AR16

CODE: 16CE2008 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech. II Semester Regular & Supplementary Examinations, April - 2019
STRUCTURAL ANALYSIS-I
(Civil Engineering)

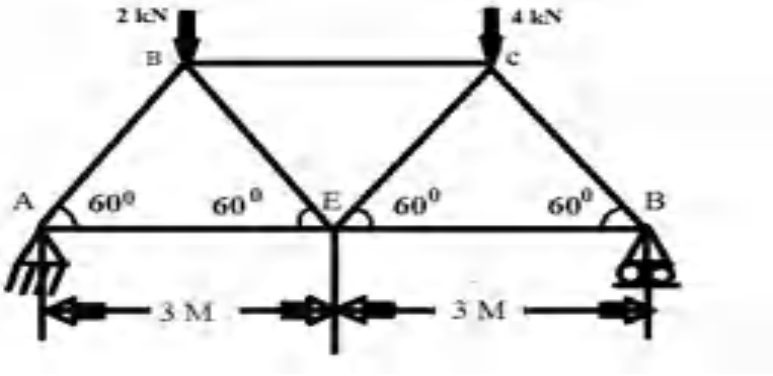
Time: 3 Hours **Max Marks: 70**

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

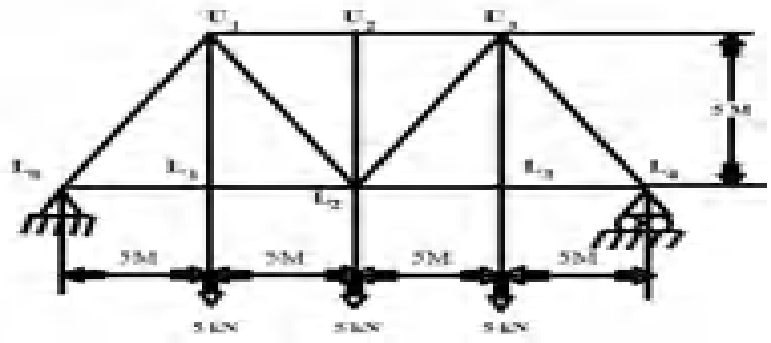
1.a) Write Assumptions in the members of a perfect frame and when did the Frame becomes deficient? (5 M)

b) Find the forces in the various members of the framed truss as shown in fig. and tabulate the results. (9 M)



(OR)

2. Find the forces in all the members of the pratt- truss loaded as shown by method of sections (14M)



UNIT-II

3. Find the prop reaction and draw the shear force and bending moment diagrams of the propped cantilever beam of span 8m and a point load 10 kN is acting at the centre of the beam (14M)

(OR)

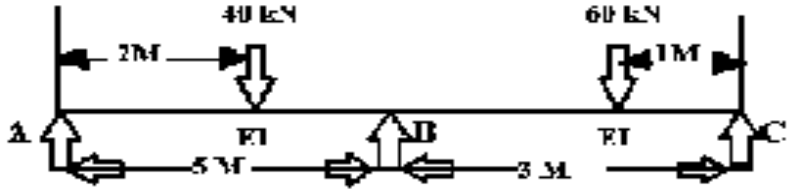
4. Find the fixed end moments, points of contra flexure, shear force and bending moment diagrams of fixed beam. The UDL load is 40kN/m acting entire span of the beam of length 8m (14M)

UNIT-III

5. Derive the Clapayrons's theorem of three moments for continous beam. (14M)

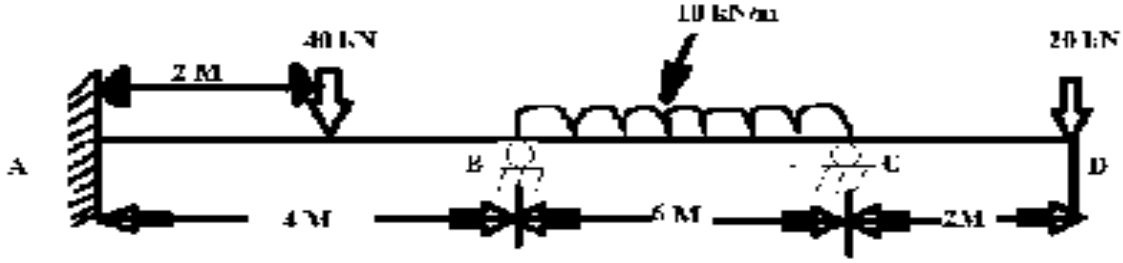
(OR)

