

**EARTHQUAKE RESISTANT DESIGN  
(ELECTIVE – I)  
(Civil Engineering)****TIME: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 X 10 = 10M]**

1.
  - a) What is a lumped mass?
  - b) Explain the terms in equation of motion?
  - c) Distinguish between free vibration and forced vibration.
  - d) What is natural frequency?
  - e) What is a tectonic plate?
  - f) What is focus?
  - g) What is epicenter?
  - h) What is magnitude of an earthquake?
  - i) How is earthquake size measured?
  - J) How many seismic zones is India divided into?

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

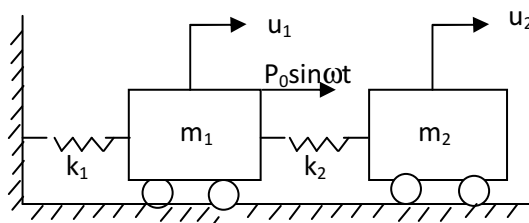
2.
  - a) Derive the equation of motion for a mass 'm' connected to spring with stiffness coefficient 'k' and a damper with damping coefficient 'c'. Consider the case of under-damped system.
  - b) Explain the concept of logarithmic decrement for spring mass dashpot system.

**(OR)**

3. For a 3-storied shear building, compute the natural frequencies, natural periods and mode shapes for the data given below. Plot the mode shapes. Neglect axial deformations in all structural elements.

Stiffness of floor:  $K_1=40 \times 10^6$  N/m,  $K_2=K_3=100 \times 10^6$  N/mMass of floor:  $M_1=110 \times 10^3$  Ns<sup>2</sup>/m,  $M_2=160 \times 10^3$  Ns<sup>2</sup>/m,  $M_3=30 \times 10^3$  Ns<sup>2</sup>/m**UNIT – II**

4. Derive the steady state solution of a two degree of freedom system without damping for the fig shown below.

**(OR)**

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**CODE: 13CE3020**

**SET-2**

5. Describe the response spectrum and explain in brief about its uses.

## UNIT – III

6. Explain the basic design principle of earthquake resistant design of reinforced concrete structures.

**(OR)**

7. An OMRF 3 storey building has the plan of 24m x 24m with 300mm x 600mm columns spaced at 6m apart c/c. The storey height is 3m. Dead load per unit area of floor including slab weight and floor finish is  $4\text{ kN/m}^2$ . Intensity of live load on the floor is  $3\text{ kN/m}^2$  and on the floor is  $1.5\text{ kN/m}^2$ . The soil below the foundation is hard and is located in Delhi. Determine the seismic forces and shear forces at different floor levels.

## UNIT – IV

8. Explain the following terms

a) Focus b) Magnitude c) Intensity d) Seismic Zone e) Seismogram

**(OR)**

9. Explain with neat sketches the different types of earthquakes and seismic waves.

## UNIT – V

10. Explain general principles to ensure sufficient ductility and ductile detailing of flexural members as per IS:13920-1993.

**(OR)**

11. The data of an inner beam-column joint in the ground floor roof is as follows:

Grade of concrete	= M25
Grade of steel	= Fe415D
Clear span of beam to the left side of joint	= 4.50m
Clear span of beam to the right side of joint	= 4.00m
Slab thickness	= 125mm
Finish on slab	= 50mm thick
Live load on floor	= $2.0\text{ kN/m}^2$
Wall thickness on beams	= 115mm
Axial load on column at joint	= 900kN
Beam size	= 230mm x 550mm with 1.5% steel at top and 0.8% steel at bottom on either side of the joint
Column size	= 230mm x 650mm with 3.46% steel

Check whether the joint satisfies weak girder- strong column proportion. Also check the shear in beam and column.

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SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, April-2017

## PRESTRESSED CONCRETE (Civil Engineering)

Time: 3 Hours

Max Marks: 70

### PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1.
  - a) Define loss of prestress.
  - b) What is the minimum strength of concrete for using in post tensioning as per IS:1343?
  - c) What do you mean by class-1 and class-2 prestressed concrete structures
  - d) Define transmission length
  - e) Draw web shear cracks in prestressed beams
  - f) Explain loss of prestress due to friction
  - g) State the reason for using high strength concrete in prestressed concrete
  - h) Explain about differential shrinkage
  - i) Draw anchorage zone stresses in post tensioned beams
  - j) What is meant by Cracking Moment?

