AR16

CODE: 16CE2008 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July-2018

STRUCTURAL ANALYSIS-I

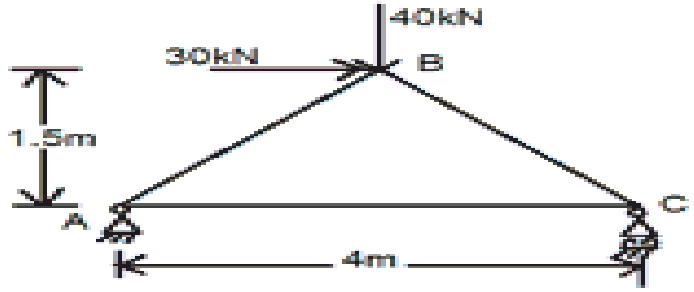
(Civil Engineering)

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

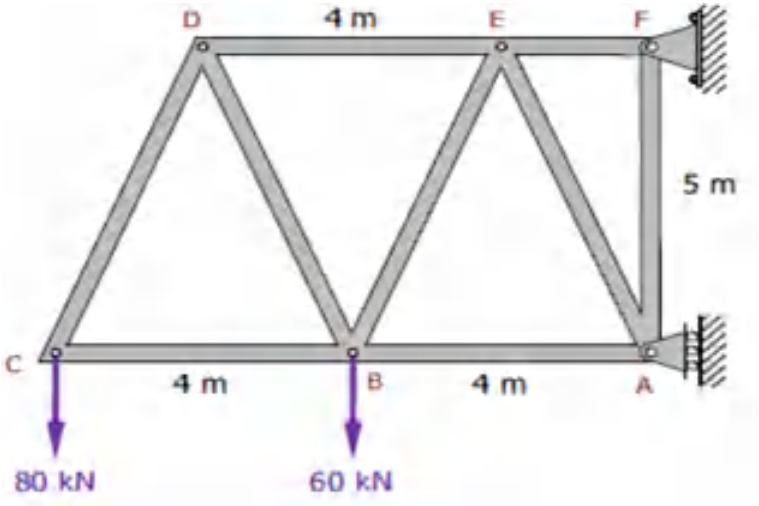
UNIT-I

1. a) What are the assumptions made in finding forces in a perfect frames? **5M**
   b) Analyse the following frame **9M**



(OR)

2. . Find the force in each member of the truss shown in Fig.6.5. **14M**



UNIT-II

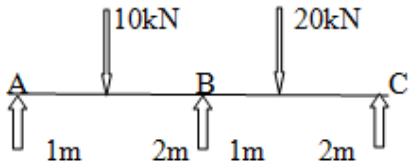
3. A beam AB of span 3m is fixed at A and propped at B. Find the Prop reaction if the beam is loaded with udl of 20kN/m over its entire span. And also determine the maximum deflection. Draw BMD and SFD. **14M**

(OR)

4. A fixed beam of 8m span is loaded with two point loads of 50 kN at a distance 2m from both the end support. Draw the bending moment and shear force diagrams. Find also the maximum deflection. Given, $I = 8 \times 10^8$ mm^4 and $E = 2 \times 10^8$kN/m^2 **14M**

UNIT-III

5. Determine the reactions at the supports for the continuous beam shown in fig. EI is constant throughout and draw S.F.D and B.M.D. **14M**

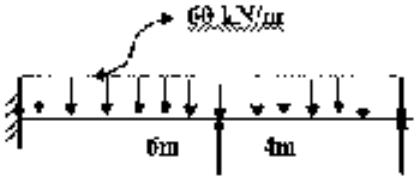


(OR)

6. A continuous beam *ABC* is fixed at *A* and *C*. It is continuous over a simple support *B*. Span *AB* is 5 m while *BC* span is 6 m. It is subjected to a concentrated load of 60 kN at 3 m from *A* and the span *BC* is subjected to uniformly distributed load of 10 kN/m. The ratio of flexural rigidity of span *BC* to *BA* is 1.5. Sketch the shear force and bending moment diagram. Use Clapeyron's theorem of three moments. **14M**

UNIT-IV

7. By Using slope deflection method analyze the two span continuous beam shown in figure .The end A is fixed while C is simply supported. The beam is having same moment of inertia. Sketch the B.M & S.F **14M**



(OR)