6. Draw the bending moment and shear force diagrams for the two span continuous beam shows in fig, given below. The beam is simply supported at the supports A and B and is continuous over the support B. EI is constant by Clapayron's theorem of three moments. (14M)



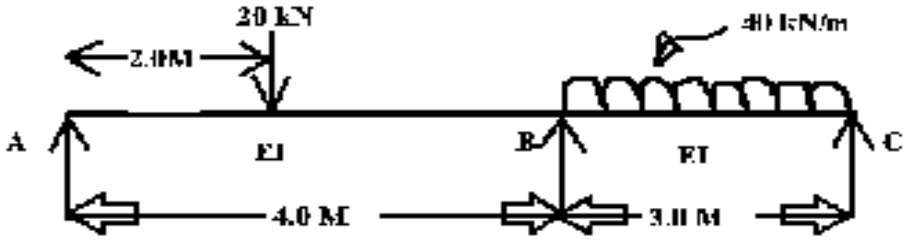
UNIT- IV

7. A Continuous beam is supported and loaded as shown in fig. during loading support B sinks by 10mm. Analyse the beam for support moments and reactions E = 2 x 10^5 N/mm^2 and I = 100 x 10^6 mm^4 constant throughout. (14M)



(OR)

8. Draw the bending moment and shear force diagram for the two span continuous beam shows in fig. given below. The beam is simply supported at the supports A and B and is continuous over the support B. EI is constant by slope deflection method. (14M)



UNIT – V

9. (a) Explain the castigliano's theorem – I (7M)
   (b) A 60mm diameter steel bar is 4m long and carries a tensile load of 200kN. Determine the strain energy stored in the bar . Take E= 200GN/m^2 (7 M)

(OR)

10. (a) Explain the castigliano's theorem – II (7M)
    (b) Find the vertical deflection at the free end of a cantilever beam of length 5m and a point load of 25kN acting at free end
    (Assume I= 30 x $10^{-4}m^4$ and E= 2 x $10^{11}N/m^2$ (7M)

AR16

CODE: 16EE2012 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech. II Semester Regular & Supplementary Examinations, April - 2019

ELECTRICAL MACHINES-II

(Electrical & Electronics Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1. a) Write the advantages disadvantages of 3- Θ induction motor, compare between different types of induction motors based on the construction of Rotor. **7M**

   b) The Induced emf between the slip ring terminals of an induction motor at standstill isn100V. The rotor windings are star connected and has a resistance of 0.4 ohms per phase and standstill reactance of 2.25 ohms per phase. Calculate, the rotor current when the slip-ring terminals are short – circuited and the rotor is rotating at a slip of 4%. **7M**

(OR)

2. a) Obtain the condition for maximum running torque and starting torque. **7M**

   b) A 6pole, 3-phase, 50hz, Induction Motor develops maximum torque of 300N-M at a speed of 960rpm. Determine the torque developed by the motor at 5% slip. The rotor resistance per phase is 0.6 ohm. **7M**

UNIT-II

3. a) Explain the working of Star – Delta starter for three phase Induction Motor. **6M**

   b) A 400V, 40HP, 50 Hz, three phase Induction Motor gave the following test data: **8M**
   No load Test :400V, 20A, 1200W,
   Blocked Rotor Test: 100V, 45A, 2750W;
   Draw the circle diagram, from it find i) full load current ii) full load power factor iii) maximum torque iv) efficiency

(OR)

4. a) Explain the cascade arrangement for controlling the speed of three phase Induction Motor. Derive the equation for speeds at which the cascade set operates. **7M**

   b) Explain the principle and operation of Induction Generator. Also write their applications. **7M**

UNIT-III

5. a) Explain the advantages of stationary armature in Synchronous Machine? **4M**

   b) Derive the expression for generated EMF in alternator. What is the effect of distribution factor (Kd) and pitch factor (Kc) on it and derive the same factors? **10M**

(OR)

6. a) Explain the armature reaction effect in synchronous generators. **7M**

   b) A 3 phase , 4 Pole,50Hz,star connected alternator has flux per pole of 0.12 Wb. It has 4 slots/pole/phase and 4 conductors per slot. If the coil span is 150 degrees. Find the induced emf/phase? **7M**

UNIT-IV

7. a) Explain how potier triangle is developed from OCC and ZPFC. **7M**

   b) A 3phase star connected 1000KVA and 11Kv alternators as a rated current of 52.5A. The Resistance of a stator/phase =0.45Ω. The tests results are given below. The OC Test If=12.5A voltage between lines=422V. ; The SC Test If=12.5A line current =52.5A Determine full load voltage regulation of alternator at 0.8 pf lagging by synchronous impedance method. **7M**

