Reg. No. : ☐☐☐☐☐☐☐☐☐☐☐

D 4154

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Fourth Semester

(Regulation 2004)

Mechanical Engineering

EC 1264 — ELECTRONICS AND MICROPROCESSORS

(Common to Automobile Engineering and Production Engineering)

(Common to B.E. (Part-Time) Third Semester Regulation 2005)

Time : Three hours   Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   Define electrostatic deflection sensitivity.

2.   Define voltage regulation.

3.   What is "thermal runaway" in transistors?

4.   Define intrinsic stand-off ratio in UJT.

5.   Draw the circuit of full adder.

6.   What are the key factors to be considered in the selection of ADC/DAC?

7.   Describe shortly on DAA instruction.

8.   What are the memory mapping techniques available in 8085?

9.   Draw the circuit that is used to drive relay coil or solenoid.

10. Differentiate absolute and incremental encoders.

PART B — (5 × 16 = 80 marks)

11. (a) A charged particle having charge thrice that of an electron and mass twice that of an electron is accelerated through a potential difference of 50 V, before it enters a uniform magnetic field of flux density of 0.02 Wb/m² at an angle of 25° with the field. Find (i) the velocity of the charged particle before entering the field (ii) Radius of the helical path and (iii) time of one revolution. (16)

Or

(b) (i) Explain the operation of a PN junction under forward bias condition. (6)

(ii) Differentiate the Avalanche and Zener breakdowns. (4)

(iii) Derive the ripple factor and efficiency of a Half wave rectifier. (6)

12. (a) With a neat diagram explain the following of the silicon controlled rectifier :

(i) Construction

(ii) Principle of operation

(iii) Characterisation

(iv) Applications. (16)

Or

(b) Write in detail about the working of N-channel J-FET along with its construction and characteristics. Support your answer with suitable diagrams. (16)

13. (a) Reduce the following equation using tabular method and implement the result : (16)

$$F = \Sigma m \ (0, \ 2, \ 3, 5, \ 8, \ 10, \ 11, \ 13)$$

Or

(b) With the support of logic and timing diagrams, explain the operation of a 4 bit synchronous binary counter. (16)

14. (a) Broadly explain the architecture of 8085 microprocessor with a neat functional block diagram. Highlight the salient features of the processor. (16)

Or

(b) Write in detail about the 8085 interrupts with a neat sketch. Also write about the instructions supporting the interrupts. (16)

15. (a) Draw the circuit and waveform of a four phase stepper motor interface and explain its operation with the sequence table.

Or

(b) Design an interface circuit that compares the present room temperature with the set temperature and switches on/off the cooler relay coil based on the result of comparison. Choose the 8 bit microprocessor of your own.

———————————