AR16

CODE: 16CE2009 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February-2021

STRENGTH OF MATERIALS-II

(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

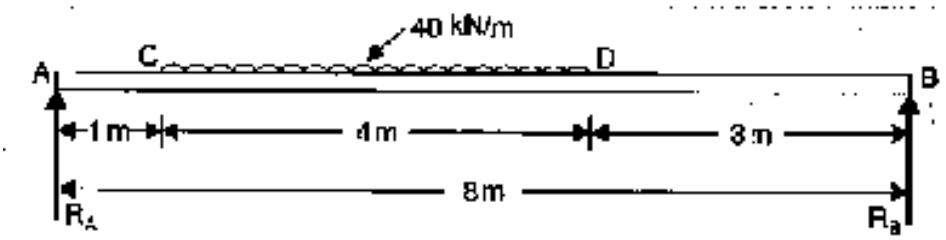
UNIT-I

1. a) Calculate the maximum deflection of a simply supported beam carrying a point load of 100 KN at mid span. Span = 6 m, E= 20000 kN/m^2. 2m

   b) Determine the deflection at the free end of a cantilever which is 2m long and carries a point load of 9kN at the free end and a uniformly distributed load of 8kN/m over a length of 1m from the fixed end. Take E = 2.2 x 10^5 N/mm^2 and I = 2.25 x 10^7 mm^4. 12m

(OR)

2. A beam of length 8m is simply supported at is ends. It carries a uniformly distributed load of 40kN/m as shown in figure below. Determine the deflection of the beam at its midpoint and also the position of maximum deflection and maximum deflection. Take E = 2 x 10^5 N/mm^2 and I = 4.3 x 10^8 mm^4. 14m



UNIT-II

3. At a point within a body subjected to two mutually perpendicular directions, the stresses are 80N/mm^2 tensile and 40N/mm^2 tensile. Each of the above stresses is accompanied by a shear stress of 60 N/mm^2. Determine principal stresses. 14m

(OR)

4. In a material the principal stresses are 50 N/mm^2, 40 N/$mm^2$and - 30N/mm^2, Calculate: 14m
   i. Total strain energy
   ii. Volumetric strain energy
   iii. Shear strain energy and
   iv. Factor of safety on the total strain energy criterion if the material yield at 100 N/mm^2.
   Take e = 200 x 10^3 N/$mm^2$and Poisson ratio = 0 .8

UNIT-III

5.	a)	Derive circumferential strain and longitudinal strain for a thin cylindrical shell subjected to internal pressure	8m
	b)	Find the circumferential stress at the inner and outer radius respectively in the case of a pipe with a 100mm internal diameter and which is 40mm thick when subjected to an internal pressure of 7.2N/mm^2	6m

(OR)

6.	a)	Derive the hoop stress developed in thick cylindrical vessel subjected to internal fluid pressure alone.	8m
	b)	A thick cylinder of steel having an internal diameter of 100mm and an external diameter of 200mm is subjected to an internal pressure of 56 N/mm^2 and an external pressure of 7 N/mm^2. Find the maximum hoop stress.	6m

UNIT-IV

7.	a)	Explain the limitations of Euler's theory	4m
	b)	A tabular steel strut is 8cm external diameter and 5cm internal diameter, 3m long and has hinged ends. This is subjected to eccentric lad. Find the maximum eccentricity for crippling load of 60% of the Euler's load. The yield stress being 300MPa and E=200GPa.	10m

(OR)

8.		A steel strut of circular cross-section 1.25m long is hinged at both ends. Find the necessary diameter in order that if a thrust of 50kN deviates at the end by 1/10th of the diameter from the axis of the strut, the greatest compressive stress shall not exceed 35MPa. If the yield stress of steel 300MPa, find the crippling load. E = 200GPa	14m