### PART-B

Answer one question from each unit

[5x12=60M]

#### UNIT-I

2.
    - a) Explain Freyssinet system of post tensioning with neat sketch? 8M
    - b) What are the advantages and disadvantages of prestressed concrete over Reinforced concrete? 4M
- (OR)
3.
    - a) Explain about tensioning devices. 6M
    - b) Explain Hoyer long line system of pretensioning. 6M

#### UNIT-II

4. Explain various losses of prestress in pre-tensioning and post-tensioning. 12M
- (OR)
5. A simply supported prestressed concrete beam spanning over 10m is of rectangular section 500mm wide by 750mm deep. The beam is prestressed by a parabolic cable having an eccentricity of 200mm at the centre of the span and zero at the end supports. The effective force in the cable is 1600kN. If the beam supports a total uniformly distributed load of 40kN/m which includes the self weight, 12M
    - (i) Evaluate the extreme fibre stresses at the mid span section using the internal resisting couple method and
    - (ii) Calculate the force required in the cable having the same eccentricity to balance a total load of 50kN/m on the beam.

**UNIT-III**

6. A post tensioned prestressed beam of rectangular section 250mm wide is to be designed for an imposed load of 12kN/m, uniformly distributed on a span of 12m. The stress in concrete must not exceed  $17\text{N/mm}^2$  in compression or  $1.4\text{N/mm}^2$  in tension at any time and the loss of prestress may be assumed to be 15%. Calculate  
a) the minimum possible depth of the beam b) for the section provided, the minimum prestressing force and the corresponding eccentricity 12M

**(OR)**

7. A pretensioned beam is prestressed using 5mm diameter wires with an initial stress of 80% of the ultimate tensile strength of the steel ( $f_{pu}=1600\text{N/mm}^2$ ). The cube strength of the concrete at transfer is  $30\text{N/mm}^2$ . Calculate the  
a) Transmission length b) compute the bond stress at  $1/4^{\text{th}}$  and  $1/2$  of the transmission length from the end 12M

**UNIT-IV**

8. A rectangular pretensioned concrete beam has a breadth of 100mm and depth of 230mm and the prestress after all the losses have occurred is  $12\text{N/mm}^2$  at the soffit and zero at the top. The beam is incorporated in a composite T-beam by casting a top flange of breadth 300mm and depth 50mm. Calculate the maximum uniformly distributed live load that can be supported on a simply supported span of 4.5m without any tensile stresses occurring if  
a) the slab is externally supported while casting and b) the pretensioned beam supports the weight of slab while casting. 12M

**(OR)**

9. A composite T-beam is made up of a pretensioned rib of 120mm wide and 250mm deep and a cast in situ slab 400mm wide and 45mm thick having a modulus of elasticity of  $30\text{ kN/mm}^2$ . If the differential shrinkage is  $100 \times 10^{-6}$  unit, determine the shrinkage stresses developed in the precast and cast in situ units 12M

**UNIT-V**

10. Derive deflection equations due to prestressing force when 12M  
(i) The prestressing cable is parabolic with  $e_{\text{ends}} = 0$ ,  $e_{\text{centre}} = e$ .  
(ii) The prestressing cable is linearly varying with  $e_{\text{ends}} = 0$ ,  $e_{\text{centre}} = e$ .

**(OR)**

11. Explain prediction of long term deflections of prestressed concrete members 12M

**Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) Define hazardous waste.
- b) What is the purpose of neutralization?
- c) What happens when a highly organic wastewater is discharged in to a stream?
- d) Give any two methods for the removal of colour of paper and pulp industry wastewater.
- e) What is meant by Common Effluent Treatment Plant?
- f) Write any four typical characteristics of complex fertilizer plant wastes.
- g) What is the importance of BOD/COD ratio in deciding method of treatment of industrial wastewater?
- h) List four major operations in integrated steel plant.
- i) What are the products of fractional distillation of crude oil?
- j) How antibiotics are produced?

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

2. Explain various characteristics of Industrial wastewater. 12M
- (OR)**
3. a) What are the various sources of bio-medical wastes? Discuss the risks involved with bio-medical wastes. 6M
- b) Explain classification of hazardous wastes with suitable examples. 6M

**UNIT-II**

4. a) Explain various methods of volume reduction of industrial wastewater in brief. 6M
- b) What are the advantages of joint treatment of industrial wastes and domestic sewage? 6M
- (OR)**
5. a) Why mixing of wastes are important in equalization tank? List various methods by which mixing can be achieved in equalization tank. 4M
- b) What is proportioning? What are the objectives of proportioning of industrial wastes? 4M
- c) What are the problems associated with joint treatment of industrial wastes and domestic sewage? 4M

**UNIT-III**

6. Explain with suitable examples, the effects of industrial pollutants on receiving streams. 12M
- (OR)**
7. a) Explain applications and limitations of municipal wastewater in industries. 6M
- b) Write a note on recirculation of industrial wastewater giving appropriate examples. 6M

# AR13

**CODE: 13CE3021**

**SET-1**

## UNIT-IV

8. a) Explain various treatment options for wastewater from a dairy industry. 6M  
b) With suitable flow diagrams explain how you manage cotton and woollen textile mill wastes. 6M