(OR)

8. a) Explain the synchronous impedance method of finding voltage regulation in alternators. **6M**

   b) Explain Blondel's two reaction theory. Draw phase diagram (Lagging Power Factor and drive expression for no load terminal voltage. **8M**

UNIT-V

9. a) Explain the principle of operation of Synchronous Motor, what do you understand by term Normal Excitation, Under Excitation & Over Excitation with the help of phasor diagrams. **7M**

   b) A 2200V, 3-phase star connected Synchronous motor has an effective resistance and synchronous reactance of 0.4 ohm and 2.4 ohm per phase respectively. The input is 900KW at normal voltage and the induced line emf is 2700V. Calculate the line current and power factor. **7M**

(OR)

10. a) Explain the effect of increased load on the synchronous motor when the excitation is kept constant. Draw necessary phasor diagrams. **7M**

    b) Explain the starting methods of synchronous motors. **7M**

AR16

CODE: 16ME2010 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech. II Semester Regular & Supplementary Examinations, April - 2019

THERMAL ENGINEERING - I

(Mechanical Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	List out the reasons for deviation between Air standard and Actual cycle of IC engine.	7m
	b)	Classify IC engines based on cylinder arrangement with simplified sketches.	7m
		(OR)	
2.	a)	Discuss briefly about Time loss factor and Heat loss factor.	
	b)	Explain the working of 4 stroke CI engine with the help of neat sketches.	7m

UNIT-II

3.	a)	What are the functions of Carburetor and explain the working of Simple carburettor with a neat sketch.	7m
	b)	Briefly explain about normal combustion in SI engines and various stages in it.	7m
		(OR)	
4.	a)	Discuss briefly about Pre-ignition applied to SI engines and its effects.	7m
	b)	What are the primary reference fuels used for rating of SI engine fuels and discuss about SI engines fuel rating.	7m

UNIT-III

5.	a)	What is meant by Ignition delay as applied to CI engines and explain how it's affect leads to detonation in CI engines.	7m
	b)	What are the primary considerations in selecting combustion chambers for CI engines and discuss the working of any one type combustion chamber.	7m
		(OR)	
6.	a)	Discuss briefly the normal combustion in CI engines.	7m
	b)	Give a detailed note on rating of CI engine fuels.	7m

UNIT-IV

7. a) Enumerate the methods used for determining friction power. 7m

   b) The following details were noted in a test on a four cylinder four stroke engine, diameter = 100mm, speed of the engine = 1600rpm, stroke= 120mm, fuel consumption = 0.2kg/min, calorific value= 44000kJ/kg, difference in tension on either side of the brake pulley= 40kgf, brake circumference is 300cm. If the mechanical efficiency is 80%. Calculate 7m
      i. Brake thermal efficiency
      ii. Indicated thermal efficiency
      iii. Indicated mean effective pressure
      iv. Brake specific fuel consumption.

(OR)

8. a) Discuss about the calculations made for drawing Heat balance sheet in IC engines 7m

   b) The following observations have been made from the test of a four cylinder, two stroke gasoline engine. Diameter is 10 cm, stroke is 15cm, speed is 1600rpm. Area of positive loop after indicated diagram = 5.75cm^2, Area of negative loop of the indicated diagram = 0.25cm^2. length of the indicator diagram is 55mm. Spring constant is 3.5bar per cm. find the indicated power of the engine? 7m

UNIT-V

9. a) Define Isothermal and Volumetric efficiencies as applied to reciprocating compressors and derive the expression for volumetric efficiency when suction conditions and free air conditions are different. 7m

   b) A 3 stage compressor is used to compress air from 1 bar to 36 bar. The compression in all stages follows the law $PV^{1.25}$ = constant. The temperature at the inlet of the compressor is 300 K. Neglecting the clearance and assuming perfect inter cooling, find out the indicated power in kW to deliver 15 m^3 of air per minute measured at inlet conditions and intermediate pressures also. Take R = 0.287 kJ/Kg K.

(OR)

10. a) Explain the working of Centrifugal compressor with the help of a neat sketch. 7m

    b) A centrifugal compressor is desired to have a total pressure ratio of 3.5:1. The inlet eye of the compressor impeller is 30 cm in diameter. The axial velocity at inlet is 130 m/s and the mass flow is 10 kg/sec. The velocity in the delivery duct is 115 m/s. The tip speed of the impeller is 450 m/s and runs at 16,000 rpm with total head isentropic efficiency of 75% and pressure coefficient of 0.72. The ambient conditions are 1.013 bar and 15^{0}C. calculate: 7m
      i. The static pressure ratio
      ii. The static pressure and temperature at inlet and outlet of compressor
      iii. Work of compressor per kg of air and
      iv. The theoretical power required.

