SPECIAL SUPPLE B.TECH/ME/7TH SEM/MECH 4143/2018

QUANTITY PRODUCTION METHODS
(MECH 4143)

Time Allotted : 3 hrs **Full Marks : 70**

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: **10 × 1 = 10**

(i) The factory where large variety of jobs involving varying productions processes can be manufactured is called
(a) job shop (b) batch production shop
(c) quantity production shop (d) mass production shop.

(ii) Gear cutting by Hobbing can be classified as
(a) rolling process (b) broaching
(c) forming process (d) generation process.

(iii) Jigs are commonly used for guiding tools for which of the following operations?
(a) Turning (b) Drilling
(c) Grinding (d) Shaping.

(iv) T-joints used in piping work is usually made by which of the following processes?
(a) Casting (b) Explosive forming
(c) Bulging (d) Magnetic pulse forming.

(v) Type of chuck used in bar fed automatic lathe is
(a) collet (b) 3-jaw
(c) 4-jaw (d) floating centre.

(vi) Which of the following items can be made by Spinning process?
(a) A cylinder
(b) Convex end of a petrol tank
(c) Any axi-symmetric part
(d) Non axi-symmetric part.

(vii) Grouping of different parts having similar geometric shapes and size is done based on concept of
(a) quantity production technology
(b) total productivity management
(c) statistical quality control
(d) group technology.

(viii) Rapid prototyping is a
(a) joining process (b) removal process
(c) regenerative manufacturing process (d) finishing process.

(ix) Tungsten Carbide tool inserts are made by
(a) forging (b) extrusion
(c) powder metallurgy (d) casting.

(x) For quantity production of bolts, threading is usually done by
(a) rolling (b) broaching
(c) forging (d) grinding.

Group – B

2. (a) Write short note outlining the characteristics for the following:
(i) Job shop Production
(ii) Just-In-Time production.

(b) List at least 2 (two) advantages & 2 (two) disadvantages of those types of productions?

3 + 3 + 6 = 12

3. Write short notes with sketches on the following production process:
(i) Spinning
(ii) Hydro Formimg
Name at least one component made by the process.

6 + 6 = 12

Group – C

4. (a) Describe with neat sketch the steps of quantity production of 'Bolts' from raw material.

(b) For production of spur gears by "Gear Shaping", explain the cutting process with sketch of the following:
(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

5. (a) Briefly explain with sketches the steps for production of 'Ball' of a ball bearing.

(b) Describe with neat sketch the steps of production of 'Connecting Rod' from raw material.

6 + 6 = 12

Group – D

6. (a) What is a machine cell? Explain with example.

(b) What is a drilling jig? Explain with a sketch.

(c) What is the difference between Inspection & Quality Control?

(d) What is 'Statistical Quality Control' and where is it applied?

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".

(c) After the parts have been grouped, what advantages can be expected during manufacture of the parts.

5 + 3 + 4 = 12

Group – E

8. (a) Name the 4 (four) major components of an industrial robot.

(b) Describe the functions of all the four major components of a "Robot".

(c) Explain with sketch 3 (three) coordinate system used by robots.

2 + 5 + 5 = 12

9. (a) Write the sequence 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.

7 + 3 + 2 = 12