AR13

PART-A

ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

1. a) What is meant by Index map?
   b) How roads are classified based on first 20 year plan in India.
   c) What are the objectives of Camber?
   d) Define gradient.
   e) Write a short notes about Right of Way.
   f) Explain the term traffic volume.
   g) Write short notes on thirteenth highest hourly traffic volume.
   h) Write a short notes on the need for road markings.
   i) Write the classification of the traffic signs.
   j) What do you mean by ROB?

PART-B

Answer one question from each unit   [5x12=60M]

UNIT-I

2. (a) Briefly outline the Highway development in India.   **6M**
   (b) Briefly explain the engineering surveys needed for locating a new highway.   **6M**
   (OR)
3. (a) What are the salient features of Bombay road plan?   **6M**
   (b) Define highway alignment. What are the factors affecting highway alignment. **6M**

UNIT-II

4. (a) Calculate the safe stopping sight distance for design speed of 50 kmph for (a) two way traffic on a two lane road, (b) two way traffic on a single plane road. Assume coefficient of friction as 0.28 and reaction time of driver as 2.5 seconds.   **6M**
   (b) Derive an expression for finding the extra widening required on a horizontal curve.   **6M**
   (OR)
5. (a) Explain super elevation. What are the factors on which the design of super elevation depends?   **6M**
   (b) The speed of overtaking and overtaken vehicles are 70 and 40 kmph respectively on a two way traffic road. If the acceleration of overtaking vehicle is 0.99 m/sec^2. Calculate the safe overtaking sight distance and minimum length of overtaking zone.   **6M**

CODE: 13CE3011 **SET-1**

6. (a) Twenty five spot speed observations were taken and were as under: **6M**
50,40,60,54,45,31,72,58,43,52,46,56,43,65,33,69,34,51,47,41,62,43,55,40,49.
Calculate 1. Time - mean speed 2. Space – mean speed.
   (b) Explain various measures that may be taken to prevent accidents. **6M**

(OR)

7. (a) Explain various patterns of On-street or Kerb parking with neat sketches. **6M**
   (b) What are the major causes for road accidents? Explain in detail. **6M**

UNIT-IV

8. (a) Write in detail about regulatory signs along with neat sketches. **6M**
   (b) What are the various types of traffic markings commonly used? What are the uses **6M**
of each?

(OR)

9. (a) What are the advantages and disadvantages of traffic signals? **6M**
   (b) The average normal flow of traffic on cross roads A and B during design period are
450 and 200 pcu per hour; the saturation flow values on these roads are estimated **6M**
as 1300 and 1000 pcu per hour respectively. The all-red time required for
pedestrian crossing is 12s. Design two phase traffic signal by Webster's method.

UNIT-V

10. (a) What are the advantages and disadvantages of the Grade separation intersection? **6M**
    (b) Write about the basic requirements of intersection at grades. **6M**

(OR)

11. (a) Explain briefly the various design factors that are to be considered in Rotary **6M**
intersection design.
    (b) What are the various types of traffic islands used? Explain the uses of each. **6M**

AR13   SET-2

CODE: 13EE3015

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular & Supplementary Examinations, Octoberber-2017
ELECTRICAL MACHINES – III
(Electrical and Electronics Engineering)

Time: 3 Hours   Max Marks: 70

PART-A

ANSWER ALL QUESTIONS   [1 X 10 = 10 M]

1. a) Which type of alternator is preferred for hydro power plant?
    b) State the essential difference between salient and non-salient pole alternators.
    c) Why short pitched coils are placed in alternator armature winding?
    d) Which regulation method is preferred for fast computation?
    e) To change the frequency of alternator, which control needs to be set?
    f) A synchronous motor is running at 0.8 pf lagging, what to do to run at 0.9 p.f leading?
    g) What are damper windings, where do place it.
    h) Is it single phase induction motor is self-starting machine?
    i) State any two applications of synchronous motor.
    j) What is meant by synchronous condenser?