AR16

CODE: 16EC2009 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

II B.Tech. II Semester Regular & Supplementary Examinations, April - 2019

ELECTRONIC CIRCUITS – II

(Electronics and Communication Engineering)

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

Answer ONE Question from each Unit
All Questions Carry Equal Marks
All parts of the Question must be answered at one place

UNIT-I

1.	a)	Explain the basic circuit of an LC oscillator and derive the condition for the oscillations?	8M
	b)	What type of feedback is employed in oscillators? And what are its advantages. Write the conditions for sustained oscillations.	6M
		(OR)	
2.	a)	Calculate the value of 'C' used in the Weybridge circuit that determines the Oscillator frequency of 10 KHZ. Assume R=50 KΩ	4M
	b)	Derive the expression for frequency of oscillations in RC-phase shift oscillator using BJT.	10M

UNIT-II

3.	a)	Draw the circuit for CASCODE Amplifier. Explain its working, obtain overall values of the circuit in terms of h-parameters.	7M
	b)	Derive Av,Ai,Ri,Ro for JFET amplifier in CS configuration	7M
		(OR)	
4.	a)	Explain about the different Coupling schemes used in amplifiers with diagrams	4M
	b)	Explain two stage RC coupled amplifier with neat sketch.	10M

UNIT-III

5.	a)	With hybrid-π model Derive expression for Common emitter Current Gain with resistive load	7M
	b)	Derive the gain bandwidth product of CE transistor amplifier at high frequency	7M
		(OR)	
6.	a)	Draw hybrid-π model of transistor for common emitter and derive g_m	7M
	b)	Derive the current gain for emitter follower at high frequencies	7M

UNIT-IV

7.	a)	Draw and explain the complementary symmetry Class-B power amplifier and derive the efficiency	7M
	b)	Draw and explain the operation of class – C power amplifier	7M
		(OR)	
8.	a)	Define Thermal-runaway ,What is the need for heat sink in amplifier circuits? What are different types of heat sinks?	7M
	b)	Define harmonic distortion ,explain how push-pull power amplifier eliminates even harmonics	7M

UNIT-V

9.	a)	Draw the double tuned amplifier and give its complete analysis	7M
	b)	What is stagger tuning? Discuss about stability of tuned amplifiers	7M
		(OR)	
10.	a)	Explain about line regulation and load regulation in a regulator	7M
	b)	Draw and explain transistor shunt voltage regulator	7M

Code No: 16CS2008 **AR16** SET-1

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech. II Semester Regular & Supplementary Examinations, April - 2019
DATABASE MANAGEMENT SYSTEMS
(Common to CSE& IT)

Time: 3 hours **Max Marks: 70**

Answer one Question from each Unit
All questions carry equal marks

UNIT-I

1. a) Explain the Data Models in detail. 8m
   b) Differentiate File Systems and Database systems. 6m

(OR)

2. a) What are the different types of database users? Discuss the main activities of each. 6m
   b) Describe Schema and Instance with an example. 8m

UNIT-II

3. a) Explain the conceptual design with the ER model. 8m
   b) Describe the key constraints for ternary relationships with an example. 6m

(OR)

4. a) Describe the Integrity constraint s over relations with an example. 8m
   b) What is a View? Explain the SQL constructs to modify the structure of tables. 6m

UNIT-III

5. a) Consider the following schema:

Suppliers (*sid:* integer, *sname:* string, *address:* string)
Parts (pid: integer, *pname:* string, *color:* string)
Catalog (*sid:* integer, *pid:* integer, *cost:* real)

Write the following queries in SQL:

I. Find the *pnames* of parts for which there is some supplier.
II. Find the *snames* of suppliers who supply every red part.
III. Find the *sids* of suppliers who supply only red parts.
IV. Find the *sids* of suppliers who supply a red part and a green part.

