AR13

CODE:13CE3016 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July- 2016

DESIGN OF STEEL STRUCTURES

(CIVIL ENGINEERING)

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

PART-A

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

1 a) How are the distortions in welded joints minimized?
b) In what situations are concave fillet welds recommended?
c) What is lateral torsional buckling of beams?
d) Differentiate between the bending and buckling of beams.
e) Why the compression members are more critical than tension members?
f) Under what circumstances will block shear failure dominate?
g) For gantry girders carrying electrically operated overhead travelling cranes, the lateral forces are increased by___
h) Maximum shear force in a gantry girder carrying an over-head travelling crane occurs when____
i) Intermediate vertical stiffeners are provided in plate girders to____
j) Vertical stiffeners in a bolted plate girder are
i) crimped ii) placed alternatively on both sides of web
iii) placed with a maximum spacing of 200 times t_w. iv) all the above.

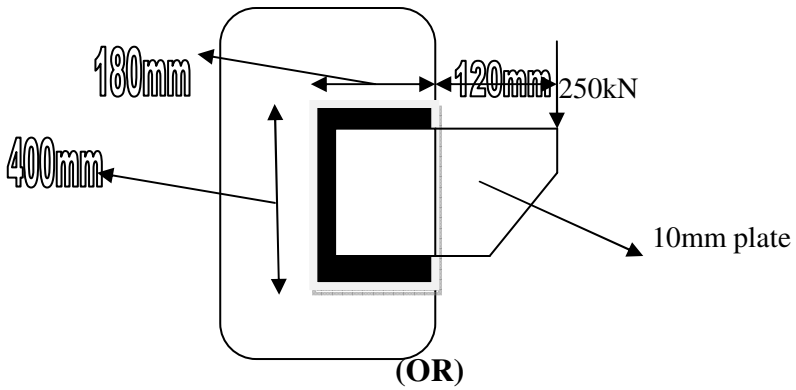
PART-B

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

UNIT-I

2.a) Design a fillet weld to connect ISA 65 45 8mm with 12mm thick gusset plate.The member carries a tensile load of 100kN.The ultimate shear stress in the weld is 410MPa.Assume connections are made in workshop (6M)

2.b) The 10mm thick bracket plate shown in figure is connected with the flange of column, ISHB300@577N/m.Find the size of the weld to transmit a factored load of 250kN. (6M)



(OR)

3.a) An ISA 150 115 12 mm angle section is to be connected to a 12 mm thick gusset plate at site.Design the fillet weld to carry a load equal to the strength of the member.The ultimate shear stress in the weld is 410MPa.Assume connections are made in workshop (6M)

3.b) Two plates 180mm wide and 8mm thick are to be connected by welding,using shop welds.Design the connection. Assume the required data. (6M)

UNIT-II

4) Design of Simply supported beam of effective span 1.5m carrying a factored concentrated load of 360kN at midspan and also perform the necessary checks.Assume 410 grade steel. (12M)

(OR)

5) Design a laterally unsupported beam for the following data
Effective span : 4m
Maximum bending moment : 550kNm
Maximum shear force : 200kN
Steel of grade : Fe410 (12M)

UNIT-III

6) A single unequal angle ISA 90 60 6mm is connected to a 10mm gusset plate at the ends with 5 number of 16mm diameter bolts in a single row to transfer tension. Determine the design tensile strength of the angle if
i) The gusset plate is connected to 90mm leg
ii) The gusset plate is connected to 60mm leg. (12M)

(OR)

7) Design a built-up column 10m long to carry factored axial load of 1080kN.The column is restrained in position but not in direction at both the ends.Provide single lacing system with bolted connections. Assume steel of grade Fe410 and bolts of grade4.6.Design the column with two channels placed toe-to-toe. (12M)

UNIT-IV

8) Design a simply supported gantry girder to carry an electric overhead travelling crane for the following data:

Crane capacity	320kN
Weight of crane and crab	300kN
Weight of crane	200kN
Minimum approach of crane hook	1.2m
Distance between c/c of wheels	3.2m
Distance between c/c of gantries	16m
Span of gantry girder	4m
Weight of rails	300N/m
Height of rails	75mm

(12M)

(OR)

9) Explain the design procedure of gantry girder (12M)

UNIT-V

10) Design a welded plate girder of 20m span which is laterally restrained using the tension field action for the following forces
Maximum moment M_z =5000kNm
Maximum shear force = 900kN (12M)

