

AR13

CODE: 13CE3012

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2018

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) If you know the compressive strength of concrete, how will you find the tensile strength and modulus of elasticity of concrete?
- b) Why ' f_{ck} ' (Cube Compressive Strength) will become ' $0.67f_{ck}$ ' (Structure concrete compressive strength) in Limit State Design?
- c) Why we are using partial safety factors for concrete 1.5 and steel 1.15 in Limit State Design?
- d) When we generally prefer Doubly Reinforced Beams?
- e) Why A_{st} (Area of tension reinforcement) is generally more when compared to A_{sc} (Area of compression reinforcement)?
- f) How you will find the neutral axis depth (X_u), if you know the total compression force ' C_u ' and total tensile force ' T_u ' in Limit State Method?
- g) What are the values for the development length (L_d)?
 - (a) Standard 90° Bend
 - (b) Standard U-Type Hook
- h) How to control the shear and flexural cracks in beams?
- i) How to identify, whether the column is a short (or) long?
- j) What is the difference between One-way slab and Two-way slab?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. A singly reinforced concrete beam with an effective span of 4m has a rectangular section with a width of 250 mm and an overall depth of 550 mm. The beam is reinforced with 3 bars of 10 mm diameter of Fe-415 HYSD (tension side) at an effective depth of 500 mm. Calculate the maximum permissible live load on the beam by Working Stress Method. Assume M-20 grade concrete.
(OR)
3. A rectangular reinforced concrete beam of width 300 mm and effective depth 600 mm is to be designed to support an ultimate moment of 600kN-m. Using M-20 grade concrete and Fe-415 HYSD bars, design suitable reinforcements in the beam at an effective cover of 50 mm by Working Stress Method.

AR13

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SET-1

UNIT-II

4. a What is limit state? How many limit states are there? Should a structure be designed following all the limit states?
b A singly reinforced rectangular beam of width 230 mm 460 mm effective depth is reinforced with 3 bars of 20 mm diameter. Determine the factored moment of resistance of the section by Limit State Method. The materials are M-20 grade concrete and Fe-415 HYSD bars.

(OR)

5. a Explain the stress block parameters for rectangular section with neat sketches.
b A singly reinforced concrete beam having width of 250 mm is reinforced with steel bars of area 3600 mm^2 at an effective depth of 450 mm. The materials are M-25 grade concrete and Fe-500 reinforcement. Compute the flexural strength (moment of resistance) of the section by Limit State Method.

UNIT-III

6. Determine the ultimate moment of resistance by limit state method of a doubly reinforced beam of rectangular section having a width 300 mm and reinforced with 5 bars of 25 mm diameter at an effective depth of 600 mm. The compression steel is made up of 2 bars of 25 mm diameter at an effective cover of 60 mm. Adopt M-20 grade concrete and Fe-500 bars.

(OR)

7. A reinforced concrete beam of rectangular section 300 mm wide is reinforced with 4 bars of 25 mm diameter at an effective depth of 600 mm. The beam has to resist a factored shear force of 400 kN at support section. Assuming $f_{ck} = 25 \text{ N/mm}^2$ and $f_y = 500 \text{ N/mm}^2$, design vertical stirrups for the section.

UNIT-IV

8. Design a short axially loaded square column, 500 mm \times 500 mm for a service load of 2000 kN. Use M-20 concrete and Fe-500 grade steel.

(OR)

9. Design a circular column to carry an axial load of 1000 kN. Use M-20 concrete and Fe-500 grade steel.

UNIT-V

10. Design a R.C. slab for a room having inside dimensions 3 m \times 7 m. The thickness of supporting wall is 300 mm. The live load on the slab may be taken as 2 kN/m^2 . Assume the slab to be simply supported at the ends. Use M-20 concrete and Fe-500 steel.

(OR)

11. Design a two-way slab for a room of size 4 m \times 5 m with discontinuous and simply supported edges on all sides with corners prevented from lifting to support a live load of 4 kN/m^2 . Adopt M-20 grade concrete & Fe-415 HYSD bars.

