AR13

CODE: 13CE2007 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Regular / Supplementary Examinations, May-2016

HYDRAULICS AND HYDRAULIC MACHINERY
(CIVIL ENGINEERING)

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

PART-A

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

1. a) What is most economical section?
   b) Differentiate hydraulic mean depth and hydraulic mean radius.
   c) Define specific energy?
   d) Write any two applications of hydraulic jump.
   e) Define shooting flow
   f) A jet of water 3 cm in diameter is striking a vertical plate with velocity of 3 m/s. Find the force exerted on the plane
   g) What are the velocity of whirl and velocity of flow?
   h) Classify the centrifugal pumps based on head.
   i) What is the example for Impulse Turbine?
   j) What are the conditions for most economical Trapezoidal?

PART-B

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

UNIT-I

2. a) State Raleigh's method of dimensional analysis? 4M
   b) The efficiency η of a fan depends on density ρ, dynamic viscosity μ of the fluid, angular velocity, diameter D of the rotor and the discharge. Express η in terms of dimensionless parameters using Raleigh's method 8M

(OR)

3. a) State Buckingham's π theorem. 4M
   b) By dimensional analysis using Buckingham's π theorem obtain an expression for the drag force R on a partially submerged body moving with a relative velocity V in a fluid , the other variable being the linier dimension l, height of surface roughness K, fluid density ρ and the gravitational acceleration g. 8M

UNIT-II

4. a) Derive the condition for the rectangular channel of best section. Show that the hydraulic mean depth of such a channel is half of the depth of flow. 5M
   b) Find the width and depth of rectangular channel to convey a discharge of 1.45 m3/sec at a velocity of 0.5 m/s. The bed of a channel has a slope of 0.0001 .Take manning's Coefficient N=0.014 7M

(OR)

5. a) Derive the expression for gradually varied flow? 5M
   b) A rectangular channel 7.5m has a uniform depth of flow of 2.0m and has bed slope of 1 in 3000. If due to weir constructed at the downstream end of the channel, water surface at a section is raised by 0.75m, determine the water surface slope with respect to horizontal at this section assuming Manning's N=0.012 7M

UNIT-III

6. a) Derive an expression for force exerted by jet on stationary flat plate? 5M
   b) A jet 150 mm diameter moving at 25 m/sec strikes a plate which remains at rest. Find the force exerted on the plate normal to it when i) the plate is held normal to the jet and ii) when the plate makes an angle of 30^0 to the jet. 7M

(OR)

7. a) Derive an expression for force exerted by jet on moving curved plate? 5M
   b) A jet of water moving at a velocity of 30 m/sec impinges on a series of vanes moving at 15m/s. The jet makes an angle of 30^0 to the direction of motion of the vanes at entry and leaves the vane at120^0. Draw the inlet and outlet velocity diagrams and find i) vane angle at inlet and outlet ii) Work done per second iii) efficiency. 7M

UNIT-IV

8. a) Draw the layout of hydro electrical power plant and name the components 5M
   b) An inward flow reaction turbine runs at 400 rpm under a head of 150 M the inlet diameter is 1.2 m and the width at inlet is 100 mm. The guide blade angle is $20^0$and the discharge of the turbine is $6m^3$/sec. Find i) work done per second ii) The hydraulic efficiency iii)The power applied to shaft. 7M

(OR)

9. a) Define draft tube . Write any two functions of draft tube. 4M
   b) A turbine is to operate under a head of 25m at 200rpm. The discharge is 9m3/sec. If the efficiency is 90% ,Determine ; i) Specific Speed of the Machine ii) Power generated iii) Type of turbine iv) performance under a head of 20 m. 8M

UNIT-V

10. a) Explain: i) Manometric efficiency ii) Mechanical efficiency iii) Overall efficiency of centrifugal pump. 4M
    b) The impeller of centrifugal pump is 300 mm outside diameter and 150 mm inside diameter. The impellor vane angles are 30^0 and 25^0at the inner and outer peripheries respectivelly and the speed is 1450 rpm the velocity of flow through impeller is constant. Find the work done by the impeller. 8M

(OR)

