AR16

CODE: 16CE2008 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, April,2018

STRUCTURAL ANALYSIS-I

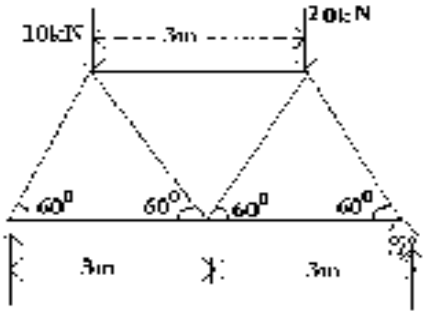
(Civil Engineering)

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

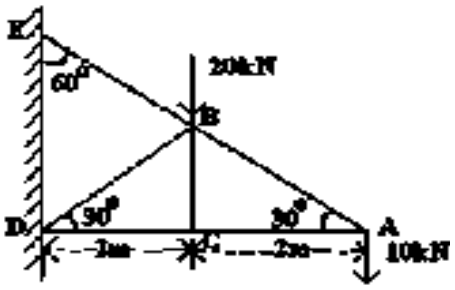
UNIT-I

1. a) Explain different types of frames with suitable example? **5M**
   b) Find the forces in all the members of the frames **9M**



(OR)

2. Using the method of joints find the forces in all the members of the cantilever truss loaded as shown in figure **14M**



UNIT-II

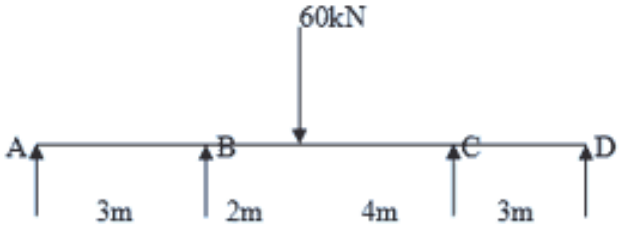
3. A beam AB of span 6m is fixed at A and propped at B. Find the Prop reaction if the beam is loaded with concentrated load of 30kN at a distance of 3m from fixed end. Draw BMD and SFD. **14M**

(OR)

4. A fixed beam of 16m span is loaded with two point loads of 80 kN at a distance 2m from both the end support. Draw the bending moment and shear force diagrams. Find also the maximum deflection. Given, $I = 5 \times 10^8$ mm^4 and $E = 2 \times 10^8$kN/m^2 **14M**

UNIT-III

5. Find the support moments and reactions for the continuous beam shown in fig. Draw S.F.D and B.M.D. **14M**

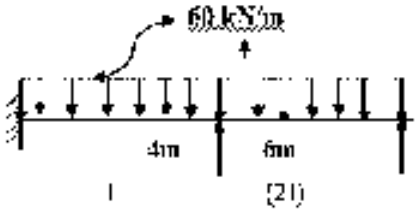


(OR)

6. A continuous beam ABCD is of uniform section. It is fixed at A, simply supported at B and C and CD is an overhang. AB=BC=5m and CD=2m.if a concentrated load of 30kN acts at D, determine the moments and reactions at A, B and C. sketch the S.F.D and B.M.D. **14M**

UNIT-IV

7. By using slope deflection method analyze the two span continuous beam shown figure. The end A is fixed while C is simply supported. Sketch the B.M & S.F **14M**



(OR)

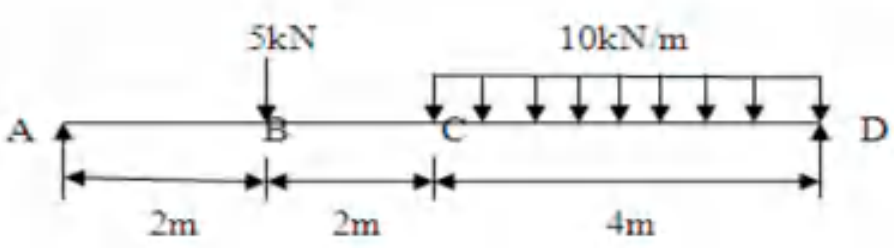
8. A beam ABC 7m long consists of span AB and BC of lengths 4m and 3m respectively. It is fixed at the end A and simply supported at B and C. The span AB carries a point load of 48kN at a distance of 1m from A while the span BC carries a point load of 36kN at a distance of 1m from C. The moment of inertia of the beam section is I for the span AB and 2I for span BC. Determine the moments the supports and draw B.M diagram **14M**

