K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: BIG DATA TECHNOLOGIES (CSE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Explain the methods of Data Storage.   7M
   (b) Explain Hadoop architecture with neat diagram.   7M

(OR)

2. (a) Explain Big Data characteristics.   7M
   (b) Explain the deployment model for Hadoop Clusters with neat diagram.   7M

UNIT – II

3. (a) Explain HDFS with neat diagram.   7M
   (b) Explain Anatomy of file write in HDFS.   7M

(OR)

4. (a) Explain the process of Replica Placement.   7M
   (b) Explain Parallel copying with distcp.   7M

UNIT – III

5. (a) Explain the benefits of MapReduce.   7M
   (b) Explain various data analysis technologies.   7M

(OR)

6. (a) Explain various parts of MapReduce.   7M
   (b) Explain the process of analyzing data with Unix tools.   7M

UNIT – IV

7. (a) Explain job submission and job initialization steps in Classic MapReduce. 7M
   (b) Explain Reduce side joins with neat diagram   7M

(OR)

8. (a) Explain Shuffle and Sort operations in MapReduce technique.   7M
   (b) What are the different types of input format in MapReduce? Explain briefly. 7M

UNIT-V

9. (a) Explain Hbase.   7M
   (b) Explain the HIVE architecture with neat diagram.   7M

(OR)

10. (a) Explain Order By and Group By queries in HIVE with examples.   7M
    (b) Write the key differences between HIVE and Relational Databases   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: CLOUD COMPUTING (CSE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Briefly explain distributed and cluster computing?   7M
    (b) Explain essential characteristics of cloud computing?   7M

(OR)

2. (a) How Cloud computing is platform and service? Explain?   8M
    (b) What are the benefits and drawbacks of cloud computing?   6M

UNIT – II

3. Discuss about the network connectivity in cloud computing?   14M

(OR)

4. Explain layered architecture of a cloud?   14M

UNIT – III

5. (a) List out and explain the services provided by IaaS.   7M
    (b) Briefly explain cloud deployment models.   7M

(OR)

6. (a) Explain the characteristics of public cloud and private cloud?   8M
    (b) Briefly explain community cloud with neat sketch?   6M

UNIT – IV

7. (a) Discuss about map reduce programming model?   7M
    (b) Write a short note on any two cloud development platforms?   7M

(OR)

8. Explain the different perspectives on SaaS development?   14M

UNIT-V

9. (a) Explain the architecture of classical data centers?   7M
    (b) Discuss about storage and networking infrastructure of data center environment?   7M

(OR)

10. (a) Explain Microsoft cloud services?   7M
    (b) What is Amazon S3? Explain in detail?   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: ARTIFICIAL INTELLIGENCE (CSE)

Time: 3 Hours　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.　(a)　Define AI. Write about different AI problems.　　　　7M
　　(b)　Explain about Water Jug Problem.　　　　7M

(OR)

2.　(a)　Define the problem from the view of state space search　　　　7M
　　(b)　Explain about control strategies.　　　　7M

UNIT – II

3.　(a)　What is knowledge representation? Write about the issues in it?　　　　7M
　　(b)　Write about Granularity of Representation.　　　　7M

(OR)

4.　(a)　Explain about the ways of representing Class Membership.　　　　7M
　　(b)　Express the following sentences in predicate logic:　　　　7M
　　　　 i. Marcus was a man
　　　　ii. Marcus was a Pompeian
　　　　iii. All Pompeian's were Romans
　　　　iv.All Romans were either loyal to Ceaser or hated him
　　　　v. Everyone is loyal to someone

UNIT – III

5.　(a)　What is nonmonotonic Reasoning? Mention the key Issues in it.　　　　7M
　　(b)　Explain about Default Reasoning in detail.　　　　7M

(OR)

6.　(a)　Explain about Baye's theorem　　　　7M
　　(b)　Write short notes on Fuzzy Logic.　　　　7M

UNIT – IV

7.　(a)　Explain about Semantic Nets.　　　　7M
　　(b)　Explain about Conceptual Dependency.　　　　7M

(OR)

8.　(a)　What are Scripts? Explain briefly.　　　　7M
　　(b)　Explain about CYC.　　　　7M

UNIT-V

9.　(a)　Explain about Minimax Search Procedure.　　　　7M
　　(b)　Explain about Alpha-Beta Cutoffs.　　　　7M

(OR)

10.　(a)　Write short notes on Syntactic Analysis.　　　　7M
　　 (b)　Write about Knowledge Acquisition.　　　　7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Supplementary Examinations of May 2019
SUB: SOFTWARE TESTING (CSE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) What are the applications of Path Testing? Explain.   7M
   (b) What are the factors that determine the importance of a Bug? What are the   7M
   Consequences of Bugs Explain?

(OR)

2. (a) What is Flow Graph? Explain the Path testing with respective Path   7M
   Predicates with Example
   (b) Define Testing Blindness? Explain the three types of Testing Blindness.   7M

UNIT – II

3. (a) Explain about Transaction Flow Techniques.   7M
   (b) What is Data Flow Testing? Compare between Control Flow and Data   7M
   Flow Testing with constructed example.

(OR)

4. Describe in detail about the Data Flow Anomaly State Graph.   14M

UNIT – III

5. (a) Discuss in detail about the Domain closure and Domain Dimensionality.   7M
   (b) Define Domain Testing? Discuss various applications of domain testing.   7M

(OR)

6. State and explain with suitable examples various two dimensional domain
   bugs.   14M

UNIT – IV

7. Discuss how the decision tables can be Basis for test case design.   14M

(OR)

8. Explain about KV Charts for one, two & three Variables and its
   Specifications   14M

UNIT-V

9. Explain about State Graph of its Good and Bad with example.   14M

(OR)

10. Explain about Node Reduction Algorithm   14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: COMPUTER GRAPHICS (CSE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) What is Presentation Graphics? Explain about How graphics used in education and training? 7M
   (b) Explain about Video Controller in detail. 7M

(OR)

2. (a) Explain in detail about raster and random scan systems. 7 M
   (b) Explain in detail about graphics input devices. 7 M

UNIT – II

3. (a) Explain about Scan converting Ellipses in detail. 7 M
   (b) Explain in detail about Cohen-Sutherland line clipping algorithm. 7 M

(OR)

4. (a) Explain in detail about Parametric Line Clipping algorithms. 7M
   (b) Explain about the different techniques for defining characters in detail. 7M

UNIT – III

5. (a) Write a detailed note on the basic two dimensional transformations. 8M
   (b) What are homogeneous co-ordinates? Explain briefly about them. 6M

(OR)

6. (a) Explain the window to viewport coordinate transformation in detail. 8M
   (b) Write a short note on Parametric cubic curves. 6M

UNIT – IV

7. (a) Differentiate parallel and perspective projections and derive their projection matrices. 8M
   (b) Write about sweep representations in detail. 6M

(OR)

8. (a) Write a short note on 3D viewing. 2M
   (b) Explain about any three color models for Raster graphics. 12M

UNIT-V

9. (a) What are the different tricks used in computer graphics animation? 4M
   (b) Explain about the different languages for describing Animation in detail. 10M

(OR)

10. (a) Mention the different types of animations. 7M
    (b) Explain briefly about the basic rules of Animation. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: INTERNET OF THINGS (CSE)

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I
1. (a) Define IOT? Explain Different Characteristics of IOT?　　　　9M
   (b) Describe about Link Layer Protocols of IOT?　　　　5M

(OR)

