AR13

CODE: 13CE3012   **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, Jan / Feb-2016
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) Explain diagonal tension in RC beams and how to resist it.
   b) When do you adopt doubly reinforced beams instead of singly reinforced beams?
   c) Write assumptions in limit state method?
   d) Write partial safety factor values for steel and concrete
   e) Explain the importance of lateral ties in columns
   f) For a balanced rectangular section (b x d) of singly reinforced beam, determine percentage of steel using M20 concrete and Fe415 steel
   g) Differentiate between long and short columns.
   h) What do you mean by axial, uniaxial and biaxial columns
   i) Differentiate between one way and two way slabs.
   j) Draw stress strain diagrams of mild steel and concrete

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 mmX450mm effective depth, simply supported over an effective span of 5m and reinforced with 4 bars of 20mm diameter on the tension side. Assume M20 and Fe 415 steel by working stress method.

(OR)

3. (a) Write about under reinforced, balanced and over reinforced sections.
   (b) Design an simply supported RC beam, for flexure, of span 4m and carrying an UDL of 40 kN/m. adopt M20 concerte and Fe415 steel

UNIT-II

4. Derive the expressions for the design stress block parameters and maximum depth of neutral axis for a given rectangular beam.

(OR)

5. Find the moment of resistance and capacity to take uniformly distributed load (including self weight) of a beam with the following data. Flange width=1200mm, Web width= 300mm, Slab thickness=120mm, effective depth=500mm, Tension steel consists of 5 # 20mm dia bars, effective length of the beam = 6m.Use M20 concrete and Fe 415 steel.

AR13

UNIT-III

6   Design an Rc beam for ultimate moment Mu= 200kN-m. The beam is having dimensions230mm x 400mm. Use M20 concrete and Fe415 steel by limit state method.

(OR)

7   An RC simply supported beam of section 300mm width and 500mm effective depth is subjected to a udl of 50 kN/m over a span of 8m. Check the section for shear and design the shear reinforcement. Consider M20 concrete and Fe 415 steel.

UNIT-IV

8   A short RCC column has a diameter of 450mm & is reinforced with 8 bars of 16mm diameter placed with a clear cover of 40mm. determine load carrying capacity of the column if the transverse reinforcement consists of
      i)   8mm mild steel ties @180mm C/C
      ii)   8mm spiral of Fe415 steel arrange a pitch of 80mm. Use M25 Concrete & Fe415 bars.

(OR)

9   Design a reinforced rectangular concrete column to carry on ultimate load of 1200KN and an ultimate moment of 200 kN-m. Use M25 grade concrete and Fe415grade steel.

UNIT-V

10   Design the slab for a room of 3.5mX8m clear dimensions. The slab rest on brick wall of 230 mm thickness. The live load on the slab is $3kN/m^2$. Adopt M20 concrete and Fe415 steel.

(OR)

11   Design a two way slab for a room 4m x 5m to support a live load of 3kN/sqm. One short side of the slab is discontinuous and corners are held down. Use M20 concrete and Fe415 steel.

***

CODE: 13EE3015

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, Jan / Feb-2016

ELECTRICAL MACHINES – III
(ELECTRICAL AND ELECTRONICS ENGINEERING)

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

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

1. a) State the significance of fractional slot windings.
   b) State the nature of armature reaction of an alternator when it is operating on unity power factor.
   c) Differentiate the salient and non-salient alternators in dimensions.
   d) For alternator will you find speed / voltage regulation, why?
   e) State the optimistic method of synchronous machine regulation computation.
   f) State the necessary conditions to made paralleling of alternator against infinite bus.
   g) State the significance of hunting.
   h) State the starting methods for single phase induction machine.
   i) State the applications of synchronous condenser.
   j) Select the suitable motor for sewing machine.

PART – B
Answer one question from each unit   **[5 X 12 = 60 M]**

UNIT - I

2. a) State the necessity of distributed winding, explain the distribution and pitch factors.[6 M]
   b) A 3 – phase, 1500 kVA, 6600 V star connected alternator with a resistance of 0.4 Ω and a reactance of 6 Ω per phase, delivers full load current at power factor 0.8 lagging, and normal rated voltage. Estimate the terminal voltage for the same excitation and load current at 0.8 power factor leading.   **[6 M]**

(OR)

3. a) Explain the phenomena of armature reaction when the alternator is delivering unity power factor and lagging power factor.   **[6+6 M]**
   b) the stator of three phase, 8 – pole, 750 r.p.m alternator has 72 slots, each of which contains 10 conductors. Calculate the r.m.s value of the e.m.f per phase if the flux per pole is 0.1 wbsinusoidally distributed. Assume full pitch coils and a winding distribution factor of 0.96.

