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17ME82

Eighth Semester B.E. Degree Examination, July/August 2022
Additive Manufacturing

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Define Additive Manufacturing. List out advantages and disadvantages in detail. **(10 Marks)**
   b. Explain the process chain of Additive Manufacturing. **(10 Marks)**

OR

2 a. Explain Molten Material System (Fused Deposition Modelling (FDM) in Additive Manufacturing with a neat sketch. **(10 Marks)**
   b. Explain post processing of Additive Manufacturing. **(10 Marks)**

Module-2

3 a. Classify hydraulic motor and explain with a neat sketch Gear Motor. **(10 Marks)**
   b. Write short notes on:
     (i) Relays
     (ii) Solenoids **(10 Marks)**

OR

4 a. With a neat sketch, explain the construction of single acting and double acting hydraulic cylinders. **(10 Marks)**
   b. Write short notes on :
     (i) Piezoelectric actuators
     (ii) Shape memory alloys **(10 Marks)**

Module-3

5 a. Classify polymers and explain melt spinning process in detail. **(10 Marks)**
   b. Briefly explain steps in powder metallurgy. List advantages, disadvantages and applications. **(10 Marks)**

OR

6 a. Sketch and explain dry spinning process. **(10 Marks)**
   b. Define atomization. Explain Gas Automization and Water Automization with sketches. **(10 Marks)**

Module-4

7 a. Explain bottom-up and top-down approaches. **(10 Marks)**
   b. Explain Scanning Electron Microscope, with a neat sketch. **(10 Marks)**

OR

8 a. Explain X-ray Powder Diffraction (XPD) in Additive Manufacturing. List advantages, disadvantages and applications. **(10 Marks)**
   b. Explain Scanning Probe Microscope (SPM) with a neat sketch. Also list advantages and disadvantages of SPM. **(10 Marks)**

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Module-5

9 a. Differentiate between Computer Numerical Control (CNC) and Direct Numerical Control (DNC) System. **(10 Marks)**

   b. Define Automation. Explain with a block diagram different levels of automation. **(10 Marks)**

OR

10 a. List the advantages and disadvantages of CNC machines. **(10 Marks)**

   b. Write a manual part program for machining the profile shown in Fig.Q10(b). (All dimensions are in mm)
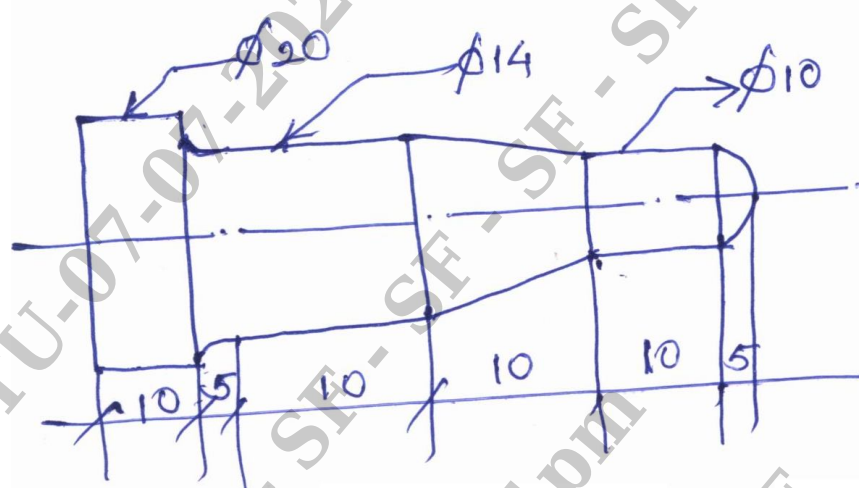

Fig.Q10(b) **(10 Marks)**

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