AR13

CODE: 13CE3012 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015
DESIGN AND DRAWING OF CONCRETE STRUTURES -I
(CIVIL ENGINEERING)

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

PART-A

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

1. a) Define balanced section.
b) Write about transformed section.
c) Define the term ultimate load.
d) Write about partial safety factors for materials.
e) Differentiate between local bond and flexural bond.
f) When do you go for doubly reinforced beam?
g) Write about maximum percentage of reinforcement for compression members as per IS code.
h) Write the effective length of a Column, if the column is fixed at both ends.
i) Differentiate between one way and two way slab.
j) Define the term development length.

PART – B

Answer One Question from each unit **[5 x 12 = 60 M]**

UNIT-I

2. a) Derive expressions for the position of neutral axis and moment of resistance of a balanced rectangular section from first principles. [6M]
b) A rectangular beam 230 mm wide and 500mm effective depth is reinforced with 3 no's of 16 mm diameter bars. Calculate the stresses developed in the materials when bending moment of 50 KN-m is applied. Assume m=13.33 [6M]

(OR)

3. a) A beam section 300 mm wide and 500 mm deep is reinforced with 4 bars of 25 mm diameter in the tension zone and 4 bars of 16 mm diameter in the compression zone. The effective cover to the reinforcement is 40 mm. Determine the moment of resistance of the section, if M20 grade concrete and Fe415 grade steels are used. [10M]
b) Write the advantages of compressive reinforcement if you provide. [2M]

UNIT-II

4.a) Derive the stress block parameters for a rectangular section. [5M]
b) Determine the ultimate moment of resistance of a rectangular section of size 230 mm x 450 mm effective depth. It is reinforced with 3 numbers 20 mm diameter bars in tension zone. Adopt M20 grade concrete & fe415 grade steel. [7M]

(OR)

5 a) Explain stress strain curves of steel and concrete. [6M]
b) Write about difference between working stress method and limit state method. [6M]

UNIT-III

6. An isolated T- beam of flange width 1500 mm and rib width is 300 mm is loaded with 20 KN/m inclusive of its self weight. The span of the beam is 6.0 m and simply supported. Thickness of slab is 120 mm. Design the beam for flexure. Use M20 grade concrete and Fe415 grade steel. [12M]

(OR)

7. A reinforced concrete beam 250mm wide & 400mm effective depth subjected to ultimate design shear force of 140kN at the supports. The percentage of tensile reinforcement at the supports is 0.75. **Design the shear reinforcement** at the supports & also design the minimum shear reinforcement at the mid span for a simply supported beam of span 6.0 m. Assume M20 grade concrete & Fe250grade steel. [12M]

UNIT-IV

8. a) Define the following. [4M]

(i) Unsupported length (ii) Effective Length

b) An RCC column is 400mm x 450mm and has to carry a factored axial load of 2000 KN. The unsupported length of column is 3.6m. If the column is effectively held in position and restrained against rotation in both ends. Find the area of reinforcement required. Use M 25 and Fe 415 bars. [8M]

(OR)

9. Determine the reinforcement to be provided in a square column subjected to uni-axial bending with the following data:
Size of the column = 450mm x 450mm
P u = 1800 KN; Mu = 220 KN m
Use M 25 concrete and Fe 415 steel. [12M]

UNIT-V

10. Design a flight slab for doglegged staircase in a hall of size 2.5 m X 5.0 m and height of floor is 3.0 m. Adopt rise and tread of each step as 150 mm and 270 mm respectively. Live load may be taken as 3 KN/m ^{2}. Use M20 grade concrete and fe415 grade steel. The landing slab is supported on sides on 230 mm walls. [12M]

(OR)

11. Design a simply supported one-way slab to suit the following data. Clear span = 3.0 m x 7m, slab supported on load bearing walls 230 mm thick, live load on slab = 3.5 KN/m^2, floor finish = 1.5 KN/m^2. UseM20 grade concrete and fe415 grade steel. [12M]

***

AR13

CODE: 13EE3016 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015

ELECTRICAL MEASUREMENTS
(ELECTRICAL AND ELECTRONICS ENGINEERING)

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

PART-A

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

1. a) What is gravity control?
   b) Define damping torque?
   c) Define phase angle error?
   d) Can a single wattmeter be used to measure reactive power?
   e) What is phantom loading?
   f) Why is friction compensation required in energy meters?
   g) What are the disadvantages of maxwell's bridge
   h) What quantity is measured with carey foster bridge?
   i) Give one application of potentiometer?
   j) Give the difference between flux meter and ballistic galvanometer.