UNIT - II

4. a) Explain the method of optimistic to compute the voltage regulation of an alternator.[5 M]
   b) A 3 – phase,3000 kVA, 11.2 kV, star connected non-salient pole alternator having armature resistance drop is2 % and the reactive drop 10 % on full load. The open circuit characteristics are given below:

Field Current (Amps)	100	150	200	250	300	400
Open Circuit voltage (Volts)	120	300	650	1200	3400	7200

Full load current on short circuit is obtained with an excitation of 175 A. Using the ampere turn method, determine the full load regulation when the power factor is 0.9 lagging. **[7 M]**

(OR)

5. a) State the significance of slip test on alternator, explain the experiment procedure.   **[6 M]**
   b) Derive the voltage regulation for salient pole synchronous generator and deduce to non-salient machine.   **[6 M]**

UNIT - III

6. a) Explain the experimental procedure for two synchronous generators connected in parallel.
    [6 M]

    b) The governors on the prime movers of two 1000 kW alternators running in parallel are so adjusted that the frequency of one of the alternators drops from 51 Hz to 48.5 Hz, that of other drops from 51 Hz to 49 Hz. Calculate (i) the load on each machine when the total load is 1250 kW and (ii) the frequency at this load. [6 M]

(OR)

7. Two 1000 kVA, 3-phasealternators are running in parallel. The setting of governors is such that rise of speed from full load to no load of machine A is 2 % and that of machine B is 3 %, the speed – load characteristics being straight lines in both cases.
    (i)   If both machines are fully loaded when the total load is 2000 kVA, find the load on each machine when the total load is 1166.6 kVA.
    (ii)   Also compute the load at which one machine ceases to supply any load. [12 M]

UNIT - IV

8. a) Explain how a synchronous motor operates and synchronous condenser and mention its applications. [6 M]

    b) A 100 HP, 4, 1000 r.p.m, 50 Hz, 3-ϕ, star connected synchronous motor is designed to operate at unity power factor at full load. The rated line current is 106 A. The armature resistance is 0.09 Ω per phase and the synchronous reactance is 2.25 Ω per phase.
    (i) Estimate the generated voltage per phase, torque angle, power developed at rated conditions.
    (ii) Repeat for 0.8 pf lagging and rated current.

(OR)

9. a) How to prevent the hunting of synchronous motor? Explain. [6 M]

    b) A 3-ϕ, 40 kW, 400 V, 50 Hz star connected synchronous motor has a full load efficiency of 90%. The synchronous impedance of the motor is 25+j12 Ω per phase. If the excitation of the motor must be adjusted to give leading power factor of 0.8, compute the induced e.m.f and total mechanical power developed at full load. [6 M]

UNIT - V

10. a) Using double field revolving theory, explain why a single phase induction motor is not self-starting. [6 M]

    b) A 230 V, 50 Hz, 4 – pole, single phase induction motor has the following equivalent circuit parameters:
    $R_{1m} = R^1_2 = 8 \ \Omega$
    $X_{1m} = X^1_2 = 12 \ \Omega$, $X_M = 200 \ \Omega$
    At a slip of 4%, calculate (i) input current (ii) input power (iii) developed power and developed torque at rated voltage. The motor speed is 1400 rpm [6 M]

11. a) Explain simply why a universal motor can operate from DC as well as AC supplies. What are the chief differences in construction between AC/DC series motor and DC series motor?
    [6 M]

    b) Explain the construction and principle operation of universal motor [6 M]

***

AR13

SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, Jan / Feb-2016
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 'full' and 'partial' journal bearing?
   b) What are the commonly used materials for sliding contact bearings?
   c) How do you express the life of bearing?
   d) Explain the various types of cylinder liners.
   e) Name the materials used for connecting rod.
   f) What is the function of a piston of an IC engine?
   g) What are the advantages and disadvantages of V-belt drive over flat belt drive?
   h) What is the stub involute gear tooth system?
   i) Where do you use helical gears?
   j) What is self locking property of threads?

PART-B

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

UNIT-I

2. (a) What are the four objectives of lubrication?
   (b) 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 (a) The amount of artificial cooling required, and (b) The mass of the lubricating oil required, if the difference between the outlet and inlet temperature of the oil is 10°C. Take the specific heat of the oil as 1850 J/Kg/^{o}C.

(OR)

3. (a) Enumerate any two advantages and disadvantages of rolling-contact bearings over sliding-contact bearings.
   (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.

UNIT-II

4. Draw and Design a connecting rod for an IC Engine running at 1800 rpm and developing a max pressure of 3.15 Mpa, the diameter of the piston is 100 mm. Mass of the reciprocating parts per cylinder 2.25 kg, length of the connecting rod 380 mm,stroke of the piston 190 mm and take Factor of safety is 6. The density of material of the rod may be taken as 8000 kg/m^3, allowable stress in the bolts as 60 N/mm^2 and in cap as 80 N/mm^2 and the buckling stress is 320 N/mm^2.

(OR)

5. Design an overhung crankshaft for a 500 mm x 600 mm gas engines. The weight of the flywheel is 80 KN and the explosion pressure is 2.5 Mpa. The gas Pressure at the maximum torque is 0.9 Mpa, when the crank angle is 30° from I.D.C. The connecting rod is 4.5 times the crank radius.