2. Give a Brief Description On　　　　14M
   (i) Wireless Sensor Networks (ii) Cloud Computing (iii) Big data Analytics

UNIT – II
3. (a) Describe about IoT applications on Environment　　　　7M
   (b) Describe about IoT applications on Energy　　　　7M

(OR)

4. Name any 5 IoT Applications and Explain each with an Example　　　　14 M

UNIT – III
5. Describe in detail about SDN and NFV for IoT　　　　14 M

(OR)

6. Explain in detail about Design methodology of any IoT Project.　　　　14 M

UNIT – IV
7. (a) Write a short note on Python data types and Data Structures.　　　　7 M
   (b) Describe The basic Steps present in the installation of Python.　　　　7 M

(OR)

8. Explain in detail about　　　　14 M
   i) Classes in Python   ii) Python packages for IoT.

UNIT-V
9. Define IoT Devices and Explain various building blocks of an IoT Devices.　　　　14 M

(OR)

10. Write a brief description on　　　　14 M
    i) linux installation on raspberry Pi   ii) raspberry Pi interfaces

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: CAD/CAM (ME)

Time: 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Discuss what are the benefits of CAD.   7 M
    (b) Briefly discuss about the Graphics terminal.   7 M

(OR)

2. Explain about different computer configurations used in CAD applications.   14 M

UNIT – II

3. Explain about windowing in detail with the help of an example.   14 M

(OR)

4. Explain about the following terms in view of 2D transformations.   14 M
    i) Translation   ii) Rotation   iii) Scaling   iv) Reflection   v) Mirroring

UNIT – III

5. Explain in detail about Bezier curve and surface representation.   14 M

(OR)

6. Explain in detail about B – rep Solid modeling.   14 M

UNIT – IV

7. (a) Write any five differences between Conventional and Flexible Manufacturing   7 M
         Systems.
    (b) Write Advantages and Disadvantages of FMS.   7 M

(OR)

8. Explain in detail about Applications of robots in manufacturing and material handling.   14 M

UNIT-V

9. (a) Write MRP Inputs and Outputs.   7 M
    (b) Write about Capacity planning.   7 M

(OR)

10. What is meant by CAPP, explain about generative CAPP in detail?   14 M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: METROLOGY (ME)

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Sketch and explain the systems of writing tolerances. 　7M
   (b) A 20mm diameter shaft and bearing are to be assembled with a clearance fit. The tolerance 　7M
   and allowances are as under:
   Allowance=0.002mm; Tolerance on hole=0.005mm; Tolerance on shaft=0.003mm
   Find the limits of size for the hole and shaft if:
   (i) The hole basis system is used
   (ii) Shaft basis system is used. The tolerances are disposed of unilaterally.

   (OR)

2. (a) What is Fit? Explain the different types of Fits with neat sketch. 　7M
   (b) What are the systems of obtaining different types of fits? Explain any one of them in detail. 　7M

UNIT – II

3. (a) What are the advantages of wavelength standard? 　7M
   (b) Explain why Sine bar is not preferred for measuring angles more than 45degree. 　7M

   (OR)

4. (a) What are the various types of plug gauges? 　4M
   (b) Explain the use of Sine bar for 　10M
   (i) Locating any work to a given angle.
   (ii) Checking or measuring unknown angles
   (iii) When a component is of large size/heavy

UNIT – III

5. (a) Explain the use and working of optical projectors. 　7M
   (b) What do you mean by R_a and R_z values? 　7M

   (OR)

6. (a) Define the following irregularities on a surface texture produced by a machining process: 　4M
   (i) Primary texture, (ii) Secondary texture, (iii) Surface flaws, and (iv) Errors of form.
   (b) What is an auto-collimator? Sketch and Explain the Principle and construction of an auto- 　10M
   collimator.

UNIT – IV

7. (a) Describe the following pitch errors of thread in brief: 　7M
   (i) Periodic Error and (ii) Drunken Error
   (b) Explain in detail with suitable sketches about various alignment tests performed on pillar type 　7M
   drilling machine.

   (OR)

8. (a) What are the various characteristics that you would measure in screw thread? Also list the 　7M
   instruments/apparatus that are required for measuring these characteristics.
   (b) Describe the following alignment tests on a milling machine with neat sketches. 　7M
   (i) Flatness of work table
   (ii) Parallelism of the work table surface to the main spindle
   (iii) Parallelism of the cross (transverse) moment of the worktable to the main spindle.

UNIT-V

9. (a) What are the uses of comparators? 　4M
   (b) Sketch and Explain the working principle of Johansson Mikrokator. 　10M

   (OR)

10. (a) Explain the chordal thickness method of measuring the gear tooth thickness. 　7M
    (b) Sketch and explain the working principle of electrical comparator. 　7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: FINITE ELEMENT METHODS (ME)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.   (a)   Write the advantages and limitations of finite element methods?   7M

      (b)   State and explain the Galerkin's principle for solving the engineering problems.   7M

(OR)

2.   Explain about equilibrium equations in elasticity subjected to body force, traction   14M
force and point loads.

UNIT – II

3.   The structure in the figure 1 is subjected to increase in temperature 80^0C.   14M
Determine displacements, stresses and support reactions P_1=60KN, P_2=75KN,
A_1=2400mm^2, A_2=1200mm^2, A_3=600mm^2, E_1=83GPa, E_2=70GPa E_3=200GPa,
α_1=18.9 x $10^{-6}/^0$C, α_2=23 x $10^{-6}/^0$C,α_3=11.7 x $10^{-6}/^0$C.
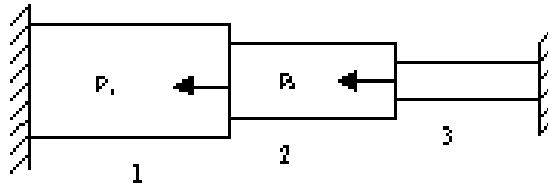

Figure:1

(OR)

4.   Explain about order of polynomial interpolation model, geometrical in variance,   14M
convergence and compatibility condition.

UNIT – III

5.   For the truss structure shown in figure 2, with indicated load, calculate the stress in   14M
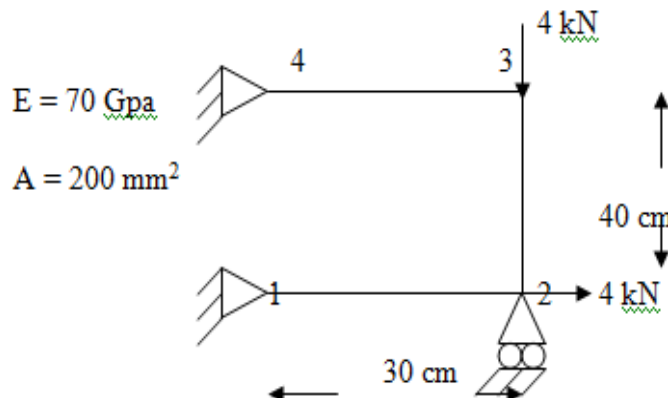each element.

Figure 2

(OR)

6.   A cantilever beam of 1 m length carries a single point load at the end of the beam of   14M
      10kN. Calculate the deflection at the end of the beam using FEM, if E=70 Gpa,
      A=500 mm^2 and I=2500 mm^4.

UNIT – IV

7.   (a)   What is a constant strain triangular element? State its properties and applications?   5M

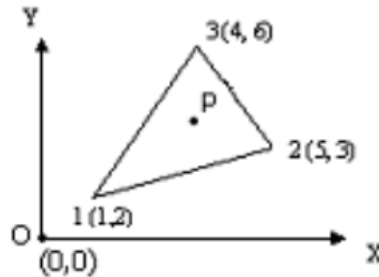   (b)   The nodal coordinates of the triangular element are shown in figure 3.   9M

Figure: 3

      At the interior Point P, the x coordinate is 3.3 and the shape function at node 1 is N_1 is
      0.3. Determine the shape functions at nodes 2 and 3 and also the y coordinate of the
      point P?