UNIT-V

9.	a)	State the importance of middle third rule in gravity dams.	2m
	b)	A masonry retaining wall of trapezoidal section is 12m high and retains earth which is level up to the top. The width at the top is 3m and at the bottom is 6m and exposed face is vertical. Find the maximum and minimum intensities of normal stress at the base. Take density of earth=1600kg/m^3 and density of masonry=2300kg/ m^3 and angle of repose of earth=30^0	12m

(OR)

10.		A trapezoidal masonry dam having 4m top width, 8m bottom width and 12m high, is retaining water up to a height of 10m. The density of masonry is 2000kg/ m^3. The coefficient of friction between dam and soil is 0.55. The allowable compressive stress is 343350N/m^2. Check the stability of dams.	14m

AR16

CODE: 16EE2011 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February-2021

POWER SYSTEMS – 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

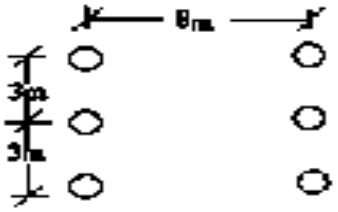
1. a) What is the effect of unsymmetrical spacing of conductors on inductance and capacitance of a 3-phase transmission line? **8M**

   b) Three conductors of a three phase line are arranged at the corners of a triangle of sides 2m, 3 m and 4m. The diameter of the conductor is 1.5cm. Calculate the inductance and capacitance of the line. **6M**

(OR)

2. a) Derive an expression for the capacitance per phase of a 3-phase line with unsymmetrical spacing. Assume the conductors to be regularly transposed. **6M**

   b) Calculate the inductance per phase of a three-phase, double circuit line as shown in below figure. The diameter of each conductor is 1.5 cm. **8M**



UNIT-II

3. a) Explain the effect of load power factor on regulation and efficiency of a transmission line. **6M**

   b) A 3-phase, 50 Hz, overhead transmission line delivers 10 MW at 0·8 p.f. lagging and at 66 kV. The resistance and inductive reactance of the line per phase are 10 Ω and 20 Ω respectively while capacitance admittance is 4×10^{-4} Siemens. Calculate (i) the sending end current (ii) sending end voltage (line-to-line) (iii) sending end power factor (iv) transmission efficiency using nominal- II method **8M**

(OR)

4. a) Deduce an expression for voltage regulation of a short transmission line with the help of a vector diagram. **6M**

   b) A 3-φ short transmission line with an impedance of (5 + j 20) Ω per phase has sending end and receiving end voltages of 46·85 kV and 33 kV respectively for some receiving end load at a power factor of 0·8 lagging. Determine : (i) power output (ii) sending end power factor **8M**

UNIT-III

5. a) Derive expressions for sending end voltage and current for a long transmission line using rigorous method. **6M**

   b) A 150 km,3-φ,110 kV, 50 Hz transmission line transmits a load of 40 MW at 0·8 pf lagging at the receiving end. Resistance/km/phase = 0·15Ω; reactance/km/phase = 0·6 Ω; susceptance/km/phase = 10^{-5} S. Determine (i) A, B, C and D constants of the line (ii) regulation of the line. **8M**

(OR)

6. a) Derive the equivalent -π network of the long transmission line. **6M**

   b) Calculate A, B, C and D constants of a 3-phase, 50 Hz transmission line 160 km long having the following distributed parameters : R = 0·15 Ω/km ; L = 1·20 × 10−3 H/km ; C = 8 × 10^{-9} F/km; G = 0 **8M**

UNIT-IV

7. a) Define Ferranti effect and explain its impact on the regulation of the transmission line **6M**

   b) A surge of 100 kV travelling in a line of natural impedance 600 ohms arrives at a junction with two lines of impedances 800 ohms and 200 ohms respectively. Find the surge voltages and currents transmitted into each branch line **8M**

(OR)

