

AR13

CODE: 13CE3012

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Regular/Supplementary Examinations, November-2016

DESIGN AND DRAWING OF CONCRETE STRUCTURES -I
(Civil Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1.
 - a) What do you understand by characteristic strength of concrete?
 - b) Which reinforcement rebar (Fe 250, Fe 415 and Fe 500) would have more ductility?
 - c) What is minimum grade of concrete used in plain concrete and RC?
 - d) Why we generally prefer 'Under Reinforced' design in real practice?
 - e) Why we are not providing beam as circular cross section?
 - f) What is the basic difference between Ultimate load method and Limit state method?
 - g) How you would calculate the number of bars in beams, and spacing in slabs if you know the A_{st} (Area of Steel) and Diameter of the Bar?
 - h) What do you understand by development length?
 - i) In a building, how you would identify the Biaxial columns?
 - j) When you provide the torsional reinforcement in slabs?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. A singly reinforced simply supported beam 200 mm wide by 550 mm overall depth is reinforced with 4 bars of 12 mm diameter at an effective depth of 500 mm. The self-weight of the beam together with the dead load is 3.5 kN/m. Adopting M-20 grade concrete and Fe-415 HYSD bars, estimate the maximum permissible live load on the beam by Working Stress Method.

(OR)
3. A reinforced concrete beam of rectangular section 300 mm wide by 650 mm deep is reinforced with 4 bars of 25 mm diameter at an effective depth of 600 mm. Calculate the neutral axis depth and estimate the safe moment of resistance of the section adopting M-25 grade concrete and Fe-415 HYSD bars by Working Stress Method.

UNIT-II

4. a Define partial safety factors of load and material. Write the expressions to determine the design load and design strength of the material from their respective characteristic values employing the corresponding partial safety factors.
- b A rectangular RC beam has a width 200 mm and is reinforced with 2 bars of 20 mm diameter at an effective depth of 400 mm. If M-20 grade concrete and Fe-415 HYSD bars are used, estimate the ultimate moment of resistance of the section by Limit State Method.

(OR)

5. a A reinforced concrete beam 300 mm wide is reinforced with 1436 mm² of Fe-415 HYSD bars at an effective depth of 500 mm. If M-20 grade concrete is used, estimate the moment of resistance of the section by Limit State Method.
- b Determine the area of reinforcement required for a singly reinforced concrete section having a breadth of 300 mm and an effective depth of 600 mm to support a factored (Ultimate) moment of 200 kN-m. (Use Limit State Method)

UNIT-III

6. Determine the moment of resistance of a T-beam having following section properties:
Effective width of flange = 2500 mm
Depth of flange = 150 mm
Width of rib = 300 mm
Effective depth = 800 mm
Area of steel: 6 bars of 25 mm diameter
Materials: M-20 grade Concrete and Fe-415 HYSD bars.

(OR)

7. A reinforced concrete beam has a support section with a width of 250 mm and effective depth of 500 mm. The support section is reinforced with 3 bars of 20 mm diameter on the tension side, 8 mm diameter two legged stirrups are provided at a spacing of 200 mm center to center. Using M-20 grade concrete and Fe-415 HYSD bars, estimate the shear strength of the support section.

UNIT-IV

8. Design a short square column for an axial compressive factored load of 1600 kN. Use M-25 grade concrete & Fe-415 HYSD bars. Use minimum % for longitudinal steel. Also design lateral ties. Sketch the details of reinforcement.

(OR)

9. A circular column, 4.6m high is effectively held in position at both ends and restrained against rotation at one end. Design the column, to carry an axial load of 1200 kN, if its dia is restricted to 450 mm. Use M-20 grade of concrete and Fe-415 HYSD bars.

UNIT-V

10. Design a simply supported RC slab for an office floor having clear dimensions of 4 m × 10 m with 230 mm wall around. Adopt M-20 grade concrete & Fe-415 HYSD bars.