(OR)

11. a) Explain the design procedure of plate girder (7M)
b) Explain various types of web stiffeners? (5M)

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AR13

CODE: 13EE3018 SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July- 2016

POWER ELECTRONICS
(Electrical and Electronics Engineering)

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

PART-A

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

1. a) Define Holding current of a thyristor?
   b) Mention two important characteristics of a Power MOSFET?
   c) What are snubber circuits?
   d) What is the function of freewheeling diodes in single phase AC-DC converters?
   e) What is the effect of Load Inductance on the output voltage of a single Phase Fully controlled AC-DC converter?
   f) Define String efficiency and Derating Factor?
   g) Draw the boost converter circuit?
   h) What are Dual Converters?
   i) What is Pulse Width Modulation Technique?
   j) Write the expression for the RMS output voltage in a single phase AC voltage Controller?

PART-B

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

UNIT-I

2. a) Describe the different modes of operation of a thyristor with the help of its static VI characteristics. [6M]
   b) What is the necessity of connecting SCR in series? What are the problems associated with series connection of SCRs? How are they eliminated? [6M]

(OR)

3. a) With the help of a neat circuit diagram and waveforms explain Synchronised UJT triggering circuit? [6M]
   b) Explain AC line commutation of a thyristor with the help of a neat circuit diagram? [6M]

UNIT-II

4. a) Describe the operation of single phase two pulse midpoint converter with relevant voltage and current waveforms for an inductive load? [6M]
   b) A single phase full converter bridge is connected to RLE Load. The source voltage is 230 V , 50 Hz. The average load current of 10A is constant over the working range. For R = 0.4Ω and L = 2mH, Calculate i)firing angle delay for E = 120 V, ii) firing angle delay for E = -120 V [6M]

(OR)

5. a) Explain the operation of single phase half controlled bridge rectifier with R-L load. Draw the relevant waveforms and derive the expression for average load voltage? [6M]
   b) Discuss the effect of source inductance on the performance of a single phase fully controlled converter, indicating clearly the conduction of various thyristors during one cycle? [6M]

UNIT-III

6. a) Explain the principle of operation of a single phase dual converter with a neat circuit diagram and waveforms. [6M]
   b) With the help of neat circuit diagram and associated waveforms, explain the operation of a three phase bridge converter with resistive load for 120^o delay angle? [6M]

(OR)

7. a) Explain the three phase fully controlled bridge converter feeding a resistive load with the help of a circuit diagram and neat waveforms? Derive the expression for the average load voltage? [6M]
   b) Compare the circulating current mode with a non-circulating current mode of operation of a Dual converter? [6M]

UNIT-IV

8. a) With neat circuit diagram and associated waveforms explain single phase to single phase step down cycloconverter with Inductive load? [6M]
   b) Derive the expression for the RMS output voltage and current for a single phase AC voltage controller feeding a resistive load with the help of a circuit diagram and relevant waveforms. [6M]

(OR)

9. a) With neat circuit diagram and associated waveforms explain step up cycloconverter with resistive load? [6M]
   b) Explain the different modes of operation of a TRAIC? [6M]

UNIT-V

10. a) A simple d.c. chopper is operating at a frequency of 2 kHz from a 96 V d.c. source to supply a load resistance of 8 Ω. The load time constant is 6 ms. If the average load voltage is 57.6 V, find the T_{on} period of the chopper, the average load current, the magnitude of the ripple current and its RMS value? [6M]
    b) Describe the principle of operation of a step down chopper circuit? [6M]

(OR)

11. a) Explain the principle of operation of a Sinusoidal PWM technique for an Inverter circuit? [6M]
    b) Draw a neat diagram of parallel inverter .Explain the working of the inverter with associated waveforms? [6M]

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AR13

CODE: 13ME3019 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July- 2016

INDUSTRIAL ENGINEERING AND MANAGEMENT
(MECHANICAL ENGINEERING)

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

PART-A

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

1. a) Define quality.
   b) What is an Industry?
   c) What is Decentralization?
   d) What is Reporting?
   e) Define Manager?
   f) Describe ABC analysis
   g) Define work study?
   h) What is a SIMO chart?
   i) What is Inspection?
   j) What is P-chart?

