AR13

CODE: 13CE3012   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, March-2017
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) What is maximum percentage of longitudinal steel in case of columns
   b) Write about partial safety factors of materials.
   c) Why is an upper limit τ_{cmax} imposed on the shear strength of a reinforced concrete beam with shear reinforcement?
   d) Compare limit state and working stress methods of design
   e) For a balanced rectangular section (b x d) of singly reinforced beam, determine depth of neutral axis
   f) When do you adopt doubly reinforced beam
   g) Write about interaction diagrams used to design columns.
   h) Define modular ratio.
   i) Differentiate between one way and two way slabs.
   j) State the reason for limiting neutral axis depth.

PART-B

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

UNIT-I

2. Determine the safe udl that can be placed on a beam of 230 mm X 400mm effective depth, simply supported over an effective span of 4.5m and reinforced with 3 bars of 20mm diameter on the tension side. Assume M20 and Fe 415 steel by working stress method.

(OR)

3. Design a simply supported RC beam, for flexure, of span 4m and carrying an UDL of 40 kN/m using working stress method. Adopt M20 concrete and Fe415 steel

UNIT-II

4. (a) Design the minimum effective depth required and also the area of steel for a rectangular beam having a width of 300 mm to resist an ultimate moment of 200 kN-m. Use M20 concrete and Fe 415 steel

   (b) Explain assumptions in limit state method of design

(OR)

5 (a) Draw and explain stress-strain curves of concrete and HYSD steel?
   (b) Obtain expression for percentage of tension steel (pt limit) for a balanced section.

UNIT-III

6   A T-beam is singly reinforced and has the following sectional properties. Estimate the ultimate moment of resistance of the section. Width of flange = 1200mm, Thickness of flange = 150mm, Width of rib = 300mm, Effective depth = 750mm, Area of tension reinforcement = 5520mm^2. Use M20 mix and Fe-415 steel (use LSM).

(OR)

7   A 250mm wide and 600mm deep RC beam section at support is reinforced with two legged 10mm dia stirrups at 200mm c/c longitudinal steel consists of 4#20mm dia bars with a clear cover of 30mm. Use M30 concrete and Fe415 steel. Determine the strength of section in shear and hence determine safe uniformly distributed load on simply supported beam to avoid shear failure.

UNIT-IV

8   Design a spiral reinforced circular column subjected to a factored load of 2000 kN. The column has an unsupported length of 3.5m. Use M25 concrete and Fe415 steel

(OR)

9   (a)   How do you check for accidental eccentricity in columns?
     (b)   Design a RC column for an ultimate load of 2000kN. Adopt M20 and Fe415 steel.

UNIT-V

10   Design the slab for a hall of 3mX7.5m clear dimensions. The slab rest on brick wall of 250 mm thickness adopt M20 concrete and Fe415steel. The live load on the slab is of 3kN/m^2.

(OR)

11   Design a two way slab for a room 5.5m x 4m clear in size and supported on all four sides by 300mm thick wall with corners held down. The live load is 4 kN/sqm. Use M20 concrete and Fe415 steel.

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ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, March-2017
ELECTRICAL MEASUREMENTS
(Electrical and Electronics Engineering)

Time: 3 Hours   Max.Marks:70

PART-A

ANSWER ALL QUESTIONS   **[1x10=10M]**

1 (a)   In case of ammeter, why a low resistance is connected in parallel with the PMMC meter?
  (b)   Differentiate deflecting force and damping force
  (c)   Why the secondary of a CT is never left open circuited?
  (d)   What is the function of astatic system?
  (e)   What is mean by Phantom Load?
  (f)   What is purpose of shading to the pressure coil of an energy meter
  (g)   What are the methods available for measurement of unknown resistance other than bridges?
  (h)   What is the principle of Flux meter?
  (i)   What is purpose of finding hysteresis loop?
  (j)   Which type of standard cell used during standardization in case of DC or AC potentiometer?

