

AR13

CODE: 13CE3020

SET-1

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

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

EARTHQUAKE RESISTANT DESIGN (CIVIL ENGINEERING)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. Briefly explain the following
 - a) Lumped mass
 - b) MDOF systems
 - c) Earthquake analysis
 - d) Role of SDOF
 - e) What are the factors incorporated in latest IS 1893 – 2002 part-1
 - f) Assumptions in the Earthquake design
 - g) Engineering Seismology
 - h) Elastic rebound theory
 - i) Codal detailing provisions
 - j) Code for ductile detailing of structure in India

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2.
 - a) Explain the advantages of MODF over SDOF systems\.
 - b) Briefly explain the following
 - (i) Undamped Vibrations
 - (ii) SDOF Systems

(OR)
3.
 - a) State the difference between static and dynamic loads.
 - b) discuss how the vibrations of motion is influenced by the above loads.

UNIT-II

4. Derive the equation for the single degree of freedom system for damped system. Hence draw the curve for displacement vs time for an over damped system.

(OR)
5. Give a detailed note on the earthquake response analysis of multi storyed building.

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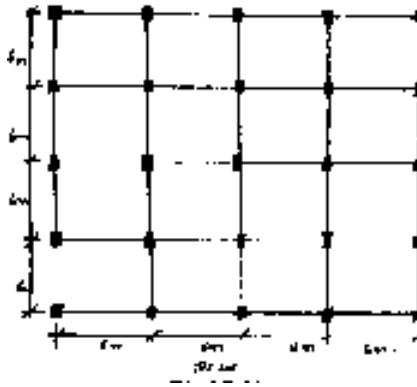
UNIT-III

6. Calculate the seismic force distribution along height for a 5 storey railway station building at New Delhi with the following details. **12 M**

Building height: $3.5 \times 5 = 17.5$ m soil; Base width = 25m ; total DL floors & roof 12500kN ; total LL on floors 5000kN; total LL on roof 1875kN.

(OR)

7. A ten storey OMRF building has plan dimensions as shown below. The storey height is 3 mts. The dead load per unit area of the floor consisting of the floor slab, finishes etc is 4 kN/m^2 weight of the partitions on the floor can be assumed to be 2 kN/m^2 . The intensity of the live load on each floor is 3 kN/m^2 . The soil below the foundation is hard and the building is located in Delhi. Determine the seismic force and shear forces at different floor levels. Take column of sizes 0.3×0.6 m **12 M**



UNIT-IV

8. Sketch and explain the different types of waves generated by an earthquake and their effects on structures. **12 M**

(OR)

9. a) Write short notes on Earthquake phenomenon. **6 M**
b) Explain about Source, Focus and Epic Center of Earthquake in detail. **6 M**

UNIT-V

10. List out the various structural irregularities which affect the performance of the RC building during earthquakes. **12 M**

(OR)

11. What are the different types of analysis that can be done to measure seismic load on a RCC framed structure. **12 M**

**III B.Tech II Semester Supplementary Examinations, July- 2016
Industrial Waste and Waste Water Management
(Elective I)
(Civil Engineering)****Time : 3 Hours****Max marks : 70****PART A****ANSWER ALL THE QUESTIONS****[1 x 10 = 10 M]**

1.
 - a) List down various types of wastes ?
 - b) list down the sources of pollution of waste water ?
 - c) Distinguish between municipal waste water and industrial waste water ?
 - d) What is neutralization technique in industrial waste water treatment ?
 - e) What is equalization technique in industrial waste water treatment ?
 - f) What are the strategies in industrial waste water management ?
 - g) What do you understand about zero discharge in industrial waste water management ?
 - h) What are the major pollutants in waste water generated from textile industry ?
 - i) List down any three limitations in common effluent treatment plant ?
 - j) List down important physical treatment methods being adopted in industrial waste water treatment ?