UNIT-V

9. Using Castigliano's theorem, obtain the deflection under a single concentrated load of 50kN acting at a distance of 4m form left support for a simply supported beam span 6m. Take EI = 2000 kN-m^2. **14M**

(OR)

10. Use strain energy method to find the deflection at the middle of the beam as shown in fig. Take E=200GPa and I= 400x$10^6$$mm^4$. **14M**



AR16

CODE: 16EE2012 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech I Semester Regular Examinations, April, 2018

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) Explain the principle of operation of a 3-phase induction motor. Explain why the rotor forced to rotate in the direction of rotating magnetic field. **7M**

   b) A 50 H.P., 3-phase, 4 pole, 50 Hz induction motor has full load efficiency of 85%. The friction and windage losses are one-third of the no-load losses and the full load rotor copper losses are equal to the iron losses. Find the full load speed. Neglect stator resistance. **7M**

(OR)

2. a) Explain why an induction motor cannot develop torque when running at synchronous speed? Define the slip speed of an induction motor and deduce how the frequency of the rotor currents and magnitude of the rotor emf are related to slip? **8M**

   b) A 3-phase, 50Hz induction motor has a full-load speed of 1440rpm. For this motor, calculate the following: **6M**
   i) Number of poles, ii) Full load slip and rotor frequency, iii) Speed of stator field with respect to stator structure.

UNIT-II

3. Explain how you construct the circle diagram of three phase induction motor from no load and blocked rotor test results. **14M**

(OR)

4. a) Explain how the equivalent circuit parameters of a poly-phase induction motor can be determined from no-load and blocked-rotor tests and per phase stator winding D.C resistance **7M**

   b) Explain the different speed control methods of Induction motor. **7M**

UNIT-III

5. a) Explain the principal of operation of a synchronous machine. **7M**
   b) Discuss the effect of armature reaction in an alternator. **7M**

(OR)

6. a) Derive generated EMF equation of alternator. **7M**
   b) An 8-pole alternator has an armature with 30 slots and 8 conductors per slot. The flux per pole is 0.08 Wb and machine rotates at 750 rpm. Calculate EMF generated, if winding factor is 0.94 and all conductors in a phase are connected in series **7M**

UNIT-IV

7. a) Derive the expression for finding regulation of salient pole alternator using two reaction theory. Draw its phasor diagram **7M**
   b) Describe the method of finding synchronous impedance of a given alternator **7M**

(OR)

8. a) What condition must be fulfilled before an alternator can be connected to an infinite bus? **7M**
   b) Two single phase alternators operate in parallel and supply a load impedance of (3+j4) Ω. If the impedance of the machine is (0.2+j2) and e.m.f are (220+j0) and (220+j0) volts respectively. Determine for each machine (i) terminal voltage (ii) power factor and (iii) output. **7M**

UNIT-V

9. a) Explain the effects of varying excitation on armature current and power factor in a synchronous motor. Draw 'V' curves **7M**
   b) The input to an 11000V , 3 phase star connected synchronous motor is 60A. The effective resistance and synchronous reactance per phase are respectively 1 Ω and 30Ω. Find the power supplied to the motor, and the induced electromotive force for a power factor of 0.8
   i) lagging ii) leading **7M**

(OR)

10. a) Explain the principle of operation of a 3- phase synchronous motor. **7M**
    b) A 2000V, 3 phase star-connected synchronous motor has an effective resistance and synchronous reactance of 0.2 ohm and 2.2 ohm per phase respectively. The input is 800kW at normal voltage and the induced line electromotive force is 2500V Calculate the line current and power factor. **7M**

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AR16

CODE: 16ME2010 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, April, 2018

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)	Classify IC engines based on Various considerations.	7M
	b)	Make a comparison between SI and CI engines.	7M
		(OR)	
2.	a)	Write a short notes on exhaust gas blow down loss.	7M
	b)	Discuss the relative advantages and disadvantages of 2 stroke engines over 4 stroke engines.	7M