PART-B

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

UNIT-I

2. Derive the torque equation of moving iron instrument and comment on the shape of the scale and explain the working of repulsion type moving iron instruments with neat diagrams. [12M]

(OR)

3. (a) What are the essential requirements of indicating instruments   [6M]
  (b) The resistance of a moving voltmeter is 11k ohm. The moving coil has 100 turns and is 40 mm long and 30 mm wide. The flux density in the air gap is 0.05 Wb/m^2. Determine the deflection produced by 220 volts if the spring control gives a defection of 1^0 for a torque of 20×10^{-7} N-m.   [6M]

UNIT-II

4. (a) write the differences between C.T and P.T   [4M]
  (b) Explain the special features incorporated in an electrodynamometer type of wattmeter so that it can be used for low power factor applications   [8M]

(OR)

5.(a) Draw the equivalent circuit and phasor diagram of C.T   [4M]
  (b) A 3-phase, 440V motor load has a power factor of 0.6. Two wattmeter's connected measure the power show the input to be 25 kW. Find the reading on each instrument.   [8M]

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UNIT-III

6. Explain with a neat sketch the construction and working principle of single phase induction type energy meter   [12M]

(OR)

7.(a) Explain the single phase moving iron power factor meter with neat sketch.   [6M]
   (b) A single phase kWh meter makes 500 revolutions per kWh. It is found on testing as making 40 revolutions in 58.1 seconds at 5 kW full load. Find out the percentage error. [6M]

UNIT-IV

8.(a) Draw the circuit of a wheatstone bridge and derive the conditions of balance   [6M]
   (b) The following data relate to the balanced AC bridge is; Arm AB: R_1=225 ohm; Arm BC: R_2=150 ohm in series with C_2=0.53 µF; Arm CD: unknown; Arm DA: R_3=100 ohm in series with L_3=7.95 mH. The oscillator frequency =1 kHz. Calculate the constants of arm CD.   [6M]

(OR)

9. Which bridge is used for frequency measurement? Give its circuit and derive the equation for frequency. Give its application and limitations.   [12M]

UNIT –V

10.(a) How is the voltmeter calibrated with DC potentiometer   [6M]
   (b) Write the difference between the DC and AC potentiometers.   [6M]

(OR)

11. Describe the step by step method for determination of BH curve of a magnetic material   [12M]

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CODE: 13ME3015   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, March-2017
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 bearing characteristic number?
    b) List the some of the bearing materials.
    c) How are Journal bearings classified?
    d) What is the stress induced in a connecting rod?
    e) What is the function of a connecting rod of an IC engine.
    f) What is the function of a oil rings of a piston.
    g) What are the materials used for flat belts?
    h) What is a herringbone gear?
    i) Define module of a gear.
    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   **12M**
    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 J / kg /
    °C.

(OR)

3. a) Define rating life, minimum life.   **3M**
    b) A shaft rotating at constant speed is subjected to variable load. The bearings **9M**
        supporting the shaft are subjected to stationary equivalent radial load of 3 kN
        for 10 per cent of time, 2 kN for 20 per cent of time, 1 kN for 30 per cent of
        time and no load for remaining time of cycle. If the total life expected for the
        bearing is 20×10^6 revolutions at 95 per cent reliability, calculate dynamic
        load rating of the ball bearing.

UNIT-II

4. Design the connection rod of I section for a single cylinder IC engine using **12M**
    the following specifications:
    Diameter of the piston = 100 mm; Mass of the reciprocating parts = 2.25 kg;
    Length of the connecting rod = 300 mm; Stroke length = 125 mm;
    Speed = 1200 rpm; Maximum explosion pressure = 3.5 N/mm^2;
    Compression ratio = 6; Factor of safety = 5; Density of the rod material =
    8000 kg/m^3; Yield stress in compression = 330MPa.

5. Design an overhang crankshaft with two main bearings for an I.C engine with the Following data:
Cylinder bore = 250mm, Stroke length =300mm
Flywheel weight =27kN ;Maximum pressure =2.5N/mm^2 ;Maximum torque is at crank rotation 30^0, the pressure at that instant = 1.7 N/mm^2. **12M**

UNIT-III

6. Design a cast iron piston for a single acting four stroke engine from the following data:
Cylinder = 100mm; Stroke = 120mm
Maximum gas pressure = 5Mpa;Brake mean effective pressure= 0.5Mpa
Fuel consumption = 0.15kg/Brake power in kW/h;Speed = 2200rpm **12M**