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

2. Elaborate on physical and chemical properties of industrial waste ?
(OR)

3. Give a brief note on treatment and disposal of industrial waste ?

UNIT-II

4. Give a brief note on equalization in industrial waste water treatment ?
(OR)

5. Elaborate on basic theories of industrial waste water management ?

UNIT-III

6. List out the disposal methods of industrial waste water ? Elaborate on problems associated with disposal of industrial waste water in to water bodies ?
(OR)

7. Present any case study of disposal of industrial waste water in to water bodies and its impact on the environment in your region ?

UNIT-IV

8.
 - a) Present schematic diagram of manufacturing process of pulp and paper industry and operations that generate waste water ?
 - b)Elaborate on treatment of waste water pulp and paper industry ?
(OR)

9.
 - a) Elaborate on treatment of waste water of tanneries industry ?
 - b) Elaborate on treatment of waste water of petrochemical refinery industry ?

UNIT-V

10. Give a brief note on advantages of common effluent treatment plant ?
(OR)

11. Give a brief note on disposal methods of industrial effluents ?

**PRESTRESSED CONCRETE
(Civil Engineering)****Time: 3 Hours****Max Marks: 70****PART-A****ANSWER ALL QUESTIONS****[1 x 10 = 10 M]**

1. a) Minimum grade of concrete is used in Pre-stressed Concrete members
- b) Define Post- tensioning system
- c) Write the expression for loss of stress due to elastic Shortening
- d) Resultant stress in the cross section of a beam at the bottom fibres subjected to eccentric straight tendon and only live loads.
- e) The maximum effective reinforcement ratio of a bonded pre-stressed concrete beam at failure according to IS 1343
- f) In the anchorage zone of post-tensioned PSC members, the stress distribution is
- g) The thickness of web in PSC girders is determined from the considerations of what strength
- h) The minimum clear cover to cables in a post –tensioned PSC girders
- i) Maximum permissible final deflection of a beam should not exceed
- j) Write any one reason to control the deflection in PSC members.

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

2. (a) Distinguish between pre-tensioning and post-tensioning. 6M
- (b) Explain why high strength steel and high strength concrete are used in pre-stressed concrete. 6M

(OR)

3. (a) Clearly explain the reasons why mild steel bars are not used for pre-stressing. 3M
- (b) List the various Post- tensioning systems and explain any one with neat sketch 9M

UNIT-II

4. (a) List various losses of pressure that occur in pre-tensioned and post-tensioned beams, giving their percentage in general. 5M
- (b) A post-tensioned concrete beam, 100 mm wide and 300 mm deep, spanning over 10 m is stressed by successive tensioning and anchoring of three cables 1, 2 and 3 respectively. The cross sectional area of each cable is 200 mm² and initial stress in cable is 1200 N/mm². Modular ratio = 6.0. The first cable is parabolic with an eccentricity of 50 mm below centroidal axis at the centre of span and 50 mm above centroidal axis at support sections. The second cable is parabolic with zero eccentricity at supports and an eccentricity of 50 mm at the centre of span. The third cable is straight with a uniform eccentricity of 50 mm below centroidal axis. Estimate percentage loss of stress due to friction in each of the cables, if they are successively tensioned and anchored. Assume $\mu=0.35$ and $k=0.0015$ perm 7M

(OR)

5. (a) How do you estimate the loss of prestress due to: 4 M
 - i) Elastic deformation ii) Shrinkage iii) Creep of concrete iv) Relaxation of steel
- (b) A pre-stressed concrete beam of symmetrical I-section spanning 8 m has its width and thickness of flanges equal to 200 mm and 60 mm respectively. The overall depth of beam is 400 mm. The thickness of web is 80 mm. The beam is pre-stressed by an eccentric straight cable with an eccentricity of 150 mm throughout with an effective force of 100 kN. The live load on the beam is 2 kN/m. Draw the stress distribution diagram at the central section for Prestress+self weight+Live load. 8M