10m

b) Write about Set comparison operators. 4m

(OR)

6. a) What is a *trigger,* and what are its three parts? Explain the differences between row-level and statement-level triggers. 7m

b) Describe about Outer joins with an example. 7m

UNIT-IV

7. a) Illustrate the problems caused by redundancy. Give examples of insertion, updation and deletion anomalies. 8m

b) Define 1NF, 2NF & 3NF with a suitable example. 6m

(OR)

8. a) Describe the two – phase locking protocol. 7m

b) Explain the desirable properties of transactions. 7m

UNIT-V

9. a) Discuss in detail the Log based recovery concept. 7m

b) Explain the Failure with loss of nonvolatile storage. 7m

(OR)

10. a) Write short note on comparison of File organizations. 6m

b) Explain in detail the tree based indexing with neat sketch. 8m

AR13

CODE: 13CE2008 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, April-2019

STRUCTURAL ANALYSIS-I

(Civil Engineering)

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

PART-A

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

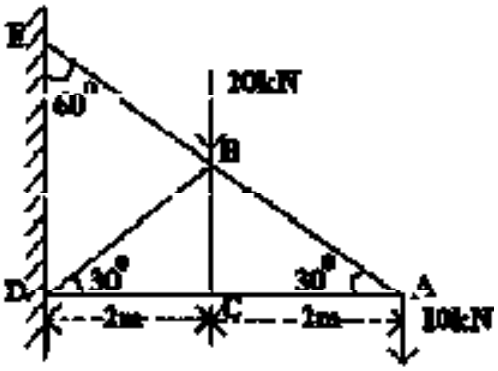
1. a) Differentiate between statically indeterminate and determinate structures?
   b) Define a perfect time?
   c) Define Eddy's Theorem?
   d) Write a short notes on elastic theory of arches?
   e) Define propped cantilever beam?
   f) What is the static indeterminacy of fixed beam?
   g) Write the general equation of clayperon's theorem?
   h) Define the point of contra flexure?
   i) Define influence line diagram?
   j) Define Muller Breslau's Principle?

PART-B

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

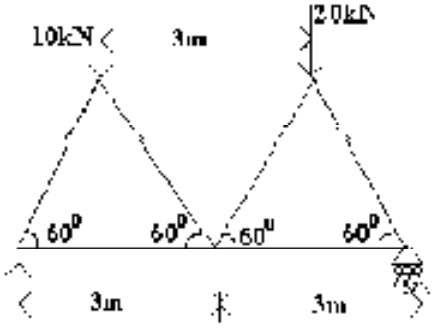
UNIT-I

2. Using the method of sections find the forces in all the members of the cantilever truss loaded as shown in figure **12M**



(OR)

3. Find the forces in all the members of the simply-supported truss loaded as shown in figure by the method of joints **12M**



AR13

CODE: 13CE2008 SET-2

UNIT-II

4. A parabolic arch rib, 20 m span and 3 m rise is hinged at the abutments and the crown and carries a point load of 10 kN at 7.5 m from the left hand hinge. Calculate the horizontal thrust and the bending moment at a section 7.5 m form right hand hinge. What is the value of the greatest bending moment in the arch, and where does it occur? **12M**

(OR)

5. .A three-hinged parabolic arch has a span of 24 m and a rise to the central hinge of 4m. The arch is loaded with two vertical 20 kN loads symmetrically situated on either side of the central hinge at 3 m horizontally from the hinge. Calculate the values of the maximum positive and negative bending moments in the arch. **12M**

UNIT-III

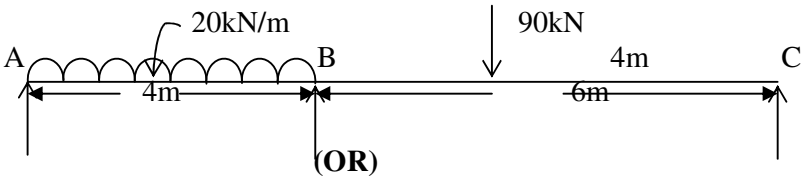
6. A horizontal cantilever of 6m long carries a u.d.l of 5 kN/m over the left half of the span. If the beam is propped at free end to the level of fixed end, find prop reaction and construct S.F and B.M diagrams. Also find the point of contraflexure. **12M**

(OR)

7. A beam AB 6m long is fixed at the both the ends and carries a uniformly distributed load of 60 kN/m over the whole span and a point load of 80 kN at the mid- span. Find the fixing moment at A and the reactions at two supports. Draw the B.M.D and S.F.D. **12M**

UNIT-IV

8. Analyse a continuous beam as shown in fig. using clayperon's theorem of three moments. Assume support B sinks by 10mm relative to A. Draw S.F and B.M diagrams. Take E= 200 KN/mm^2 and I= 8x10^7 mm^4. **12M**



(OR)

9. Derive the expression for clapeyron's theorem of three moments for a two spanned continuous beam. **12M**

UNIT-V

10. Two wheel loads of 16 kN and 8 kN at a fixed distance of 2m apart, cross a beam of 10m span. Draw Influence Line Diagram for bending moment for a point 4m from left support and calculate the maximum bending moment at that point. **12M**