11. a) Explain the terms NPSH and Cavitation 4M
    b) A four stage centrifugal pump is discharging 0.2 m^3/sec against the total head of 60 m and runs at 350 rpm . the vanes are curved backward at an angle of 60^0 to the tangent at outlet .The velocity of flow at the outlet is 0.27 times the corresponding peripheral velocity. Hydraulic losses are one-third of the velocity head at outlet of the impeller . find i) outer diameter of the impeller .ii) Manometric efficiency iii) guide blade angle at outlet . Assume radial entry. 8M

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AR13

CODE: 13EE2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular / Supplementary Examinations, May-2016

ELECTRICAL MACHINES – II

(Electrical and Electronics Engineering)

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

PART-A

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

1. a) Explain the principle of power transfer form primary to secondary in a Transformer
   b) Why the wattmeter reads only Iron losses during Open Circuit Test
   c) At what load condition the regulation of a transformer is less than Zero
   d) Why Transformer core is Laminated?
   e) Why do we require tertiary winding in the three phase transformer?
   f) What is the maximum possible synchronous speed of 3-phase, 50Hz Induction Motor?
   g) What is the advantage of the double cage rotor over single cage rotor
   h) How do you change the direction of rotation of 3-phase Induction Motor
   i) Why is the rotor rheostat starter unsuited for a cage motor?
   j) What are the application of Induction Generator

PART-B

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

UNIT-I

2. a. Develop Equivalent circuit of Transformer and describe briefly various parameters involved in it. **6M**
   b. A 1-ø transformer has 1000 turns on the primary and 200 turns on the secondary. The no-load current is 3amp at a p.f of 0.2 lagging. Calculate the primary current and power factor, when the secondary is 280amp at a power factor of 0.8 lagging. **6M**

(OR)

3. a. What are the different losses in a transformer? Derive the maximum efficiency of the transformer. **6M**
   b. The maximum efficiency of a 500 KVA, 3300/500V, 50 Hz, single phase transformer is 97% at 3/4 full load, upf. If the impedance is 10%, calculate the regulation at full load, pf 0.8 lagging. **6M**

UNIT-II

4. a What is an Autotransformer? Derive an expression for saving of copper in autotransformer when compared with two winding transformer. **5M**
   b A 100KVA, 6600/250V, 50Hz, transformer gave the following results: **7M**
   OC Test (LV side): 2 A, 900W, Normal Voltage.
   SC Test (HV side): 12A, 290V, 860W
   Calculate the efficiency and percentage regulation at full-load 0.8 power factor leading.

(OR)

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CODE: 13EE2011 SET-2

5.		With neat sketch explain about Scott connection	**12M**

UNIT-III

6.	a.	Explain why the rotor of poly-phase Induction motor can never attain synchronous speed.	**5M**
	b.	A 400V, 4-pole, 3-phase, 50Hz induction motor has a rotor resistance and reactance per phase of 0.01 ohm and 0.1ohm respectively. Determine (i) Maximum torque in N-m and the corresponding slip. (ii) the full load slip and power output in watts, if maximum torque is twice the full load torque. The ration of stator to rotor turns is 4.	**7M**

(OR)

7.	a.	Develop the equivalent circuit of 3-phase Induction Motor	**5M**
	b.	A 10 kW, 3-phase, 50 Hz, 4 pole induction motor has a full load slip of 0.03. Mechanical and stray load losses at full load are 3.5% of output power. Compute (i) power delivered by stator to rotor (ii) electromagnetic torque at full load and (iii) rotor copper losses at full load.	**7M**

UNIT-IV

8.		A 15 kW, 415V, 4 pole, 50 Hz delta connected 3-phase induction motor gave the following test results**:** No load test **:** 415 V, 10.5 A, 1510 W Blocked rotor test **:** 105 V, 28A, 2040 W Draw the circle diagram and find full load current, power factor and efficiency. Assume copper losses divide equally between stator and rotor under short circuit condition.	**12M**

(OR)

9.	a.	What are different starters used for 3 phase induction motor? In each case give the ratio between starting torque and full load torque.	**6M**
	b.	A 3-phase Induction Motor whose full load slip is 4% takes six times full load current when switched directly on to the supply. Calculate the approximate starting torque in terms of the full load torque when started by means of an autotransformer starter, having a 70 % voltage tap.	**6M**