**(OR)**

9. a) How are the liquid wastes from an oil refinery managed? 8M  
b) Draw a neat flow diagram for the manufacturing process of Kraft pulp and paper mill and explain recovery of black liquor. 4M

## UNIT-V

10. What are the advantages and limitations of Common Effluent Treatment Plants? 12M  
**(OR)**  
11. a) Write a short note on suitability of Common Effluent Treatment Plants. 4M  
b) Discuss various effluent disposal methods. 8M

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# AR13

CODE: 13ME3025

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

III B.Tech II Semester Regular / Supplementary Examinations, April-2017

## AUTOMOBILE ENGINEERING (Mechanical Engineering)

Time: 3 Hours

Max Marks: 70

### PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What is the objective of lubrication?  
b) What is the function of carburetor?  
c) What are different types of nozzles?  
d) What is the function of pressure cap in the water cooling system?  
e) What are the materials used for contact breaker in a battery ignition system?  
f) What are the types of starting motor switches?  
g) What is the function of universal joint in transmission system?  
h) Define king pin inclination.  
i) What is the function of shock absorber in suspension system?  
j) What are the parts of hydraulic braking system?

### PART-B

Answer one question from each unit

[5x12=60M]

#### UNIT-I

2. a) Write the advantages and disadvantages of rear wheel drive. 6M  
b) Explain rotor lubricating oil pump with neat sketch 6M  
(OR)
3. a) Explain wet sump lubrication system with neat sketch 8M  
b) Define Turbo charging and super charging. 4M

#### UNIT-II

4. a) Explain A.C. Mechanical Fuel Pump with neat sketch 6M  
b) What are the advantages of petrol injection over carburetor method? 6M  
(OR)
5. a) Explain light duty air cleaners. 6M  
b) What are the types of fuel injection system? Explain common rail fuel injection system? 6M

#### UNIT-III

6. a) Explain pump circulated water cooling system with neat sketch 8M  
b) What are the requirements of Anti freeze solutions? 4M  
(OR)

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CODE: 13ME3025

SET-2

7. a) Explain battery ignition system with neat sketch. 6M  
b) Explain centrifugal spark advancing mechanism. 6M

## UNIT-IV

8. a) Explain torque converter with neat sketch. 6M  
b) Explain the mechanism of wind screen wiper with sketch 6M  
(OR)  
9. a) Explain single plate clutch with neat sketch 6M  
b) Explain sliding mesh gear box 6M

## UNIT-V

10. a) Explain mechanical braking system. 6M  
b) What are the requirements of braking fluid? 6M  
(OR)  
11. a) Explain Ackerman steering gear mechanism 6M  
b) Explain telescopic type shock absorber with neat sketch 6M



# AR13

CODE: 13CS3024

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

III B.Tech II Semester Regular Examinations, April-2017

## SOFTWARE PROJECT MANAGEMENT (Computer Science Engineering)

Time: 3 Hours

Max Marks: 70

### PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) List the parameters of Software Economics  
b) Define Quality of a product  
c) What is a Meta process  
d) What is RTE?  
e) List any four Software Process Workflows.  
f) What are Minor Milestones?  
g) Define PRA?  
h) What is the purpose of software architecture team?  
i) List the Quality Indicators.  
j) What are the two dimensions of discriminating factors?

### PART-B

Answer one question from each unit

[5x12=60M]

#### UNIT-I

2. Explain the evolution of waterfall model in detail 12M  
(OR)
3. a) How do you define Software Economics? Explain modern software economics. 6M  
b) Explain briefly about Pragmatic software cost estimation 6M

#### UNIT-II

4. a) What are the key practices that improve overall software quality? 6M  
b) Write about the top five principles of a modern process. 6M  
(OR)
5. a) Explain the first two phases of the life-cycle process. 6M  
b) Explain construction and Transition Phases. 6M

#### UNIT-III

6. a) What is a model? Explain about technical perspective of model-based architecture. 6M  
b) Draw and explain the workflow of iteration in workflows of the process. 6M  
(OR)
7. Write about 12M  
a) Major milestones  
b) Minor milestones  
c) Periodic status assessments

**UNIT-IV**

- |    |    |   |           |
|----|----|---|-----------|
| 8. | a) | Discuss the conventional work breakdown structure issues. | <b>8M</b> |
|    | b) | Discuss the Planning Guidelines                           | <b>4M</b> |

**(OR)**

- |    |  |   |            |
|----|--|---|------------|
| 9. |  | Explain in detail about Project Organizations | <b>12M</b> |
|----|--|---|------------|

**UNIT-V**

- |     |  |                                    |            |
|-----|--|------------------------------------|------------|
| 10. |  | Explain Briefly about Core Metrics | <b>12M</b> |
|-----|--|------------------------------------|------------|