PART-B

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

UNIT-I

2. Explain the working principle and operation of PMMC instrument with a neat diagram [12 M]

(OR)

3. What are different types of errors with instruments? Classify them. [12 M]

UNIT-II

4. (a) Derive the condition for deflection torque in a Wattmeter? [7M]
   (b) A 3-phase 500 V motor load has a power factor of 0.6. Two wattmeters connected to measure the input. They show the input to be 45 KW. Find the reading of each instrument [5M]

(OR)

5 Derive the condition for phase angle error in a current transformer with the help of a phasor diagram [12M]

AR13

CODE: 13EE3016 **SET-1**

UNIT-III

6		With neat sketch explain working of a 3 phase energy meter	[12M]
		(OR)	
7		Explain the construction and working of a power factor meter?	[12 M]

UNIT-IV

8	(a)	How sensitivity analysis can be done using wheatstone bridge. Explain.	[7M]
	(b)	How is insulation resistance measured? Explain.	[5M]
		(OR)	
9	(a)	How are inductance of low Q coils measured. Explain.	[5M]
	(b)	What are the advantages of Hay's Bridge. Explain with the help of a phasor diagram.	[7M]

UNIT-V

10		How can potentiometer circuit used for calibration of various equipment. Explain in detail.	[12M]
		(OR)	
11		How can a hysteresis loop be obtained using CRO for a ring specimen. Explain.	[12M]

***

AR13

CODE: 13ME3015 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015
DESIGN OF MACHINE MEMBERS - II
(MECHANICAL ENGINEERING)

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

PART-A

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

1. a) What is meant by hydrodynamic lubrication?
   b) List the important physical characteristics of a good bearing material.
   c) Define Viscosity index. Why is it used?
   d) Classify crank shafts based on the position of the crank
   e) List the types of piston rings
   f) Why is an idler pulley used in belt drives
   g) What are the advantages of a wire rope over a fiber rope
   h) Identify the formative number of teeth in a helical gear if T is the number of teeth and α is the helix angle
   i) Relate the helix angle with friction angle in a screw jack to ensure self-locking condition
   j) Mention the different types of stresses that are induced in power screws

PART-B

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

UNIT-I

2. (a) How do you express the life of a bearing? What is an average or median life?
   (b) The ball bearings are to be selected for an application in which the radial load is 2000N during 90% of the time and 8000N during the remaining 10%. The shaft is to rotate at 150 rpm. Determine the minimum value of the basic dynamic load rating for 5000 hours of operation with not more than10 percent failures.

(OR)

3. (a) Explain the following terms with reference to journal bearings: (i) Bearing characteristic curve (ii) Bearing modulus
   (b) Design a suitable journal bearing for a centrifugal pump from the following available data: Load on the bearing=13.5 kN, diameter of the journal=80 mm, speed=1440 rpm, Bearing characteristic number at a working temperature of 75^0C=30, permissible bearing pressure intensity=0.7N/mm^2, average atmospheric temperature=30^0C.

UNIT-II

4. Determine the dimensions of an *I* - section connecting rod for a petrol engine for the following data: Diameter of the piston= 110 mm, mass of the reciprocating parts = 2 kg, length of the connecting rod from the centre to centre=325 mm, stroke length=150 mm, R.P.M= 1500 with possible over speed of 2500, compression ratio=4:1 and minimum explosion pressure=2.5N/mm^2.

(OR)

5 Design the various components of the valve gear mechanism for a horizontal diesel engine for the following data: Bore = 140 mm, stroke=270 mm, power=8.25 kW, speed=475 rpm, maximum gas pressure=3.5 N/mm^2. The valve opens 33^0 before ODC and closes 1^0 after IDC. It opens and closes with constant acceleration and deceleration for each half of the lift. The length of the rocker arm on either side of the fulcrum is 150 mm and the induced angle is 160^0. The weight of the vlave is 3N.

UNIT-III

6 Design a cast iron piston for a single acting four stroke engine for the following data: Cylinder bore= 100 mm, stroke=125 mm, maximum Gas pressure=5 N/mm^2, mechanical efficiency = 80%, fuel consumption=0.15 kg per brake power per hour, higher calorific value of fuel=$42X10^3$ kJ/kg, speed=2000rpm. Any other data required for the design may be assumed.

(OR)

7 (a) Mention the factors upon which the coefficient of friction between the belt and the pulley depends.

(b) Determine the width of a belt that transmit 10 kW to a pulley of 300 mm diameter, if the pulley makes 1600 rpm and the coefficient of friction between the belt and the pulley is 0.22. Assume the angle of contact as 210^0, and the maximum tension in the belt is not to exceed 8 N/mm.

UNIT-IV

8 Calculate the power that can be transmitted safely by a pair of spur gears with the data given below. Calculate also the bending stresses induced in the two wheels when the pair transmits this power. Given that the number of teeth in pinion=20, number of teeth in gear=80, module=4 mm, width of the teeth=60 mm, tooth profile=20^0 involute, Allowable bending strength of the material=200 MPa for pinion, and 160 MPa for gear, speed of the pinion=400 rpm, service factor=0.8, lewis form factor=0.154-0.912/T, velocity factor=3/3+v.