AR13

CODE: 13EE3016

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2018

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 Instrument
b) Classify instruments based on their functions.
c) State the disadvantages of Dynamometer type wattmeter.
d) State the disadvantage of instrument transformers.
e) Why Al disc is used in induction type energy meter.
f) What are the types of energy meters?
g) What is the range of medium resistance?
h) State the advantages of Kelvin double bridge method.
i) State the advantages of crompton potentiometer.
j) Name the potentiometer material used.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. Describe the construction and working principle of PMMC instrument. Derive an expression for the deflecting torque and write advantages of PMMC. [12M]
- (OR)
3. How moving iron instruments are classified? Explain with the neat sketches the working of an attraction type MI instrument and derive an expression for the deflecting torque. [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. Explain the errors in electro dynamometer type wattmeter. [12M]

UNIT-III

6. a) With neat sketch explain 1-Ø Moving Iron type power factor meter [6M]
b) Explain how the following adjustments are made in a single phase induction type Energy meter. [6M]
 - i) Lag adjustment
 - ii) Adjustment for friction compensation
 - iii) Creeping
 - iv) Over load compensation
 - v) Temperature compensation
- (OR)
7. Describe the construction and working of two element Induction type energy meter. [12M]

AR13

CODE: 13EE3016

SET-1

UNIT-IV

8. a) How to measure the low value of resistance by using Kelvin's double bridge? [6M]
b) Derive the balance equation for Hay's bridge and draw phasor diagram. [6M]
(OR)
9. a) Derive the balance equation for Anderson's bridge and draw phasor diagram. [6M]
b) Explain the working of Carey Foster slide-wire bridge. [6M]

UNIT-V

10. What do you mean by standardization and explain the working principle of DC Crompton's Potentiometer and its applications [12M]
(OR)
11. a) Describe a method of experimental determination of flux density in a specimen of magnetic material. [6M]
b) Discuss the construction of Polar type A.C. potentiometer and its working principle. [6M]

**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) Define bearing modulus
b) List the important physical characteristics of a good bearing material.
c) How is rolling contact bearings classified?
d) What are the types of cranks available?
e) Name the two ends of a connecting rod of an IC engine.
f) What is the function of a piston of an IC engine.
g) Name the material used for V-belt drive.
h) What is a herringbone gear?
i) What is multi start thread?
j) What is self locking property of threads?

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

2. A full journal bearing of 50 mm diameter and 100 mm long has a bearing pressure of 1.4 N/mm^2 . The speed of the journal is 900 r.p.m. and the ratio of journal diameter to the diametral clearance is 1000. The bearing is lubricated with oil whose absolute viscosity at the operating temperature of 75°C may be taken as 0.011 kg/m-s . The room temperature is 35°C . Find :
1. The amount of artificial cooling required, and 2. The mass of the lubricating oil required, if the difference between the outlet and inlet temperature of the oil is 10°C . Take specific heat of the oil as $1850 \text{ J / kg / }^\circ\text{C}$. **12M**

(OR)

3. a) Define rating life, minimum life. **3M**
b) Select a single row deep groove ball bearing for a radial load of 4000 N and an axial load of 5000 N, operating at a speed of 1600 r.p.m. for an average life of 5 years at 10 hours per day. Assume uniform and steady load. **9M**

UNIT-II

4. Determine the cross section details of a connecting rod for an I.C. engine running at 1800 r.p.m. and developing a maximum pressure of 3.15 N/mm^2 . The diameter of the piston is 100 mm ; mass of the reciprocating parts per cylinder 2.25 kg; length of connecting rod 380 mm; stroke of piston 190 mm and compression ratio 6 : 1. Take a factor of safety of 6 for the design. The density of material of the rod may be taken as 8000 kg/m^3 . The rod is to be of I-section for which you can choose your own proportions. Draw a neat dimensioned sketch showing provision for lubrication. Use Rankine formula for which the numerator constant may be taken as 320 N/mm^2 and the denominator constant $1 / 7500$. **12M**

(OR)

5. Design a side or overhung crankshaft for a 250 mm × 300 mm gas engine. **12M**
The weight of the flywheel is 30 kN and the explosion pressure is 2.1 N/mm². The gas pressure at the maximum torque is 0.9 N/mm², when the crank angle is 35° from I. D. C. The connecting rod is 4.5 times the crank radius.

UNIT-III

6. Design a cast iron piston for a single acting four stroke engine for the **12M**
following data:
Cylinder bore = 100 mm ; Stroke = 125 mm ; Maximum gas pressure = 5 N/mm² ; Indicated mean effective pressure = 0.75 N/mm² ; Mechanical efficiency = 80% ; Fuel consumption = 0.15 kg per brake power per hour ; Higher calorific value of fuel = 42 × 10³ kJ/kg ; Speed = 2000 r.p.m.