(OR)

11. A uniform load of 30kN/m, 5m long, crosses a girder 20m span. Calculate the maximum S.F and B.M at a section 8m from the left support. Also find the maximum shear and the absolute maximum B.M in the beam. **12M**

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AR13

CODE: 13EE2011 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, April-2019

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) What is the role of core in the transformer?
   b) When do you get negative regulation in transformer
   c) Define `all day efficiency'.
   d) What is an auto transformer?
   e) Why tap changing is employed in transformer?
   f) What is meant by Crawling?
   g) Why starter is required for 3 phase induction motor?
   h) Draw torque-slip characteristics of 3-phase induction motor.
   i) Why is the rotor rheostat starter unsuited for a cage motor?
   j) What will happen if three phase Induction Motor is rotated more than its Synchronous speed

PART-B

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

UNIT-I

2. a. Explain how induced EMF is produced in 1-Phase Transformer under No-Load Condition with the help of diagrams. **6M**
   b. A 10KVA 2000V/440V single phase transformer has resistances and leakage reactance as follows R_1=50Ω, X_1= 12.5 Ω, R_2=0.2Ω, X_2=0.5 Ω. Determine secondary terminal voltage when it is supplying rated current at 0.8 power factor lagging. Neglect the no-load current. **6M**

(OR)

3. a. What is voltage regulation of a transformer? Derive the approximate voltage drop equation for lagging loads. **6M**
   b. The primary and secondary windings of a 500 KVA transformer have resistance of 0.42 Ω and 0.0011Ω respectively. The primary and secondary voltages are 6,600 V and 400 V respectively and the iron loss is 2.9 KW. Calculate efficiency at full-load, 0.8 power factor. **6M**

UNIT-II

4. a) Describe the back to back test for determining the regulation and efficiency of a pair of similar transformer giving the circuit diagram. What are the limitations of the test? **6M**
   b) Calculate the efficiency, voltage at the secondary terminal and primary input current of a transformer with 4KVA 200/400V 1-phase 50HZ for unity and 0.8 lagging from the following results **6M**

O.C test: 200V	0.8A	70Watts
S.C Test: 20V	10A	60Watts.

(OR)

5.	a.	Explain the conditions required to operate two transformers in parallel.	**5M**
	b.	Explain scott connection in transformers.	**7M**

UNIT-III

6.	a.	Explain the construction of three phase induction motor with near diagram	**6M**
	b.	A746KW, 3-Ø, 50Hz,16 pole induction motor has a rotor impedance of (0.02+j0.15)Ω at stand still. Full load torque is obtained at 360rpm. Calculate (i) the ratio of maximum torque to full load torque. (ii) The speed for maximum torque.	**6M**

(OR)

7.	a.	Explain the phenomenon of crawling and cogging in three phase Induction Motor	**4M**
	b.	A 440v, 3phase, 50HZ, 4 pole, Y connected induction motor has a full load speed of 1425 rpm. The rotor has an impedance of (0.4+4J) ohm and rotor /stator turns ration of 0.8. Calculate (i) full load torque (ii) rotor current and full load rotor CU loss (iii) power output if windage and friction losses amount to 500W (iv) maximum torque and the speed at which it occurs	**8M**

UNIT-IV

8.		A 20 HP, 400V,50Hz,3- Ø star connected Induction Motors has the following test data: No Load Test: 400V 9A CosØ=0.2 Blocked Rotor Test: 200V 50A CosØ=0.4 Draw a circle diagram and determine (i) line current (ii) power factor (iii) Efficiency; at full load	**12M**

(OR)

9.	a.	Why do we require starters? Explain the working of Star –Delta Starter for 3- Ø Induction motors and auto transformer starter with neat diagrams?	**7M**
	b.	Find the ratio of starting to full load current in a 10KW (Output), 400V, 3-Phase induction motor with star/delta starter, given that full load is 0.85, the full load efficiency is 0.88 and blocked rotor current at 200V is 40A. Ignore magnetizing current.	**5M**

UNIT-V

10.	a.	Name the different methods of speed control of a poly-phase squirrel –cage type induction motor. What are its limitations and advantages of each method.	**6M**
	b.	The rotor of a 4-pole, 50Hz slip-ring induction motor has a resistance of 0.30 ohms per phase and runs at 1440rpm. At full load. Calculate the external resistance per phase which must be added to lower the speed to 1320rpm, the torque being the same as before.	**6M**