(OR)

9 (a) What is a herringbone gear? Where are they used?

(b) A pair of helical gears with 30^0 helix angle is used to transmit 15 kW at 10,000 rpm of the pinion. The velocity ratio is 4:1. Both the gears are to be made of hardened steel of static strength 100 N/mm^2. The gears are 20^0 stub and the pinion is to have 24 teeth. The face width may be taken as 14 times the module. Find the module and face width from the standpoint of strength and check the gears for the wear.

UNIT-V

10 The lead screw of a lathe has ACME threads of 60 mm outside diameter and 8 mm pitch. It supplies drive to tool carriage which needs an axial force of 2 kN. A collar bearing with inner and outer radius as 30 mm and 60 mm respectively is provided. The coefficient of friction for the screw threads is 0.12 and for the collar is 0.10. Find the torque required to drive the screw and the efficiency of the screw.

(OR)

11 Design and draw a screw jack for lifting a safe load of 150 kN through a maximum lift of 350 mm. The elastic strength of the material of the screw may be taken as 240MPa in compression and 160 MPa in shear. The nut is to be made of phosphor bronze for which the elastic strengths in tension, compression and shear are respectively 130, 115, 100 MPa. Bearing pressure between the threads of the screw and the nut may be taken as 18 N/mm^2. Safe crushing stress for the material of the body is 100 MPa. Coefficient of friction for the screw as well as collar may be taken as 0.15.

***

AR13

CODE: 13EC3014 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015

DIGITAL COMMUNICATIONS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

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

PART-A

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

1. a) The main limitation of PCM system is message signal amplitude. Why?
   b) What is the condition to avoid slope overload distortion?
   c) Differentiate BPSK and BFSK.
   d) What is the difference between probability of error and bit error rate?
   e) Differentiate optimum filter and matched filter.
   f) Give the expression of entropy for M independent messages.
   g) Give the mathematical expression of channel capacity for noise free communication system.
   h) Differentiate source and channel coding.
   i) Mention various error detection mechanisms.
   j) Differentiate systematic block code and systematic cyclic code.

PART-B

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

UNIT-I

2. (a) Give the significance of low pass filter before sampling in PCM system
   (b) What are the parameters to be considered for selection of line encoding format? Alternate mark inversion is one of the best line encoding formats. Why? Represent the following binary data using various signaling formats
   i. 1 0 1 0 1 0 1 0 1 0 ii. 1 1 0 0 1 1 0 0 1 1

(OR)

3. (a) Discuss the basic issues involved in the design of regenerative repeater for pulse code modulation.
   (b) Describe how adaptive delta modulation overcomes the draw backs of delta modulation with neat block diagram and waveforms.

UNIT-II

4. (a) Describe the generation and detection of DPSK signal. And discuss the merits and de-merits of DPSK over BPSK.
   (b) Illustrate the operation of base band signal receiver with neat diagram.

(OR)

5 (a) The probability of error for QPSK signal is almost same as BPSK signal. Why? Explain with constellation diagram.
   (b) Probability of error for BPSK system is superior over BFSK and BASK systems. Why?

AR13

CODE: 13EC3014 **SET-1**

UNIT-III

6 (a) Explain in detail about the concept of amount of information and Entropy with its properties

(b) An analog signal has a 4 kHz bandwidth. The signal is sampled at 2.5 times the nyquist rate and each sample is quantized into one of 256 equally likely levels. Assume that the successive samples are statistically independent.

i. What is the information rate of this source?

ii. Can output of this source be transmitted without errors over a Gaussian channel with a bandwidth of 50 kHz and S/N ratio of 23 dB?

iii. What will be the bandwidth of an analog channel for transmitting the output of the source without errors if the S/N ratio is 10 dB?

(OR)

7 (a) Discuss Shannon- Fano and Huffman coding algorithms with an example and compare them.

(b) Discuss the mutual information for independent input and output communication system

UNIT-IV

8 (a) Explain the matrix representation of Linear Block codes.

(b) For a (6,3) systematic linear block code parity check bits are formed from the following. $C_4=d_1 \oplus d_3$, $C_5=d_1 \oplus d_2 \oplus d_3$, $C_6=d_1 \oplus d_2$. Construct generator matrix and all possible code words.

(OR)

9 (a) Explain about Block codes in which each block of k message bits encoded in to n bits with an example.

(b) Design a decoder with shift registers implementation by considering an example.

UNIT-V

10 (a) Design a rate ½ convolution encoder with constraint length v=3 and d=4. Construct the trellis diagram for this encoder

(b) Differentiate linear block codes and convolution codes.