UNIT-V

10.	a.	Discuss various speed control methods on stator side of 3-phase induction motor.	**6M**
	b.	A 4-pole Induction motor and a 6-pole Induction motor are connected in cumulative cascade. The frequency in the secondary circuit of the 6-pole motor is observed to be 1.0Hz. Determine the slip in each machine and the combined speed of the set. Take supply frequency as 50Hz.	**6M**

(OR)

11.	a.	Discuss various speed control methods on rotor side of 3-phase induction motor.	**6M**
	b.	Explain the principle of operation of Induction Generator.	**6M**

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AR13 SET-2

Code: 13ME2010

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Regular / Supplementary Examinations, May-2016

DESIGN OF MACHINE MEMBERS - I

(MECHANICAL ENGINEERING)

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

PART-A

Answer all questions **[1 X 10 = 10 M]**

1. a) What does Fe E 220 indicates?
   b) How do you define Factor of Safety for Fatigue Loading?
   c) What do you understand by the term 'efficiency of a riveted joint'?
   d) What factors are considered in selection of weld type?
   e) What is meant by stud?
   f) What is meant by hoop stress.
   g) What is meant by cotter?
   h) What materials are used for manufacture of shafts?
   i) List different types of shaft couplings?
   j) Draw the variation of wahl stress factor wrt spring index?

PART-B

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

UNIT-I

2. (a) Explain maximum principal stress and shear stress failure theories [6M]
   (b) Design a hollow shaft required to transmit 11.2 MW at a speed of 300 r.p.m. The maximum shear stress allowed in the shaft is 80 MPa and the ratio of the inner diameter to outer diameter is 3/4 [6M]

(OR)

3. a) Explain the methods to reduce stress concentration factor. [4M]
   b) A cold drawn steel rod of circular cross-section is subjected to a variable bending moment of 565 Nm to 1130 N-m as the axial load varies from 4500 N to 13 500 N. The maximum bending moment occurs at the same instant that the axial load is maximum. Determine the required diameter of the rod for a factor of safety 2. Neglect any stress concentration and column effect. Assume the following values: Ultimate strength = 550 MPa Yield strength = 470 MPa
   Size factor = 0.85 Surface finish factor = 0.89 Correction factors = 1.0 for bending = 0.7 for axial load The endurance limit in reversed bending may be taken as one-half the ultimate strength. [8M]

Code: 13ME2010

UNIT-II

4. Figure shows a plate riveted on to a vertical column with three rivets placed at three corners of an equilateral triangle of size 75 mm. A load of 37 kN acts on the plate at a distance of 125 mm from vertical line through a rivet as shown in Figure 4. If the permissible stress in rivet is 60 N/mm2 calculate the diameter of the rivet. [12M]

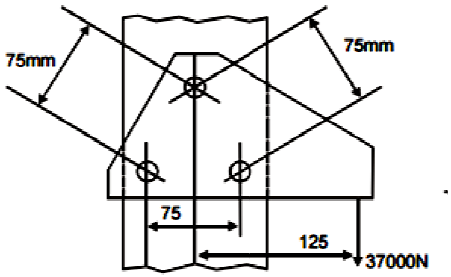

Figure 4

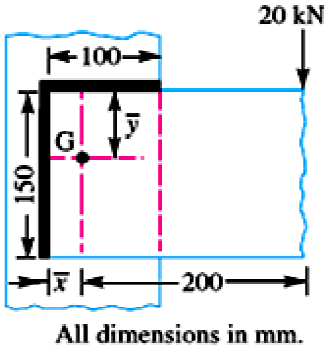

Figure 5

(OR)

5. a) Discuss the advantages of welded joints over riveted joints [4M]

b) Fig.5 shows a welded joint subjected to an eccentric load of 20 kN. The welding is only on one side. Determine the uniform size of the weld on the entire length of two legs. Take permissible shear stress for the weld material as 80 MPa. [8M]

UNIT-III

6. (a) Explain the design procedure for bolts when the load acting is eccentric and perpendicular to the axis of the bolts [6M]

