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

DESIGN OF CONCRETE STRUCTURES –II
(CIVIL ENGINEERING)

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

PART-A
ANSWER ALL QUESTIONS   **[1 x 10 = 10 M]**

1.
  a) Define footing
  b) What is the minimum thickness of footing at the edge of RCC footing
  c) What percentage of negative moments are to be designed at interior support of a flat slab
  d) Write any two advantages of flat slab
  e) Write the expression for impact factor for RC bridges in terms of span of the slab L
  f) What are the component parts of Bridges
  g) Classify the concrete piles
  h) Dia of Bulb (D) in terms of dia of stem of the under-reamed piles(d)
  i) Which code is used for design of water tanks?
  j) Write any two types of water tanks.

PART-B

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

2. A rectangular column 450mmx600 mm transverse a dead load of 880 kN and live load of 1420 kN without any moment, there is no over burden pressure. The SBC of soil is 140 kN/m^2.use M$_{20}$ grade concrete and Fe415steel. Design the rectangular footing to support the column   12M

(OR)

3. Design reinforced concrete combined rectangular footing for two columns A and B located 3.6 m apart the sizes of the columns are 400mm x 400mm and 600mm x 600 mm , the loads on them are 1000kN and 1500 kN respectively. The projection of the footing parallel to the length of the footing beyond the axis of the column A is limited to 590 mm. The SBC of the soil is 280kN/M^2 . Use M20 concrete and Fe 415 steel.   12M

UNIT-II

4. Design an interior pannel of a flat slab for a live load of 4000 N/m^2 the slab provided with a floor finishing weighing 1000N/m^2 .The pannels are 6m x 6m. Drops shall be provided. Use M20 concrete and Fe415 steel.   12M

(OR)

5. A hall is Circular with an internal diameter of 6.5 m. Design a simply supported slab for the hall for the live load of 3500 N/m^2. Use M20 concrete and Fe415 steel.   12M

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UNIT-III

6. (a) Explain the IRC specifications for loading on bridges   6M
    (b) Explain the components of bridges   6M

(OR)

7. Design the simple slab bridge for the following requirements: 12M
    i) Clear span = 5m   ii) Clear width of carriageway = 6.8 m iii) Live load=
        IRC class A loading Use M20 concrete and Fe415 steel.

UNIT-IV

8.   A column carrying a load of 2500 kN has to be supported by four piles each of   12M
    300mm x300 mm. The piles are spaced at 1.2 m centres. The column size is
    500mmx 500mm. Design the pile cap. Use M20 grade concrete and Fe 415 steel.

(OR)

9. The foundation of a structure is to consist of 16 piles to carry a total load of 12000 12M
    kN. The piles are 350 mm x 350 mm and are 9 m long. They are spaced at 1.50 m
    centres. Design one of the piles. The effective length of a pile may be taken as 0.60
    times the actual length. Use M20 concrete and Fe 415.

UNIT-V

10. Design a circular tank to the following requirements: 12M
     (i) Diameter of tank = 6 meters
     (ii) Depth of water = 3.75 meters
     (iii)The tank rests on ground.
     (iv)The walls and the base slab are not monolithic.
     Use M 20 concrete and Fe 415 steel.

(OR)

11. A reinforced concrete water tank is 6 m x 3 m with a maximum depth of 2.50 m.   12M
     150mm x 150 mm splays are provided at junction of walls and base slab. The tank
     is supported on brick masonry walls all round. Design the tank. Use M 20 and Fe
     415 steel.

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CODE: 13EE3017

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2016
POWER SYSTEMS-III
(Electrical and Electronics Engineering)

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

PART-A
ANSWER ALL QUESTIONS [1 x 10 = 10 M]

1. a) Define restriking voltage.
    b) What is the function of an arc quenching medium in a circuit breaker?

    c) Write the universal torque equation.
    d) Name different types of distance relays.
    e) Write any two abnormal condition of an alternator.
    f) What is the necessity of CT in protective scheme?
    g) Define three zone distance protection scheme.
    h) What is the range of frequency in carrier current protection?
    i) What is neutral grounding?
    j) What is BIL?