AR13

SET-1

UNIT-III

6   Draw and design cast iron piston for a single acting 4-stroke engine for the following data. Cylinder bore=300mm; stroke=450 mm; Maximum gas pressure=5Mpa; Indicated mean effective pressure=0.7 Mpa; Mechanical efficiency=80%; Fuel consumption=0.3 kg per KW of power per hour; Higher calorific value= 46×10^3 kJ/kg; Speed= 3500rpm. Any other data required for the design may be assumed.

(OR)

7   Design a belt drive to transmit 110 KW for a system consisting of two pulleys of diameters 0.9 m and 1.2 m, centre distance of 3.6 m, a belt speed 20 m/s, coefficient of friction 0.3, a slip of 1.2% at each pulley and 5% friction loss at each shaft,20% over load.

UNIT-IV

8   The following particulars of a single reduction spur gear are given: Gear ratio= 10:1; distance between centers =660 mm approximately; pinion transmits 500 KW at 1800 r.p.m; involute teeth of standard proportions (addendum=m) with pressure angle of 22.5^0; permissible normal pressure between teeth = 175 N per mm of width. Find (a) The nearest standard module if no interference is to occur (b) The number of teeth on each wheel (c) The necessary width of pinion and (d) The load on the bearings of the wheels due to power transmitted.

(OR)

9   A pair of helical gears with 30^0 helix angle is used to transmit 15 KW at 10000 r.p.m of the pinion. The velocity ratio is 4:1. Both the gears are to be made of hardened steel of static strength 100 Mpa. 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 wear.

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.

(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.

***

AR13

CODE: 13EC3014   **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, Jan / Feb-2016

DIGITAL COMMUNICATIONS
(ELECTRONICS AND COMMUNICATION ENGINEERING)

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

PART-A

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

1. a) What are the applications of PCM?
   b) Different types of noise effects in delta modulation
   c) Define Nyquist rate.
   d) Define m-ary systems
   e) What is the probability of error?
   f) Define optimum filter.
   g) What are the amount of information properties?
   h) What are the error detection and correction capabilities of hamming codes ?
   i) How syndrome is calculated in Hamming codes and cyclic codes?
   j) Differentiate between block codes and cyclic codes?

PART-B

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

UNIT-I

2. a) Discuss the advantages and disadvantages of digital communication system.

   b) Distinguish between natural sampling and flat top sampling with neat schematics, listing out their merits and demerits.

(OR)

3. a) Draw the block diagram of Delta modulation and explain it with its drawbacks.
   b) With neat diagrams, explain the principle of working a sample and hold circuit. List out its applications

UNIT-II

4. a) What are different digital modulation techniques available? Compare them with regard to the probability error
   b) What is matched filter and explain in detail.

(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) Let X is a discrete random variable with equally probable outcomes x1=A, and x2=-A and conditional probability pdf's p(y/xi), i=1, 2 be the Gaussian with mean xi and variance σ2. Calculate average mutual information I(X; Y).

   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 systematic code form for the binary cyclic codes

(OR)

9.a) Discuss the properties of syndrome calculations in binary cyclic codes.

   b) Discuss about matrix description of linear block codes.

UNIT-V

10. a) Compare the linear block codes, Cyclic codes and the convolutional 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?

AR13

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
III B.Tech I Semester Supplementary Examinations, Jan / Feb-2016
COMPUTER NETWORKS
(Computer Science Engineering)

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

PART-A

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

1. a). Define protocol
    b). Define internet
    c.) What is frame.
    d).What is the function of ALOHA
    e). What is static and dynamic routing.
    f.) What is sub net
    g).Write the packet format of TCP segment
    h).Define Jitter
    i). What is WWW
    j). What are the services of E-mail.

PART-B

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

UNIT – I

2.   a) Differentiate connection oriented and connection less services.
        b) Describe the process of encapsulation and de-capsulation with the help of OSI model.

(OR)

3.   a) Explain the addressing concept in TCP / IP protocol suite.
        b) Give a brief note on internet standards and standard organizations.

UNIT – II

4.   a) Write a short notes on error correcting and detecting codes.
        b) Write a short notes on Elementary data link protocols.

(OR)

5.   a) How CSMA is useful in flow control. Explain in detail.
        b) Write a short notes on LAN bridges.

UNIT – III

6.   a) Describe the design issues of network layer.
        b) What are the classes of IP V4. Explain in detail.

(OR)

7.   a) What is count to infinity problem explain in detail.
        b) Explain the leaky bucket and token bucket algorithm.

UNIT – IV

8.   a) What are the elements of transport protocol.
        b) Explain the connection release procedure of transport layer.

(OR)

9.   a) Describe the flow control procedure for Transport layer.
        b) Explain about UDP role in internet transport layer.

UNIT – V

10.   Write a short notes on following
        a) HTTP   b) E-mail   c) Web documents

(OR)

11.   a) What is DNS. Explain in detail.
        b) Explain in detail about SNMP

***