

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****III B.Tech I Semester Regular / Supplementary Examinations, November-2016****TRANSPORTATION ENGINEERING-I****(Civil Engineering)****Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1.
 - a) What are the recommendations of Jayakar committee?
 - b) Define Highway Alignment.
 - c) Explain PIEV theory.
 - d) Write the formula for the extra widening to be provided on a pavement at the horizontal curves.
 - e) Write a short note on the Intermediate Sight Distance.
 - f) Define spot speed.
 - g) Define road traffic density
 - h) What are the different methods for designing the traffic signals?
 - i) Write the importance of road marking in our day to day life
 - j) Write a short notes on conflicts at the intersection for two lane two way roads.

PART-B**Answer one question from each unit****[5x12=60M]****UNIT-I**

2.
 - (a) Compare the Nagpur road plan and the second twenty year road plan; discuss the merits of each **6M**
 - (b) What are the various requirements of an Ideal alignment? Discuss briefly. **6M**
- (OR)
3.
 - (a) What are the various methods of classifying roads? **6M**
 - (b) Briefly explain the engineering surveys needed for locating a new highway. **6M**

UNIT-II

4.
 - (a) A two lane road with design speed 80 kmph has horizontal curve of radius 480m. Design the rate of superelevataion for mixed traffic. By how much should the outer edge of the pavement be raised with respect to the centre line, if the pavement is rotated with respect to the centre line and the width of the pavement at the horizontal curve is 7.5m? **6M**
 - (b) Explain briefly the different types of vertical curves with neat sketches. **6M**
- (OR)
5.
 - (a) Derive an expression for calculating the overtaking sight distance on a highway. **6M**
 - (b) Discuss the factors on which the amount of camber to be provided depends. Specify the recommended ranges of camber for different types of pavement surfaces. **6M**

AR13

CODE: 13CE3011

SET-2

UNIT-III

6. (a) What are the various objects and applications of spot speed studies? **6M**
(b) Explain briefly the various aspects investigated during parking studies. What are the uses of these studies? **6M**

(OR)

7. (a) Enumerate the different methods of carrying out traffic volume studies. Indicate the principle of each. **6M**
(b) What are the applications of collision diagrams and condition diagrams? **6M**

UNIT-IV

8. (a) What are the advantages and disadvantages of traffic signals? **6M**
(b) With neat sketches show various types of traffic signs, classifying them in proper groups. **6M**

(OR)

9. (a) At a right angled intersection of two Roads 1 has four lanes with a total width of 12.0m and Road 2 has two lanes with a total width of 6.6m. The volume of traffic approaching the intersection during design hour are 900 and 743 PCU/hour on the two approaches of Road 1 and 278 and 180 PCU/hour on the two approaches of Road 2. Design the signal timings as per IRC guidelines. **6M**
(b) What are the various types of traffic markings commonly used? What are the uses of each? **6M**

UNIT-V

10. (a) With neat sketch show few typical patterns of unchannelized and channelized intersections. **6M**
(b) Draw a neat sketch of a full cloverleaf and show the movement of traffic. **6M**
- (OR)**
11. (a) What are the various types of traffic islands used? Explain the uses of each. **6M**
(b) What are the advantages and disadvantages of the Grade separation intersection? **6M**

CODE: 13EE3015**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)****III B.Tech I Semester Regular / Supplementary Examinations, November-2016****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) what is the main advantage of a short pitch coils in the alternators?
 - b) Why mmf method is called optimistic method?
 - c) What is the effect of varying excitation of an alternator running in parallel with another alternator?
 - d) What is meant by load angle of an alternator?
 - e) Define regulation of an alternator?
 - f) Mention the applications of synchronous motors?
 - g) What is the purpose of damper winding in synchronous machines?
 - h) What is synchronous capacity?
 - i) Mention two applications of universal motor?
 - j) Mention the application of permanent capacitor start and run motor?

PART-B**Answer one question from each unit****[5x12=60M]****UNIT-I**

- 2 (a) List out the differences between salient pole alternator and non-salient pole alternator. [6M]
- (b) Find no load phase and line voltage of a star connected 3 phase 4 pole alternator which runs at 1500 rpm having flux/pole of 0.05 wb sinusoidal distributed its stator has 48 slots having double layer winding. each coil has 6 turns and coil is chorded by 2 slots. [6M]

(OR)

3. (a) Draw the phasor diagrams of an loaded alternator i) unity power factor ii) leading power factor iii) lagging power factor. [6M]
- (d) Deduce an expression for i) coil span factor ii) distribution factor of synchronous generator. [6M]

UNIT-II

- 4.(a) Explain potier triangle method of finding the voltage regulation of an alternator. [6M]
- (b) The open circuit and short circuit test of a 3 phase star connected 1000 KVA; 2000V, 50HZ synchronous generator are [6M]

| | | | | | | |
|----------------------|-----|------|------|------|------|------|
| Field amperes: | 10 | 20 | 25 | 30 | 40 | 50 |
| O.C terminal voltage | 800 | 1500 | 1760 | 2000 | 2350 | 2600 |
| S.C current | 200 | 250 | 300 | - | - | - |

The armature effective resistance is 0.2ohms /phase draw the characteristics curves and estimate the full load % regulation at 0.8 power factor lagging and leading by using synchronous impedance method.

