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SEAT No. :

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[4959]-1120 A

**B.E. (Electronics)
d-MECHATRONICS**

(2012 Course) (Elective - IV) (Semester-II) (404212)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume suitable data, if necessary.*

Q1) a) List the phases in mechatronics design process. Explain with neat diagram. **[6]**

b) Explain functions of mechatronics system. **[4]**

OR

Q2) Write short note on (Any Two): **[10]**

- a) Brakes.
- b) Autonomous mechatronics system.
- c) Network mechatronics system.

Q3) a) Explain V-model of designing of self optimizing system. **[6]**

b) Differentiate design fetch at system level and module level. **[4]**

OR

Q4) a) Design mobile robot with neat diagram. **[6]**

b) Explain key elements of control mechatronics system. **[4]**

Q5) a) Explain in detail TIA / EIA serial interface standards. **[10]**

b) Write a short note on UART with neat diagram. **[8]**

OR

P.T.O.

Q6) Write short note on following (Any Three): **[18]**

- a) Unbalanced Vs Balanced transmission.
- b) Point to point Vs. multipoint communication system.
- c) Asynchronous serial data format.
- d) Simplex, Half Duplex & full duplex.

Q7) a) Explain in detail functional requirement of data logger. **[10]**

- b) What are the software options available in data logging system. Explain. **[6]**

OR

Q8) a) Explain case study of any one application of data logging system in mechatronics. **[10]**

- b) Write a short note on: **[6]**
 - i) Online analysis.
 - ii) Offline analysis.

Q9) a) Explain in detail X-ray based fabrication of MEMS. **[10]**

- b) What are the mechanical properties of MEMS. **[6]**

OR

Q10) Write short note on (Any Two): **[16]**

- a) Inertial sensors (MEMS).
- b) Micromachine pressure sensors.
- c) Microscale Vacuum Pumps.