UNIT-II

3.	a)	What is meant by Detonation? Discuss the factors affecting detonation in SI engines.	7M
	b)	Discuss the working of any two types of combustion chambers used in SI engines	7M
		(OR)	
4.	a)	What is Flame front in SI engines? Discuss the factors affecting flame propagation.	7M
	b)	Write a short notes on rating of SI engine fuels and mention the additives used to reduce knocking in SI engines.	7M

UNIT-III

5.	a)	List out the requirements of fuel supply system for diesel engines.	7M
	b)	What is Ignition delay period? Discuss the variables affecting Ignition delay period in CI engines	7M
		(OR)	
6.	a)	Explain about normal combustion stages in CI engines.	7M
	b)	List out various combustion chambers used in diesel engines and explain the working of any one type with a neat sketch.	7M

UNIT-IV

7. a) Define the following terms: (i) Brake thermal efficiency (ii) Brake specific fuel consumption (iii) Mechanical efficiency (iv) Relative efficiency (iv) Stoichiometric air fuel mixture (v) Indicated thermal efficiency (vi) Air standard efficiency (vii) Indicated power — 7M

   b) The following data relates to 4-cylinders, 4-stroke petrol engine, air fuel ratio by weight = 16:1, calorific value of fuel = 45200 kJ/kg, mechanical efficiency =82%, air standard efficiency = 52%, relative efficiency = 70%, volumetric efficiency = 78%, stroke to bore ratio = 1.25, suction conditions = 1 bar, 25^{o}C, rpm = 2400, power at brakes = 72 kW. Calculate a) compression ratio, b) indicated thermal efficiency, c) brake specific fuel consumption, d) bore & stroke — 7M

(OR)

8. a) Draw a heat balance sheet for IC engines — 7M

   b) In a trial of a single cylinder oil engine working on diesel cycle the following observations were made : C.R.=15, Oil consumption 10.2 kg/hr, C.V.=44,000 kJ/kg, air consumption = 3.8 kg/min, N=1900 rpm. Torque on brake drum = 186 N-m, quantity of cooling water used = 16 kg/min, temperature rise = 36^{o}C; exhaust gas temperature = 400^{o}C, room temperature = 20^{o}C, C_p for exhaust gas=1.17 kJ/kg-K, calculate brake thermal efficiency and prepare heat balance sheet on minute basis. — 7M

UNIT-V

9. a) Show that indicated work required per unit mass of air compressed is unaffected by the clearance volume in reciprocating compressor. — 7M

   b) Make a comparison between Reciprocating and Rotary compressors. — 7M

(OR)

10. a) Make a comparison between Centrifugal and Axial flow compressors. — 7M

    b) An axial flow compressor having eight stages and with 50% reaction design compresses air in the pressure ratio of 4:1. The air enters the compressor at 20 C and flows through it with a constant speed of 90m/s. The rotating blades of the compressor rotate with a mean speed of 180m/s. Isentropic efficiency of the compressor may be taken as 82%. Calculate (i) Work done by the machine (ii) Blade angles. Take γ = 1.4 and C_p = 1.005 kJ/kg K**.** — 7M

AR16

CODE: 16EC2009 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, April, 2018

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	Draw the circuit of Hartley oscillator and explain its working. Derive the expression for frequency of oscillation	**9**
	b	In Hartley oscillator if L_1=0.2mH, L_2=0.3mH and C= 0.003 μF calculate the frequency of oscillation.	**5**
		(OR)	
2.	a	Draw the circuit diagram of a Wein-bridge oscillator and briefly explain its operation.	**9**
	b	What makes the quartz produce stable oscillations?	**5**

UNIT-II

3.	a	Derive the equation for the overall voltage gain of a multistage amplifier in terms of individual voltage gains.	**5**
	b	Consider any one multitransistor circuit and explain its specialized characteristics such as overall larger voltage gain or an overall larger current gain.	**9**
		(OR)	
4.	a	Discuss briefly the choice of transistor configuration in a cascade amplifier	**5**
	b	Sketch Darlington pair Amplifier and explain its working	**9**