(OR)

11.	a.	What is an Induction generator? Describe, the operation of a Self-excited 3-phase Induction generator	**7M**
	b.	Two 50Hz, 3-phase Induction motors having six and four poles respectively are cumulatively cascaded, the 6-pole motor being connected to the main supply. Determine the frequencies of the rotor currents and the slips referred to each stator field if the set has a slip of 2%.	**5M**

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AR13 SET-1

Code: 13ME2011

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, April-2019

THERMAL ENGINEERING - I
(Mechanical Engineering)

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

PART-A

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

1. a) What is the Compression ratio range for SI engine?
   b) Why heavier mass of flywheel is required in 4-s engine compared to 2- S engine?
   c) What is meant by scavenging?
   d) What is blow by?
   e) Define Squish?
   f) Write the effect of turbulence on knocking?
   g) Write the relation among Indicated power, Brake power and frictional power?
   h) What is the difference between positive displacement and Dynamic compressor?
   i) Write condition for minimum work done in reciprocating air compressor?
   j) Write TWO advantages of multi stage compression?

PART-B

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

UNIT-I

2. a) What are the assumptions in air standard cycles? [6M]
   b) Explain the following i) Exhaust blow down ii) volumetric efficiency? [6M]

(OR)

3. a) Explain the operation of battery ignition system with neat sketch? [8M]
   b) Explain air cooling system? [4M]

UNIT-II

4. Define abnormal combustion? Explain the variables effecting the knocking? [12M]

(OR)

5. a) Draw theoretical pressure – crank angle (P-θ) diagram and actual pressure – crank angle (P-θ) diagrams and explain? [4M]
   b) What are different types of combustion chambers for SI engine and explain? [8M]

UNIT-III

6. a) Explain the stages of combustion in CI engine? [8M]
   b) Write the differences in the knocking of SI and CI engines? [4M]

(OR)

7. Write different types of air swirls? Explain suction induced swirl and write advantages and disadvantages of it? [12M]

Code: 13ME2011

UNIT-IV

8. A trail was conducted on a single cylinder 4-S oil engine having a cylinder diameter of 30cms and stroke 45cms. The engine is working on the 4-s cycle and the following observations were made. [12M]
Duration of trial = 54min,Total fuel used is = 7lits,Calorific value is 42MJ/kg, Total no. of revolutions =12624, Gross IMEP=7.25bar,Pumping IMEP=0.35bar, Net load on the brake= 150kg,Diameter of brake wheel drum=1.78m, Dia of the rope=4cms, Cooling water circulated= 550lits,Cooling water temperature rise=48^{o}C, Specific heat of water = 4.18kJ/kg.K, Sp.Gravity of oil = 0.8, Calculate the mechanical efficiency and also the unaccounted losses.

(OR)

9. A two-stroke CI engine develops a brake power of 368kW while its frictional power is 73.6kW. Its fuel consumption is 180kg/hr and works with an air-fuel ratio of 20:1. The heating value of the fuel is 42000kJ/kg. Calculate the (i) Indicated power (ii) mechanical efficiency (iii) air consumption per hour (iv) Indicated thermal efficiency and (v) brake thermal efficiency. [12M]

UNIT-V

10. a) Obtain the expression for work done in a single stage Reciprocating air compressor neglecting clearance. [6M]
    b) A single stage reciprocating compressor takes in 1m^3 of air per min at 1.013bar and 15^{o}C and delivers it at 7bar. If the law of compression is $PV^{1.35}$= C, and the clearance is negligible, determine the Indicated Power? [6M]

(OR)

11. a) Explain with a simple sketch construction and working of a centrifugal compressor? [6M]
    b) A centrifugal air compressor delivers 15.2kg/s of air with a total head pressure ratio of 4 to 1. The speed of the compressor is 15000rpm. Inlet total head temperature is 15^{0}C, slip factor is 0.9, power input factor is 1.04 and 60% isentropic efficiency, calculate the overall diameter of the impeller and power input. [6M]

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AR13

CODE: 13EC2008 **SET-I**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, April-2019

ELECTRONIC CIRCUITS – II
(Electronics and Communication Engineering)

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

PART-A

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

1. a) Explain transformer coupling.
   b) Draw the circuit diagram of two stage RC coupled amplifier.
   c) Write difference between open loop and closed loop circuits.
   d) Write difference between positive and negative feedback in terms of gain.
   e) Draw BJT based phase shift oscillator.
   f) Draw wein bridge oscillator.
   g) Explain thermal stability.
   h) What is meant by heat sink?
   i) What is load regulation?
   j) What is meant by single tuned amplifier?