PART – B

Answer one question from each unit   [5 X 12 = 60 M]

UNIT - I

2. a) Explain the terms coil span factor and distribution factor in connection with alternator armature windings and deduce the e.m.f equation of an alternator incorporating the effects of these factors. [6 M]
    b) A 3 – phase alternator has windings distributed in 36 slots around stator circumference. Each winding is made up of full pitched coils formed from 40 conductors accommodated in each slot. A 4 – pole rotor is driven at 25 r.p.s and resultant air gap flux is sinusoidally distributed. Total flux per pole is 0.2 wb. Calculate the breadth factor and voltage generated in each phase. [6 M]

(OR)

3. a) Explain the different methods of excitation system of alternators. [6 M]
    b) A star connected, 3-phase, 4 – pole, 50 Hz alternator has a single layer winding in 24 slots. There are 50 turns in each coil and the flux per pole in 0.05 wb. Compute the open circuit voltage (E_0). [6 M]

UNIT - II

4. a) Name and explain the factors responsible for making terminal voltage of an alternator are less than the induced voltage. [5 M]
    b) An 11 kV, 1000 kVA, 3-ϕ, star connected alternator has a resistance of 1.2 Ω per phase. The open circuited curve and the characteristics with rated full load current at zero power factor are given the following table. Compute the voltage regulation of the alternator for full load current at power factor of 0.8 lagging. [7 M]

Field Current (Amps)	40	50	110	140	180
Open Circuit voltage (Volts)	5800	7000	12500	13750	15000
Line voltage for ZPF load	0	1500	8500	10550	12500

(OR)

5. a) Derive the expression for finding regulation of salient pole alternator using two reaction theory. Draw the phasor diagram. [6 M]

CODE: 13EE3015

b) A 1500 kVA, star connected, 2300 V, 3-phase, salient pole synchronous generator has reactance X_d= 1.95 Ω and X_q = 1.4 Ω per phase. All losses may be neglected. Find the excitation voltage for operation at rated kVA and power factor of 0.85 lagging.   [6 M]

UNIT - III

6. a) Explain the experimental procedure for synchronous generator connected in parallel against infinite bus.   [6 M]

    b) Two 50 MVA, 3-phase alternators operate in parallel. The settings of governors are such that the rise in speed from full load to no load is 2% in one machine and 3% in another machine, the speed load characteristics being straight lines in both cases. If each machine is fully loaded, when the total load is 100 MW, what would be the load on each machine when the total load is 75 MW?   [6 M]

(OR)

7. Explain the effect of variation of (i) excitation and (ii) steam supply on power output of two parallel connected alternators   [12 M]

UNIT - IV

8. a) What is meant by hunting. Explain the deference suppression methods followed   [6 M]

    b) Explain V curves and inverted V curves   [6 M]

(OR)

9. a) A synchronous motor develops torque only at the synchronous speed where as an induction motor develops torque at all speeds except at synchronous speed. Mention the reasons.   [6 M]

    b) A 2200 V, 373 kW, 3-phase, star connected synchronous motor has a resistance of 0.3 Ω and a synchronous reactance of 3 Ω per phase respectively. Determine the induced e.m.f per phase if motor works on full load with an efficiency of 94% and a power factor of 0.8 leading.   [6 M]

UNIT - V

10. a) Describe the construction and working of a shaded pole motor.   [6 M]

    b) A 230 V, 50 Hz, 4 – pole, single phase induction motor has the following test results:

    Blocked rotor test : 120 V, 9.6 A, 460 W

    No load test : 230 V, 4.6 A, 128 W

    The stator winding resistance is 1.5 Ω, and during the blocked rotor test, the starting winding is open. Determine the equivalent circuit parameters. Also find the core, friction and windage losses.   [6 M]

11. a) Why single phase induction motor is not self-starting? Give any three methods to start single phase induction motor.   [6 M]

    b) Explain double field revolving theory.   [6 M]

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PART-A

ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1. a) List out the major differences between orthogonal cutting and oblique cutting?
   b) Define tool life equation?
   c) Write down various types of taper turning methods?
   d) Bring out at least two differences between Capstan and turret Lathe?
   e) Compare the planer and shaper process?
   f) What are the types of broaching operations?
   g) Define grinding ratio?
   h) List out at least four finishing processes?
   i) What are types of CNC machine?
   j) What is function of ball screw?

