

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

CLASS: M.TECH  
BRANCH: EEE

SEMESTER : II  
SESSION : SP/19

SUBJECT: EC599 SENSORS & ACTUATORS

TIME: 3.00 Hrs.

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.
- 

- Q.1(a) What are the various classification of the sensors? Discuss briefly. [5]  
Q.1(b) Briefly discuss the steps involved in thick film and thin film sensors technology. [5]
- Q.2(a) How does the piezoelectric effect is used in the sensors? Also write about the different types of deformation modes used in the sensors. [5]  
Q.2(b) Explain the basic scheme of the electromagnetic flowmeter. [5]
- Q.3(a) Explain the design of standard hydrogen electrode? How it is used for the measuring half-cell potential. [5]  
Q.3(b) What is photo-emissive cell? Explain the importance and basic construction of the photomultiplier cell. [5]
- Q.4(a) Briefly discuss the various sensors used in the automobile application. [5]  
Q.4(b) What are the various functions of the sensors in the manufacturing and production process? Explain the reflected pulse type distance sensors. [5]
- Q.5(a) What are the pneumatic and hydraulic actuators? Differentiate between single acting and double acting cylinders. [5]  
Q.5(b) Discuss the operation of the DC motor. What are the various types of DC motors? Explain. [5]

:::::22/04/2019 M:::::