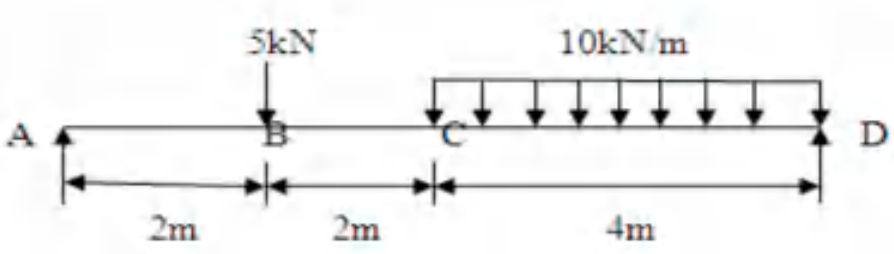
8. A beam ABC 7m long consists of span AB and BC of lengths 4m and 3m respectively. It is fixed at the end A and simply supported at B and C. The span AB carries a point load of 48kN at a distance of 1m from A while the span BC carries a point load of 36kN at a distance of 1m from C. The moment of inertia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

UNIT-V

9. A simply supported beam carries a point load 'P' eccentrically on the span of length l, at a distance of a from the left hand support respectively. Find the deflection under the load. Assume uniform flexural rigidity. Using Castigliano's 1st therom. **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= $400 \times 10^6 mm^4$. **14M**



AR16

CODE: 16EE2012 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July-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) Derive an expression for maximum torque developed in a three-phase induction motor. And explain the torque –slip characteristics. **7M**

   b) A 3-phase, 4 pole, 50Hz induction motor has a rotor resistance of 0.1 ohm per phase and stand still reactance of 0.8 ohm per phase. If the full load slip is 5%. Determine the full load torque as a percentage of maximum torque. What should be the value of external rotor resistance per phase to give half of the maximum torque at starting. **7M**

(OR)

2. 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**

UNIT-II

3. a) Prove that the ratio of maximum torque to starting torque is $(1+a^2) / 2a$ where 'a' is the ratio of rotor resistance per phase to rotor stand still leakage reactance per phase. **4M**

   b) A 15 kW, 400V, 4 pole, 50Hz, 3-phase, star connected induction motor gave the following test results **10M**

   No load test: 400V, 9A, 1310W

   Blocked rotor test: 200V, 50A, 7100W

   Voltage and current are line values Stator and rotor ohmic losses at stand still are assumed equal. Draw the circle diagram. Hence, determine the maximum power input and maximum power output.

(OR)

4. a) Describe briefly the various methods of speed control of 3-phase induction motor. **7M**

   b) Explain briefly about the different types of starting methods of 3-phase induction motor. **7M**

UNIT-III

5. a) Explain in detail about the constructional details of an alternator. **10M**
   b) Determine the frequency of a 12 pole alternator rotating at 600 R.P.M. If the no.of.poles is tripled, then what will be its new frequency? **4M**

(OR)

6. a) Explain about the integral slot winding and fractional slot winding. Discuss their merits and demerits. **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) Explain the merits and demerits of e.m.f and m.m.f methods. **7M**
   b) A 3phase star connected alternator is rated at 1600kVA, 13500 V. The armature effective resistance and synchronous reactance are 1.5 Ohm and 30 Ohm respectively per phase. Calculate the percentage regulation for a load of 1280 KW at power factor of 0.8 leading. **7M**

(OR)

8. a) Develop an expression for regulation of a salient pole synchronous generator. **7M**
   b) A 3-Phase, Star connected alternator is rated at 1600 KVA, 13500 V. The armature effective resistance and synchronous reactance are 2 ohms and 20 ohms respectively per phase. Calculate the percentage regulation for a load of 1200 kW at power factors of (i) 0.85 leading **7M**

UNIT-V

9. a) Explain the construction and principle of operation of a synchronous motor? **7M**
   b) A 400-V, 6-pole, 3-phase, 50 Hz, start connected synchronous motor has a it takes a current of 15 A at unity power factor when operating with a certain filed current. If the load torque is increases until the line current is 60 A, the filed current remaining unchanged. Find the gross torque development, and the new power factor. **7M**

(OR)

10. a) Explain the various starting methods of synchronous motor **7M**
    b) Explain the effects of varying excitation on armature current and power factor in a synchronous motor. Draw 'V' curves **7M**

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AR16

CODE: 16ME2010 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July-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)	What are the important functions of a lubricant? Explain briefly the working of a splash-lubrication system with a neat sketch.	7 M
	b)	Explain I.C. Engine classification.	7 M
		(OR)	
2.	a)	Compare the thermal efficiencies of Otto, Diesel and Dual cycles with the help of T-s diagram under the following conditions: (i) For the same compression ratio and heat addition (ii) For the same compression ratio and heat rejection (iii) For the same peak pressure, peak temperature and heat rejection.	8 M
	b)	Explain the following (i) time loss factor (ii) heat loss factor (iii) exhaust blowdown factor (iv) loss due to gas exchange process (v) loss due to rubbing friction (vi) volumetric efficiency	6 M

