

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

**CLASS: MTECH/MSC
BRANCH: CIVIL/CAAD/SER/EEE/MECH/BT**

**SEMESTER : II
SESSION : SP/19**

TIME: 3:00 HOURS

SUBJECT: PE515 SMART MANUFACTURING

FULL MARKS: 50

INSTRUCTIONS:

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
 2. Attempt all questions.
 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.
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- Q.1(a) Describe about the sub-components of a computer integrated manufacturing (CIM) system with the help of a block diagram. [5]
- Q.1(b) Distinguish between CAD and CAE. Explain the application of CAE with a suitable example. [5]
- Q.2(a) Write about the classification of robots based on arm geometries/types of robot joints with the help of figures. [5]
- Q.2(b) Define and explain the 'Degrees of freedom' (DoF) in the arm and wrist of a robot with the help of a figure. [5]
- Q.3(a) Explain the various components and path tracing methods of an AGV. [5]
- Q.3(b) Describe the typical features and applications of any two types of AGV's. [5]
- Q.4(a) Explain with a model describing the various phases of E-Manufacturing. [5]
- Q.4(b) Describe the objectives and concept of agile manufacturing with an example. [5]
- Q.5(a) With suitable examples, write about the different drivers of Industry 4.0. [5]
- Q.5(b) Discuss applications of Internet of Things (IoT) to engineering problems with a case study. [5]

:03/05/2019:M