(OR)

8.   Describe about shape function of CST element, strain displacement matrix [B] for   14M
      CST element.

UNIT-V

9.   The coordinates of the nodes of a triangular element are 1(-1,4), 2(5,2) and 3(3,6) of   14M
      thickness 0.2 cm. The convection takes place over all surfaces with a heat transfer
      coefficient of 150 W/m^{2}K and T∝= 30^{0}C. Determine the conductivity matrix and load
      vector if the internal heat generation is 200 W/cm^3. Assume thermal conductivity the
      element is 100 W/m K.

(OR)

10.   A Uniform steel fin of length 25 cm, with a rectangular section 5 cm X 2.5 cm. If the   14M
      heat transfer takes place by convection from all the sides while the root of the fin is
      maintained at 300^{0}C, determine the temperature distribution in the fin.
      Assume k = 25 W/m K, h = 250 W/m^2 K and T∝ = 25^{0}C.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Supplementary Examinations of May 2019
SUB: INSTRUMENTATION & CONTROL SYSTEMS (ME)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Briefly explain about dynamic performance characteristics.	7M
	(b)	Draw the generalized scheme of a typical measurement system and explain about various components of it.	7M

(OR)

2.	(a)	State and explain the dynamic characteristics of a measurement system.	7M
	(b)	What. are the functional elements of measuring system? Explain with the suitable examples.	7M

UNIT – II

3.	(a)	Explain the use of piezo electric transducers for displacement measurement.	7M
	(b)	Discuss various principles of temperature measurement.	7M

(OR)

4.	(a)	Explain the use of thermal conductivity gauges for pressure measurement.	7M
	(b)	Describe the arrangement of thermocouples for the measurement of average temperature of a room.	7M

UNIT – III

5.	Explain with a neat sketch the functioning of displacer type liquid level measuring instrument.	14M

(OR)

6.	Explain construction and the working principle of a Rotameter with a neat diagram.	14M

UNIT – IV

7.	(a)	What is the temperature compensation with respect to strain gauges?	7M
	(b)	List the essential characteristics required for the backing material of a bonded strain gauge.	7M

(OR)

8.	(a)	Define gauge factor. Explain the factors which affect the gauge factor.	7M
	(b)	Explain the method for measuring the bending strain using the resistance strain gauge with a neat sketch.	7M

UNIT-V

9.	(a)	Draw a block diagram of a typical closed loop system.	7M
	(b)	Draw and explain block diagram for speed control system.	7M

(OR)

10.	(a)	State advantages and limitations of open-loop control system.	7M
	(b)	Draw and explain block diagram for level control system.	7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: PRODUCTION AND OPERATIONS MANAGEMENT (ME)

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Discuss the objectives of production and operations management. 　　7M
   (b) Define agile manufacturing. Explain the principles of agile manufacturing. 　　7M

(OR)

2. (a) Compare job production and mass production. 　　7M
   (b) Explain the characteristics of KANBAN production system. 　　7M

UNIT – II

3. (a) Describe exponential smoothing method of sales forecasting. State its advantage and limitation. 　　7M
   (b) Given the following data, use the linear regression to develop a relation between the no. of rainy days and the no. of games lost by a team. 　　7M

Year	09	10	11	12	13	14	15	16	17	18
Rainy days	15	25	10	10	30	20	20	15	10	25
Games lost	25	20	10	15	20	15	20	10	5	20

(OR)

4. (a) A company believes its sales are arising according to a linear trend. Demand during the last nine months has been as follows. Use the least squares method to determine a linear trend line. Forecast the sales for each of the remaining months in the year. 　　7M

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Demand	5	19	18	15	31	22	27	30	28

   (b) Explain Master Production Schedule (MPS). 　　7M

UNIT – III

5. (a) Distinguish between the product layout and process layout. Under what conditions each type layout is appropriate. 　　7M
   (b) What is Line Balancing? Explain the terms: Minimum rational work Element, Total work content, Cycle Time, Line Efficiency, and Balance Delay. 　　7M

(OR)

6. (a) Discuss the factors affecting location of a plant in a geographical area. 　　7M
   (b) The required production volume in an 8 hour shift is 480. Determine the line efficiency and balance delay using RPW method? 　　7M

Element	1	2	3	4	5	6	7	8	9	10
T_e	0.5	0.3	0.7	0.5	0.6	0.3	0.4	0.6	0.8	0.9
Precedence	-	1	1	1	3	3,4	2	5,6	4	7,8,9

UNIT – IV

7. (a) List out assumptions in basic EOQ model. Derive the equation for determining EOQ. 7M

   (b) Discuss the differences between PERT and CPM. 7M

(OR)

8. (a) Discuss the different costs associated with inventory. 7M

   (b) A project consists of eight activities. The precedence relationships and the activity durations are given below. Construct an arrow diagram for the project network. Find the critical path. Calculate the total float and the project duration for all the activities. 7M

Task	A	B	C	D	E	F	G	H
Precedence	-	A	A	B	C	C	D, E	F, G
Duration	8	5	6	10	9	7	3	6

UNIT-V

9. (a) Find the sequence for the following 8 jobs that minimizes the total elapse time for the completion of all jobs. Each job is processed in the order CAB. Find the total elapsed time and idle time of each machine. 7M

Machine Jobs	1	2	3	4	5	6	7	8
A	4	6	7	4	5	3	6	2
B	8	10	7	8	11	8	9	13
C	5	6	2	3	4	9	15	11

   (b) Describe Priority Scheduling rules. Also explain measures of performance. 7M

(OR)

10. (a) The following jobs are waiting to be processed at a machine center. In what sequence would the jobs be processed according to the decision rules: (i) SPT (ii) EDD. All dates are specified as manufacturing planning calendar days. All the jobs arrive on day 210. Which is the best decision rule? 7M

Job	A	B	C	D	E
d_j	260	258	260	270	275
t_j	30	16	8	20	10

   (b) Discuss the inputs of Material Requirement Planning. 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: RAPID PROTOTYPING (ME)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Describe the necessity for the compression in product development?   7 M
    (b) Differentiate prototype and rapid prototyping?   7M
                                            (OR)
2. Classify the rapid prototyping system and describe any 4 classification?   14 M

UNIT – II

3. (a) Explain the principle of Stereolithography?   7 M
    (b) Describe the processing activities of Stereolithography?   7M
                                            (OR)
4. (a) Describe the influence of various process parameters on stereo lithography?   7 M
    (b) Explain the application of stereo lithography systems?   7M

UNIT – III

5. Explain the principle, constructional features and working of fusion deposition   14 M
    modeling?
                                            (OR)
6. Sketch and explain the solid ground curing?   14 M

UNIT – IV

7. Describe the principle and operation of laminated object manufacturing?   14 M
                                            (OR)
8. Explain the principle and operation of thermal jet printer?   14M

UNIT-V

9. (a) Describe the principle and operation of selective laser sintering processes?   7 M
    (b) Differentiate castable resin moulds and castable ceramic moulds?   7M
                                            (OR)
10. (a) Explain the importance of magic communication?   7 M
    (b) What are factors influencing the accuracy of rapid manufacturing processes?   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: VLSI DESIGN (ECE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	Explain NMOS fabrication process flow with neat diagrams	14M