PART-B
Answer one question from each unit [5 x 12=60M]
UNIT-I

2. a) Discuss recovery rate theory and energy balance theory of arc interruption in a circuit breaker. 8M
    b) Explain the process of current chopping while interrupting low inductive currents. 4M
    (OR)
3. a) Describe the construction, operating principle and application of minimum oil circuit breaker. Also mention their merits and demerits. 8M
    b) Explain the rating of circuit breakers. 4M

UNIT-II

4. a) Discuss the essential qualities of a protective relay in detail. 6M
    b) Classify various types of over current relays and explain their characteristics. 6M
    (OR)
5. a) Explain current and time setting of a relay. The current rating of an over current relay is 5A.PSM=2,TSM=0.3, CT ratio=400/5,Fault current =4000A. Determine the operating time of the relay. 8M

    At TSM=1,operating time at various PSM are

PSM	2	4	5	8	10	20
Operating time in sec.	10	5	4	3	2.8	2.4

    b) What are the merits and demerits of static relays over electromagnetic relays ? 4M

UNIT-III

6. a) Explain the following protection schemes employed for alternator.   8M
        i)Field suppression ii)protection against pole slipping
    b) Describe the working principle of restricted earth fault protection of alternator.   4M

(OR)

7. a) Explain the differential protection of large power transformer with a neat wiring diagram.   8M
    b) What type of protective device is used for the protection of an alternator against overheating of its (i) stator, (ii) rotor? Discuss them in brief.   4M

UNIT-IV

8. a) Explain the Translay scheme of protection of feeder with a neat sketch.   6M
    b) Describe the differential protection of bus bars.   6M

(OR)

9. a) Explain three zone distance protection for transmission lines.   6M
    b) Explain the carrier blocking protective scheme for transmission lines   6M

UNIT-V

10. a) Explain the following neutral grounding methods.   8M
        i) Reactance   ii) Resonant Grounding

    b) Describe the operation of Zinc - Oxide Lighting Arrester.   4M

(OR)

11. a) Explain any one method of protection against lightning over voltages.   6M
    b) What are the disadvantages of ungrounded neutral systems? Explain   6M

CODE: 13ME3018　　　　　　　　　　　　　　　　　　**SET-2**

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

METROLOGY
(Mechanical Engineering)

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

PART-A

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

1.　a)　What is fundamental deviation
　　b)　Discuss International Standard System
　　c)　How least count on Bevel Protractor can be measured.
　　d)　Discuss the functioning of plug ring gauge
　　e)　What are the advantages of Optical flats
　　f)　List out the instruments used for flat surface measurement
　　g)　What is surface waviness
　　h)　Distinguish between mechanical and electrical comparators.
　　i)　Highlight the need of alignment tests on machine tools
　　j)　Write a note on the applications of CMM

PART-B

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

UNIT-I

2.　a)　Explain difference between interchangeable manufacturing and selective assembly　**6 M**
　　b)　Differentiate between 'hole basis system' and 'shaft basis system'　**6 M**

(OR)

3.　A hole and mating shaft are to have a nominal assembly size of 50mm. The **12 M**
　　assembly is to have maximum clearance of 0.15mm and minimum clearance of
　　0.05mm. The hole tolerance is 1.5 times the shaft tolerance. Determine the limits
　　for both hole and shaft using
　　i) Hole basis system ii) Shaft basis system

UNIT-II

4.　a)　Describe with the aid of sketches how internal and external diameters can be　**6 M**
　　　　measured using a rule and caliper.
　　b)　Explain why a micrometer provides a more positive reading than a vernier caliper　**6 M**

(OR)

5.　State the essential requirements for accuracy in the construction of a sine bar. Why **12 M**
　　is it that the use of sine bar is not recommended for angles larger than 45PoP with
　　the reference plane. Explain how a sine bar may be employed to determine the
　　inclined angle of a taper plug gauge

UNIT-III

6.　Discuss the applications of Tool maker's microscope. Also discuss its advantages **12 M**
　　over conventional measuring instruments

(OR)

7.　a)　Explain in detail the application of optical flats. And also list out their advantages.　**6M**
　　b)　Briefly describe the role of surface plates in metrology with suitable sketches.　**6M**

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UNIT-IV

8. Explain how a pneumatic comparator works with neat sketch and briefly enumerate the advantages of differential pneumatic comparators **12 M**