UNIT-II

3.	a)	Discuss the effects of the following factors on the combustion process in S.I engine. (i) Composition of mixture (ii) Load (iii) Compression ratio (iv) speed (v) Turbulence and shape of the combustion chamber (vi) Spark plug location	8 M
	b)	Briefly explain the time factors that affect the knock in S.I engines.	6 M
		(OR)	
4.	a)	Describe the F-type of combustion chamber with the help of a simple diagram. How is the knocking tendency reduced in this type of combustion chamber?	8 M
	b)	Explain briefly the methods of detecting knock?	6 M

UNIT-III

5.	a)	What is delay period? What are the factors that affect the delay period in C.I engines?	7 M
	b)	Classify the C.I engine combustion chambers. Explain open combustion chambers of C.I engine with neat sketches.	7 M
		(OR)	
6.	a)	Describe with the help of diagrams the air-swirl and squish in the C.I engine combustion chamber.	8 M
	b)	Describe the air cell type of combustion chamber with the help of a diagram.	6 M

UNIT-IV

7. A trail was conducted on a single-cylinder oil engine having a cylinder diameter of 30 cm and stroke 45 cm. The engine is working on the four-stroke cycle and the following observations were made: 14 M
Duration of trail = 54 minutes
Total fuel used = 7 litres
Calorific value = 42 MJ/kg
Total number of revolutions = 12624
Gross imep = 7.25 bar
Pumping imep = 0.35 bar
Net load on the brake = 150 kg
Diameter of the brake wheel drum = 1.78 m
Diameter of the rope = 4 cm
Cooling water circulated = 550 litres
Cooling water temperature rise = 48^0C
Specific heat of water = 4.18 kJ/kg K
Specific gravity of oil = 0.8
Calculate the mechanical efficiency and also the unaccounted losses.

(OR)

8. During the trail of a single-cylinder, four-stroke oil engine, the following results were obtained. 14 M
Cylinder diameter = 20 cm
Stroke = 40 cm
Mean effective pressure = 6 bar
Torque = 407 Nm
Speed = 250 rpm
Oil consumption = 4.5 kg/h
Calorific value of fuel = 43 MJ/kg
Cooling water flow rate = 4.5 kg/min
Air used per kg of fuel = 30 kg
Rise in cooling water temperature = 45^0C
Temperature of exhaust gases =420^0C
Room temperature = 20^0C
Mean specific heat of exhaust gas = 1 kJ/kg K
Specific heat of water = 4.18 kJ/kg K
Find the indicated power, brake power and draw up a heat balance sheet for the test in kJ/h.

UNIT-V

9. a) Derive the minimum work condition for a stage compression in a reciprocating compressor. 7 M

   b) A single-cylinder, single-acting air compressor running at 300 r.p.m. is driven by a 23 kW electric motor. The mechanical efficiency of the drive between motor and compressor is 87%. The air inlet conditions are 1.013 bar and 15^0C and the delivery pressure is 8 bar. Calculate the free-air delivery in m^3/min, the volumetric efficiency, and the bore and stroke of compressor. Assume that the index of compression and expansion is n = 1.3, that the clearance volume is 7% of the swept volume and that the bore is equal to the stroke. 7 M

(OR)

10. 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 root blower and vane type compressors. 8 M

AR16

CODE: 16EC2009 **SET-I**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(An Autonomous Institution)

II B.Tech II Semester Supplementary Examinations, July-2018

ELECTRONIC CIRCUITS- II

(Electronics and Communication Engineering)

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

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. State and explain Barkhausen criterion. 7M

b. Determine the frequency of oscillations when RC phase shift oscillator has R=10KΩ, C=0.01μF, and R_e=2.2KΩ. Also find minimum current gain needed for this purpose. 7M

(OR)

2. a.Explain the operation of Wien bridge oscillator and derive the expression for frequency of oscillations. 8M

b. In a transistorized Hartley oscillator, two conductance's are 2mH and 20μH, while the frequency is to be changed from 950KHZ to 2050KHZ. Calculate the range over which the capacitor is to be varied. 6M

UNIT-II

3. a. Draw and explain the frequency response of two cascaded CE amplifiers. 8M

b. Explain the selection of configuration for multistage amplifiers. 6M

(OR)