(OR)

2.	Define the following terms	14M

  i.   Oxidation
  ii. Lithography
  iii. Diffusion
  iv. Encapsulation

UNIT – II

3.	(a)	Define fan-in and fan-out, Explain their effects on propagation delay	7M
	(b)	Explain about pull-up's and pull-down's	7M

(OR)

4.	(a)	Draw V-I characteristics of NMOS transistor and explain its operation	7M
	(b)	Derive the Drain to Source current equation in saturation and resistive region	7M

UNIT – III

5.	(a)	Draw a stick diagram for two input N-MOS NAND and NOR gates	14M

(OR)

6.	(a)	Draw a stick diagram for N-MOS and CMOS inverters	9M
	(b)	What are the limitations of scaling	5M

UNIT – IV

7.	(a)	Implement Full-adder circuit using transmission gates	7M
	(b)	Write a short note on parity generators	7M

(OR)

8.		What are the alternate gate circuits are available, explain them with suitable sketch	14M

UNIT-V

9.	(a)	Describe the chip level test techniques	7M
	(b)	Explain the function level testing	7M

(OR)

10.		Explain the design flow of FPGA	14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: ELECTRONIC MEASUREMENTS AND INSTRUMENTATION (ECE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Differentiate static and dynamic characteristics. 6M
   (b) Define sensitivity and retardation lag. Express sensitivity mathematically. What is deflection factor? 8M

(OR)

2. (a) State different types of harmonic distortion analyzer. 4M
   (b) State with a diagram, the suppression method of a harmonic distortion analyzer. 10M

UNIT – II

3. What is digital voltmeter? Explain the working principle of successive approximation type digital voltmeter with a neat sketch. 14M

(OR)

4. What is the use of digital tachometer? Explain the working principle with a neat sketch. 14M

UNIT – III

5. (a) Draw the neat diagram of both vertical and horizontal deflection systems and explain briefly about their working. 10M
   (b) Describe an overview of applications of a CRO. 4M

(OR)

6. (a) State the standard specifications of a sample CRO. 4M
   (b) Explain with a diagram how frequency can be measured using a gear wheel method. 10M

UNIT – IV

7. (a) Describe the operation of the Wheatstone bridge with a neat sketch. 10M
   (b) What are the limitations of Wheatstone bridge? 4M

(OR)

8. (a) A Maxwell bridge is used to measure inductive impedance at a frequency of 3kHz. The bridge constants at balance are arm 1: a capacitor of value 0.02µF in shunt with 390kΩ; arm 3 opposite to the arm 1 is having the unknown component; the other arms have each 18kΩ resistor. Find the equivalent series circuit of the unknown impedance. What is the value of the quality factor? 10M
   (b) What is the usual procedure for balancing the Maxwell bridge? Explain with the circuit diagram. 4M

UNIT-V

9. (a) List three types of temperature transducers and describe the applications of each. 8M
   (b) What re the difference between active and passive transducers? 6M

(OR)

10. (a) What parameters should be considered in selecting a transducer? 6M
    (b) Define active transducer and passive transducer. Give the examples of each. 8M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Supplementary Examinations of May 2019
SUB: OPTICAL COMMUNICATIONS (ECE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Draw the block diagram of optical fiber communication system and explain about each block   8M
    (b) Explain Advantages of Optical Fiber Communications   6M

(OR)

2. (a) What is the significance of total internal reflection and numerical aperture of an optical fiber?   7M
    (b) Write about mode coupling and V number.   7M

UNIT – II

3. (a) Explain various fiber materials   8M
    (b) Write about scattering losses in an optical fiber   6M

(OR)

4. (a) Explain bending losses with neat sketch in an optical fiber.   7M
    (b) Explain about the following: 7M
        (i) Material dispersion.
        (ii) Wave guide dispersion.

UNIT – III

5. (a) Write about Laser diode to fiber coupling ?   7M
    (b) Write about Equilibrium numerical aperture?   7M

(OR)

6. (a) Explain the power coupling calculation of optical fiber.   7M
    (b) Explain about fiber splicing techniques in detail.   7M

UNIT – IV

7. (a) Explain briefly about LED structures.   7M
    (b) Derive laser diode rate equation.   7M

(OR)

8. (a) Explain PIN photo detector with neat sketch.   7M
    (b) Explain how temperature effects on Avalanche gain in PIN diode   7M

UNIT-V

9. (a) What are the principles of the WDM technique? List various advantages.   7M
    (b) Discuss rise time budget in an optical link with example   7M

(OR)

10. (a) Explain about point-point links in optical system design   7M
    (b) Explain link power budget with examples.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: DIGITAL IMAGE PROCESSING (ECE)

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Explain the following relationship between the pixels i) Neighbourhood ii) Adjacency iii) Equivalence iv) Relation　　7M

   (b) Discuss about the mathematical tools used for image processing　　7M

(OR)

2. (a) Explain the fundamental steps in digital image processing.　　7M

   (b) With neat diagram explain the concept of sampling and quantization.　　7M

UNIT – II

3. (a) Explain the translation and rotation property of DFT.　　7M

   (b) Obtain the Hadamard matrix for N=4.　　7M

(OR)

4. (a) Explain the properties of Unitary transforms. Explain the concept of separability.　　7M

   (b) State the differences between the different types of transforms in the context of computations, energy compaction.　　7M

UNIT – III

5. (a) What is histogram? Explain in detail about histogram equalization with an example　　7M

   (b) List the low and high frequency components in the context of image.What is image sharpening and explain the various filters used?　　7M

(OR)

6. (a) Discuss in brief about the enhancement methods using Homomorphic filtering.　　7M

   (b) Explain the concept of frequency domain enhancement along with one technique for smoothing and sharpening.　　7M

UNIT – IV

7. (a) Explain why the degradation filters are used in the noisy environment only　　7M

   (b) Discuss the discrete formulation of degradation model.　　7M

(OR)

8. (a) Define segmentation and explain edge detection.　　7M

   (b) Explain the region based segmentation.　　7M

UNIT-V

9. (a) Explain the need for Compression and also the redundancies present in image.　　7M

   (b) Generate the Huffman code for COMMITTIEE　　7M

(OR)

10. (a) With neat block diagram explain transform coding.　　7M

    (b) Discuss about various compression standards.　　7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAP

B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: EMBEDDED REAL TIME OPERATING SYSTEMS (ECE)

Time : 3 Hours　　　　　　　　　　　　　　　　　　Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	What are the various application areas of Embedded systems	6M
	(b)	Explain the core of Embedded systems.	8 M

(OR)

2.	(a)	Explain the I/O Subsystem of Embedded System.	8M
	(b)	Explain Embedded Firmware briefly.	6 M

UNIT – II

3.	(a)	What is UART? Discuss the handshaking process in UART serial port..	6M
	(b)	Explain in detail about parallel port devices with neat diagram?	8M

(OR)

4.		Describe about VLSI Integrated circuit design.	14 M

UNIT – III

5.	(a)	With a neat sketch explain about Timer cum counting device.	8 M
	(b)	Explain about network embedded systems.	6 M

(OR)

6.	(a)	Explain the concept in I2C Bus?	6 M
	(b)	List and explain Network protocols.	8 M

UNIT – IV

7.	(a)	What are the different types of operating system and explain it in detail.	8M
	(b)	Describe about Multiprocessing and Multitasking.	6M

(OR)

8.	(a)	Explain interrupt service routines related to embedded RTOS	8M
	(b)	Describe about Task Synchronization.	6M

UNIT-V

9.		Explain in detail about Embedded system in Automobiles.	14 M

(OR)

10.		Explain with a neat diagram ES design for a Smart Card.	14 M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B.Tech. VII Sem.(R15) RegularExaminations of November 2018
SUB: MANAGEMENT SCIENCE (EEE, ECE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. List out the functions of management and which do you consider the most affective   14M
    management in present day context?