(OR)

11. Design a two-way slab for a residential roof to suit the following data:
Size of roof = 4.5 m × 6 m
Edge conditions: Simply supported on all the sides on load bearing masonry walls
300 mm thick without any provision for torsion at corners
Material: M-20 grade concrete and Fe-415 HYSD bars

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
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III B.Tech I Semester Regular / Supplementary Examinations, November-2016

ELECTRICAL MEASUREMENTS

(Electrical and Electronics Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) Define Calibration.
b) Name the types of instruments used for making voltmeter and ammeter.
c) Name the methods used for power measurement in three phase circuits
d) How the CT and PT are connected in the circuits.
e) Define creeping.
f) Define Phantom loading.
g) What is the range of low resistance?
h) State the use of Wein bridge.
i) State the applications of potentiometer
j) Define standardization.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) The inductance of a moving iron ammeter is given by the $L = (20 + 10\theta - 30\theta^2) \mu H$, where θ is the angle of deflection in radians. Determine the deflection in the meter for a current of 8A, if the spring constant is 10×10^{-6} Newton meters/radians. [6M]
b) What is the difference between MI and MC instruments. [6M]
(OR)
3. With neat figure, explain the construction and operation of repulsion type moving Iron instrument and derive an expression for the deflecting torque. Give the advantages and limitations of such instruments. [12M]

UNIT-II

4. Draw the equivalent circuit and phasor diagram of a potential transformer. Derive the expression for ratio and phase angle errors. [12M]
(OR)
5. a) Explain in detail about LPF wattmeter. [6M]
b) Explain why Electrodynamicometer type can be used on both AC&DC. Derive equation for the Instantaneous deflecting torque? [6M]

UNIT-III

6. a) With neat sketch explain 1-Ø electro dynamo type power factor meter [6M]
b) Explain the calibration of Energy meter by Phantom loading? [6M]
(OR)
7. Explain the working principle and operation of induction type energy meter [12M]

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UNIT-IV

8. a) Derive the expression for bridge sensitivity for Wheatstone bridge with equal arms. [6M]
b) Derive the equation for balance in the case of Maxwell's induction bridge. [6M]
(OR)
9. a) How Schering bridge is used for the measurement of unknown capacitance. Derive its balance equation. [6M]
b) Explain how Wien's bridge used for frequency and derive expression for frequency in terms of bridge parameters. [6M]

UNIT-V

10. a) Explain the principle of operation of Ballistic galvanometer with neat diagram. [6M]
b) Explain the construction and working of a Magnetic Potentiometer. [6M]
(OR)
11. Write the standardization procedure of DC Crompton's potentiometer and explain its construction & working with a neat sketch. [12M]

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

1.
 - a) Explain wedge film and squeeze film journal bearings.
 - b) In thrust bearing, the load acts -----
 - c) Name the various types of ball bearings.
 - d) Why are connecting rods made of I- sections?
 - e) What is difference between centre and overhung crankshafts?
 - f) Name two criteria for calculating the thickness of piston head.
 - g) What are the advantages of chain drives?
 - h) In which gear drive is self-locking possible?
 - i) Define the term modulus?
 - j) What do you understand by overhauling of screw?

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

2.
 - (a) What is the difference between full journal bearing and partial journal bearing?
 - (b) A footstep bearing supports a shaft of 150 mm diameter which is counter bored at the end with a hole diameter of 50 mm. If the bearing pressure is limited to 0.8 N/mm^2 and the speed is 100 r.p.m.; find (a) The load to be supported (b) The power lost in friction and (c) The heat generated at the bearing. Assume coefficient of friction is 0.015.

(OR)

3.
 - (a) What are the applications of rolling-contact bearing?
 - (b) A single-row deep groove ball bearing No.6002 is subjected to an axial thrust of 1000 N and a radial load of 2200 N. Find the expected life that 50% of the bearing will complete under this condition.

UNIT-II

4. Draw and Design a connecting rod for an IC Engine running at 1800 rpm and developing a max gas pressure of 4 Mpa, the diameter of the cylinder bore is 100 mm. Mass of the reciprocating parts per cylinder 2.5 kg, length of the connecting rod 350 mm, stroke of the piston 175mm and take Factor of safety is 6. The density of material of the rod may be taken as 7800 kg/m^3 , allowable stress in the bolts as 50 N/mm^2 and in cap as 75 N/mm^2 and the buckling stress is 310 N/mm^2 .