4. a.Explain various types of coupling methods used in multistage amplifiers. 7M

b. What is the effect of cascading on frequency response and bandwidth? 7M

UNIT-III

5. a Explain about Hybrid-π capacitances. How the Hybrid-π parameters vary with temperature? 7M

b Short circuit CE current gain of a transistor is 25 at a frequency of 2MHZ. If f_β=200KHZ, Calculate (i) f_T (ii) h_{fe} (iii) Find the $|A_I|$ at frequency of 10MHZ and 100 MHZ. 7M

(OR)

6. a. Derive the expressions for transconductance and input conductance of transistor hybrid-π model. 8M

   b. Following measurements of a certain transistor are available at room temperature and with I_c= 5 mA, h_{fe} = 100, h_{ie} = 0.62 KΩ. Short circuit current gain A_{is} = 10 at 10MHz. C_{bc} = 3_{pF}. Calculate f_T and f_{β}. 6M

UNIT-IV

7. a. Explain the advantages of push-pull amplifiers. Derive an expression for the efficiency of a class-B push pull amplifier. 7M

   b. Explain class-A power amplifier with neat sketch 7M

(OR)

8. a. Explain the classifications of power amplifiers based on the period of conduction. 6M

   b. A single stage class–A amplifier has V_{CC}=20volts,V_{CEQ}=10 volts, I_{CQ}=600mA and collector load resistor R_L =16Ω. The AC output current varies by ± 300mA with AC input signal. Determine (i) The power supplied by the source to the amplifier circuit (ii) DC power consumed by the load resistor (iii) AC power developed across the load resistor. (iv)DC power delivered to the transistor (v) DC power wasted in transistor collector (vi) overall efficiency and (vii) collector efficiency. 8M

UNIT-V

9. a. Derive the expression for voltage gain of single tuned amplifier with a neat diagram. 8M

   b. A single tuned RF amplifier uses a transistor with an output resistance of 50KΩ, output capacitance of 15PF and input resistance of next stage is 20kΩ.The tuned circuit consists of 47PF capacitance in parallel with series combinations of 1μH inductance and 2Ω resistance. Calculate (i) resonant frequency (ii) effective quality factor and (iii) bandwidth of the circuit. 6M

(OR)

10 a. Define different performance parameters of a voltage regulator and explain their importance. 7M

   b. Define the terms i) Load Regulation ii) Line Regulation iii) Ripple Rejection and iv) Temperature Stability pertaining to Voltage Regulator ICs. 7M

Code No: 16CS2008 **AR16** SET- 2

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

UNIT-I

1. a) Describe about Database system structure with neat sketch. 10m
   b) Explain the role of Data base Administrator. 4m

(OR)

2. a) Explain the levels of abstraction in DBMS with neat sketch. 7m
   b) Explain in detail the Database languages. 7m

UNIT-II

3. a) Explain the database design process in detail. 8m
   b) Describe the weak entities with an example. 6m

(OR)

4. a) Explain the ER to Relational Mapping with an example. 10m
   b) Write in brief about Querying relation data. 4m

UNIT-III

5. a) Consider the following schema:
   Sailors (*sid:* integer, *sname:* string, *rating:* integer, *age:* real)
   Boats (*bid:* integer, *bname:* string, *color:* string)
   Reserves (*sid:* integer, *bid:* integer, *day:* date)

Write the following queries in SQL:

I. *Find the names of sailors who have reserved a red 01' a green boat.*
II. *Find all sids of sailors who have a rating of 10* or *reserved boat 104*
III. *Find the names of sailors who have reserved boat 103.*
IV. *Find the names of sailors who have* not *reserved a red boat.* 10m

b) Explain how the Null values are supported in the Relational Model. 4m

(OR)

6. a) Describe the Correlated Nested queries with an example. 7m
b) Explain the Complex integrity constraints in SQL. 7m

UNIT-IV

7. a) Discuss in detail the Schema refinement in database design. 10m
b) Consider a relation '*R*' with five attributes *ABCDE.* You are given the following dependencies: A→B, BC→A, ED→A. Is *R* in 3NF? Explain. 4m

(OR)

8. a) What is a lock?. Describe the types of locks used in concurrency control. 6m
b) Explain in detail the Time stamp based protocols. 8m

UNIT-V

9. a) Discuss the Shadow paging in detail. 8m
b) Explain the different types of failures in brief. 6m

(OR)

10. a) How the data is organized in hash based indexing? Explain. 8m
b) Describe the File organization and Indexing. 6m

AR13

CODE: 13CE2008 **SET-I**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-2018
STRUCTURAL ANALYSIS –I
(Civil Engineering)