PART-B

Answer one question from each unit   **[5x12=60M]**

UNIT-I

2. a) Explain the various methods of metal cutting with neat diagram?   6M
   b) Describe the various types of chip formation in metal cutting process?   6M

(OR)

3. a) Explain the procedure to find cutting forces of orthogonal cutting process by   8M
      Merchant's Force diagram with assumptions?
   b) Describe the need and various functions of cutting fluid in machining process and 4M
      mention the types cutting fluid with its properties?

UNIT-II

4. a) Explain various operations generally carried out in central lathe machine tool with 6M
      neat diagram?
   b) Suggest a suitable taper turning method do produce long internal and external taper 6M
      to produce on the a given workpiece and discuss the method in detail with neat
      diagram?

(OR)

5. a) Describe the automatic screw type machine with constructional features and neat   6M
      diagram?
   b) Explain in detail about bar feed mechanism with neat diagram?   6M

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UNIT-III

6. a) Describe the quick return mechanism in shaper machine and also discuss quick return ratio with neat diagram?   8M

   b) Explain about power and motion transformation in planer machine from motor to tool and work piece with neat diagram?   4M

(OR)

7. a) Explain tool indexing mechanism in milling machine with neat diagram?   8M

   b) Explain the material removal mechanism in broaching compared to other machining process and discuss the major advantages of the broaching process?   4M

UNIT-IV

8. a) Explain about surface grinding process with neat diagram and discuss its process parameters?   6M

   b) Explain the selection criteria for selecting grinding wheel with particular application for machining soft and hard material?   6M

(OR)

9. a) Explain about lapping process in detail with neat diagram and discuss about its process parameters?   4M

   b) Explain the various methods of gear fabrication process with neat diagram?   8M

UNIT-V

10. a) Explain the basic constructional details of CNC machine?   6M

    b) Explain in detail about the slide ways, linear bearings and feed derives in CNC machine?   6M

(OR)

11. a) Explain about the factors should be considered to design CNC machine for improving the machine accuracy?   8M

    b) Explain about G –codes and M-codes in CNC part programming with an example?   4M

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CODE: 13EC3013   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular & Supplementary Examinations, Octoberber-2017

DIGITAL IC APPLICATIONS
(Electronics and Communication Engineering)

Time: 3 Hours   **Max Marks: 70**

PART – A

ANSWER ALL QUESTIONS   **[1 X 10 = 10 M]**

1. a) Define Noise margin.
    b) Explain in brief how a CMOS device can be destroyed.
    c) What is a multiplexer?
    d) Illustrate how an EXOR gate can be used as an inverter.
    e) Specify the significance of carry look ahead adder.
    f) Summarize the operation of a simple floating point encoder.
    g) Differentiate between a latch and a flip-flop.
    h) Bring out the differences between ripple and parallel counters.
    i) List the advantages of CPLD.
    j) Why D flip-flops are used in shift registers?

PART – B

Answer one question from each unit   **[5 X 12 = 60 M]**

UNIT- I

2. a) Illustrate the functional behavior of 3-input CMOS NAND gate with the help of neat
       sketches.   [6 M]
    (b) Discuss about the dynamic electrical behavior of CMOS device with reference to
       propagation delay and power dissipation.   [6 M]
                                      (OR)
3. a) Describe the operation of ECL 2-input OR/NOR gate with neat diagrams.   [6 M]
    b) Discuss the importance of selection of noise margin and fan-out in interfacing TTL
       and CMOS logic circuits.   [6 M]