UNIT-III

5. a Describe the short-circuit current gain versus frequency response of a BJT and define the cutoff frequency. **9**

   b Calculate the bandwidth f_β and capacitance $C\boldsymbol{\pi}$ of a bipolar transistor. Consider a bipolar transistor that has parameters f_T = 20 GHz at I_C = 1 mA, βo = 120, and $C\mu$ = 0.08 pF. **5**

(OR)

6. a Draw the high frequency **π** model of a transistor and explain it. **8**

   b Compare h-parameters with hybrid-**π** parameters. **6**

UNIT-IV

7. a Draw the circuit of a class A transformer coupled power amplifier and show that the maximum collector efficiency is50%. **8**

   b Explain the following harmonic distortion, frequency distortion and phase distortion. **6**

(OR)

8. a Draw the circuit of complementary symmetry power amplifier and explain its operation. Compare it with conventional class-B push pull power amplifier. **9**

   b Write short notes on heat sinks. **5**

UNIT-V

9. a Explain the operation of capacitance coupled single tuned amplifier and derive the expression for voltage gain. **9**

   b Compare single tuned, double tuned and Stagger tuned Amplifiers? **5**

(OR)

10. a Describe the operation of transistorised shunt regulator. **9**

    b Define line regulation and load regulation in a voltage regulator. **5**

AR16

CODE: 16CS2008 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Regular Examinations, April,2018

DATABASE MANAGEMENT SYSTEMS

(Common to CSE & IT)

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 draw backs of conventional file processing system.	**7M**
	b)	What are the advantages of DBMS? Explain them,	**7M**
		(OR)	
2.	a)	Write short notes on i. Schema ii. Instance iii. Data Abstraction	**6M**
	b)	Draw and explain detailed system structure of database system	**8M**

UNIT-II

3.	a)	Explain the following Entity set ii) Relationship set iii) Weak-entity set.	**6M**
	b)	Draw an E-R diagram for a Hospital Management system with all components and Explain.	**8M**
		(OR)	
4.		Explain in detail about various constrains used in relational model	**14M**

UNIT-III

5.	a)	Write and explain the structure of SQL SELECT statement with suitable example.	**7M**
	b)	Explain the advantages of NULL values used in SQL.	**7M**
		(OR)	
6.	a)	What is outer join? Explain different types of outer joins in SQL with examples.	**7M**
	b)	Compare cursors and triggers with examples.	**7M**

UNIT-IV

7.	a)	Why the functional dependency is needed? Explain the types of functional Dependencies.	**7M**
	b)	Define normalization, Explain briefly about different normal forms.	**7M**
		(OR)	
8.	a)	Explain in detail about Serializability and Recoverability used in scheduling of transactions.	**7M**
	b)	What is a time-stamp? Write and explain the steps of basic time-stamp ordering protocol.	**7M**

UNIT-V

9.	a)	Explain why the recovery is needed?	**7M**
	b)	Describe Log-based Recovery techniques,	**7M**
		(OR)	
10.	a)	Explain in detail about indexed accessing methods	**7M**
	b)	Explain in detail about internal hashing Techniques	**7M**

AR13

CODE: 13CE2008 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, April, 2018

STRUCTURAL ANALYSIS-I

(Civil Engineering)

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

PART-A

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

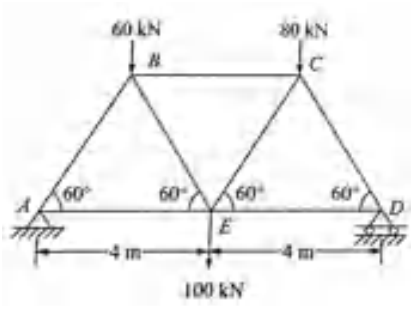
1. a) Define truss.
   b) What is the advantage of arch action over the beam action?
   c) Define kinematic indeterminacy.
   d) What is the deflection of a cantilever beam when it is subjected to udl?
   e) What is a Propped cantilever?
   f) State Clapeyron's theorem of three moments.
   g) What is the indeterminacy of propped cantilever beam?
   h) What is the slope at fixed support?
   i) Give examples of statically indeterminate structures with degree of redundancy equal to 1 & 2.
   j) What is the difference between ILD and BMD?