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

PART –A

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

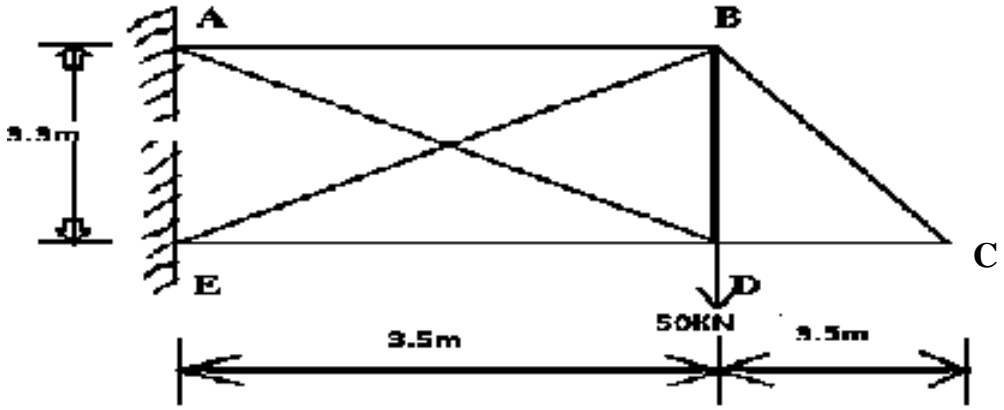
1 (a) Explain briefly external and internal indeterminacy of the truss.
(b) What is kinematic indeterminacy?
(c) What are the main objects of structural analysis?
(d) How many reactions are developed at the roller end?
(e) In a fixed beam the moment at the internal hinge is.....
(f) Which method is used to find the reaction at the propped end?
(g) What is the point of inflexure.
(h) What is the bending moment at the mid span of the simply supported beam when a point load acting at mid span.
(i) What is the deflection at the fixed end of cantilever beam?
(j) Define influence line.

PART –B

ANSWER ONE QUESTION FROM EACH UNIT **[5 X 12 = 60M]**

UNIT – I

2. Find the forces in the members of the truss as shown. The cross sectional area and young's modulus of all the members are the same.

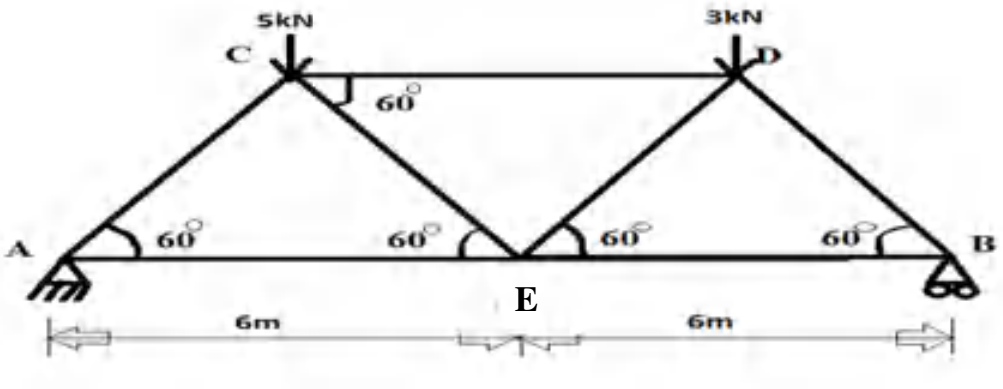


(OR)

AR13

CODE: 13CE2008 **SET-I**

3. Find the forces in the members of the truss as shown .The cross – sectional area and young's modulus of all the members are the same.



UNIT – II

4. A three hinged parabolic arch of span 30.0m and rise 6.0m carries uniformly distributed load of 60kN/ horizontal meter run over the right half of the span. Calculate the support reactions and also find bending moment, radial shear and normal thrust at a section 10m from the right support.

(OR)

5. A three hinged circular arch of span 25m and rise 7m carries uniformly distributed load of 40kN/ horizontal meter run over the left half of the span. Calculate the support reactions and also find bending moment, radial shear and normal thrust at a section 8m from the left support.

UNIT – III

6. A cantilever beam of length 6m is carrying a point load of 70kN at a distance of 4m from the fixed end . The cantilever is propped rigidly at free end. Determine the reaction at the rigid propped draw SF and BM diagrams.

