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**Question Paper Code : 20822**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2018.

Seventh Semester

Mechanical Engineering

ME 6702 – MECHATRONICS

(Common to Manufacturing Engineering/Mechanical and Automation Engineering/Production Engineering)

(Regulations 2013)

(Also common to PTME 6702 — Mechatronics for B.E. (Part-Time) — Fifth Semester — Mechanical Engineering — Regulations 2014)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Illustrate how capacitive sensor works when area changes?
2. Define response time and time constant based on sensors.
3. Write the needs of register in microcontroller.
4. Sketch the functional pin description of 8085.
5. State CWR of 8255.
6. What are the features of 8255?
7. Draw the ladder diagram of latch ckt.
8. List the different programming methods of PLC.
9. A stepper motor has a step angle of 7.5 degree. How many pulses required for the motor to rotate through five complete revolutions?
10. Write the working principle of stepper motor.

PART B — (5 × 13 = 65 marks)

11. (a) Write short notes on Thermistor and RTD with its applications.

Or

(b) Brief the construction and working principle of following;

(i) Linear and rotary potentiometer (5)

(ii) Strain gauge. (8)

12. (a) List and explain the various types of addressing modes in detail in 8085 $\mu p$ with example for each.

Or

(b) Draw and explain the architecture and functional units of 8085 microprocessor.

13. (a) (i) Demonstrate LED interface with 8255. (5)

(ii) Demonstrate the circuit for interfacing stepper motor interface using 8085 microprocessor and PPI. (8)

Or

(b) Briefly explain the pin description, architecture and control modes of 8255 in detail.

14. (a) Draw the ladder logic diagram of OR, NOR, NAND and XOR logic.

Or

(b) Elaborate the construction and I/O details of PLC.

15. (a) Demonstrate the automatic car park barrier using PLC.

Or

(b) Brief the various stages of mechatronics system development.

PART C — (1 × 15 = 15 marks)

16. (a) Demonstrate the details about inductive transducer used to measure the linear displacement.

Or

(b) Design a traffic light controller using 8255 microprocessor.