PART-B

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

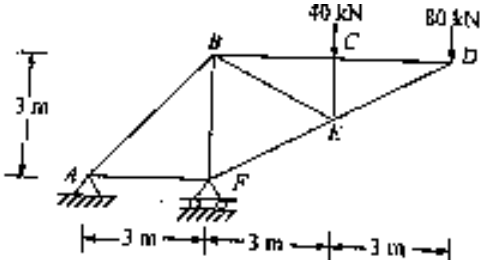
UNIT-I

2. Determine the forces developed in the members of the truss shown in fig.



(OR)

3. Determine the forces in all the members of the truss shown in fig.



UNIT-II

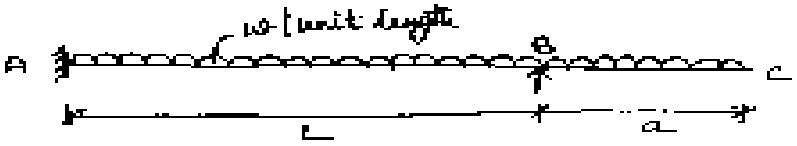
4. A Three hinged parabolic arch of 40m span has abutments at unequal levels. The highest point of the arch is 4m above the left support and 9m above the right abutment. The arch is subjected to a uniformly distributed load of 15kN/m run over its entire span. Find the horizontal thrust and bending moment at a point 8m from the left support.

(OR)

5. A symmetrical three hinged parabolic arch of span 40 mts and rise 8 m carries an uniformly distributed load of 30 kN/m over the left of span. The hinges are provided at these supports and at the centre of arch. Calculate the reactions at the supports. Also calculate bending moment, radial shear and normal thrust at a distance of 10 m from the left support.

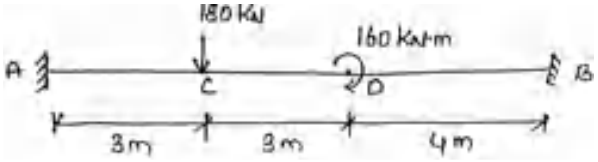
UNIT-III

6. Fig. shows a propped cantilever with overhang loaded with uniformly distributed load. Find the overhang length so that the deflection at free end is zero.



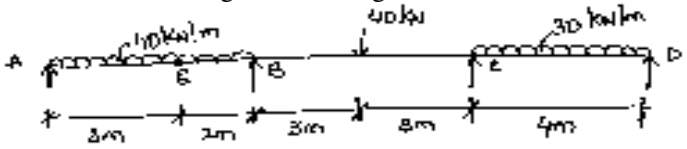
(OR)

7. Find the fixed end moments and plot bending moment diagram for the given fig. If support B sinks by 10 mm E = 200 KN/mm^2 and I = 2.75 x 10^7 mm^4 .



UNIT-IV

8. The continuous beam shown in fig. is simply supported at A, B, C and D and hinged at E. Find support moments and bending moment diagram



(OR)

9. A continuous beam ABCD 18 m long is simply supported at A,B, D and hinge at C. It consists of spans AB, BC and CD of length 6 m. It carries a point load of 80 kN on span AB at a distance 2 m from A, a load of 10 kN/m on the span 'BC' distributed uniformly. A load of 50 kN on span CD at a distance 3 m from B. Find B.M and S.F also draw diagram.

UNIT-V

10. Determine the absolute B.M when a load is shown in fig. crosses a simply supported beam of span 30 m with 100 kN load leading.

(OR)

11. Two point loads of 4kN and 6kN spaced 6m apart cross a girder of 16m span, the 4kN load leading from left to right. Construct the maximum shear force and bending moment diagrams.

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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, 2018
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 happens if DC supply is applied to the Transformer?
   b) What do you understand by the term "Ideal Transformer"?
   c) Why the rating of Transformer is expressed in kVA rather than in KW?
   d) What type of protection is provided in the starter meant for 3-phase induction motor?
   e) Name the tests required to draw circle diagram?
   f) What is the condition for maximum torque at starting in a 3-face induction motor?
   g) Why the slots on the rotor of an induction motor are usually skewed?
   h) Which type of induction motor develops higher starting torque?
   i) What are the methods for controlling the speed of induction motor from the router side?
   j) Give the applications of squirrel cage induction motor?