**(OR)**

- |     |  |   |            |
|-----|--|---|------------|
| 11. |  | Explain Briefly about CCPDS-R Case study. | <b>12M</b> |
|-----|--|---|------------|

# AR13

CODE: 13CS3025

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

III B.Tech II Semester Supplementary Examinations, April-2017

## ADVANCED COMPUTER ARCHITECTURE (Computer Science Engineering)

Time: 3 Hours

Max Marks: 70

### PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Define a Multiprocessors and list out different types of Multiprocessors
- b) What is Locality of reference
- c) What are the steps taken when interrupts occur
- d) Explain Various classifications of Parallel processors
- e) Distinguish static RAM and dynamic RAM
- f) What are the steps required for a pipelined processor
- g) What is cache coherence?
- h) Define Miss rate
- i) What is blocking and non-blocking networks.
- j) Define Multi Vector Computer

### PART-B

Answer one question from each unit

[5x12=60M]

#### UNIT-I

2. a) Explain Memory coherence in shared memory multiprocessor 6M
  - b) What are the factors that influence the performance of a processor 6M
- (OR)
3. a) What are the different elements of Modern computers? Explain briefly 6M
  - b) Give brief note on MIMD Computers 6M

#### UNIT-II

4. a) What is the purpose of Distributed multiprocessor and explain briefly 6M
  - b) Explain memory Hierarchy briefly 6M
- (OR)
5. a) What is multiprocessor Cache Coherence 6M
  - b) Differentiate Instruction set architecture and computer architecture 6M

# AR13

CODE: 13CS3025

SET-2

## UNIT-III

6. Discuss following under Linear and Non Linear pipeline processors 12M  
a) Clocking and Timing control  
b) Speedup  
c) Efficiency and Throughput  
(OR)
7. a) Explain Synchronous and Asynchronous models of pipeline 6M  
b) Explain Nonlinear pipelining and reservation tables 6M

## UNIT-IV

8. a) Compare Multiprocessor with time shared bus and multiprocessor with cross-bar switch 6M  
b) Explain different Shared memory multiprocessors 6M  
(OR)
9. a) What is a Vector processing and explain different vector instruction types 7M  
b) Explain Multi port memory Inter connection structure 5M

## UNIT-V

10. a) What is Deadlock Virtual Channel and how it works? 6M  
b) Discuss about Message Routing Schemes 6M  
(OR)
11. a) Explain Snoopy bus protocol under Cache Coherence 7M  
b) Explain different Flow Control Strategies. 5M

# AR13

CODE: 13IT3006

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)

III B.Tech II Semester Regular / Supplementary Examinations, April-2017

## IMAGE PROCESSING (Information Technology)

Time: 3 Hours

Max Marks: 70

### PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) In an M X N image, What is the meant for M and N?  
b) What do you meant by Gray level?  
c) List the 2 categories of image enhancement.  
d) What is meant by histogram equalization?  
e) What are the two properties used for establishing similarity of edge pixels?  
f) What is Data Compression?  
g) What are boundary descriptors?  
h) Define coding efficiency?  
i) Explain the categories of digital storage?  
j) What is point processing?

### PART-B

Answer one question from each unit

[5x12=60M]

#### UNIT-I

2. a) What are the fundamental steps in digital image processing. Elaborate each step in detail with suitable block diagram. 8M  
b) What is Digital Image? How it is represented? 4M  
(OR)
3. a) What do you mean by adjacency and connectivity? Illustrate various types of adjacencies among pixels. 8M  
b) What is aliasing in images and how it can be avoided? 4M

#### UNIT-II

4. Discuss the image enhancement using smoothing and sharpening spatial filters with an emphasis given to the mechanics of spatial filtering. 12M  
(OR)
5. a) What is the objective of image enhancement and mention different image enhancement techniques? 4M  
b) Write a short note on enhancement using arithmetic operations. 8M

# AR13

CODE: 13IT3006

SET-2

## UNIT-III

6. a) What are different types of redundancies in digital images? Explain how these can be exploited to achieve compression? 6M  
b) Explain Bit-Plane coding image compression model. 6M  
(OR)
7. a) With neat block diagram explain a lossless predictive coding model used for image compression. 6M  
b) What are the various coding techniques for error-free compression and discuss in detail Huff-man coding. 6M

## UNIT-IV

8. a) Define the opening and closing. List the properties of opening and closing operations. 8M  
b) Explain the concept of Erosion operator with examples. 4M  
(OR)
9. Explain the following concepts in morphology. i) Boundary extraction 12M  
ii) Region filling

## UNIT-V

10. a) What is canny edge detector? Explain how the algorithm used to detect edges. 8M  
b) Define Edge of an Image. Give its Types. 4M  
(OR)
11. a) What is image segmentation? What are the applications of image segmentation? 4M  
b) Explain the working of region based segmentation. 8M