(OR)

7. a) Draw the sketches of various types of belt drives. **3M**
b) A cast iron pulley transmits 20 kW at 300 r.p.m. The diameter of pulley is 550 mm and has four straight arms of elliptical cross-section in which the major axis is twice the minor axis. Find the dimensions of the arm if the allowable bending stress is 15 MPa. Mention the plane in which the major axis of the arm should lie. **9M**

UNIT-IV

8. A pair of straight teeth spur gears is to transmit 20 kW when the pinion rotates at 300 r.p.m. The velocity ratio is 1 : 3. The allowable static stresses for the pinion and gear materials are 120 MPa and 100 MPa respectively. The pinion has 15 teeth and its face width is 14 times the module. Determine : 1. module; 2. face width; and 3. pitch circle diameters of both the pinion and the gear from the standpoint of strength only, taking into consideration the effect of the dynamic loading. **12M**

(OR)

9. A pair of helical gears are to transmit 15 kW. The teeth are 20° stub in diametral plane and have a helix angle of 45°. The pinion runs at 10 000 r.p.m. and has 80 mm pitch diameter. The gear has 320 mm pitch diameter. If the gears are made of cast steel having allowable static strength of 100 MPa; determine a suitable module and face width from static strength considerations and check the gears for wear, given $\sigma_{es} = 618$ MPa. **12M**

UNIT-V

10. A screw jack is to lift a load of 80 kN through a height of 400 mm. The elastic strength of screw material in tension and compression is 200 MPa and in shear 120 MPa. The material for nut is phosphor-bronze for which the elastic limit may be taken as 100 MPa in tension, 90 MPa in compression and 80 MPa in shear. The bearing pressure between the nut and the screw is not to exceed 18 N/mm². Design and draw the screw jack. **12M**

(OR)

11. Explain design procedure of the following machine tool elements **12M**
a) Spindles b) Slide Ways

AR13

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
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III B.Tech I Semester Supplementary Examinations, January-2018

DIGITAL COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) State any two non-uniform quantization rules.
- b) State the merits of digital communications.
- c) ISI cannot be avoided justify the statement.
- d) Name the properties of cyclic codes.
- e) What are the advantages of QPSK over PSK?
- f) What is ideal Nyquist channel?
- g) What is mutual information?
- h) What is the structure of parity check matrix?
- i) What are Hamming codes ?
- j) What are line codes?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a) Explain the transmitter and receiver sections of a delta modulation system. 8M
 - b) Explain the need of modified duo-binary signaling scheme. 4M
- (OR)**
3. a) Explain companding in PCM systems. 6M
 - b) Explain the noise considerations in PCM systems. 6M

UNIT-II

4. a) Derive error probability of QPSK systems. 6M
 - b) What is a Matched filter? Derive its properties. 6M
- (OR)**
5. a) Explain Maximum likelihood decoding for coherent detection of signals in noise. 6M
 - b) Explain the signal space diagram of a PSK signal. Draw the block diagram of PSK transmitter and receiver. 6M

UNIT-III

6. a) Explain capacity of Gaussian channel and bandwidth. 7M
b) Explain the terms information, average information, mutual information and entropy. 5M
- (OR)
7. a) A DMS X has five symbols X_1, X_2, X_3, X_4 , & X_5 with $P(X_1)=0.4, P(X_2)=0.19, P(X_3)=0.16, P(X_4)=0.15, P(X_5)=0.1$. Construct a Shannon-Fano code & calculate the efficiency of the code & repeat with the same for Huffman code & Compare the result. 7M
b) Show that information carried compositely due to X_1 & X_2 , $I(X_1, X_2)$ is summing of the individual informations $I(X_1)$ & $I(X_2)$. 5M

UNIT-IV

8. a) Explain the error detection and error correction capabilities of linear block codes. 7M
b) Explain hamming codes with an example. 5M
- (OR)
9. a) Explain the steps in calculation of syndrome. 5M
b) A (7, 4) Hamming code defined by the generator polynomial $g(x) = 1+x+x^3$ and the code word 0111001 sent was received as 0101001. Determine the syndrome polynomial $s(x)$ and show that it is identical to error polynomial $e(x)$. 7M