PART-B

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

UNIT-I

2. a) Derive the expression for induced emf of a transformer? 6M
   b) Explain the various losses in a transformer? 6M

(OR)

3. a) Draw the equivalent circuit of transformer and explain the significance of each term in it? 6M
   b) A transformer has copper loss of 1.5% and reactance drop of 3.5% when tested at full load. Calculate its full load regulation at 6M
   i) UPF ii) 0.8pf lagging iii) 0.8 pf leading

UNIT-II

4. Explain the about Scott connection of 3phase transformer. 12M

(OR)

5 A 2000KVA, 6600/400V, 3phase transformer is delta-connected on the hv side and star connected on lv side. Determine its percentage resistance and percentage reactance drops percentage efficiency and percentage regulation at full load 0.8pf leading. given the following data 12M
SC Test : HV data: 400V, 175A,17KW
OC Test : LV data : 400V,150A, 15KW

UNIT-III

6. a) How the rotating magnetic field is produced in 3phase induction motor? 6M

   b) A 3 phase 50Hz induction motor has a full load speed of 1440RPM , calculate number of poles, full load slip, rotor frequency, speed of the stator field with reference to stator structure? 6M

(OR)

7. a) Sketch and explain the torque slip characteristics of the squirrel cage and slip ring induction motor ? 6M

   b) A 6 pole 50Hz 3phase induction motor has rotor resistance of 0.4ohms per phase , and the maximum torque is 200Nm at 850 RPM . find the torque at 4% slip and additional rotor resistance to get 2/3 of maximum torque at starting 6M

UNIT-IV

8. a) Explain the methods to start the 3phase induction motor ? 6M

   b) A 50 kW , 400V,3phase 6pole 50Hz, induction motor has full load slip of 3%. If the ratio of standstill reactance to resistance per rotor phase is 4, estimate the plugging torque at full speed 6M

(OR)

9. a) Explain the necessity of starter in 3phase induction motor? 6M

   b) Find the ratio of starting to full load current in a 10kW 400v,3phase induction motor with star delta starter. Given the full load power factor is 0.85, the full load efficiency is 0.88 and the blocked rotor current at 200V is 40amps . neglect magnetising current. 6M

UNIT-V

10. a) Explain the methods of speed control of cage type 3phase induction motor? 6M

    b) Two 3phase slip-ring induction motors each having 4pole operates in cascade connection. The supply is 440V,50Hz what the obtainable speeds? 6M

(OR)

11. a) Explain the basic principle of induction motor speed control by pole changing? 6M

    b) Explain cascade arrangement for controlling speed of 3phase induction motor? 6M

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AR13

CODE: 13ME2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, April, 2018
THERMAL ENGINEERING - I
(Mechanical Engineering)

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

PART-A

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

1. a) What are the important advantages and disadvantages of reciprocating I.C Engines compared to E.C Engines?
   b) Classify I.C engines based on thermodynamic cycle and working cycle.
   c) Differentiate between Combustion and Burning.
   d) What is meant by ignition? What is the interrelation between combustion and ignition?
   e) What is the importance of air-swirl in C.I engine combustion chamber?
   f) What are the different types of regions of a spray in C.I engine?
   g) What is the importance of engine testing?
   h) Name the different methods used to determine the frictional power.
   i) Define isothermal efficiency of a reciprocating air compressor.
   j) Explain surging and stalling in axial flow compressors.