(b) The cylinder head of a steam engine is subjected to a pressure of 1 N/mm2. It is held in position by means of 12 bolts. The effective diameter of the cylinder is 300 mm. A soft copper gasket is used to make the joint leak proof. Determine the size of the bolts so that the stress in the bolts does not exceed 100 MPa. [6M]

(OR)

7. A steel tube 240 mm external diameter is shrunk on another steel tube of 80 mm internal diameter. After shrinking, the diameter at the junction is 160 mm. Before shrinking, the difference of diameters at the junction was 0.08 mm. If the Young's modulus for steel is 200 GPa, find: 1. tangential stress at the outer surface of the inner tube; 2. tangential stress at the inner surface of the outer tube ; and 3. radial stress at the junction. [12M]

Code: 13ME2010

UNIT-IV

8. Explain the design procedure for sleeve and cotter joint [12M]

(OR)

9. A shaft is supported by two bearings placed 1 m apart. A 600 mm diameter pulley is mounted at a distance of 300 mm to the right of left hand bearing and this drives a pulley directly below it with the help of belt having maximum tension of 2.25 kN. Another pulley 400 mm diameter is placed 200 mm to the left of right hand bearing and is driven with the help of electric motor and belt, which is placed horizontally to the right. The angle of contact for both the pulleys is 180° and □= 0.24. Determine the suitable diameter for a solid shaft, allowing working stress of 63 MPa in tension and 42 MPa in shear for the material of shaft. Assume that the torque on one pulley is equal to that on the other pulley. [12M]

UNIT-V

10. It is required to design a rigid type of flange coupling to connect two shafts. The input shaft transmits 37.4 kW power at 175 rpm to the output shaft through the coupling. The design torque is 1.5 times of the rated torque. Select suitable material for various parts of the coupling,design the coupling and specify the dimensions of its components. [12M]

(OR)

11. A safety valve of 60 mm diameter is to blow off at a pressure of 1.2 N/mm2. It is held on its seat by a close coiled helical spring. The maximum lift of the valve is 10 mm. Design a suitable compression spring of spring index 5 and providing an initial compression of 35 mm. The maximum shear stress in the material of the wire is limited to 500 MPa. The modulus of rigidity for the spring material is 80 kN/mm2. Calculate : 1. Diameter of the spring wire, 2. Mean coil diameter,3. Number of active turns, and 4. Pitch of the coil. [12M]

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AR13

CODE: 13EC2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.TECH II SEM REGULAR EXAMINATIONS, MAY, 2016

ELECTROMAGNETIC WAVES AND TRANSMISSION LINES

(Electronics and Communication Engineering)

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

PART-A

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

1. a) Define Divergence of a vector
   b) State coulombs law.
   c) State Biot savart's law.
   d) Define skin depth
   e) What is loss tangent
   f) Define Brewster angle
   g) List the applications of the smith chart
   h) What are secondary and primary constants of transmission line
   i) Define VSWR
   j) Define phase and group velocities.

PART-B

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

UNIT-I

2. a Derive the boundary conditions at the interface between dielectric and dielectric
   b Using Gauss law, derive expression for electric field intensity and electric flux density due to an infinite sheet of conductor of charge density ρ c/m^2.
3. a Derive the expression for capacitance of a spherical capacitor.
   b Derive the expression for electric field intensity due to a long infinite line charge.

UNIT-II

4. a Derive the expression for Magnetic field intensity due to infinite long straight conductor.
   b Derive the Expression for energy stored in magnetic field.
5. a Discuss different types of Magnetic materials.
   b Discuss the applications of Ampere's law.

UNIT-III

6. a Discuss modified Amperes law and its physical interpretation in detail
   b Explain Transformer and Motional electromotive forces.
7. a Prove Maxwell's equations and explain for time varying fields.
   b Given H=$H_m e^{j(\omega t+\beta z)} \hat{a}_x A/m$ in free space. Find E.