(OR)

7. Design a V-belt drive to the following specifications: Power to be transmitted = 75 kW Speed of driving wheel = 1440 rpm Speed of driven wheel = 400 rpm Diameter of driving wheel = 300 mm Centre distance = 2500 mm Service = 16 hours /day. **12M**

UNIT-IV

8. A gear drive is required to transmit a maximum power of 22.5 kW. The velocity ratio is 1:2 and r.p.m. of the pinion is 200. The approximate centre distance between the shafts may be taken as 600 mm. The teeth has 20° stub involute profiles. The static stress for the gear material (which is cast iron) may be taken as 60 MPa and face width as 10 times the module. Find the module, face width and number of teeth on each gear. Check the design for dynamic and wear loads. The deformation or dynamic factor in the Buckingham equation may be taken as 80 and the material combination factor for the wear as 1.4. **12M**

(OR)

9. Design a pair of helical gears for transmitting 22 kW. The speed of the driver gear is 1800 r.p.m. and that of driven gear is 600 r.p.m. The helix angle is 30° and profile is corresponding to 20° full depth system. The driver gear has 24 teeth. Both the gears are made of cast steel with allowable static stress as 50 MPa. Assume the face width parallel to axis as 4 times the circular pitch and the overhang for each gear as 150 mm. The allowable shear stress for the shaft material may be taken as 50 MPa. The form factor may be taken as0.154 – 0.912 / T_E, where T_E is the equivalent number of teeth. The velocity factor may be taken as , 350 /(350 + v) where v is pitch line velocity in m / min. The gears are required to be designed only against bending failure of the teeth under dynamic condition. **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/mm^2. Design and draw the screw jack. **12M**

(OR)

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

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PART-A

ANSWER ALL QUESTIONS [1 x 10 = 10 M]

1. a) Define Inter Symbol Interference.
    b) Write any two properties of mutual information.
    c) Define coding efficiency.
    d) Define Nyquist rate.
    e) What are two types of sampling?
    f) Define Quantization error.
    g) State source coding theorem
    h) What is Shannon's limit?
    i) What is Memory less channel?
    j) What is non coherent PSK?

PART-B

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

UNIT-I

2. a) With the help of neat diagrams, explain the transmitter and receiver of Pulse code modulation. 6M
    b) Explain the elements of Digital communication System. 6M

(OR)

3. a) Explain the operation of differential pulse code modulation with neat diagram 6M
    b) Explain Nyquist's Orientation for distortion less baseband transmission 6M

UNIT-II

4. a) Explain ASK digital modulation technique. 6M
    b) Derive error probability of PSK. 6M

(OR)

5. a) Discuss about the difference between DPSK and QPSK. 6M
    b) Explain the correlation receiver with neat diagram. 6M

UNIT-III

6. a) Explain about the concept of (1). Amount of information (2).Infinite information (3).Zero information. 6M
    b) A source produces one of five possible symbols during each interval having probabilities $p(x_1)=1/4$, $p(x_2)=1/8$, $p(x_3)=1/4$, $p(x_4)=1/8$ and $p(x_5)=1/4$. Obtain the individual information contained in each symbol and entropy of the source. 6M

(OR)

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7. a) A discrete memory less source having four symbols with probabilities p(x1)=0.5, 6M
p(x2)=0.25, p(x3)=p(x4)=0.125. Generate Huffman coding and find efficiency of
coding

b) b) Apply the Shanon-Fano coding procedure for the following. 6M

[X]	x1	x2	x3	x4	x5	x6	x7	x8
[Y]	1/4	1/8	1/16	1/16	1/16	1/4	1/16	1/8

Take m=2, calculate entropy, code length and efficiency.

UNIT-IV

8. Consider the (7,4) linear block code whose generator matrix is given below. Find all the 12M
code vectors, find parity check matrix, minimum weight of this code.