(OR)

5. Design a center crankshaft at angle of maximum twisting moment for a single-cylinder vertical engine using the following data: Cylinder bore = 125mm, (L/r) ratio = 4.5, maximum gas pressure = 2.5 Mpa, Length of stroke = 150 mm, weight of flywheel cum belt pulley = 1KN, total belt pull = 2 KN, width of hub for flywheel cum belt pulley = 200 mm. The torque on the crankshaft is maximum when the crank turns through 25° from the top dead centre and at this position the gas pressure inside the cylinder is 2 Mpa. The belts are in horizontal direction. Assume suitable data and state assumptions you make.

UNIT-III

- 6 Draw and design cast iron piston for a single acting 4-stroke engine for the following data. Cylinder bore=100 mm; length of stroke=125 mm, brake mean effective pressure = 0.65 Mpa, Maximum gas pressure=5 Mpa, Fuel consumption=0.25 kg per brake power per hour; Higher calorific value=42000 kJ/kg; Speed=2000 r.p.m. Any other data required for the design may be assumed.

(OR)

- 7 A leather belt 9 mm x 250 mm is used to drive a cast iron pulley 900 mm in diameter at 336 r.p.m. If the active arc on the smaller pulley is 120° and the stress in tight side is 2 Mpa, find the power capacity of the belt. The density of leather may be taken as 980 Kg/m^3 , and the coefficient of friction of leather on cast iron is 0.35.

UNIT-IV

8. A reciprocating compressor is to be connected to an electric motor with the help of spur gears. The distance between the shafts is to be 500 mm. The speed of the electric motor is 900 r.p.m. and the speed of the compressor shaft is desired to be 200 r.p.m. The torque, to be transmitted is 5000 N-m. Taking starting torque as 25% more than the normal torque, determine (a) Module and face width of the gears using 20 degrees stub teeth and (b) number of teeth and pitch circle diameter of each gear. Assume suitable values of velocity factor and Lewis factor.

(OR)

- 9 A helical cast steel gear with 30° helix angle has to transmit 35 KW at 1500 r.p.m. If the gear has 24 teeth, determine the necessary module, pitch diameter and face width for 20° full depth teeth. The static stress for cast steel may be taken as 56 Mpa. The width of face may be taken as 3 times the normal pitch. What would be the end thrust on the gear? The tooth factor for 20° full depth involute gear may be taken as $0.154 - (0.912/T_E)$, where T_E represents the equivalent number of teeth

UNIT-V

- 10 A screw jack carries a load of 22 KN. Assuming the coefficient of friction between screw and nut as 0.15, design the screw and nut. Neglect collar friction and column action. The permissible compressive and shear stresses in the screw should not exceed 42 Mpa and 28 Mpa respectively. The shear stress in the nut should not exceed 21 Mpa. The bearing pressure on the nut is 14 N/mm^2 . What will be the efficiency of screw?

(OR)

- 11 (a) What type of material is suitable for slide ways? Give some important properties.
(b) Write a design procedure for the slide ways.

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What do you understand by the term aliasing
b) Why Quantization is required?
c) What is the main difference in DPCM and DM?
d) What is convolution code?
e) What is baseband signal receiver?
f) What is the value of maximum signal to noise ratio of the matched filter?
g) Define information rate?
h) What are discrete messages?
i) What is the structure of generator matrix?
j) How syndrome is calculated in Hamming codes and cyclic codes?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Explain the different types of Sampling.
b) Discuss about the elements of digital communication system with neat sketch.

(OR)

3. a) Draw the block diagram of PCM Generator and explain each block.
b) Explain the advantages of Adaptive Delta Modulation over Delta Modulation and how is it achieved.

UNIT-II

4. a) Describe in detail with block diagram the binary ASK, PSK & FSK schemes.
b) Explain the base band transmission of M-ary data with suitable diagrams.