PART-B

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

UNIT-I

2. a) Explain about the different Coupling schemes used in amplifiers. 4M
   b) Explain two stage RC coupled amplifier with neat sketch. 8M

(OR)

3. a) Explain JFET amplifiers in CS configuration. 6
   b) Explain frequency response of RC coupling. 6

UNIT-II

4. a) Explain voltage shunt and current series feedback amplifiers. 6
   b) Give general characteristics of negative feedback 6

(OR)

5. a) Explain different methods of analysing feedback amplifier 6
   b) A series – shunt feedback amplifier employs a basic amplifier with input and output resistances each of 1KΩ and gain A=2000V/V. The feedback factor $\beta = 0.1$ V/V. Find the gain A_f, the input resistance R_{if}, and the output resistance R_{of} of the closed-loop amplifier. 6

UNIT-III

6. a) Explain crystal oscillators 6
   b) Derive expression for frequency of JFET based RC phase shift oscillator 6

(OR)

7. a) Derive expression for frequency of BJT base RC phase shift oscillator 6

b) As oscillator is formed by loading a trans-conductance amplifier having a positive gain with a parallel RLC circuit and connecting the output directly to the input (thus applying positive feedback with a factor β =1). Let the trans-conductance amplifier have an input resistance of 10KΩ. The LC resonator has L=10 μH, C=100pF, and Q = 100. For what value of trans-conductance G_m will the circuit Oscillate? At what frequency? 6

UNIT-IV

8. a Explain the operation class D and class S amplifiers 6

b Explain complementary symmetric push pull amplifier 6

(OR)

9. a Explain operation of class AB amplifier 6

b Explain large signal frequency response of class A amplifier 6

UNIT-V

10. a) Explain series and shunt voltage regulators. 6

b) Explain overload voltage protection. 6

(OR)

11. a) Explain class C tuned amplifier. 6

b) A coil having an inductance of 10 μH is intended for applications around 1-MHz frequency. Its Q is specified to be 200. Find the equivalent parallel resistance R_p. What is the value of the capacitor required to produce resonance at 1MHz? What additional parallel resistance is required to produce a 3-dB bandwidth of 10 kHz? 6

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AR13

CODE: 13CS2007 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, April-2019

DATABASE MANAGEMENT SYSTEMS

(Common to CSE & IT)

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

PART-A

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

1. a) Distinguish between Physical and Logical data independence.
   b) Define Multi-valued attribute.
   c) Write the responsibilities of DBA.
   d) Differentiate Primary key with Unique Key.
   e) What is View? What are its advantages?
   f) What are ACID properties?
   g) Define candidate key
   h) Write syntax of select clause
   i) List types of indexes.
   j) Define Check point

PART-B

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

UNIT-I

2. a) Discuss the three schema Architecture 6M
   b) Discuss the main characteristics of the database approach 6M

(OR)

3. a) Explain with examples various Database Models. 8M
   b) Explain the term Query processor 4M

UNIT-II

4. a) What is an ER diagram and discuss several choices to be made when generating an ER diagram 8M
   b) What is a view? What is update restriction on a view? 4M

(OR)

5. a) Discuss the DIVISION operation. How is it represented, and what are the requirements of the numerator and denominator relations 6M
   b) Discuss the various types of inner join operations 6M

UNIT-III

6. Create tables for Sailors(sid: integer, sname: string, rating: integer, age: real); 12M
   Boats (bid: integer, bname: string, color: string);
   Reserves (sid: integer, bid: integer, day: date).
   i. Find all information of sailors who have reserved boat number 101.
   ii. Find the names of sailors who have reserved a red boat, and list in the order of age.
   iii. Find the names of sailors who have reserved at least one boat
   iv. Find the ids and names of sailors who have reserved two different boats on the same day

(OR)

7. a) What is a Trigger? What is the general form of a writing a trigger? Compare row and statement Triggers 8M
   b) Briefly explain about Nested queries. 4M

UNIT-IV

8. a) List out problems caused by Redundancy 6M
   b) What is Lossless-Join Decomposition? Explain 6M

(OR)

9. a) Explain Serializability and Recoverability 6M
   b) Briefly discuss about Schema Refinement in Database Design 6M

UNIT-V

10. a) Why concurrency control is needed in the databases? Explain with examples 6M
    b) How Time Stamp Concurrency technique works. Discuss with example 6M

(OR)

11. a) Explain about ISAM with example 6M
    b) Discuss about the shadow paging 6M

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