the importance of jigs in production?
- (d) How is a hole in a component being manufactured in large quantity inspected?

3 +3 + 3 + 3= 12

- 7.(a) What is Group Technology and what is its importance in quantity production? Answer with examples.
  - (b) For classification of parts in Group Technology list 3 (three) "Design Attributes" and 3 (three) "Manufacturing Attributes".

9 + 3 = 12

### Group - E

- 8. (a) Describe the functions of all the four major components of a "Robot".
  - (b) Mention the applications of a Robot in respect of(i) transfer of materials(ii)machine loading & unloading

4+(4+4)=12

- 9.(a) Write the sequences of Powder Metallurgy production processes and briefly describe the processes.
  - (b) Mention two advantages of products made by Powder Metallurgy process.
  - (c) Name two components that are made by powder metallurgy

8+2+2=12