PART-B

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

UNIT-I

2. a) Compare four-stroke and two-stroke engines indicating relative merits and demerits. 4 M
   b) Explain the processes of Otto and Diesel air-standard cycles with *p-V* and *T-s* diagrams. Derive the compression ratio and thermal efficiency of each cycle. 8 M

(OR)

3. a) Explain briefly the Dry-sump lubrication system with a neat sketch. Mention the applications in which this type of lubrication system is utilized. 5 M
   b) In an engine working on Diesel cycle, the inlet pressure is 1 bar. The pressure at the end of isentropic compression is 32.425 bar. The ratio of expansion is 6. Calculate the air-standard efficiency and the mean effective pressure of the cycle. 7 M

UNIT-II

4. a) Explain the octane rating of fuel in S.I engines. 4 M
   b) Show the flame speed pattern with the help of a diagram. How does the flame travel pattern divide the combustion process into distinct phases? 8 M

(OR)

5. a) Explain briefly the factors affecting combustion in S.I engines. 5 M
   b) What is abnormal combustion? Show the difference between normal combustion and abnormal combustion on a pressure-crank angle (p-θ) diagram. Explain the auto-ignition phenomenon. 7 M

UNIT-III

6. a) Explain the methods of controlling knock in C.I. engines. 4 M
   b) What are the types of divided combustion chambers in C.I engines? Explain briefly with neat sketches. 8 M

(OR)

7. a) Explain combustion stages in CI engine. 8 M
   b) What are the advantages and disadvantages of the IDI swirl chamber over the open chamber? 4 M

UNIT-IV

8. A four-stroke cycle gasoline engine has four cylinders of 8.5 cm bore and 9.5 cm stroke. The engine is coupled to a brake having a torque radius of 35 cm. At 3000 rpm with all cylinders firing, the net brake load is 430 N. When each cylinder in turn is cut-off, the average net brake load produced at the same speed by the remaining three cylinders is 350 N. Estimate the indicated mean effective pressure of the engine. With all cylinders firing the fuel consumption is 0.24 kg/min, and the calorific value of fuel is 44,000 kJ/kg. The cooling water flow rate is 65 kg/min and the temperature rise is 12^0C. The air/fuel ratio is 15, the temperature of the exhaust gas is 450^0C, the temperature of the test room is 17^0C, the barometric pressure is 76 cm of Hg, the proportion of hydrogen by mass in fuel is 15.5%, the mean specific heat of dry exhaust gases is 1 kJ/kg K, the specific heat of superheated steam is 2 kJ/kg K. Determine (i) indicated mean effective pressure, (ii) indicated thermal efficiency (iii) brake specific fuel consumption and (iv) volumetric efficiency based on atmospheric conditions. Draw up heat balance sheet on kJ/min and percentage basis. 12 M

(OR)

9. A four-cylinder S.I engine has a bore of 60 mm and a stroke of 85 mm. it runs at 3000 rpm and is tested at this speed against a brake which has a torque arm of 0.35 m. The net brake load is 160 N and the fuel consumption is 6.6 l/hr. The specific gravity of the fuel used is 0.78. The lower calorific value of fuel is 44,000 kJ/kg. A Morse-test is carried out and the cylinders are cut out in the order 1,2,3,4 with the corresponding brake loads of 114, 110, 112 and 116 N respectively. Calculate for this speed (i) brake power (ii) brake mean effective pressure (iii) brake thermal efficiency (iv) brake specific fuel consumption (v) indicated power (vi) mechanical efficiency and (vii) indicated mean effective pressure. 12 M

UNIT-V

10. a) Describe with a neat sketch the construction and working of a single-stage single acting reciprocating air compressor. 7 M
    b) Free air of 30 m^3/min is compressed from 1.013 bar to 2.23 bar. Calculate the power required (i) if the compression is carried out in roots blower, (ii) if the compression is carried out in vane blower and (iii) the isentropic efficiency in each case. Assume that there is 25% reduction in volume before the back-flow occurs. 5 M

(OR)

11. a) Show on *p-V* diagram and compare the work done in a two-stage compression of reciprocating compressor without intercooling and with intercooling. 6 M
    b) Explain axial flow compressor with neat sketch. 6 M

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AR13

CODE: 13EC2008 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, April, 2018

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) Distinguish between Darlington pair and cascade amplifier
   b) Which coupling technique is efficient and why?
   c) Define sensitivity and desensitivity of gain in feedback amplifiers.
   d) List the General characteristics of negative feedback amplifiers.
   e) Mention two essential conditions for a circuit to maintain oscillations.
   f) What are the differences between feedback amplifiers and Oscillators?
   g) What is the significance of Push-pull amplifiers?
   h) What is Heat sink?
   i) Define tuned amplifier.
   j) Define Line Regulation.