UNIT-III

6. A Pre-tensioned, T-section has a flanges 1200 mm wide and 150 mm thick. The width and depth of the rib are 150 and 1500mm respectively. The high-tensile steel has an area of 4700 mm^2 and is located at an effective depth of 1600 mm. If the characteristic cube strength of the concrete and the tensile strength of steel are 40 N/mm^2 and 1600 N/mm^2 respectively. Calculate the flexural strength of the I-section. 12M

(OR)

7. (a) Explain different methods of improving the shear strength resistance of P.S.C. members. 4M
- (b) The end block of a pre-stressed concrete beam of rectangular section, 100 mm wide and 200 mm deep Using Guyons method compute the position and magnitude of maximum tensile stress and bursting tension for the end block with concentric anchoring force of 100kN transmitting to concrete by a distribution plate 100 mm wide and 50 mm deep 8M

UNIT-IV

8. A Composite T- beam is made up of pre-tensioned rib 100 mm wide and 200 mm deep , and a cast in situ slab 400 mm wide and 40 mm thick having a modulus of elasticity 28 kN/mm^2 . If the differential shrinkage is 100×10^{-6} units . Determine the shrinkage stresses developed in pre-cast and cast- in situ units. 12M

(OR)

9. A pre stressed pre tensioned beam of rectangular section has a breadth of 100 mm and depth of 200 mm with an effective span of 5 m is prestressed by tendon with their centroids coincide with the bottom kern. The initial force in the tendon is 150 kN. The loss of prestress may be assumed to be 15% .The beam is incorporated in a composite T-beam by casting top flange of breadth 400 mm and thickness 40 mm. if composite beam supports a live load of 8 kN/m^2 . Compute the resultant stresses developed in the precast pre-tensioned beam and cast in situ slab for the unpropped case . If the modulus of elasticity of concrete in slab and beam are different assume $E_c = 35 \text{ kN/mm}^2$ 12M

UNIT-V

10. (a) Explain the difference between short term and long term deflections in P.S.C members. 4M
- (b) A concrete beam having rectangular section is 100 mm wide and 300 mm deep is pre-stressed by a parabolic cable carrying an initial force of 240 kN. The cable has an eccentricity of 50 mm at centre of span and concentric at supports. If the span of beam is 10 m and live load is 2 kN/m , estimate the short term deflection at centre of span. Assume $E = 38 \text{ kN/mm}^2$ ϕ (creep coefficient) as 2.0 and loss of prestress is 20% of initial stress after 6 months. Estimate long term deflections at the centre of span at this stage, assuming that dead load and live load are simultaneously applied the release of pre-stress. Density of concrete is 24 kN/m^3 . 8M

(OR)

11. (a) List the various factors influencing the deflections of pre-stressed concrete members. 6M
- (b) Explain with examples the effect of tendon profile on deflections of pre-stressed concrete members. 6M

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

1. a) What are the various ways of representing negative numbers? Give Examples.
- b) Write about bus structure.
- c) Explain shift micro operations?
- d) Define instruction cycle.
- e) Differentiate SRAM and DRAM.
- f) What is the use of virtual memory?
- g) Define peripheral processing.
- h) Write about programmed I/O technique.
- i) Explain about vector processor.
- j) Write about multiprocessor characteristics.

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

2. a) List out the functional units in computer and explain in detail with diagrams 6M
- b) Briefly explain the operational concepts in a computer? 6M

(OR)

3. a) Explain about fixed point representation with example. 6M
- b) Describe the role of system software to improve the performance of a computer. 6M

UNIT-II

4. a) Explain about applications of logical micro operations? 6M
- b) Design a 4-bit binary decremter using half adders and explain its functionality. 6M

(OR)

5. a) Design a 4-bit adder/sub tractor circuit using full adders and explain its function. 6M
- b) Explain about various addressing modes with examples. 6M

UNIT-III

6. a) What are the physical characteristics of disk system and write short notes on Magnetic Disks. 6M
- b) Discuss about mapping from virtual address to physical address using pages. 6M