UNIT-IV

8. a Prove that $E_x = 0 = H_x$ for a uniform plane wave propagating in 'x' direction.
   b Obtain reflection and transmission coefficients in case of normal incidence in dielectric interface
9. a Obtain the propagation characteristics of plane wave in good conductors and dielectrics
   b Discuss poynting theorem and vector in detail

UNIT-V

10. a Obtain expressions for α,β,□,Z_0 of a loss less and distortion less transmission line.
    b A transmission line of length 0.3λ has Z_0=100Ω and is terminated in a load of impedance of 200 +j180Ω. Find reflection coefficient, VSWR and input impedance.
11. a A loss less transmission line of length 100m has an inductance of 28μH and a capacitor of 20nF.find 1. propagation velocity,2.phase constant at operating frequency of 100KHz 3.characteristic impedance of the line
    b Define open circuit and short circuited line and prove $Z_o = \sqrt{Z_{sc}Z_{oc}}$

AR13

CODE: 13CS2008 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular / Supplementary Examinations, May, 2016

COMPUTER ORGANIZATION AND ARCHITECTURE

(COMMON TO CSE & IT)

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

PART-A

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

1. a) What is the use of buffer register?
   b) What is meant by MAR and MDR?
   c) What is indexed addressing mode?
   d) Write the Add/subtract rule for floating point numbers
   e) What is meant by memory management unit?
   f) What do you mean by static memories?
   g) What are the functions of I/O interface?
   h) Define DMA controller
   i) What are the major characteristics of a pipeline?
   j) Give the difference between RISC and CISC

PART-B

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

UNIT-I

2. a) Explain about arithmetic and logic micro operations. 6 M
   b) Explain the representations of floating point numbers in detail 6 M

(OR)

3. a) Explain the multiple bus organization in detail. 6 M
   b) Explain the execution of an instruction with diagram 6 M

UNIT-II

4. a) Discuss the principle behind the Booth's algorithm? 6 M
   b) Discuss the principle of operation of carry-look ahead adders 6 M

(OR)

5. a) write in brief general processor organization. 6 M
   b) Explain the working of floating point adder and subtractor 6 M

UNIT-III

6. Give the structure of semiconductor RAM memories. Explain the read and write operations in detail. 12 M

(OR)

7. a) Explain the organization of magnetic disks in detail. 8 M
   b) Explain the concept of memory hierarchy. 4 M

UNIT-IV

8. Explain the functions to be performed by a typical I/O interface with a typical input output interface. 12 M

(OR)

9. Write note on the following. 12 M
   i) Bus arbitration
   ii) Printer process communication
   iii) USB
   iv) DMA

UNIT-V

10. Discuss the various hazards that might arise in a pipeline. What are the remedies commonly adopted to overcome/minimize these hazards. 12 M

(OR)

11. Explain multiprocessor inter connection structure 6 M
    Explain the influence of instruction sets. 6 M

CODE: 13CS2008

II B.Tech II Semester Regular / Supplementary Examinations, May, 2016

COMPUTER ORGANIZATION AND ARCHITECTURE
(COMMON TO CSE & IT)

Note: **Q.No 5** a) write in brief general processor organization

CODE: 13CS2008

II B.Tech II Semester Regular / Supplementary Examinations, May, 2016

COMPUTER ORGANIZATION AND ARCHITECTURE
(COMMON TO CSE & IT)

Note: **Q.No 5** a) write in brief general processor organization

CODE: 13CS2008

II B.Tech II Semester Regular / Supplementary Examinations, May, 2016

COMPUTER ORGANIZATION AND ARCHITECTURE
(COMMON TO CSE & IT)

Note: **Q.No 5** a) write in brief general processor organization

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II B.Tech II Semester Regular / Supplementary Examinations, May, 2016

COMPUTER ORGANIZATION AND ARCHITECTURE
(COMMON TO CSE & IT)

Note: **Q.No 5** a) write in brief general processor organization

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II B.Tech II Semester Regular / Supplementary Examinations, May, 2016

COMPUTER ORGANIZATION AND ARCHITECTURE
(COMMON TO CSE & IT)

Note: **Q.No 5** a) write in brief general processor organization

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II B.Tech II Semester Regular / Supplementary Examinations, May, 2016

COMPUTER ORGANIZATION AND ARCHITECTURE
(COMMON TO CSE & IT)

Note: **Q.No 5** a) write in brief general processor organization