(OR)

2. Write responsibilities of management towards shareholders, workers, consumers, suppliers,   14M
    Government and society.

UNIT – II

3. How corporate planning is useful in business organisations?   14M

(OR)

4. What is plant layout? With suitable examples, distinguish between process layout and   14M
    product layout?

UNIT – III

5. 'HRM is dynamic and keeps undergoing transformation', discuss   14M

(OR)

6. Define Inventory control. Discuss the objectives and functions of Inventory control.   14M

UNIT – IV

7. Define work measurement and narrate the objectives of work measurement.   14M

(OR)

8. What do you understand by acceptance sampling and explain the concepts of single and   14M
    double sampling plans?

UNIT-V

9. Explain PERT and its advantages for implementing a new project?

                                                                                       14M

(OR)

10. The project schedule has the following characteristics:

Activity	1-2	2-3	3-6	2-4	1-5	5-6	4-6	5-7	7-8	6-8
Expected time in months	4	2	6	6	2	8	9	7	10	1

                                                                                       14M

Construct Network and find
i) Critical Path
ii) Expected time to built the plan

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: ADVANCED CONTROL SYSTEMS (EEE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) For the given open loop transfer function $G(s) = \dfrac{K}{s(s+4)(s+6)}$ Design suitable lead compensator so that the phase margin is $\geq 30^0$ and the velocity error constant $K_V \geq 15$.   9M

    (b) Explain the process of designing Proportional controller using root-locus approach.   5M

(OR)

2. (a) For the system having transfer function $G(s) = \dfrac{2s+1}{s^3+3s^2+3s+1}$ Design a PI controller ensuring phase margin$=50^0$ and settling time Ts = 6sec.   8M

    (b) Design a lag compensator that will provide a phase lag of 50^0 and attenuation of 15 dB at 2 rad/sec. Also determine the transfer function.   6M

UNIT – II

3. (a) Consider the following system
    $\dddot{y} + 6\,\ddot{y} + 6\dot{y} + 11y = 6u$ 7M
    Obtain a state space representation of this system in observable canonical form.

    (b) Explain the duality between controllability and observability.   7M

(OR)

4. (a) Obtain a state model for the system described by   7M
    $$T(s) = \frac{Y(s)}{U(s)} = \frac{2s^3+7s^2+12s+8}{s^3+6s^2+11s+9}$$

    (b) Discuss the concept of controllability and observability with an example.   7M

UNIT – III

5. (a) Derive the necessary and sufficient conditions for design of state feedback control through pole placement.   7M

    (b) The state equation of linear time invariant systems is   7M
    $$\begin{bmatrix} \dot{x_1} \\ \dot{x_2} \\ \dot{x_3} \end{bmatrix} = \begin{bmatrix} 0 & 1 & 0 \\ -1 & -2 & 1 \\ 3 & 0 & -2 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} + \begin{bmatrix} -1 \\ 2 \\ 1 \end{bmatrix} u$$
    Consider the closed loop poles at $-1.5 \pm j4, -5.5,$ design a state feedback controller.

(OR)

6. (a) States and prove the properties of state transaction matrix   6M

    (b) Show that the solution to the homogeneous state equation $\dot{x}(t) = A\,x(t)$ is unique.   8M

UNIT – IV

7. (a) Explain the popular nonlinearities. Derive the describing function of relay with dead zone. — 9M

   (b) List out the properties of nonlinear systems. — 5M

(OR)

8. (a) Determine and sketch the describing function for saturation and dead-zone nonlinearity. — 8M

   (b) Derive the necessary expression for describing functions. — 6M

UNIT-V

9. (a) The non-linear system described by the following equations — 7M
   $$\dot{x}_1 = -2x_1 + 4x_2 \quad \text{and} \quad \dot{x}_2 = x_1 - 3x_2 - x_2^3$$
   Observe the stability of equilibrium state.

   (b) State and explain the Lyapanov's instability theorem. — 7M

(OR)

10. (a) Test the stability of the following system by using variable gradient method. — 7M
    $$\dot{x}_1 = -2x_1 + 3\,x_1^2\,x_2 \quad \text{and} \quad \dot{x}_2 = -4x_2$$

    (b) State and explain Krasovskii's method of stability analysis of control system. — 7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: HVDC TRANSMISSION (EEE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) What is the need of HVDC transmission.   4M
    (b) With the help of a schematic diagram explain about the major apparatus required for   10M
        HVDC converter station.

(OR)

2. (a) With neat sketch explain the different kinds of HVDC links.   7M
    (b) For a fixed power transmission, explain how the economic choice of voltage level   7M
        selected in DC transmission system.

UNIT – II

3. (a) Define pulse number? What are factors considered for choice of converter   4M
        configuration?
    (b) Draw the schematic diagram of a 6 pulse Graetz 's circuit and explain its principle   10M
        operation

(OR)

4. (a) Explain the effect of overlap angle on the converter circuit.   6M
    (b) Explain the individual characteristics of a Rectifier and an Inverter with sketches.   8M

UNIT – III

5. (a) Briefly explain about the principle of a two terminal DC link control.   8M
    (b) Write short notes on System and Control hierarchy   6M

(OR)

6. (a) Explain about IPC scheme of a firing angle control of HVDC systems.   8M
    (b) Write short notes on power control   6M

UNIT – IV

7. (a) Discuss the various faults exist in converter station? Explain.   8M
    (b) Write short notes on DC Smoothing reactor.   6M

(OR)

8. (a) Explain about the Transient over voltages in DC line   8M
    (b) Write short notes on DC Breakers.   6M

UNIT-V

9. (a) Explain in detail the concept of reactive power requirement in HVDC converters.   10M
    (b) Write short notes on Static var system.   4M

(OR)

10. (a) Discuss about various types of AC filters that can be used for harmonic reduction.   8M
    (b) Write short notes on design aspects of Filters.   6M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Supplementary Examinations of May 2019
SUB: SWITCH GEAR & PROTECTION (EEE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I
1. (a) Explain in detail about the internal causes of over voltages?
   (b) Explain about horn gap and multi gap lightning arresters with diagrams?

(OR)

2. (a) Discuss the advantages and disadvantages of over head ground wires?
   (b) Explain in detail about the insulation coordination?

UNIT – II
3. (a) What are the ratings and specifications of a circuit breaker?
   (b) List the properties of SF6 gas and explain how it is used in circuit breakers

(OR)

4. (a) Write the operation of an oil circuit breaker with neat diagram also Lists its advantages and disadvantages?
   (b) A circuit breaker is rated at 1500A, 2000MVA, 33kV, 3 sec, 3 phase oil circuit breaker. Find the normal rated current, breaking current, making current and shot time current rating by defining each term?

UNIT – III
5. (a) Explain the operation of a non directional induction relay with neat sketch?
   (b) Derive the equation for the torque developed in an induction relay?

(OR)

6. (a) Write the advantages and disadvantages of static relays?
   (b) Explain the Operation principle and characteristics of MHO and Off set MHO relay

UNIT – IV
7. (a) Explain the operation of merz-price protection of an alternator?
   (b) A star connected three phase, 10MVA, 6.6kV alternator is protected by using circulating current protection, the star point is earthed by using a resistor 'r'. Estimate the value of earthing resistor if 80% of the stator winding is protected against earth faults. Assume an earth fault setting of 20%. Neglect the impedance of the alternator?