(OR)

7. A fixed beam is shown in Fig 2. Solve the beam and also draw the B.M and S.F Diagrams.

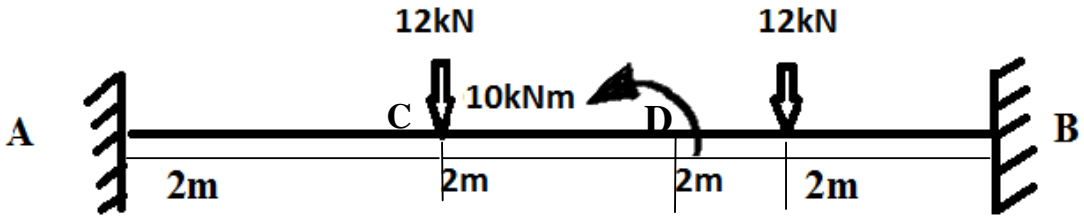


FIGURE -2

AR13

CODE: 13CE2008 **SET-I**

UNIT – IV

8. A continuous beam ABC consists of two spans AB of length 4m, and BC of length 3m. The span AB carries a point load of 120kN at its middle points. The span BC carries a point load of 150KN at 1m from C. The end A is fixed and the end C is simply supported Find:
   (i) The moments at the supports
   (ii) The reactions at the supports and
   (iii) Draw the B.M diagram .
   Use Clapeyron's theorem of three moments.

(OR)

9. Analyse the continuous beam shown in Fig 3. Use three moment equation Draw S.F & B.M diagram.

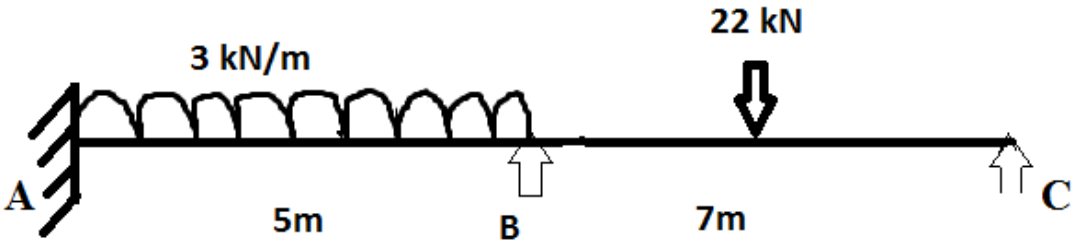


FIGURE - 3

UNIT – V

10. A system of wheel loads crosses a girder of 21.60m span, which is simply support at its ends. The loads and their distances are as follows.
    Wheel load (kN) ; 120 220 220 170;
    Distance between centre (metres) : 1.80 2.70 2.40 2.10
    Determine (i) The maximum B.M at quarter span.
    (ii) The maximum B.M in the girder

(OR)

11 An overhanging beam DABC, 14m long is supported at A & B DA =BC = 2m: AB=10m. Draw the influence lines for the reactions at A and B, Shear and bending moment at section 3m from A. Hence obtain their values for a uniformly distribute load of 10kN/m, 5m long acting from A

AR13

CODE: 13EE2011 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-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) Define voltage regulation of a transformer?
   b) What are the losses in transformer?
   c) What advantages as the star connection over the delta connection?
   d) A 6-pole induction motor the supply frequency was 60Hz then its synchronous speed will be?
   e) Define slip in 3 phase induction motor?
   f) Give any three applications for slipring induction motor?
   g) What is an open delta system?
   h) What is meant by Plugging?
   i) Name the tests required to draw circle diagram?
   j) What is the condition for maximum torque at starting in a 3-face induction motor?

PART-B

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

UNIT-I

2. a) Describe the constructional features and principle of operation of single phase transformer? 6M
   b) Calculate the regulation of a transformer in which the ohmic loss is 1%of the output and reactance drop of 5% of the voltage, when the power factor is 0.8 lagging 6M

(OR)

3. Draw and explain the phasor diagrams of a single phase transformer at lagging, leading and unity power factors? 12M

UNIT-II

4. a) Discuss unbalanced operation of 3phase transformers and also mention its advantages and disadvantages? 6M
   b) Three phase transformer has 400 turns on the primary and 40 turns on the secondary. The supply voltage is 3300 volts find the secondary voltage on no load and the windings are connected in star to delta, delta to star. 6M

(OR)

5.		Draw and explain the scott connection of transformers and what are the applications?	12M

UNIT-III

6.		Derive the torque expression of a 3 phase induction motor under running conditions and obtain the condition for maximum torque.	12M

(OR)

7.	a)	Explain the power stages in three phase induction motor?	6M
	b)	A three phase 4 pole,50HZ, induction motor has a slip of 2% at no load and 4% at full load find i) synchronous speed ii) no load speed iii)full load speed	6M

UNIT-IV

8.	a)	A 10KW, 400V, 6 pole delta connected squirrel cage induction motor gave following test results No load test : 400V,8.1A,750W Blocked rotor test: 90V,34A,1350W Calculate equivalent circuit parameters	6M
	b)	Draw and discuss star to delta auto transformer starter for three phase induction motor?	6M