(OR)

7. a) What is a mapping function? List out and explain the different Mapping techniques? 6M
- b) Write about the memory hierarchy and explain the organization of main memory 6M

UNIT-IV

8. a) Explain about I/O accessing and data transfer techniques. 12M

(OR)

9. a) Explain about I/O channel and processor? 6M
- b) Briefly give the overview of different I/O devices. 6M

UNIT-V

10. a) List and explain different interconnection structures used in multiprocessors? 6M
- b) Explain different types of parallel processors? 6M

(OR)

11. a) Write briefly about Inter-Processor Arbitration Techniques. 6M
- b) Explain about RISC pipeline? 6M

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

1. a) 10 units of product x_1 costs Rs. 40 while 5 units of product x_2 costs Rs.25 .What is the objective function of this information will be?
- b) Define surplus variable.
- c) What is the degeneracy in Linear Programming problem?
- d) How do you convert maximal assignment problem into minimal assignment?
- e) Write one assumption of job sequencing problem?
- f) Mean arrival rate at a telephone booth is Poisson with 6 per hour and average phone call time is distributed exponentially at 3 minutes. Then what is the probability that a person arriving to the booth will have to wait?
- g) Find present worth factor for second year if money value changes with time at 10%?
- h) When the game is said to be strictly determinable?
- i) What are the different times estimates in PERT?
- j) Define slack.

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

2. a Solve graphically **8M**
 Maximize $Z=50x_1 + 60x_2$
 Subject to $x_1 + x_2 \leq 12$
 $2x_1 + 3x_2 \geq 60$
 $x_1, x_2 \geq 0$
 - b Write the characteristics of standard LPP. **4M**
- (OR)**
3. Food x contains 6 units of vitamin A per gram and 7 units of vitamin B per gram and costs Rs. 12 per gram . Food Y contains 8 units of vitamin A per gram and 12 units of vitamin B and costs Rs. 20 per gram. The daily minimum requirements of vitamin A and vitamin B are 100 units and 120 units respectively. Find the minimum cost of product mix. Solve by Big M method? **12M**

UNIT-II

4. A company has 3 factories A,B and C which supply units to warehouses X,Y and Z every month. The capacities of the factories are 60 ,70 and 80 units at A,B and C respectively .The requirements of X,Y and Z per month are 50,80 and 80 units respectively. Transportation cost per unit in rupees is given in the following table. Find the optimum cost of transportation **12M**

	X	Y	Z
A	8	7	5
B	6	8	9
C	9	6	5

(OR)

5. a Explain Hungarian method to solve the assignment problem. **8M**
- b Write a short note on unbalanced assignment **4M**

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UNIT-III

6. An old shopping complex is intended to be renovated. This is done in two phases namely repairing the patches etc., and then white washing. The time estimate in hours for each of these floors is given below. **12M**

	Floors				
	1	2	3	4	5
Repair	20	28	25	20	22
White wash	24	26	15	27	15

Find the sequence that minimises the idle time of repairing and white washing jobs. Also find the total elapsed time. Assume no passing and both come and go at the same time and find idle time of each jobs

(OR)

7. In a railway station only one train is handled at a time. The yard can accommodate only two trains to wait. Arrival rate of trains is 6 per hour and the railway station can handle them at the rate of 12 per hour. Find the steady state probabilities for the various number of trains in the system. Also find the average waiting time of a newly arriving train. **12M**

UNIT-IV

8. A manufacturer offered 2 machines A and B. A is priced at Rs. 5000 and running costs are estimated at Rs.800 for each of the first 5 years, increasing by Rs.200 per year in the sixth and subsequent years. Machine B which has the same capacity as A with Rs.2500 but will have running cost of Rs.1200 per year for 6 years, increasing by Rs.200 per year thereafter. If money is worth 10% per year, which machine should be purchased?(Assume that machines will eventually be sold for scrap at a negligible price) **12M**

(OR)