8. a) Explain skin and proximity effects on transmission lines. **6M**

   b) A 3-phase, 220 kV, 50 Hz transmission line consists of 1·5 cm radius conductor spaced 2 meters apart in equilateral triangular formation. If the temperature is 40ºC and atmospheric pressure is 76 cm, calculate the corona loss per km of the line. Take mo = 0·85 **8M**

UNIT-V

9. a) Deduce an approximate expression for sag in overhead lines when the supports are at unequal levels **6M**

   b) A string of 3 insulators is connected across a100kV line. If the capacitance of each disc to earth is 0.1 of the capacitance of the insulator, calculate (i) the distribution of voltage on the insulator discs and (ii) the string efficiency **8M**

(OR)

10. a) Derive an expression for string efficiency of a string consisting of three insulators **6M**

    b) A transmission line has a span of 150 m between level supports. The conductor has a cross-sectional area of 2cm^2. The tension in the conductor is 2000kg. If the specific gravity of the conductor material is 9.9 g/cm^3 and wind pressure is 1.5 kg/m length, calculate the sag. What is the vertical sag? **8M**

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AR16

CODE: 16ME2011 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February-2021

MACHINE DRAWING

(Mechanical Engineering)

TIME: 3 HOURS **MAX. MARKS: 70**

NOTE: Answer any two questions from section A and Section B is compulsory

PART A **2X15=30M**

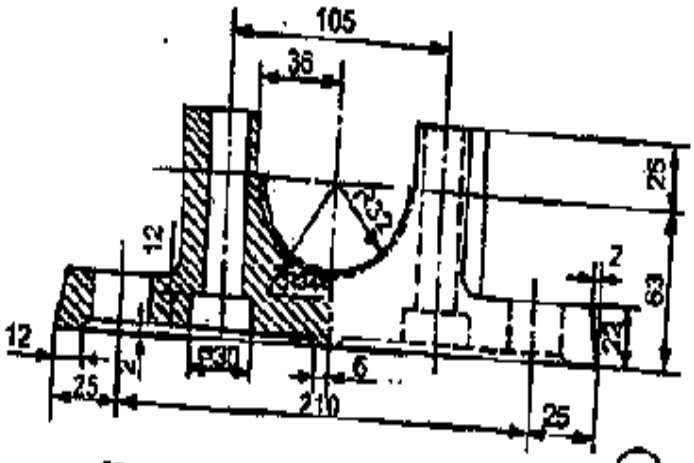
1. Draw the sectional front view and top view of knuckle joint with sleeves to connect shafts of 35 mm

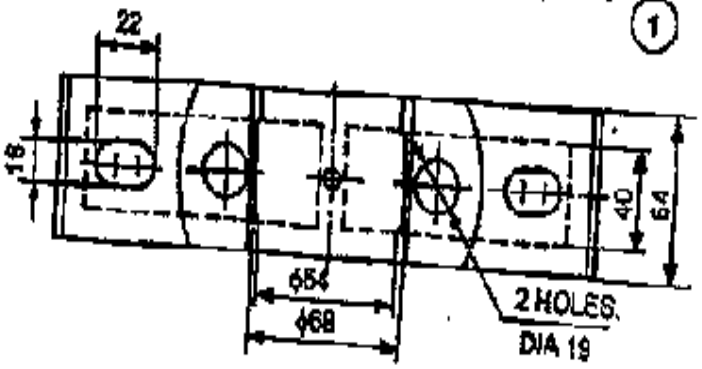
2. Draw the sectional front view and top view of double riveted butt joint with single strap Zigzag type to join two plates of 20 mm thickness each.