(OR)

8. Explain with a neat circuit diagram the differential protection scheme used to protect star-delta transformers. Describe with a sketch the operation of buchholz relay.

UNIT-V
9. Explain over-current protection of feeders. How is the protection system graded with respect to the time of operation of relays for a radial feeder?

(OR)

10. (a) Discuss in detail about the three zone protection of transmission lines
    (b) Discuss the operation of differential protection of bus bars with diagram?

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: ELECTRICAL DISTRIBUTION SYSTEMS (EEE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1.	(a)	Explain the terms i) Load factor, ii) Loss factor, iii) Demand factor, iv) Average demand	7M
	(b)	Write the necessary mathematical relations for loss factor and load factor	7M

(OR)

2.	(a)	Distinguish between primary distribution and secondary distribution with the help of a diagram	7M
	(b)	Explain residential commercial, agricultural and industrial loads and their load and demand factor	7M

UNIT – II

3.	(a)	With a neat sketch explain the radial type of primary feeder	7M
	(b)	Explain the loop type primary feeder	7M

(OR)

4.	(a)	Derive the expression for power loss in a uniformly distributed load	7M
	(b)	Explain the 3 phase balanced primary lines.	7M

UNIT – III

5.	(a)	What are the various benefits through optional location of substation	7M
	(b)	Derive the necessary equation for substation area with N-Primary feeders	7M

(OR)

6.	(a)	What is the best optimum location for substation?	7M
	(b)	Neatly draw the busbar arrangements for substations	7M

UNIT – IV

7.	(a)	Derive the equation for voltage drop in an uniformly distributed load	7M
	(b)	Deduce the power los equation in a Non uniformly distributed load.	7M

(OR)

8.	(a)	Discuss the different types of power capacitors	7M
	(b)	What is the role of power factor? What is the effect of shunt and series capacitor	7M

UNIT-V

9.	(a)	What are the objectives of DA and define project planning	7M
	(b)	Explain in detail SCADA	7M

(OR)

10.	(a)	What is GIS explain in detail	7M
	(b)	Explain AMR	7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: POWER QUALITY (EEE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) Explain the following terms with reference to the power quality.   8M
       (i) Notching.   (ii) Voltage Fluctuation.
       (iii) Distributed Generation (DG).   (iv) Ground Grid.
   (b) Discuss the power quality evaluation procedure.   6M

(OR)

2. (a) Define power quality. Explain the reasons for increased concern in power quality.   8M
   (b) What is power quality and what is voltage quality? Explain how the power quality is   6M
       equal to voltage quality.

UNIT – II

3. (a) Explain about sources of sags and interruptions.   8M
   (b) Explain the following terms related with power quality problem.   6M
       (i) Impulsive transient   (ii) Oscillatory transient

(OR)

4. (a) Explain the transmission system sag performance evaluation.   7M
   (b) Explain with neat sketch principles of overvoltage protection.   7M

UNIT – III

5. (a) Discuss about different types of harmonic sources of industrial loads.   7M
   (b) Explain various devices for controlling harmonic distortion.   7M

(OR)

6. What are the indices most commonly used for measuring the harmonic content of a
   waveform and explain in detail.   14M

UNIT – IV

7. (a) Explain in detail about various systems available for permanent power quality
       monitoring.   7M
   (b) Describe the various types of power quality data assessment.   7M

(OR)

8. (a) Write short notes on power quality monitoring standards.   6M
   (b) Explain the various power quality monitoring considerations.   8M

UNIT-V

9. Compare the performance of the network-reconfiguring type custom power devices
   used for improving the power quality.   14M

(OR)

10. (a) Explain how dynamic voltage restorer (DVR) can improve power quality.   6M
    (b) Explain the principle and operation of unified power quality conditioner.   8M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: STRUCTURAL ANALYSIS - II (CE)

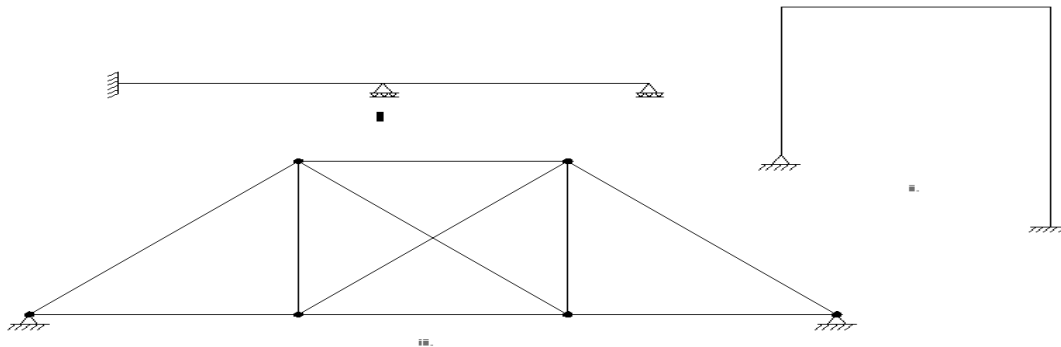Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT-I

1. Explain static indeterminacy and kinematic indeterminacy with an example.   14M

(OR)

2. Obtain the degree of static indeterminacy and degree of kinematic indeterminacy for   14M
    the structures shown in figure i, ii and iii.

UNIT-II

3. A three hinged parabolic arch of 20m symmetrical span and 5m rise, carries a UDL of   14M
    40 kN/m on the entire span and a point load of 200 kN at 5m from right end.
    Determine the reactions also. Also determine bending moment and normal thrust at
    5m from left end.

(OR)

4. A suspension cable having supports at same level has a span of 40m and maximum   14M
    dip of 4m. The cable is loaded with UDL of 10 kN/m through its length. Calculate the
    maximum and minimum tension in the cable. Also find the length of the cable.

UNIT-III

5. A moving UDL of 20 kN/m and 8m long cross over a simply supported girder of span   14M
    20m. Determine
    i. Maximum +ve shear, force −ve shear force and B.M at 6m from left support.
    ii. Absolute maximum shear force and bending moment anywhere on the girder.

(OR)

6. A girder having a span of 180m is simply supported at the ends. It is traversed by a   14M
    train of loads as shown in **figure 2** . The 60 kN load is leading. Find the maximum
    bending moment which can occur

      (i)Under the load 200kN load.   (ii)Under 50kN load.
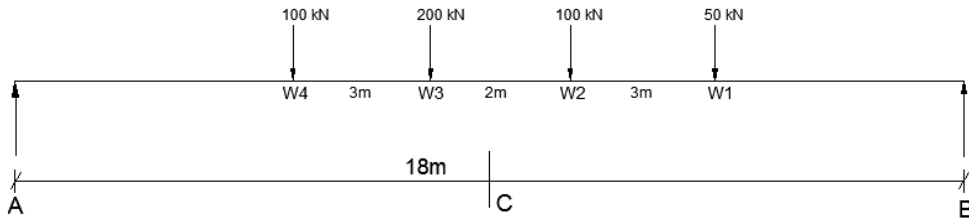
Figure 2

UNIT-IV

7. For a simply supported beam of span 25m, compute by influence line principle, 14M
   i. Maximum bending moment at 8m from left support,
   ii. Absolute maximum bending moment.
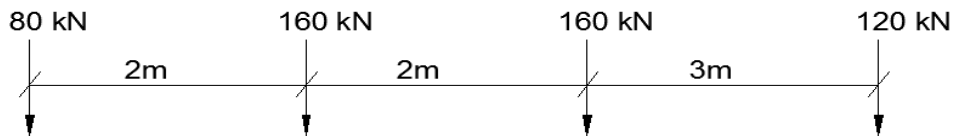   The series of concentrated loads to be taken as rolling load system as shown in **fig 3**.