9. Use the graphical method to solve the game **12M**

Player A	Player B	
	A1	A2
	A3	A4
	A5	
	B1	B2
	-6	7
	4	-5
	-1	-2
	-2	5
	7	-6

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UNIT-V

10. A project has the following data 12M

Job	Optimistic time	Most likely time	Pessimistic time
(1,2)	3	4	5
(1,3)	1	2	3
(2,3)	6	8	10
(2,4)	2	5	8
(2,5)	3	5	7
(3,4)	6	9	12
(4,7)	1	1	1
(5,6)	2	5	8
(6,7)	4	8	12

- (i) Draw the net work (ii) Determine the critical path and the project length

(OR)

11. A project has the following data 12M

Activity	A	B	C	D	E	F	G	H
t_o	4	8	4	1	2	4	10	18
t_m	5	12	5	3	2	5	14	20
t_p	6	16	12	5	2	6	18	34

$A < C$; $B < D$; $A, D < E$; $B < F, C, E, F < G$; $G < H$

- (i) Draw the net work, (ii) Find the critical path and the expected time of completion of the project?

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SET 1

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

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

MICRO PROCESSOR AND MICRO CONTROLLERS (Electronics and Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART – A

Answer all Questions

[1 x 10 = 10]

1. a) What is the difference between Microprocessor and Microcontroller?
b) What are the basic modes of operation of 8255?
c) Upon Reset what is the value of SP
d) Define is an assembler directive
e) Distinguish between the memories mapped I/O peripheral I/O
f) What is DF? If it is set what happened
g) What is the use of 8251 chip?
h) What is the purpose of control word written to control register in 8255?
i) List the interrupts in 8051
j) Differentiate the xchd and swap instructions

PART-B

Answer one question from each Unit

[5 x 12=60]

UNIT-I

2. Draw and explain the architecture of 8086 in detail 12M
(OR)
3. a) What is meant by addressing mode? Explain the different addressing modes of 8086 with syntax & example 6M
b) What is meant by segmentation and explain the procedure for finding the Effective address 6M

UNIT-II

4. Write an ALP to perform Arithmetic operations (add, sub, mul & div) on 8-bit data and store the result in consecutive memory locations. Assume DS: 3000 SI: 2000 12M
(OR)
5. a) What is an assembler directive? Explain the following assembler directive with
i) PUBLIC ii) PROC iii) MACRO 6M
b) Explain the execution of PUSH and POP instructions with respect to stack Addressing mode. 6M

UNIT-III

6. a) Briefly explain the concept of memory paging in 80386 microprocessor with Suitable schematic diagram 6M
b) List all the additional features that the 80386 microprocessor has over 8086 6M
(OR)
7. a) Describe three major additions or improvements that the 80486 processor has over 80386 processor 6M
b) How are the tasks in 80386 systems protected from each other? 6M

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UNIT-IV

8. Sketch and explain the interface of 8279 to the 8086 microprocessor in minimum 12M mode. Interface 8x8 keypad and 16x 7 Seg LED display. Write an 8086-assembly program to read the key codes of keys and display TEKKALI

(OR)

9. a).Specify handshaking signals and their functions if port A of 8255 is set-up as input port in mode 1. 6M
b) With a neat block diagram, explain in detail the internal architecture of 8255 and its registers 6M

UNIT-V

10. a) Draw the block diagram of 8051 and explain in detail 8M
b) Sketch the Internal Ram of 8051 and explain 4M
- (OR)**
11. a) Briefly explain the addressing modes of 8051 with an example 8M
b) Draw and explain the PSW of 8051 and explain 4M

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

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

NETWORK SECURITY AND CRYPTOGRAPHY
(Computer Science and Engineering)

Time: 3 Hours

Max. Marks: 70

PART-A

Answer all the questions

[10 x 1=10]

1. a) Define threat and attack
b) Differentiate stream and block cipher?
c) How is the S-box constructed?
d) If a bit error occurs in plain text block M1, how far does the error propagate in CBC mode of DES?
e) Define weak collision property of a hash function
f) What are the properties a digital signature should have?
g) Why the leading two octets of message digest are stored in PGP message along with encrypted message digest?
h) List the advantages and disadvantages application level gateway?
i) What does meant by a trusted system?
j) Define worm?