PART-B

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

UNIT-I

2. a) Explain various steps in planning and also explain the advantages and limitations of planning. **6**

   b) Explain the functioning of line and staff type of organization clearly indicating its merits and limitations. **6**

(OR)

3. a) Explain the organizational structure with various principles of organizing. **6**

   b) What is span of control? Discuss the factors influencing it. **6**

UNIT-II

4. a) Explain the steps in plant layout. What are the various merits and demerits of process layout? **6**

   b) Discuss about various types of layouts with appropriate illustrations. **6**

(OR)

5. a) What is batch production? What are its characteristics, advantages and limitations? **6**

   b) Explain briefly the objectives of production management **6**

UNIT-III

6.	a)	What is flow process chart? What are different types of flow process charts? Compare and contrast them	6
	b)	Explain different charts and diagrams used in method study.	6

(OR)

7.	a)	Explain the factors influencing productivity.	6
	b)	Discuss the steps of work sampling	6

UNIT-IV

8.	a)	What is EOQ? Derive the expression for the same	6
	b)	Briefly explain the functions and duties of Store Manager?	6

(OR)

9.	a)	A manufacturing company purchase 9000 parts of a machine for its annual requirements ordering for month usage at a time, each part costs Rs. 20. The ordering cost per order is Rs. 15 and carrying charges are 15% of the average inventory per year. You have been assigned to suggest a more economical purchase policy for the company. What advice you offer and how much would it save the company per year?	8
	b)	Explain the duties of a Purchase Manager.	4

UNIT-V

10.	a)	Discuss the fundamental factors affecting quality.	6
	b)	What do you mean by TQM? Explain the benefits of TQM.	6

(OR)

11.	a)	What is ISO? What are the benefits of ISO 9000 series?	6
	b)	Explain the objectives of quality control. Explain the cause of variation in quality.	6

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AR13

CODE: 13EC3021 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July- 2016

VLSI DESIGN

(Electronics & Communication Engineering)

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

PART-A

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

1. a) What are the merits of BICMOS technology?
   b) Define Figure of merit?
   c) Explain the concept of sheet resistance shortly?
   d) Define trans conductance?
   e) Draw a CMOS inverter circuit?
   f) Define Power supply scaling?
   g) Draw a stick diagram for 2 input nand gate?
   h) Define clock skew?
   i) Draw the transfer characteristics of CMOS inverter?
   j) Which tools are used for synthesis?

PART-B

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

UNIT-I

2.	a)	Explain the fabrication procedure for N-Well CMOS technology?	8M
	b)	What are the deficiencies of MOS technology? How do we overcome them?	4M
		(OR)	
3.	a)	What are the various masks used in CMOS p-well process? What is the significance of each?	6M
	b)	What are the differences between CMOS and BiCMOS technologies in fabrication?	6M

UNIT-II

4.	a)	Derive the relation between $I_{ds} - V_{ds}$ for a MOS transistor ?	6M
	b)	What are the various aspects to be considered to estimate the threshold voltage of MOS transistor?	6M
		(OR)	
5.	a)	Determine Z_{pu} /Z_{pd} for NMOS inverter driven by another inverter?	6M
	b)	What are the Alternative forms of pull-up circuits explain with circuits?	6M

UNIT-III

6.	a)	Draw the stick diagram of a 2x1 multiplexer	6M
	b)	Draw the stick diagram of a 3 INPUT NOR gate	6M
		(OR)	
7.	a)	Design a symbolic layout for a complementary CMOS circuit that implements F= (A + BC)`	6M
	b)	Draw the stick diagram of a 4 input NAND gate	6M

AR13

CODE: 13EC3021 **SET-2**

UNIT-IV

8.	a)	Explain briefly about different types of capacitors in MOS technology.	6M
	b)	Write short notes on switch logic .	6M
		(OR)	
9.	a)	Design a Arithmetic Logic Unit to perform several operations	6M
	b)	Explain how to design even and odd parity generator circuits	6M

UNIT-V

10.	a)	Mention the procedures involved in testing of a sequential circuits?	6M
	b)	Write a short note on system level test techniques?	6M
		(OR)	
11.	a)	What is the need for Architecture level Testing in VLSI design flow?	6M
	b)	Explain about the chip level test techniques?	6M

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AR13

CODE: 13CS3019 **SET 1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, July- 2016

UNIX Programming

(Computer Science Engineering)

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

PART-A

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

1. a) Define UNIX Operating System
   b) List out different types of shell.
   c) Define pipe.
   d) What is zombie process.?
   e) Write in detail about chmod Command
   f) Explain in detail about lseek function.
   g) Short note on file descriptor?
   h) Difference between fork() and vfork()?
   i) Difference between Unidirectional and Bidirectional pipe
   j) What is Semaphores ?