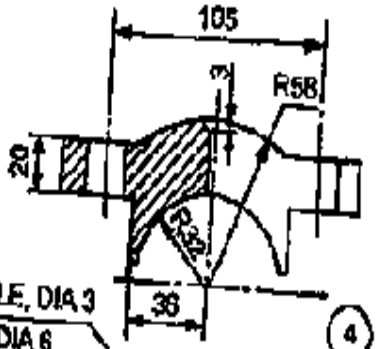
3. Draw two views of a foot step bearing for a shaft 100 mm diameter

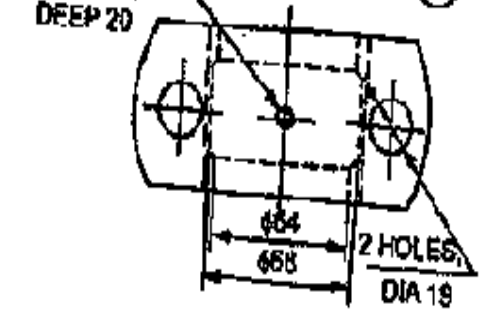
PART B **1X40=40M**

1. Figure 1 gives the part drawings of Plummer block. Assemble all the parts and draw the following assembled views. a) Sectional front view b) Top view.



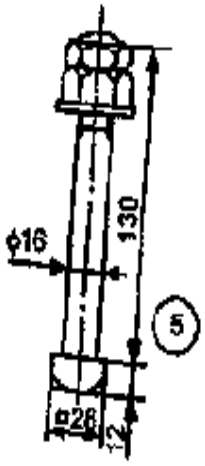


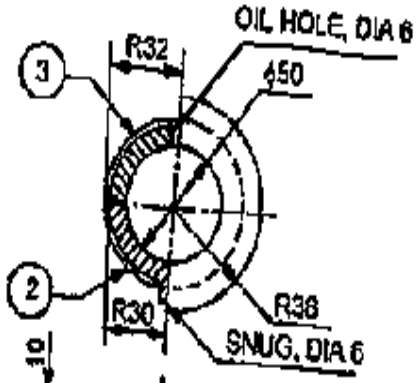


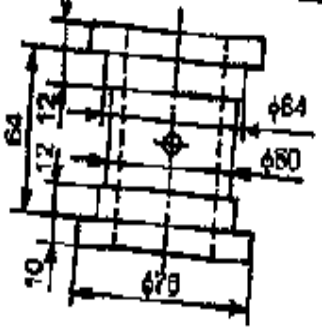


Parts list

Sl. No.	Name	Matl.	Qty.
1	Base	CI	1
2	Bearing brass	Bronze	1
3	Bearing brass	Bronze	1
4	Cap	CI	1
5	Bolt with nuts	MS	2







Plummer block

AR16

CODE: 16EC2012 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February-2021

RANDOM VARIABLES AND STOCHASTIC PROCESSES

(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 different approaches for the definition of probability and list the drawbacks **7M**

   b) In three boxes there are capacitors as shown in table. An experiment consists of first randomly selecting a box, assuming each has the same likelihood of selection, and then selecting a capacitor from the chosen box. **7M**

Capacitors(μF)	**Box1**	**Box2**	**Box3**	**Totals**
0.01	20	95	25	140
0.1	55	35	75	165
1.0	70	80	145	295
Totals	145	210	245	600

   i. Determine the probability of selecting a 0.01μF capacitor, given that box2 is selected?

   ii. If a 0.01μF capacitor is selected, determine the probability that it comes from box3?

(OR)

2. a) State and Explain with necessary expressions, the Baye's theorem **7M**

   b) Define the following **7M**

   i) Samples space ii) Mutually exclusive event

   ii) iii) Independent event iv) Exhaustive event v) equally likely

UNIT-II

3. a) Define and explain the Probability Density Function and its properties. **7M**

   b) Define and explain the properties of probability distribution function. **7M**

(OR)

4. a) Define and explain the Characteristic Function and its properties. **7M**

b) The pdf of a continuous r.v. X is given by **7M**

$$f_X(x) = \begin{cases} \frac{1}{3} & 0 < x < 1 \\ \frac{1}{3} & 1 < x < 2 \\ 0 & \text{otherwise} \end{cases}$$

, Find the corresponding cdf $F_X(x)$ and sketch $f_X(x)$ and $F_X(x)$.