PART-B

Answer one question from each

[5 x 12=60]

UNIT-I

2. a) Explain the various security attacks? 4M
b) Discuss any four Substitution Techniques and list their merits and demerits. 8M
- (OR)**
3. a) Discuss in detail about format string attacks and SQL injection? 6M
b) What is hijacking? Explain about the TCP Session hijacking? 6M

UNIT-II

4. a) List the important features of Blowfish and explain the Encryption and decryption process in Blowfish algorithm with neat diagrams. 7M
b) Explain various ways of key distribution with neat sketch. 5M
- (OR)**
5. a) Discuss the basic uses of MAC and Hash Function with neat sketch? 5M
b) Users A and B use the Diffie Hellman key exchange technique, a common prime $q=11$ and a primitive root $\alpha=7$. 7M
 - (i) If user A has private key $X_A=3$. What is A's public key Y_A ?
 - (ii) If user B has private key $X_B=6$ What is B's public key Y_B ?
 - (iii) What is the shared secret key? Also write the algorithm.

UNIT-III

6. a) Explain the differences between Kerberos version4 and version5 in detail. 6M
b) Draw the X.509 certificate format and explain each field. 6M
(OR)
7. a) Explain about various MIME transfer encoding techniques. 5M
b) List and explain various content types in MIME and S/MIME. 6M

UNIT-IV

8. a) Explain the various steps involved in SSL record protocol and handshake protocol. 6M
b) List the services provided by IPSec? Explain about encapsulation security payload? 6M
(OR)
9. a) What is SET? How does SET work? Discuss the dual signature purpose in SET ? 6M
b) What is security association? What are parameters used to define security association in security association database entry? 6M

UNIT-V

10. a) Explain the architecture of distributed intrusion detection with neat sketch? 6M
b) Explain the structure and various phases of virus? 6M
(OR)
11. a) Explain characteristics of firewalls and it's types with neat sketch. 7M
b) Explain about the password protection system. 5M

COMPUTER NETWORKS (Information Technology)

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

PART-A

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

1. a) What are the advantages of distributed processing?
- b) Differentiate between internet and Internet.
- c) What is Wavelength-Division Multiplexing?
- d) Define circuit-switched network.
- e) What kind of error is undetectable by the checksum?
- f) Write down three protocols for noisy channels.
- g) Compare a random access protocol with a channelizing protocol.
- h) What is the relation between a switch and a bridge?
- i) Differentiate between piconet and scattetnet.
- j) Define virtual LAN.

PART-B

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

UNIT-I

2. Explain TCP/IP protocol suite. [12 M]

(OR)

3. a) What is topology? Categorize the four basic topologies in terms of line configuration. [6M]
- b) Define a network. What are the criteria necessary for an effective and efficient network? Explain each one briefly. [6M]

UNIT-II

4. What is frequency division multiplexing? Explain frequency division multiplexing and demultiplexing process with an example. [12 M]

(OR)

5. Write a short notes on
- a) Packet switching [6 M]
- b) Circuit switching [6 M]

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UNIT-III

6. Explain the error correction and detection techniques used in linear block coding. [12 M]

(OR)

7. Give the detailed description of point to point protocol frame format and transition phases. [12 M]

UNIT-IV

8. What is pure ALOHA? Explain the procedure for pure ALOHA protocol with an example. [12 M]

(OR)

9. a) What is the difference between Thicknet and Cheapernet? [6 M]
b) What are the common Standard and Gigabit Ethernet implementations? [6 M]

UNIT-V

10. Discuss about five categories of connecting devices. [12 M]

(OR)

11. Explain the Satellite Networks with example. [12 M]