UNIT- II

4. a) Explain the behavior of 74 x 151 Multiplexer with the help of truth table.   [6 M]
    b) Write a data flow VHDL program for a 4-input, 8-bit multiplexer.   [6 M]
                                      (OR)
5. a) Illustrate how an 8-bit comparator can be constructed using two 74 x 85 ICs.   [6 M]
    b) Write a VHDL program for a 3 x 8 decoder in behavioral model.   [6 M]

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UNIT- III

6. (a) Illustrate any one approach for building a 16-bit barrel shifter.   [6M]

    (b) Write a VHDL program for adding and subtracting 8-bit integers of various types.
                                                                              [6M]

(OR)

7. a) Explain the operation of dual priority encoder with the help of neat diagrams.   [6 M]
    b) Write a behavioral VHDL code for fixed to floating point conversion.   [6 M]

UNIT- IV

8. a) Explain the operation of positive edge triggered D flip-flop with the help of timing
       diagrams.   [6 M]
    b) State the VHDL structural program for D latch.   [6 M]

(OR)

9. a) Illustrate how 74 x 163 counter can be used as excess-3 counter with neat sketch.[6 M]
    b) Give the VHDL architecture for counting in excess-3 order.   [6 M]

UNIT- V

10. a) Illustrate the operation of a full adder using ROM.   [6 M]

    b) Realize F(A, B, C) = ∑m (1, 2, 5, 6, 7) using a PLA.   [6 M]

(OR)

11. a) Implement the operation of BCD to Excess-3 code converter using PLA.   [6 M]

    b) Perform the comparison between various programmable devices indicating their merits
    and demerits.   [6 M]

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CODE: 13CS3011

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Regular & Supplementary Examinations, Octoberber-2017

COMPILER DESIGN
(Common to CSE & IT)

Time: 3 Hours   **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS   **[1 X 10 = 10 M]**

1. a)   Define a pre-processor.
    b)   List out the roles of a parser in compiler design.
    c)   What is the goal of predictive parsing compared to back tracking?
    d)   What do you mean by the strength of attribute grammars?
    e)   What do you mean by a handle of a right sentential form and given an example of it?
    f)   Name two reasons why stack allocation strategy cannot be used for activation records.
    g)   Distinguish between control link and access link in activation record.
    h)   What is peephole optimization? When it can be applied.
    i)   Explain L-attributed definition.
    j)   Explain briefly about object code forms.

PART-B

Answer one question from each unit   **[5 X 12=60M]**

UNIT-I

2. (a)   Briefly describe about the phases of a compiler.   [6M]
    (b)   Explain briefly above lex and yacc tools.   [6M]

(OR)

3. (a)   Briefly explain the logical phases of a compiler model.   [6 M]
    (b)   Compare compiler and an interpreter with the help of suitable examples.   [6 M]

UNIT-II

4. (a)   Consider the following grammar and test whether the grammar is LL(1) or not.   [6 M]

        i. $S \rightarrow 1AB / \epsilon, A \rightarrow 1AC /0C$

        ii. $B \rightarrow OS, C \rightarrow l$

    (b)   Write short notes on following.   [6 M]
        (i) back tracking parser (ii) operator precedence parser.

(OR)

5   Construct CLR parsing table for the following grammar   [12 M]
         $S \rightarrow CC$
         $C \rightarrow cC \mid d$

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UNIT-III

6 (a) Briefly describe about the representation of the three address statement in intermediate code generation.   [6 M]

   (b) Write short notes on S-attributed definition.   [6 M]

(OR)

7 Explain in detail various type of Grammars, Languages and its equivalent recognizers?   [12M]

UNIT-IV

8 (a) Explain scope and lifetime of variable with some suitable examples.   [6M]

   (b) Discuss local optimization techniques.   [6M]

(OR)

9 (a) What is data structure used to implement a symbol table in an efficient way? Give reasons?   [6M]

   (b) What is a data flow equation explain with suitable example   [6M]

UNIT-V

10 Explain about Data-Flow analysis of structured flow graphs.   [12M]

(OR)

11 Write and explain an algorithm for building a DAG from a basic Block   [12M]