(OR)

9.		Explain any three methods of starting large induction motors and compare their values of starting torque.	12M

UNIT-V

10.		Discuss any two speed control methods for a three phase induction motor?	12M

(OR)

11.	a)	How is the speed of three phase induction motor control by its stator voltage control?	6M
	b)	A 25 kW 400V three phase 4 pole 50HZ induction motor has full load slip of 5%.If the ratio of the stand still reactance to resistance per phase is 4. Estimate the plugging torque at full speed?	6M

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AR13

CODE: 13ME2011 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, July-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 is TDC and BDC? Represent them on a suitable sketch.
   b) Define an internal combustion engine and an external combustion engine? Give examples.
   c) What is meant by controlled combustion and an uncontrolled combustion?
   d) Why is spark advance required? Explain.
   e) What is the typical range of compression ratio in C.I engines?
   f) What is meant by cold starting?
   g) What is meant by unaccounted losses in an I.C. engine?
   h) Define specific fuel consumption and specify its S.I units.
   i) What is meant by a positive displacement type compressor? Give examples.
   j) What is the advantage of axial flow compressor over centrifugal compressor? Why it is used in gas turbine applications?

PART-B

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

UNIT-I

2. a) Write all the assumptions made in an Air-standard cycle? 4 M
   b) What is the necessity of engine cooling? Explain briefly the types of cooling in reciprocating I.C. Engines. Mention the advantages and disadvantages of each cooling system. 8 M

(OR)

3. a) What are the requirements of an ignition system of a spark-ignition engine? Explain each factor briefly. 5 M
   b) Explain simple carburettor with neat sketch. 7 M

UNIT-II

4. a) Describe briefly the engine variables affecting the flame speed. 5 M
   b) Explain T-head type and L-head type combustion chambers with neat sketches. 7 M

(OR)

5. a) Explain briefly the basic requirements of a good combustion chamber in an S.I engine. 4 M
   b) Explain the three stages of combustion in an S.I engine with the help of pressure-crank angle (p-θ) diagram. 8 M

UNIT-III

6. a) Explain the combustion chamber characteristics of a C.I ngine. 4 M
   b) Explain the phenomenon of knock in C.I engines and compare it with S.I engine knock. 8 M

(OR)

7. a) Draw and describe the spray pattern when fuel is injected into swirling air. 5 M
   b) What are the requirements of a good combustion chamber of a C.I engine? Give the classifications of different types of combustion chambers of a C.I engine. 7 M

UNIT-IV

8. An eight-cylinder four-stroke SI engine of 80 mm bore and 100 mm stroke is tested at 4500 rpm on a dynamometer which has 55 cm arm. The dynamometer scale reading was 40 kg. the time for 100 cc of fuel consumption is recorded as 9.5 seconds. The calorific value of fuel is 44,000 kJ/kg. Air at 1 bar and 27^0 C was supplied to the carburettor at the rate of 6 kg/min. Assume specific gravity of fuel to be 0.7. Clearance volume of each cylinder is 65 cc. Determine the (i) brake power, (ii) brake mean effective pressure, (iii) brake specific fuel consumption, (vi) brake specific air consumption (v) air/fuel ratio, (vi) brake thermal efficiency, (vii) volumetric efficiency and (viii) the relative efficiency. 12 M

(OR)

9. The following observations were made during a test on an oil engine: 12 M
   Brake power = 30 kW
   Fuel used = 10 kg/h
   Calorific value of fuel = 42,000 kJ/kg
   Jacket circulating water = 9 kg/min
   Rise in temperature of cooling water = 60^0C
   The exhaust gases are passed through the exhaust gas calorimeter for determining the heat carried away by exhaust gases.
   Water circulated through the exhaust gas calorimeter = 9.5 kg/min
   Rise in temperature of water passing through the calorimeter = 40^0C
   Temperature of exhaust gases leaving the calorimeter = 80^0C
   Air/fuel ratio on mass basis = 20
   Ambient temperature = 17^0C
   Mean specific heat exhaust gases = 1.0 kJ/kg K
   Specific heat of water = 4.18 kJ/kg K
   Draw up a heat balance sheet on kJ/min and percentage basis.