(OR)

5. a) Draw the block diagram of DPSK modulator and explain how synchronization problem is avoided for its detection.
b) Draw the block diagram of baseband communication receiver and explain the importance of each block.

UNIT-III

6. a) Explain channel capacity in terms of discrete and analog channels?
b) discuss about shanon-fano coding and Huffman coding in detail

(OR)

7. a) write short notes on
i) entropy and its properties
ii) information and its properties
iii) average information and mutual information
b) State and Explain Shannon's theorem

UNIT-IV

8. a) Explain the principle and operation of encoder for hamming codes.
b) Explain the advantages and disadvantages of cyclic codes

(OR)

9. a) Explain the algebraic structure of cyclic codes.
b) Discuss about error detecting and error correction capabilities of linear block codes

UNIT-V

10. a) Discuss about the Time domain approach in encoding of convolution codes.
b) Explain about Viterbi algorithm with an example

(OR)

11. Briefly explain about the Code Tree, Trellis, and State Diagrams of a convolutional Encoder with an example?

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1.
 - a) What is meant by topology? name some popular topologies
 - b) Define flow control?
 - c) Mention the types of error correcting methods
 - d) Define virtual circuit?
 - e) Define Routing?
 - f) Define Congestion Control?
 - g) What is the purpose of hamming code?
 - h) What do you mean by sub netting?
 - i) Define TCP?
 - j) Discuss the three main division of the domain name space

Part-B

Answer one question from each unit

[5*12=60M]

UNIT-I

2. (a) what is TCP/IP Model? Explain the functions and protocols and services of each Layer?
- (b) Write short notes on
 - i) Physical address
 - ii) logical address

(OR)

3. (a) write a short notes on

- i) LAN
- ii) MAN
- iii) WAN

- (b) Discuss various types of networks topologies in computer network. Also discuss various advantages and disadvantages of each topology.

UNIT-II

4. (a) Explain error detection and error correction techniques?
- (b) Explain HDLC?

(OR)

5. (a) Explain stop-and-wait-protocol?
- (b) Explain CSMA?

UNIT- III

6. (a) Define flooding? Explain link state routing algorithm?
(b) Compare between IPV4 AND IPV6?

(OR)

7. (a) Define congestion? Explain congestion control in datagram subnets?
(b) Define routing algorithm? Explain multicast routing?

UNIT-IV

8. (a) What is the TCP transmission policy and explain the Congestion control.
(b) What are the various services provided by the network layer to the transport layer?

(OR)

9. (a) Discuss the various issues of transport layer in details
(b) With neat architecture and explain UDP in detail.

UNIT-V

10. (a) Explain the architecture and services of e-mailing system.
(b) Explain DNS with reference to its components and working.

(OR)

- 11) Explain on i) WWW
ii) E-mail

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SET 2

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
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III B.Tech I Semester Regular / Supplementary Examinations, November--2016

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) What are LCD's? where are they commonly used?
c) What is stairstep effect?
d) What is odd parity rule?
e) What is composite transformation?
f) Define Viewport.
g) Write matrix for scaling in 3-D.
h) What is clipping?
i) What is Animation?
j) What is meant by visible surface? Give example.

PART-B

Answer one question from each unit

[5 x 12=60M]

UNIT-I

2. (a) Explain the working of CRT ? [6M]
(b) Explain color CRT monitors? [6M]
- (OR)
3. (a) Explain Raster scan systems? [6 M]
(b) Explain Flat-Panel displays? [6 M]

UNIT-II

4. (a) Write DDA 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 2D transformations and explain with homogeneous coordinate transformation matrix representation? [6 M]
(b) Find the new coordinates of the triangle A(0,0) B(1,1) C(5,2) after it has been magnified to twice the size. [6 M]

(OR)

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SET 2

- 7 (a) Write about Reflection and Shear. [6 M]
(b) Explain Sutherland-Hodgeman polygon Clipping [6 M]

UNIT-IV

- 8 (a) Explain rotation transformation in 3-D? [6M]
(b) List out the properties of Bezier curves? [6M]
(OR)
9 (a) Explain projections in 3-D? [6M]
(b) What are 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 morphing? [6M]