1	0	0	0	1	0	1
0	1	0	0	1	1	1
0	0	1	0	1	1	0
0	0	0	1	0	1	1

(OR)

9. a) What is cyclic code? Explain the structure of cyclic code. 6M
b) Ilustrate the steps to calculate syndrome of a binary cyclic code. 6M

UNIT-V

10. a) Compare the block codes and convolution codes. 6M
b) Explain in detail about code tree and trellis diagram. 6M

(OR)

11. a) Find the generator matrix of a (7,4) cyclic code when generato polynomial 6M
$g(x)=1+x^2+x^3$ for systematic code.
b) Write about maximum likelihood decoding of convolution codes. 6M

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CODE: 13CS3012   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, March-2017

COMPUTER NETWORKS
(Computer Science and Engineering)
Time: 3 Hours   Max Marks: 70

PART-A
ANSWER ALL QUESTIONS   [1 x 10 = 10 M]

    1. a) Why are protocols needed?
        b) Define checksum.
        c)   Define Congestion Control
        d) Define CRC
        e) Define flooding
        f) How many layers are there under TCP/IP
        g) Define TCP
        h) Define routing
        i)   Define HTTP
        j) What is meant by data communication?

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

2. (a) What are the applications of Computer Networks?

  (b) Explain about the OSI reference model in detail

(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 in detail CSMA Protocol in detail
   (i) 1-persistance CSMA.
   (ii) Non-persistence CSMA.
   (iii) P-persistence CSMA.

   (b) Write short notes on

   i) Pure ALOHA   ii) Slotted ALOHA

(OR)

5) a) Explain the sliding window protocols in details

   b) Explain hamming error detection method

UNIT- III

6. (a) Difference between connections oriented service and connectionless service

   (b) Explain distance vector routing algorithm with a suitable example

(OR)

7. (a) Draw and explain the IPV4 format

   (b) Define routing algorithm? Explain multicast routing

UNIT IV

8. (a) What are the various services provided by the network layer to the transport layer?

   (b) Difference between TCP and UDP

(OR)

9. (a) Explain the TCP segment header
   (b) Explain the two-way army problem.

UNIT- V

10. (a) Define DNS? Explain the DNS name space.

    (b) Explain briefly about the simple network message protocol.

(OR)

11. Explain on

    i)WWW   ii)E-mail

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PART-A

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

1. a) Define scan conversion.
    b) List two graphics software standards.
    c) Explain world coordinates.
    d) Define rotation.
    e) Mention the disadvantage of line DDA algorithm.
    f) Give the matrix representation for 3D translation transformation.
    g) Define spline.
    h) Explain 3d viewing pipeline with pictorial representation.
    i) Define computer animation.
    j) Explain parameterized systems in brief.

PART-B

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

UNIT-I

2. (a) Explain how refresh cathode ray tube workswith a neat diagram.   [6M]
    (b) Explain how liquid crystal display works with a neat diagram.   [6M]

(OR)

3. (a) Explain Plasmapanel display device with a neat diagram.   [6 M]
    (b) Explain raster scan systems with a neat diagram.   [6 M]

UNIT-II

4. (a) Derive Bresenham's line generating algorithm having line slope   [6M]
         magnitude less than 1.
    (b) Explain basic inside-outside tests.   [6 M]

(OR)

5   (a) Derive midpoint circle generating algorithm.   [6 M]
    (b) Explain scanline polygon fill algorithm.   [6 M]

UNIT-III

6   (a) Explain how convex polygon can be clipped.   [6 M]

    (b) Perform 90degrees rotation of triangle having vertices A(0,0),B(5,1) and   [6 M]
         c(3,4) about pivot point (2,3).

(OR)

7   (a) List out the various basic 2D transformations and explain with homogeneous   [6 M]
         coordinate transformation matrix representation?
    (b) Explain how an object can be reflected about any given arbitraryline y=mx+c.   [6 M]

UNIT-IV

8 (a) Explain basic 3D rotationtransformation with matrices.   [6M]
   (b) Explain hermite interpolation method.   [6M]

(OR)

9 (a) Derivehow perspective projection coordinates can be obtained.   [6M]
   (b) Explain cubic Bezier curve with an example.   [6M]

UNIT-V

10 (a) Explain back face detection.   [6M]
    (b) Explain design of animation sequences and explain raster animation.   [6M]

(OR)

11 (a) Explain Painter's algorithm.   [6M]
    (b) Explain Depth-Buffer algorithm.   [6M]