(OR)

9. With the help of neat sketch describe the construction and working of the following **12 M**
    a) Profilometer   b) Tomlinson surface meter

UNIT-V

10. a) What is meant by drunken thread? What difficulties does it present in finding the pitch of the thread? **6 M**
    b) What is the objective of measurement of thread elements? Mention some important thread elements of linear measurement. **6 M**

(OR)

11. a) Explain various errors is Gear measurement **6 M**
    b) Does a gear tooth vernier actually measure the defined tooth thickness. If not, state the mathematical relation which you will apply to find the correct thickness **6 M**

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CODE: 13EC3020   SET 1

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

DIGITAL SIGNAL PROCESSING
(Electronics and Communication Engineering)

Time: 3 Hours   Max Marks: 70

PART – A
ANSWER ALL QUESTIONS   [1 x10 = 10]

1. a)   Find the Energy of the signal $x(n) = \left(\dfrac{1}{2}\right)^n u(n)$

    b)   Determine the system $y(n) = x\left(\dfrac{n}{2}\right)$ is time-invariant or not

    c)   How many stages are there for radix-2, DIT or DIF for N sample sequence.
    d)   What is ROC of Z-transform?
    e)   What are the properties of Chebyshev filters?
    f)   List the different types of structures for realization of IIR systems?
    g)   Why FIR filters are always stable?
    h)   Give the importance of interpolation used in multi-rate digital signal processing system?
    i)   Name few architectures used for programmable DSPs?
    j)   Name the buses of TMS320C5X architecture?

PART – B

Answer One question from each Unit   [5 x 12 = 60]

UNIT – I

2. a)   What are the basic operations on discrete-time signals? Illustrate with an example.   [6M]

    b)   Show that the system described by the differential equation $\dfrac{dy(t)}{dt} + 10y(t) + 5 = x(t)$ is non-

         linear.   [6M]
                                   (OR)
3. a)   A discrete system is given by the following difference equation:
         $y(n) - 5y(n-1) = x(n) + 4x(n-1)$. Where x(n) is the input and y(n) is the output. Determine
         its magnitude and phase response.   [6M]

    b)   Determine whether the system with impulse response $h(n) = 4^n u(2-n)$ is (i) causal and

       (ii) stable.   [6M]
UNIT – II
4. a)   A LTI system is described by the equation
         $y(n) = x(n) + 0.81x(n-1) - 0.81x(n-2) - 0.45y(n-2)$. Determine the transfer function of
         the system.   [6M]

    b)   State and prove the following properties of DFT.
         (i)   Circular Time Shifting
         (ii)   Time Reversal   [6M]
                                   (OR)

5. a)   Compute the 4-point DFT of the sequence $x(n) = \{2,1,4,3\}$ using DIT FFT algorithm.   [6M]

   b)   Compare Radix-2 DIT and DIF FFTs.   [6M]

UNIT – III

6. a)   Explain the design procedure for the IIR digital filter by using Impulse Invariance method ?   [8M]

   b)   Convert the analog filter with system function $H_a(s) = \dfrac{3s}{s^2 + 0.5s + 2}$ with T=1sec using Bilinear transformation.   [4M]

(OR)

7.   Design a digital Butterworth filter that satisfies the following constraint using Bilinear transformation. Assume T=1sec.

$$0.9 \le \left| H\left(e^{j\omega}\right) \right| \le 1 \ ; \ 0 \le \omega \le \frac{\pi}{2}$$

$$\left| H\left(e^{j\omega}\right) \right| \le 0.2 \ ; \frac{3\pi}{4} \le \omega \le \pi$$

[12M]

UNIT – IV

8. a)   Realize the following system function $H(z) = \dfrac{1}{2} + \dfrac{1}{3}z^{-1} + z^{-2} + \dfrac{1}{4}z^{-3} + z^{-4} + \dfrac{1}{3}z^{-5} + \dfrac{1}{2}z^{-6}$ using minimum number of multipliers?   [6M]

   b)   Explain the procedure of designing FIR filter using Fourier series method.   [6M]

(OR)

9.   Design a Linear phase FIR low pass filter with a cut off frequency of 0.5π rad/sample by taking 11 samples of ideal frequency response.   [12M]