(OR)

11 (a) Describe the procedure of Decoding of convolution codes using Viterbi algorithm.

(b) A convolution encoder has a single shift register with two stages, (i.e constraint length K=3), three modulo 2 adders, and an output multiplexer. The generator sequences of the encoder are as follows: $g^{(1)}=(1, 0, 1)$; $g^{(2)}=(1, 1, 0)$; $g^{(3)}=(1, 1, 1)$. Draw the block diagram of the encoder and determine the output sequence for the input d(1 1 0 1).

***

AR13

CODE: 13CS3012 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015

COMPUTER NETWORKS
(COMPUTER SCIENCE ENGINEEING)

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

PART-A

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

1. a) How the reliability of token ring topology can be improved?
   b) Define framing and what are the deferent types of framing?
   c) What is ALOHA?
   d) Is there any relationship between transmission media and topology?
   e) Define Hub.
   f) What is congestions? what are the conditions for occurring the congestion?
   g) In what situations contention based MAC protocols are suitable?
   h) What is the use of SMP?
   i) Describe various fields in frame format of IPV4?
   j) How can you prevent / counter threats to network security?

PART-B

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

UNIT-I

2. (a) What is the use of computer networks? Classify computer network according to their Geography.
   (b) Discuss the function of various layers in OSI reference model.

(OR)

3. (a) Explain the different network architectures by considering the central ideas common to all network architectures.
   (b) Describe the TCP/IP reference model.

UNIT-II

4. (a) Discuss the frame format of Token ring network.
   (b) How collision detection takes place in CSMA/CD?

(OR)

5 (a) Enumerate in detail about the internet checksum and Cyclic Redundancy check algorithm with an example.
   (b) Explain in detail the error correction method.

AR13

CODE: 13CS3012 **SET-2**

UNIT-III

6 (a) Discuss the Link state routing algorithm in detail taking an example.
(b) Discuss in detail IP datagram.

(OR)

7 (a) Differentiate between virtual circuit and datagram connection.
(b) Discuss distance vector routing algorithm taking a suitable example.

UNIT-IV

8 (a) Discuss connection establishment and connection release in TCP.
(b) Discuss how TCP provides reliability using error control.

(OR)

9 (a) What is internetworking? Discuss the various global addressing schemes and the issues in forwarding the IP.
(b) Compare the features of UDP, TCP and SCTP.

UNIT-V

10 (a) Discuss about the data manipulation functions.
(b) What is SMP? Explain it in detail.

(OR)

11 (a) Explain in detail about the electronic mail.
(b) Discuss the three domains of the Domain Name space.

***

AR13

CODE: 13IT3001 **SET 1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.TECH I SEM REGULAR EXAMINATIONS, NOVEMBER, 2015

COMPUTER GRAPHICS
(INFORMATION TECHNOLOGY)

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

PART-A

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

1. a) What is a frame buffer?
   b) Write short notes on color CRT monitors?
   c) What is even-odd rule?
   d) What is stair step effect?
   e) What is Zooming?
   f) What is exterior Clipping?
   g) Write matrix for translation in 3-D.
   h) What is projection transformation?
   i) What is Animation?
   j) Define Morphing?

PART-B

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

UNIT-I

2. (a) Discuss various applications of Computer Graphics? [6M]
   (b) Distinguish raster and random scan displays? [6M]

(OR)

3. (a) Explain the working of CRT with a neat diagram? [6 M]
   (b) Explain DVST and mention its advantages and disadvantages compared to refresh CRT? [6 M]

UNIT-II

4. (a) Write Bresenham's algorithm for line drawing. [6M]
   (b) Explain the scan line fill algorithm? [6 M]

(OR)

5 (a) Write mid-point circle generation algorithm. [6 M]
   (b) Explain boundary fill algorithm? [6 M]

UNIT-III

6 (a) Explain basic 2-Dimensional transformations. [6 M]
   (b) Prove that two successive rotations are additive. [6 M]

(OR)

7 (a) What is reflection? Discuss about different reflections with examples. [6 M]
   (b) Explain Cohen-Sutherland line Clipping. [6 M]

AR13

CODE: 13IT3001 **SET 1**

UNIT-IV

8	(a)	Explain 3-D rotations?	[6M]
	(b)	List out the properties of Bezier curves?	[6M]
		(OR)	
9	(a)	Explain 3-D projections.	[6M]
	(b)	Write the properties of B-Splines?	[6M]

UNIT-V

10	(a)	Explain back face removal algorithm?	[6M]
	(b)	Explain raster animation?	[6M]
		(OR)	
11	(a)	Explain painter's algorithm with a neat diagram?	[6M]
	(b)	Explain Z-Buffer algorithm?	[6M]

*****