Figure 3

(OR)

8. What is an influence line? Explain its advantages in structural analysis. 14M

UNIT-V

9. For the beam shown in **figure 4**, use the flexibity method to:
   (a) Determine the deflection at B
   (b) Determine all the reactions at supports. 14M

(OR)

10. For the beam shown in **figure 4**, use the stiffness method to:
    (c) Determine the deflection at B
    (d) Determine all the reactions at supports.

14M
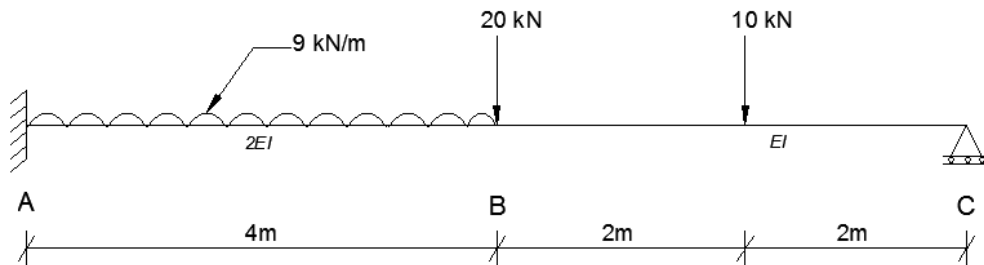
Figure 4.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: DESIGN AND DETAILING OF REINFORCED CONCRETE STRUCTURES-II (CE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. Design a simply supported slab to cover a room with internal dimensions of 3.6 m x 5.4 m and wall thickness of 300 mm all around. Assume a live load of 4 kN/m^2 and a floor finish of 75mm thick. Use M30 grade of concrete and Fe500 grade steel. Assume that the corners of the slab are held down firmly. Consider mild exposure conditions and unit weight of concrete as 25 kN/m^3 and that of floor finish as 20 kN/m^3.   14M

(OR)

2. Design a circular slab of 3 m diameter to cover an overhead tank. The slab is simply supported at the periphery by a 200 mm thick RC wall. Consider a live load of 3 kN/m^2 and floor finish load of 1.5 kN/m^2. Use M25 grade of concrete and Fe500 steel. Assume mild exposure conditions   14M

UNIT – II

3. Design the reinforcement in a column of size 300 mm X 600 mm, subject to an axial load of 1500 kN due to dead loads and 1000 kN due to live loads. The column has an unsupported length of 3.5 m and is braced against sideway in both directions. Use M25 grade of concrete and Fe500 steel. Assume mild exposure conditions.   14M

(OR)

4. An un-braced column 230mmX450mm in section is un-braced in both the principal directions. The column ends are fixed and the column has unsupported length of 3.6m. The column carries an ultimate axial load of 1000kN & ultimate moment of 75KN-m & 50kN-m about major axis bisecting the depth, at its ends. Assume M25 grade of concrete & Fe415 Grade steel and effective cover of 50mm. Determine the area of longitudinal reinforcement.   14M

UNIT – III

5. Design an isolated rectangular footing for a column of size 300 mm x 600 mm, carrying an axial load of 450 kN (under service loads, due to dead and live loads). Assume an allowable soil bearing pressure of 150 kN/m^2 at a depth of 0.5 m below the ground. Assume M25 concrete and Fe500 steel.   14M

(OR)

6. Design a combined footing for two columns, C1 with size 300 mm x 300 mm, reinforced with 8-20mm diameter bars, and C2 with size 400 mm x 400 mm, reinforced with 8-25mm diameter bars, supporting axial loads of P1 = 750 kN and P2 = 1200 kN respectively (under service loads). The centre to centre distance between the two columns is 3.5 m. The allowable soil bearing pressure at 1.0 m below ground level is 250 kN/m^2. Assume Fe500 and M25 concrete in both the columns and the footings.   14M

UNIT – IV

7. Explain the different types of retaining walls and their behavior, with neat sketches. 14M

(OR)

8. Design a T-shaped cantilever retaining wall to retain earth embankment 3.2 m high above the ground level. The unit weight of earth is $18kN/m^3$ and its angle of repose is 30°, the embankment is horizontal at its top. The safe bearing capacity of a soil may be taken as $150kN/m^2$ and the coefficient of friction between soil and concrete as 0.50. Use M25 grade of concrete and Fe415 Grade Steel. 14M

UNIT-V

9. Design a rectangular water tank resting on the ground and having a capacity of 200Kl. Overall height of the tank is restricted to 5M with a free board of 500mm. The bearing capacity of soil at the site is 300kN/m2. The material is to be used in the construction are concrete mix of grade M25 and HYSD steel bars of Fe500 grade steel. 14M

(OR)

10. Design a cylindrical water tank of capacity $500m^3$ (500,000 liter) resting on the ground and having a flexible base. The materials used in the construction are M30 grade of concrete & HYSD steel of grade Fe500. The overall height of the tank is restricted to 5M with a free board of 500mm. The bearing capacity of a soil at the site is $250kN/m^2$. 14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: DESIGN & DETAILING OF STEEL STRUCTURES (CE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
**All questions carry Equal Marks.**

UNIT - I

1. (a) What are the assumptions made in the plastic analysis ? List them.   7 M
    (b) What are the two methods of plastic analysis ? Briefly explain them.   7 M

(OR)

2. A tie member consisting of an ISA 80 mm x 50 mm x 8 mm (Fe 410 grade steel) is welded to a 12 mm   14M
    thick gusset plate at site. Design weld to transmit load equal to the design strength of the member.

UNIT – II

3. Determine the effective net area for the section shown in Fig.1. The angles are connected as   14M
    shown in the figure. The steel is of grade Fe 410.
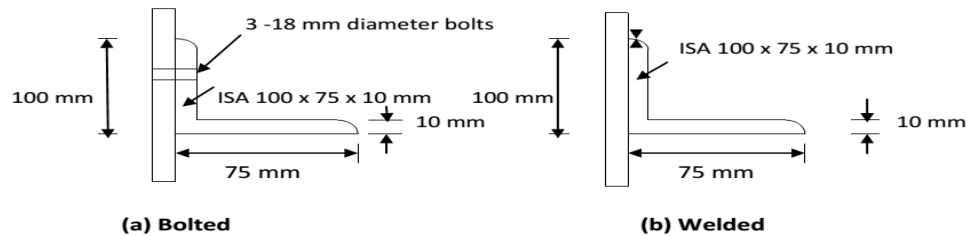
(OR)

4. Design a column to support a factored load of 1050 kN. The column has an effective length   14M
    of 7.0 m with respect to z-axis and 5.0 m with respect to y-axis. Use steel of grade 410.

UNIT – III

5. Determine the design bending strength of ISLB 350 @ 486 N/m considering the beam to be   14M
    (i) laterally supported and (ii) laterally unsupported. The design shear force V is less than the design
    shear strength. The unsupported length of the beam is 3.0 m. Assume steel of grade Fe 410.

(OR)

6. Design a laterally supported beam of effective span 6 m for the following data :   14M
    Grade of steel : Fe 410 ; Maximum bending moment : M = 150 kN-m
    Maximum shear force: V = 210 kN. Check for deflection is not required.

