BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: BE **SEMESTER : VII**
BRANCH: CHEM.ENG. / CHEM & POLY. **SESSION : MO/19**

SUBJECT: PC7011 PLASTICS PRODUCT DESIGN

TIME: 3 HOURS **FULL MARKS: 60**

INSTRUCTIONS:
1. The question paper contains 7 questions each of 12 marks and total 84 marks.
2. Candidates may attempt any 5 questions maximum of 60 marks.
3. The missing data, if any, may be assumed suitably.
***4*. Before attempting the question paper, be sure that you have got the correct question paper.**
5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.

Q.1(a)	Why plastics in product design?	[2]
Q.1(b)	Write down the steps in plastics product design.	[4]
Q.1(c)	Discuss the general criteria for material selection with an example.	[6]
Q.2	Discuss the process selection guidelines for the following plastics processing techniques? (i) Compression molding (ii) Extrusion (iii) Calendering (iv) Thermoforming (v) Blow molding (vi) Filament winding	[6x2]
Q.3(a)	Write down the objective of structural design in plastics product design.	[2]
Q.3(b)	Discuss the different approaches used by product designer in structural design of plastics product.	[4]
Q.3(c)	Discuss the following factors in structural design of plastics product which the designer will need to assess before beginning any type of structural design calculations? (i) Part geometry (ii) Loading conditions	[2x3]
Q.4(a)	Write down the assumptions used to calculate the stresses and deflection in straight beams.	[2]
Q.4(b)	Discuss the following structural design with a neat sketch. (i) Pressure vessels (ii) Plates	[2x5]
Q.5(a)	Why rapid prototyping is important for product design?	[2]
Q.5(b)	Discuss the methodology of rapid prototyping with a neat sketch.	[4]
Q.5(c)	Discuss the any two types of rapid prototyping techniques with a neat sketch.	[6]
Q.6(a)	Write down the key differences in machining plastics and metals to obtain high quality finished products.	[2]
Q.6(b)	Discuss ultrasonic welding of plastics with a neat sketch.	[4]
Q.6(c)	Discuss the following techniques used for joining of plastics with a neat sketch. (i) Mechanical fasteners (ii) Adhesive bonding	[2x3]
Q.7	Discuss the product design process for the product plastics park bench.	[12]

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