UNIT-III

5. a) Determine PDF of sum of two random variables. **7M**

b) A joint density is given as **7M**

$$f_{X,Y}(x,y) = \begin{cases} x(y+1.5) & for\ 0 < x < 1; 0 < y < 1 \\ 0 & otherwise \end{cases}$$

Find all the joint moments m_{nk}, n and k = 0,1.

(OR)

6. a) Define and explain the Joint Distribution Function and its properties. **7M**

b) If X and Y are two independent random variables such that E[X] = λ1, variance of X is σ12, E[Y] = λ2, variance of Y is σ22, then calculate the co-variance of [X,Y] **7M**

UNIT-IV

7. a) Define a random process and classify random processes with neat sketch. **7M**

b) If a random process X (t) =Acosωt + Bsinωt is given, where A and B are uncorrelated zero mean random variables having the variance σ^2. Show that X(t) is wide sense stationary. **7M**

(OR)

8. a) Explain Time average and ergodicity in detail **7M**

b) A random process is given as X(t) =At, where A is an uniformly distributed random variable on (0,2). Find whether X(t) is WSS or not. **7M**

UNIT-V

9. a) State and prove the properties of auto correlation **7M**

b) Derive the relation between power spectral density and auto correlation functions. **7M**

(OR)

10. a) State and prove properties of cross power density spectrum **7M**

b) Let X(t) = cos(ωt + θ) and Y(t) = sin(ωt + θ) where θ is a random variable uniformly distributed in [-π, π]. Find the cross-covariance of X(t) and Y(t). **7M**

AR16

CODE: 16CS2008 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February-2021

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)	Draw and explain the three level architecture of database system.	**7M**
	b)	What is a data model? Explain in detail about various data models.	**7M**
		(OR)	
2.	a)	List and explain about different users of database system.	**8M**
	b)	List and explain various database languages with examples.	**6M**

UNIT-II

3.	a)	Discuss in detail about various concepts used in ER-model.	**8M**
	b)	Specify and explain various structural constraints of relationship type.	**6M**
		(OR)	
4.	a)	Describe the properties of a relation.	**6M**
	b)	What is a view? How views are implemented?	**8M**

UNIT-III

5.	a)	By considering an example describe various data update operations in SQL.	**8M**
	b)	What is a group function? List and explain how to use group functions in SQL with appropriate examples.	**6M**
		(OR)	
6.	a)	List and explain the common data types available in SQL.	**8M**
	b)	Explain the following with examples. i) Nested Queries ii) Correlated Queries	**6M**

UNIT-IV

7.	a)	What is a functional dependency? Explain its types.	**6M**
	b)	Explain in detail about Fourth and Fifth normal forms.	**8M**
		(OR)	
8.	a)	What is normalization? Explain in detail about various normal forms.	**7M**
	b)	What is concurrency control? With suitable examples explain various concurrency problems.	**7M**

UNIT-V

9.	a)	Discuss in detail about different types of failures.	**7M**
	b)	Describe the concept of shadow paging technique.	**7M**
		(OR)	
10.	a)	What is an index structure? Explain how to use hash table as an index structure for a database.	**7M**
	b)	Compare and contrast B-trees and B+ trees.	**7M**

AR13

CODE: 13CE2006 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February-2021

STRENGTH OF MATERIALS-II

(Civil Engineering)

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

PART-A

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

1. a) Write down the expression for major principal stress, minor principal stress and maximum shear stress when a thin cylindrical shell is subjected to internal fluid pressure and torque.
   b) Write an expression for the change in volume of a thin cylindrical shell subjected to internal fluid pressure.
   c) What do you mean by Lame's equations ?
   d) Define the term 'obliquity' and write how it is determined.
   e) Write an expression for the stresses on an oblique plane of rectangular body, when the body is subjected to a simple shear stress.
   f) Write an expression for the torque transmitted by a hollow circular shaft of external diameter = D_0 and internal diameter = D_i.
   g) Define the term 'Polar modulus'.
   h) Define torsional rigidity of a shaft.
   i) Explain the assumptions made in Euler's column theory.
   j) Write an expression for crippling load for a long column when one end of the column is fixed and other end is hinged.