UNIT-V

10. a) Explain encoding of convolution codes in time domain. 6M
b) Develop state and trellis diagrams of convolution codes with an example. 6M
- (OR)
11. a) Explain maximum likelihood decoding of convolution codes 5M
b) Illustrate viterbi algorithm with steps 7M

AR13

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SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2018

COMPUTER NETWORKS

(Computer Science & Engineering)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What is meant by distributed processing?
b) Mention the layers of TCP/IP reference model.
c) Define Frame.
d) What is CSMA/CD?
e) Differentiate Connectionless and Connection Oriented Services.
f) Define a Virtual circuit.
g) Compare TCP and UDP.
h) What Congestion?
i) Write about SNMP.
j) What is Multicasting?

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. a Draw and explain OSI-ISO reference model. **6M**
b Discuss in detail about different Network models. **6M**
- (OR)**
3. a What is Internet? List and explain various Internet Protocols. **6M**
b Discuss in detail about standard Ethernet. **6M**

UNIT-II

4. a Discuss briefly about design issues of Data link layer. **6M**
Explain about Error Control
Flow Control
Framing
b How does CRC checker know that the received data unit is damaged? Explain with an example. **6M**

(OR)

5. a Compare HDLC Frame with the LLC and MAC frame formats. **6M**
b Describe about Sliding window protocol. **6M**

UNIT-III

6. a Explain Spanning tree algorithm for Bridges. **6M**
b Describe in detail about the Hierarchical routing. **6M**

(OR)

7. a Explain briefly about the shortest path routing algorithm. **6M**
b Draw and explain the Header format of IPv4. **6M**

UNIT-IV

8. a Explain briefly about various elements of Transport protocol. **6M**
Describe any three of the following elements
i) Addressing
ii) Connection establishment
iii) Connection Release
iv) Flow Control and buffering
b Discuss about UDP message queue. **6M**

(OR)

9. a What is internetworking? Explain tunnelling in detail. **6M**
b Explain UDP header format and UDP applications **6M**

UNIT-V

10. a Explain the DNS Name Space and DNS protocol. **6M**
b Write short notes on i) SNMP and E-Mail **6M**

(OR)

11. a Explain about HTTP Request Message Format? **6M**
b What is WEB Documents? Explain with its categories? **6M**

AR13

CODE: 13IT3001

SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

III B.Tech I Semester Supplementary Examinations, January-2018
COMPUTER GRAPHICS
(Information Technology)

Time: 3 Hours

Max Marks: 70

PART-A

ANSWER ALL QUESTIONS

[1 x 10 = 10 M]

1. a) What is mean by frame buffer
b) What are screen co-ordinators
c) Difference between DDA and Bresenham's algorithm.
d) Define pixel
e) What do you mean by scaling?
f) Define view port
g) Write about polygon clipping.
h) What is transformation matrix?
i) Write about raster animation.
j) Define morphing.

PART-B

Answer one question from each unit

[5x12=60M]

UNIT-I

2. List the operation characteristics of the following display techniques
i) Raster refresh system ii) Vector refresh system
iii) Plasma panels and iv) LCD

(OR)

3. a) Explain in detail about the raster-scan displays.
b) Distinguish between CRT monitors and Direct View Storage Tube (DVST) devices.

UNIT-II

4. a) What are the steps involved in bresenham's line drawing algorithm? Explain with example.
b) Explain the flood-fill algorithm for filling polygons.

AR13

CODE: 13IT3001

SET-2

(OR)

5. a) Write and explain the mid-point circle generation algorithm.
- b) Explain the steps involved in generation of DDA algorithm.

UNIT-III

6. a) Explain different types of 2D transformations with homogeneous coordinate matrix representations.
- b) Explain mid-point subdivision algorithm with an example.

(OR)

7. a) Find the reflection of a point A (5, 9) about the line $y=x+5$.
- b) Explain cohen-sutherland line clipping algorithm.

UNIT-IV

8. a) Discuss briefly about various 3D transformation.
- b) Explain in detail about Beziere curves with examples.

(OR)

9. a) Write the properties of B-Spline curves.
- b) Explain various methods for generation of curves and surfaces.

UNIT-V

10. a) What difficulties are encountered in implementing the painter's algorithm.
- b) Write about advantages and disadvantages of Z-buffer method.

(OR)

11. a) Discuss about various animation languages.
- b) Explain about back face removal algorithm.