UNIT-V

10. a) Explain briefly the methods employed to increase the isothermal efficiency of a reciprocating compressor. 6 M
    b) Draw the velocity diagrams at the inlet and outlet of an axial flow compressor. 6 M

(OR)

11. a) Explain root blower and vane type compressors. 5 M
    b) Explain the working of Centrifugal compressor with a neat sketch. 7 M

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Code: 13EC2008

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

ELECTRONIC CIRCUITS-II

(Electronics and Communication Engineering)

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

PART-A

Answer all questions **[1 X10 = 10 M]**

1. a) What is the overall bandwidth of n-stage cascaded amplifier?
   b) What is cascode amplifier
   c) What is the effect of negative feedback on distortion
   d) What is R_i and R_o of current series feedback amplifier
   e) Which oscillator has both positive and negative feedbacks
   f) What are advantages of using crystal oscillators
   g) What is the conduction angle of class AB power amplifier
   h) What is the main advantage of transformer coupling
   i) What is the advantage of stagger tuning
   j) Draw the line and load regulation characteristics for zener voltage regulator

PART-B

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

UNIT-I

2. a) Draw the circuit diagram of single stage RC coupled BJT amplifier. Discuss the effect of emitter bypass capacitor on low frequency response

   b) What is the effect of bandwidth on multi stage amplifiers? Explain with necessary equations.

(OR)

3. Draw the circuit of a two stage RC coupled BJT amplifier and derive the overall voltage gain.

UNIT-II

4. a) Draw block diagram of single loop negative feedback circuit and explain each block briefly.

   b) For a voltage series feedback amplifier with parameters of basic amplifier A_v=200, R_i=5KΩ, R_o=20KΩ, BW=50KHz having β=0.02 calculate A_{vf}, R_{if}, R_{of} and BW_f.

(OR)

CODE: 13EC2008

5. a) What are the different types of basic amplifiers used in a negative feedback system? Explain briefly.
   b) Determine A_{vf}, R_{if} and R_{of} of a negative feedback amplifier having open loop parameters A=100, R_i=10KΩ, Ro=20KΩ, with a feedback factor of 0.1.

UNIT-III

6. a) Explain Barkhausen criterion for sustained oscillations.
   b) Calculate the operating frequency of a transistor Colpitts oscillator having L=10μH, C1=0.01μF,C2=0.1μF.

(OR)

7. Draw the generalized circuit diagram of transistor LC oscillator and derive the relation for frequency of oscillations.

UNIT-IV

8. What is harmonic distortion in transistor amplifier circuits? Derive the relation for total harmonic distortion.

(OR)

9. a) Explain why class D power amplifier is an ideal power amplifier.
   b) A single stage class A power amplifier operated with V_{cc}=20V, V_{ceQ}=10V, I_{cQ}=600mA, R_L=16Ω. If the AC output current is varied by 3mA, find the conversion efficiency.

UNIT-V

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10. Derive the expression for bandwidth of capacitor coupled single tuned amplifier in CE configuration.

(OR)

11. a) Explain series voltage regulator with neat circuit diagram.
    b) Draw the circuit diagram of tuned amplifier and derive it's Q factor.

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AR13

CODE: 13CS2007 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, July-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 a data model?
   b) Differentiate DDL & DML.
   c) Define Entity-set.
   d) What is SQL?
   e) Mention set operators used in SQL.
   f) Define trigger.
   g) What is two-phase locking protocol?
   h) What are the advantages of normalization?
   i) What is a Log?
   j) Define Hashing.

PART-B

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

UNIT-I

2.	a)	Draw and explain the three level architecture of database system.	6M
	b)	What are the advantages of DBMS?	6M
		(OR)	
3.	a)	List and explain about different users of database system.	8M
	b)	What are the functions of DBA?	4M

UNIT-II

4.	a)	Discuss in detail about various concepts used in ER-model.	8M
	b)	What is an weak-entity? Explain it with suitable example	4M
		(OR)	
5.	a)	What is a view? How views are implemented?	4M
	b)	Explain any four relational algebraic operations with suitable examples	8M

UNIT-III

6.	a)	What is a group function? List and explain how to use group functions in SQL with appropriate examples.	6M
	b)	By considering an example describe various data update operations in SQL.	6M
		(OR)	
7.	a)	Write and explain the structure of SQL SELECT statement with suitable example.	6M
	b)	Explain the concept of trigger with appropriate example.	6M

UNIT-IV

8.	a)	Explain the need of normalization**.**	4M
	b)	Describe various normal forms with suitable examples	8M
		(OR)	
9.	a)	Describe the properties of a transaction.	6M
	b)	Explain in detail about timestamp based concurrency control techniques.	6M

UNIT-V

10.	a)	Explain about different types of failures occurred in the system.	6M
	b)	Describe various methods of defining indexes on multiple keys.	6M
		(OR)	
11.	a)	Describe hash based index. When does a collision occur in hashing?	6M
	b)	Explain about B+ - Tree indexing	6M

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