UNIT – IV

7. Design a seat connection for a factored beam end reaction of 110 kN. The beam section is ISMB 250   14M
    @ 365.9 N/m connected to the flange of column section ISHB 200 @ 365.9 N/m using bolted
    connections. Steel is of grade Fe 410 and bolts are of grade 4.6.

(OR)

8. In a framed connection an ISLB 350 @ 485.6 N/m transmits an end reaction of 220 kN and a moment   14M
    of 22 kNm, under factored loads to a column ISHB 300 @ 576.6 N/m. Design the connections.

UNIT-V

9. Design a slab base for a column ISHB 350 @ 710.2 N/m subjected to a factored axial compressive load   14M
    of 1500 kN for the following conditions : (i) Load is transferred to the base plate by direct bearing of
    column flanges. (ii) Load is transferred to the base plate by welded connections; the column end and
    the base plate are not machined for bearing. Whether anchor bolts are required ? The base rests on
    concrete pedestal of grade M 20.

(OR)

10. A column ISHB 35O @ 661.2 N/m carries an axial compressive factored load of 1700 kN. Design a   14M
    suitable welded gusset base. The base rests on M 15 grade of concrete.

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VII Sem. (R15) Supplementary Examinations of May 2019
SUB: TRANSPORTATION ENGINEERING – II(CE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) What is ballast? What are the different types and enumerate the requirements of good ballast. 7M
    (b) Determine the number of sleepers required for the construction of 1800 m of B.G. track, with sleeper density of N + 5. 7M

(OR)

2. (a) With the help of a neat sketch, show the various components of a typical railway track. 7M
    (b) Explain the concepts of cant and negative super elevation. And also discuss the differences between them. 7M

UNIT – II

3. (a) What is a tunnel? Explain elaborately the types of tunnelling in railways. 14M

(OR)

4. Define a yard and explain the classification of yards with neat sketches if necessary. 14M

UNIT – III

5. (a) Explain about the factors to be considered for selecting a site for an airport. 7M
    (b) With a neat sketch explain about the layout and functions of a terminal area of an airport. 7M

(OR)

6. (a) What is wind rose diagram? How it is used for finalizing the runway orientation at a given location? 7M
    (b) Explain the terms Linear concept, Pier concept and satellite concept 7M

UNIT – IV

7. (a) Explain various types of break waters. 7M
    (b) What are the factors to be considered for the selection of harbours on a sandy coast and lower reach of a river. 7M

(OR)

8. What is a harbour? Explain the types of harbours with neat sketches and also discuss the differences of natural harbours and artificial harbours. 14M

UNIT-V

9. (a) What is Dredging? Classify the different types of dredging works. 7M
    (b) What are the various services that are required for the maintenance of shipping terminals? 7M

(OR)

10. (a) Discuss elaborately with neat sketches about the maintenance of lock gates and caissons. 14M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA

B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: WATER RESOURCES ENGINEERING - II (CE)

Time: 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) What is a spillway? What are its essential requirements? Describe the various components of a spillway.   7M
   (b) Describe with a neat sketch a volute siphon spillway.   7M

(OR)

2. (a) Describe with neat sketches: (i) Tainter gates and (ii) Drum gates.   7M
   (b) What is a stilling basin? Describe Type I and Type II stilling basins.   7M

UNIT – II

3. (a) What is a fall in a canal? Why is it necessary to provide a fall in a canal? What are the considerations according to which the location of a fall is decided?   7M
   (b) How are canal falls classified? Explain.   7M

(OR)

4. Explain the procedure for designing a Sarda type fall.   14M

UNIT – III

5. (a) Describe the procedure for designing a head regulator for a distributary.   7M
   (b) Define a canal outlet. Explain the various types of canal outlets.   7M

(OR)

6. (a) What is flexibility of a canal outlet? Derive an expression for the flexibility.   7M
   (b) Define proportionality of an outlet. Distinguish between proportional, hyper-proportional and sub-proportional outlets. Obtain an expression for the setting of these three types of outlets.   7M

UNIT – IV

7. (a) What is a cross-drainage work? What are the various types of cross-drainage works? Explain briefly.   7M
   (b) Discuss the various factors affecting the selection of the suitable type of cross-drainage work.   7M

(OR)

8. How are the aqueducts classified? Explain with neat sketches. Indicate the circumstances under which each one is used.   14M

UNIT-V

9. (a) What is 'Water resources planning'? Explain in detail the water resources of India.   7M
   (b) Explain the classification of water resources development projects.   7M

(OR)

10. (a) Explain the terms:
    (i) Project formulation and (ii) Project evaluation.   7M
    (b) Explain the planning strategies related to water use and future needs.   7M

K.S.R.M. COLLEGE OF ENGINEERING (AUTONOMOUS), KADAPA
B. Tech. VII Sem. (R15) Regular Examinations of November 2018
SUB: ADVANCED FOUNDATION ENGINEERING (CE)

Time : 3 Hours   Max. Marks: 70

Answer any FIVE Questions choosing one question from each unit.
All questions carry Equal Marks.

UNIT - I

1. (a) What are different types of sheet pile walls? Draw the sketches showing the pressure distribution. **7 M**

    (b) A cantilever sheet pile retains soil to a height of 6 m. Find the depth to which the pile should be driven assuming two-thirds of the theoretical passive resistance is developed on the embedded length. Soil properties are $\gamma = 19$ kN/m^3 and $\varphi = 30^o$. Use approximate method. **7 M**

(OR)

2. (a) Describe the equivalent beam method for the analysis of an anchored sheet pile. **8 M**

    (b) Discuss about Rowe's Moment Reduction curves. **6 M**

UNIT – II

3. (a) Draw different types of apparent pressure diagrams used in the design of braced cuts. What are the factors that affect the pressure distribution? **7 M**

    (b) Explain the procedure to check the safety of coffer dam against slipping and bursting. **7 M**

(OR)

4. (a) What is a coffer dam? Name the different types of coffer dams and discuss their relative advantages and disadvantages. **7 M**

    (b) A rectangular strutted excavation 2 m wide, is made in a plastic clay having unit weight 18 kN/m^3 and undrained cohesion 20 kN/m^2. If the depth of cut is 4.5 m, what is the factor of safety against base failure? Take bearing capacity factor N_c as 7.0. **7 M**

UNIT – III

5. (a) What are the preventive measures for rectification of tilts and shifts of well foundation? **7 M**

    (b) Explain the design aspects of individual components of well foundation. **7 M**

(OR)

6. Discuss the IRC method for the design of well foundation. **14 M**

UNIT – IV

7. (a) Explain the general observations of collapsible soil. **7 M**

    (b) Explain the method of foundation design and treatment of collapsible soil **7 M**

(OR)

8. (a) Explain the methods to evaluate the swell potential and swell pressure. **8 M**

    (b) An expansive soul profile has an active-zone thickness of 5.2 m. A shallow foundation is to be constructed at a depth of 1.2 m below the ground surface. Based on swell test, the following are given. **6 M**

Depth (m)	1.2	2.2	3.2	4.2	5.2
Swell (%)	3.0	2.0	1.2	0.55	0

Estimate the total possible swell under the foundation. If the allowable total swell is 15 mm, what would be the necessary undercut?

UNIT-V

9. (a) Discuss the principles and scope of soil-cement stabilization. **7 M**

    (b) Explain the principle of soil-bitumen stabilization. What are the factors affecting the properties of soil-bitumen. **7 M**

(OR)

10. (a) Enumerate the stabilization of soil by grouting stating the different types of grouts. **7 M**

    (b) Discuss the Reinforced earth along with its application. **7 M**