PART-B

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

UNIT-I

2. a) Perform the analysis of Darlington pair amplifier circuit
   b) Four identical cascaded stages have an overall upper 3-dB frequency of 20 KHz and a lower 3-dB frequency of 20Hz. What are f_L and f_H of each stage? Assume non interacting stages?

(OR)

3. a) Explain R-C coupled amplifier with neat sketch.
   b) When 2-stages of identical amplifiers are cascaded, obtain the expressions for overall voltage gain, current gain and power gain.

UNIT-II

4. a) An amplifier has a mid-frequency gain of 100 and a bandwidth of 200 KHz. What will be the new bandwidth and gain, if 5% negative feedback is introduced?

   b) Draw the circuit of a feedback pair with voltage shunt topology and find the voltage gain.

(OR)

5. a) Draw the circuit of a feedback pair with Current shunt topology and find the voltage gain.

   b) Explain voltage series feed back amplifier and give input and output impedances

UNIT-III

6. a) Classify different types of oscillators based on frequency range.
   b) A Colpitts oscillator is designed with pF C 100 1 = and pF C 7500 2 = . The inductance is variable. Determine the range of inductance values, if the frequency of oscillation is to vary between 950 KHz and 2050 KHz.

(OR)

7. a) Why RC oscillator are not suitable for high frequency applications.
   b) Draw the circuit diagram of a Hartley oscillator. Derive the expression for frequency of oscillation

UNIT-IV

8. a) Draw the circuit diagram of class-B Push pull amplifier and explain the operation
   b) With neat sketch explain MOSFET power amplifier.

(OR)

9. a) With neat sketch explain Transformer Coupled Audio power amplifier
   b) What is thermal runaway? Explain a remedy for it.

UNIT-V

10. a) Draw the equivalent circuit of a capacitance coupled single tuned amplifier and derive the equation for voltage gain.

    b) Draw and explain the circuit diagram for series type voltage regulator

(OR)

11. a) Discuss about double tuned voltage amplifier.
    b) Explain stagger tuned amplifier with neat sketch

AR13

CODE: 13CS2007 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, April, 2018

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) What is DBA
   b) Define view
   c) Describe the properties of a relation.
   d) What is Functional Dependency
   e) Define primary key.
   f) What is order of a relation
   g) What is the degree of a Relation
   h) What are ACID Properties
   i) Define Concurrency
   j) Expand the term BCNF

PART-B

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

UNIT-I

2. a) Analyze the structure of the DBMS 8M
   b) What are the responsibilities of DBA 4M

(OR)

3. a) Explain the advantages of DBMS over File System 6M
   b) Explain Data base models with examples 6M

UNIT-II

4. a) Explain the relational algebra operations with suitable examples 8M
   b) Explain the terms weak entity and strong entity with example 4M

(OR)

5. a) Discuss about various integrity constraints over Relations 6M
   b) Draw an ER diagram for a university system. Identify entities, relations, aggregations, and generalizations of a university system 6M

UNIT-III

6. a) The Schema defined for Employee Management System is: 6M

Employee: EmpID, Name, Address, Dept, Salary.

Department: DeptID, Name, Loc.

Create and insert the data for the above schema Write

SQL queries for the following and show the result.

(i) Retrieve the details of the employee who gets the maximum salary. List names of all the employees who earns more than 1, 00,000 per annum.

Give the names of the employee with designation Assistant professor.

b) Explain joins with an examples 6M

(OR)

7. Give one example of SQL Query for the following keywords 12M
a) EXISTS b) ANY c) GROUP BY … HAVING

UNIT-IV

8. Take a un-normalized relation and apply the rules of 1st, 2nd, 3rd normal forms show the transformations at each stage 12M

(OR)

9. a) List out problems caused by Redundancy 6M
b) Briefly explain Boyce-Codd Normal Form 6M

UNIT-V

10. a) Briefly discuss about Concurrent Execution of Transaction 6M
b) What are ACID properties? Explain 6M

(OR)

11. a) Briefly explain recovering from a system crash 6M
b) What is Media Recovery? Explain 6M

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