(OR)

5. (a) Explain the TWO reaction theory & application to salient pole synchronous generator. 6M]
- (b) Derive an expression for finding voltage regulation of salient pole alternator using two reaction theory [6M]

CODE: 13EE3015**UNIT-III**

6. (a) What are the advantages of connecting the alternators in parallel ? and what are the conditions to be fulfilled for successful parallel operation of alternators. [6M]
- (b) Two 500 KVA alternators operating parallel, share the following loads combined i)250 kW at 0.9 p.f (lag) ii)150 kW at 0.8 p.f (lag) iii)300 kW at 0.75 (lag) iv)100 kW at 0.9 p.f (lag.) . One machine is applying 400 kW at 0.9 p.f lag, calculate the power and p.f of the other machine. [6M]

(OR)

7. (a) What are the different methods for parallel operation of alternators and explain parallel operation of three phase alternators with neat diagrams. [6M]
- (b) Two 75 MW 3phase alternators are operating in parallel and are sharing equal loads of 150 MW corresponding to full load of each machine .the settings of governors are such that the raise in speed from full load to no load is 2% in first machine and 3% in the other machine . the speed regulation characteristics may be assumed to be straight line in both the cases. Determine the load on each machine when the total load is 100MW. [6M]

UNIT-IV

- 8 (a) Explain the effect of varying excitation on armature current and p.f for constant load on synchronous motor. [6M].
- (b) A 75 kw 400v 4pole 3ph star connected synchronous motor has a resistance and synchronous reactances for phase of 0.04ohms and 0.4ohms respectively compute for full load 0.8 power factor lead ingthe open circuit emf /phase and gross mechanical and power developed .assume an efficiency of motor is 92.5%. [6M]

(OR)

9. (a) Name the different methods of starting a synchronous motor&explain the induction motor start &run method. [6M]
- (b) A 3 phase synchronous motor is absorbing 100kw connected in parallel with a factory load of 400 KW having alagging power factor of 0.8. ifthe combined a power factor is 0.9 lagging. what is the KVA rating of synchronous motor and its power factor. [6M]

UNIT-V

10. (a) Explain why 1-phase induction motor does not self-starting .discusses its operation based on double field revolving theory . [6M]
- (b) Derive the equivalent circuit of a 1-phase induction motor with the help of double field revolving theory. [6M]

(OR)

- 11.(a) Mention the problems usually Encountered when a dc series motor is operated on a.c compare the design modifications are to be in corporate for its satisfactory operation [6M]
- (b) Explain the construction and principal of working of a universal motor and mention its applications. [6M]

AR13

CODE: 13ME3014

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Regular / Supplementary Examinations, November-2016

METAL CUTTING & MACHINE TOOLS (Mechanical Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 X 10 = 10 M]

1.
 - a) What are the primary cutting parameters?
 - b) Describe the factors influencing the tool wear.
 - c) What is a back gear arrangement on a Lathe machine?
 - d) Sketch and describe the functions of Lathe Dog.
 - e) Distinguish between Simple Indexing and Direct Indexing?
 - f) List out the advantages of hydraulic shaper.
 - g) What is grinding ratio?
 - h) Sketch and indicate different parts on a broaching tool.
 - i) Highlight the various components used for the linear motion on a CNC machine tool.
 - j) Briefly describe the role of Canned Cycles.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2.
 - (a) Explain the various forces acting on the cutting tools during the cutting operation [4M]
 - (b) Explain the functions of machine tools [4M]
 - (c) Explain about various types of cutting fluid and their properties [4M]
- (OR)
3.
 - (a) Explain in detail about Merchant's Circle [6M]
 - (b) Discuss in detail about various types of tool materials used in metal cutting operation [6M]

UNIT-II

4. Explain with neat sketches about right thread cutting method on Lathe Machine. [12M]
- (OR)
5. Explain about the following types of lathes and given their advantages [12M]
 - i) Turret lathe
 - ii) Engine lathe

UNIT-III

6.
 - (a) Explain the working of a shaper drive mechanism [6M]
 - (b) What are the various operations that can be performed on a drilling machine and briefly explain about the working principle? [6M]
- (OR)
7.
 - (a) Sketch and explain the working of a column and knee type milling machine. [6M]
 - (b) What type of indexing method is suitable for obtaining 109 divisions on a work piece? Explain [6M]

AR13

CODE: 13ME3014

SET-1

UNIT-IV

- 8 (a) Sketch and explain cylindrical grinding. [6M]
(b) What are the functions of an abrasive wheel? Explain about the various types of abrasive wheel. [6M]