PART B

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

UNIT – I

2 (a) Brief the Features of UNIX [6 M]
(b) Explain the UNIX Backup Utilities [6 M]

(OR)

3 (a) Draw and Explain the architecture of UNIX Operating System ? [6 M]
(b) Write a short note on networking commands? [6 M]

UNIT – II

4 (a) Explain about pipes and input redirection in UNIX shells? [7 M]
(b) Write a shell script to find whether a given integer is prime or not. [5 M]

(OR)

5. Write a short note on [12 M]
(i)here document (ii) shell meta characters (iii) redirection operators

UNIT - III

6. (a) With an example explain the difference between fgetc() and getc() system calls.[6 M]
(b) Discuss about various directory system calls. [6 M]

(OR)

7. (a) Illustrate the difference between system calls & Library functions? [6 M]
(b) Explain some standard I/O system calls [6 M]

UNIT – IV

8. (a) Explain the operation of fork and vfork system calls in detail [6 M]
(b) Discuss in detail about unreliable signals [6 M]

(OR)

9. (a) Discuss about interrupted system calls [6 M]
(b) Explain following functions with an example?
(i) abort (ii) sleep [6 M]

UNIT – V

10. (a) Write a C Program to demonstrate the working of Bidirectional communication with pipes [8 M]
(b) Explain the advantages of FIFOs over pipes [4 M]

(OR)

11. Explain with a program, the concept of file locking with semaphores [12 M]

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AR13

CODE: 13IT3004 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July- 2016

DESIGN AND ANALYSIS OF ALGORITHMS
(Information Technology)

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

PART-A

1. a) Define Big-Oh notation.
   b) What is an articulation point of a graph?
   c) Solve T(n)=T(n/2)+C where C is a constant.
   d) Can all the feasible solutions be optimal solutions?
   e) How dynamic programming is different from Greedy method?
   f) Give two applications of Travelling sales person problem.
   g) Define Explicit constraints.
   h) What is Live node and E-node in state space tree?
   i) What is the difference between backtracking and branch and bound?
   j) Draw a picture showing the relation between P, NP, NP hard and NP complete.

PART-B

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

UNIT-I

2. a) Show that $f(n)+g(n)=O(n^2)$ where $f(n)=3n^2-n+4$ and $g(n)=n\log n+5$ 5M
   b) Discuss Amortized analysis with an example. 7M

(OR)

3. a) Develop the algorithm for Union using weighting rule. Explain with an example. 6M
   b) Develop the algorithm for Find using collapsing rule. Explain with an example. 6M

UNIT-II

4. a) Write and explain the control abstraction of divide and conquer. 6M
   b) Write an algorithm for quick sort by using recursive method. 6M

(OR)

5. a) Give the control abstraction for Greedy method. 6M
   b) What is the solution generated by the function JS (Job Sequencing) when n=7, P[1:7]=(3,5,20,18,1,6,30) and d[1:7]=(1,3,4,3,2,1,2) 6M

UNIT-III

6. a) Find the minimum no of operations required for the following chain matrix multiplication using dynamic programming. A(30,40) * B(40,5) * C(5,15) * D(15,6). 7M
   b) Define merging and purging rules in 0/1 knapsack problem 5M

(OR)

7. a) Explain the reliability design problem 6M
   b) Write an algorithm for all pairs shortest paths problem. 6M

AR13

CODE: 13IT3004 **SET-2**

UNIT-IV

8.	a)	Write the recursive algorithm for general backtracking technique.	5M
	b)	Let w = {15, 7, 20, 5, 18, 10, 12} and m=35. Find all possible subsets of w that sum to m. Draw the portion of the state space tree that is generated.	7M

(OR)

9.	a)	What is graph coloring problem? Explain with an example.	6M
	b)	Write an algorithm for finding Hamiltonian cycles in the graph.	6M

UNIT-V

10.		Draw the portion of the state space tree generated by FIFO Branch and Bound for the following 0/1 knapsack instance. n=5, m=12, (P1,P2,P3,P4,P5) = (10,15,6,8,4) ,(w1,w2,w3,w4,w5) = (4,6,3,4,2). Find the optimal solution for this instance.	12M

(OR)

11.	a)	State and Explain cook's theorem.	6M
	b)	Differentiate between NP-complete and NP-Hard.	6M

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