Question Paper

Exam Date & Time: 05-Mar-2021 (02:00 PM - 05:00 PM)

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

THIRD SEMESTER B.TECH END SEMESTER EXAMINATIONS, MARCH 2021

AEROSPACE MATERIALS AND MANUFACTURING TECHNOLOGY [AAE 2154]

Marks: 50 **Duration: 180 mins.**

A

Answer all the questions.

Instructions to Candidates: Answer ALL questions Missing data may be suitably assumed

1) With a neat sketch explain the hot isostatic and cold isostatic process. (4)

A)

B) List and explain the factors affecting the diffusion process. (3)

C) Calculate the angles which [2 1 0] direction of cubic unit cell makes with [1 1 0] & [0 1 0]. With a neat sketch show the miller indices for the same in the cubic unit cell. (3)

2) List and explain the process parameters affecting the strength of the component using the powder metallurgy technique. (3)

A)

B) Differentiate between crystalline and amorphous solids. (3)

C) With a neat sketch explain the abrasive water jet machining process. List and explain the process parameters affecting the MRR. (4)

3) With a neat sketch explain the delta region in the iron-carbon equilibrium phase diagram. List the reactions coming across in the iron-carbon phase diagram with its basic equation. (4)

A)

B) With a neat sketch explain the interstitial defects. (3)

C) With a neat sketch explain the explosive forming in the sheet metal process. (3)

4) With a neat sketch derive the atomic packing factor of the FCC structures. (3)

A)

B) With relevant sketches explain the design consideration during the powder metallurgy process. (3)

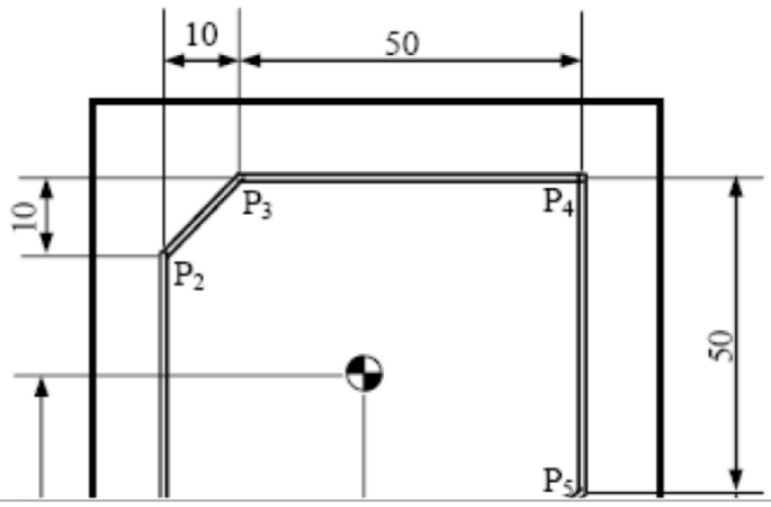
C) With a neat sketch explain the Vacuum Assisted Resin Transfer Molding. List the merits and demerits of the process. (4)

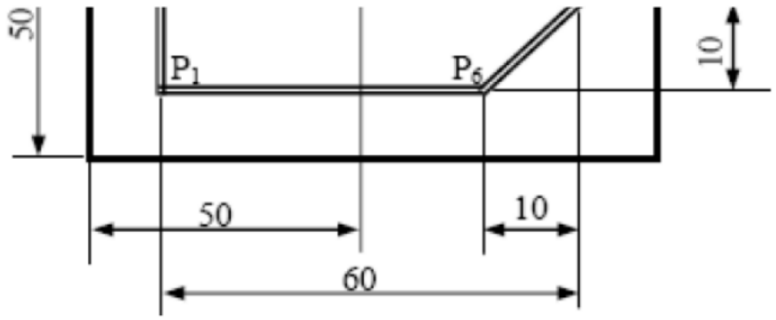
5) With a neat sketch explain the wire EDM process. (3)

A)

B) With a neat sketch explain the slipping and twining mechanism. (3)

C) Write the part program for the part shown below. Consider the depth of cut as 1mm and cut per pass as 1mm. (4)





Billet Size : 100 x 100 x 10 mm

Cutter Dia: 6 mm

-----End-----