(OR)

- 9 (a) Explain in detail about buffing operation [6M]
(b) Explain about the following [6M]
 i) Honing
 ii) Lapping
 iii) Grinding

UNIT-V

- 10 (a) Explain the design considerations of CNC for improving machining accuracy. [6M]
(b) How closed loop feedback control functions in NC machines [6M]

(OR)

- 11 Explain in-detail the different types of NC codes used in manual part program with suitable example. [12M]

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)**

III B.Tech I Semester Regular / Supplementary Examinations, November-2016

**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) Draw the logic levels for CMOS.
b) Define Noise Margin of TTL logic family.
c) Draw the logic symbol diagrams for three state devices
d) Which logic gates can be used as 1-bit comparator?
e) Write behavioural VHDL code for half adder.
f) Write the difference between encoder and priority encoder.
g) Explain the operation of shift register.
h) Convert JK flip-flop to D flip-flop.
i) Draw the basic structure of FPGA.
j) Realize the output function of 2x1 multiplexer using PAL.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Design a CMOS circuit for 4 input OAI gate. Draw the logic diagram and function table. 6M
b) Explain the operation of basic emitter coupled logic family. 6M
(OR)
3. a) With neat diagram, explain the operation of two input NAND gate using TTL logic family. 6M
b) Explain about how interfacing can be done between CMOS/TTL with the help of diagrams. 6M

UNIT-II

4. a) Design and write a behavioural VHDL code for IC 74X151. 6M
b) Realize and explain the operation of 4 to 16 decoder using IC 74X138. 6M
(OR)
5. a) Realize 12 bit comparator using IC 74X85 and explain its operation. 4M
b) Design and write a behavioural VHDL code for IC 74X155. 8M

AR13

CODE: 13EC3013

SET-1

UNIT-III

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|----|----|---|----|
| 6. | a) | Explain the operation of barrel shifter using IC 74x151 and write a VHDL code for the same. | 8M |
| | b) | Write short notes on floating point encoder. | 4M |
| | | (OR) | |
| 7. | a) | Design and write a VHDL code for 4-bit parallel adder. | 6M |
| | b) | Draw the gate level diagram for 4X4 combinational multiplier using adders. | 6M |

UNIT-IV

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|----|----|--|----|
| 8. | a) | Design MOD-5 counter using flip-flops | 6M |
| | b) | Write a VHDL code for IC 74X195 | 6M |
| | | (OR) | |
| 9. | a) | Design and explain the operation of modulo-193 counter using 74x163 ICs. | 8M |
| | b) | Explain about synchronous design methodology. | 4M |

UNIT-V

- | | | | |
|-----|----|---|----|
| 10. | a) | Explain the logic diagram for PAL16R8. | 6M |
| | b) | Explain about 1-bit DRAM cell operation with timing diagrams. | 6M |
| | | (OR) | |
| 11. | a) | Write the comparison between PLD's. | 6M |
| | b) | Design logic diagram for PROM and explain with suitable example | 6M |

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.TECH I SEM REGULAR/SUPPLEMENTARY EXAMINATIONS, NOVEMBER-2016

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 cross compiler
b) Define Left factoring
c) Define assembler
d) Define parsing
e) What is syntax directed definition?
f) What are the different data structures used for symbol table?
g) Name the techniques in loop optimization
h) Define copy propagation
i) Define ambiguity
j) Define LR(0) items

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a Compare compiler and interpreter with examples 4M
b Explain in detail about lexical analyzer 8M
- (OR)
3. Describe the various phases of a compiler in detail. Trace the output of each phase for the program segment position: = initial+ rate*60 where rate is real data type. 12M

UNIT-II

4. Convert the following grammar into LL(1) grammar and construct the LL(1) Parsing table:
E → E+T | T
T → T*F | F
F → (E) | id 12 M
- (OR)
5. a Explain the two types of bottom up parsing with examples 6M
b Write about SR conflicts and RR conflicts of shift reduce parsers. 6M

UNIT-III

6. What is a three address code? List the common three address instruction forms. 12M
Generate three address code for
While ($i < 10$)
{
 $x = 0$;
 $i = i + 1$;}

(OR)
7. a Explain in detail about run time stack and heap storage allocation 6M
 b Explain the Specification of simple type checker for statements, expressions and functions. 6M

UNIT-IV

8. a Discuss in detail about principle sources of code optimization 6M
 b Explain in detail about loop optimization techniques. 6M
(OR)
9. a Explain common sub expression elimination optimization technique with an example. 6M
 b Write the quadruples, triples for the expression: 6M
 $-(a+b) + (c+d) * (a+b+c)$

UNIT-V

10. a Explain the importance of register allocation with respect to optimization. 6M
 b Write down the applications of the DAG 6M
(OR)
11. Give the procedure for constructing DAG. 12M
And Construct DAG for the following basic block:
 $D := B - C$
 $E := A + B$
 $B := B + C$
 $A := E - C$