UNIT – V

10. a)   Explain the VLIW architecture with its block diagram?   [8M]

   b)   What is the difference between Von Neumann and Harvard architecture?   [4M]

(OR)

11. a)   Write a short note on instruction Pipelining in TMS320C5X processors?   [8M]

   b)   What are the addressing modes of TMS320C5X processing?   [4M]

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CODE: 13CS3018   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech II Semester Supplementary Examinations, July-2016
COMPUTER GRAPHICS
(Computer Science and Engineering)

Time: 3 Hours   **Max. Marks: 70**
PART-A
Answer all the questions   **[10 x 1=10]**

1. a) What is aspect ratio?
   b) Define Stereoscopic Views.
   c) Compare B-SPLINE and SPLINE transformation
   d) What is random scanning?
   e) What is Bezier-basis function?
   f) Compare Morphing and Data Glove
   g) Give two polygon surface characteristics?
   h) Name any three font editing tools.
   i) Find the amount of memory required by an 8 plane frame buffer each of red, green and blue having 640×480 resolution
   j) Compare Hermit Surfaces and B-Spline Surfaces

PART-B
Answer one question from each unit   **[5 x 12 = 60M]**
UNIT-I
2. a) Investigate the applications of computer graphics in various engineering domains.
   b) Differentiate between Raster scan displays and Random scan displays in detail.
                                        (OR)

3. Define Shadow Masking and differentiate shadow mask method and beam penetration methods?
UNIT-II
4. a) Randomize a line between (5, 5) and (8, 8) by using DDA Algorithm?
   b) Calculate the points to draw a ellipse having $r_x=8$ and $r_y=6$
                                        (OR)
5. Explain the steps in midpoint circle drawing algorithm
UNIT-III
6. Explain the procedure for writing Cohen-Sutherland algorithm with a neat labeled diagram and explain it with an example.
                                        (OR)
7. Prove that two scaling transformations commute, that is S1S2 = S2S1
UNIT-IV
8. Show that the composition of two rotations is additive by concatenating the matrix representations for $R(\theta_1)$ and $R(\theta_2)$ to obtain $R(\theta_1). R(\theta_2)$
                                        (OR)
9. Derive the Equations for Quadric surfaces.
UNIT-V
10. Short notes on the following:
       a) Z-Buffer   b) The Painters algorithm
                                        (OR)
11. Write short notes on
       a) Back face Removal   b) Morphing

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Code No: 13IT3003   **SET-1**

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

OBJECT ORIENTED ANALYSIS AND DESIGN
(Information Technology)

Time: 3 hours   **Max.Marks:70**

PART- A

Answer ALL Questions   **[10 x 1 = 10]**

1. a) How do you identify Use case?
   b) What is Booch Methodology?
   c) Define Pattern.
   d) What is UML (Unified Modeling Language)?
   e) What is Sequence diagram?
   f) What is Use case diagram?
   g) Define Class responsibility?
   h) What is Corollary?
   i) Define Class visibility?
   j) What are the Initial and final states of Activity diagram?

PART- B

Answer one Question from each Unit   **[5 x 12 = 60]**
UNIT- I

2. Explain UML Use case diagram with all notations by considering Net bank ATM application.   12M

(OR)

3. Elaborate
   a. UML Architecture   6M
   b. UP- Unified Process.   6M

UNIT- II

4. Define an Object. Write in details about UML Class diagram by considering School Management System.   12M

(OR)

5. Describe the following with suitable example
   a. Aggregation   4M
   b. Composition   4M
   c. Class Attributes and Methods   4M

UNIT- III

6. What is Dynamic Model? Explain Activity diagram with complete notations. 12M

(OR)

7. Draw an Interaction diagram for Withdrawal operation of the Net Banking application.
                                                                                                 12M

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UNIT- IV

8. Explain the following
   - a. Interface   4M
   - b. Component   4M
   - c. Timing diagram   4M

(OR)

9. Explain Multiplicity relationship with suitable examples.   12M

UNIT- V

10. Explain about Implementation diagram with an example.   12M

(OR)

11. Draw a state Transition diagram for customer object in Net banking application. 12M

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