PART-B

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

UNIT-I

2. a) Find the expression for circumferential stress and longitudinal stress for a longitudinal joint and circumferential joint.
   b) A cylinder of internal diameter 0.50m contains air at a pressure of 7N/mm^2 (gauge). If the maximum permissible stress induced in the material is 80 N/mm^2, find the thickness of the cylinder.

(OR)

3. A cast iron pipe of 200mm internal diameter and 12mm thick is wound closely with a single layer of circular steel wire of 5mm diameter, under a tension of 60 N/mm^2. Find the internal compressive stress in the pipe section. Also find the stresses set up in the pipe and steel wire, when water under a pressure of 3.5N/mm^2 is admitted into the pipe. Take E for cast iron as 1×10^5 N/mm^2 and for steel as 2×10^5 N/mm^2. Poisson's ratio is given as 0.3.

UNIT-II

4. a) Derive an expression for the radial pressure and hoop stress for a thick spherical shell.
   b) Determine the maximum and minimum hoop stress across the section of a pipe of 400mm internal diameter and 100 mm thick, when the pipe contains a fluid at a pressure of 8 N/mm^2. Also sketch the radial pressure distribution and hoop stress distribution across the section.

(OR)

5. A steel tube of 200 mm external diameter is to be shrunk into another steel tube of 60 mm internal diameter. The diameter at the junction after shrinking is 120mm. Before shrinking on, The difference of diameters at the junction is 0.08 mm. Calculate the radial pressure at the junction and the hoop stresses developed in the two tubes after shrinking on. Take E as 2×10^5 N/mm^2.

UNIT-III

6. At a point within a body subjected to two mutually perpendicular directions, the stresses are 80N/mm^2 tensile and 40N/mm^2 tensile. Each of the above stresses is accompanied by a shear stress of 60 N/mm^2. Determine principal stresses.

(OR)

7. An elemental cube is subjected to tensile stresses of 30 N/mm^2 and 10 N/mm^2 acting on two mutually perpendicular planes and a shear stress of 10 N/mm^2 on these planes. Draw the Mohr's circle of stresses and hence or otherwise determine the magnitudes and directions of principals stresses and also the greatest shear stress.

UNIT-IV

8. a) When a circular shaft is subjected to torsion show that the shear stress varies linearly from the axis to the surface.

   b) A solid circular shaft and a hollow circular shaft whose inside diameter is (3/4) of the outside diameter, are of the same material, of equal lengths and are required to transmit a given torque. Compare the weights of these two shafts if the maximum shear stress developed in the two shafts are equal.

(OR)

9. A composite shaft consists of copper rod of 30 mm diameter enclosed in a steel tube of external diameter 50 mm and 10 mm thick. The shaft is required to transmit a torque of 1000 N-m. Determine the shear stresses developed in copper and steel, if both the shafts have equal lengths and welded to a plate at each end, so that their twists are equal. Take modulus of rigidity for steel as twice that of copper.

UNIT-V

10. Derive the equation for the Euler's crippling load for a column with one end fixed and the other is free.

(OR)

11. A hollow cylindrical cast iron column is 4 m long with both ends fixed. Determine the minimum diameter of the column if it has to carry a safe load of 250kN with a factor of safety of 5. Take the internal diameter as 0.8 times the external diameter. Take σ_c = 550 N/mm^2 and α = 1/1600 in Rankine's formula.

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AR13

CODE: 13ME2012 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

II B.Tech II Semester Supplementary Examinations, February-2021

MACHINE DRAWING

(Mechanical Engineering)

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

Note: Answer any two questions from section A and Section B is compulsory

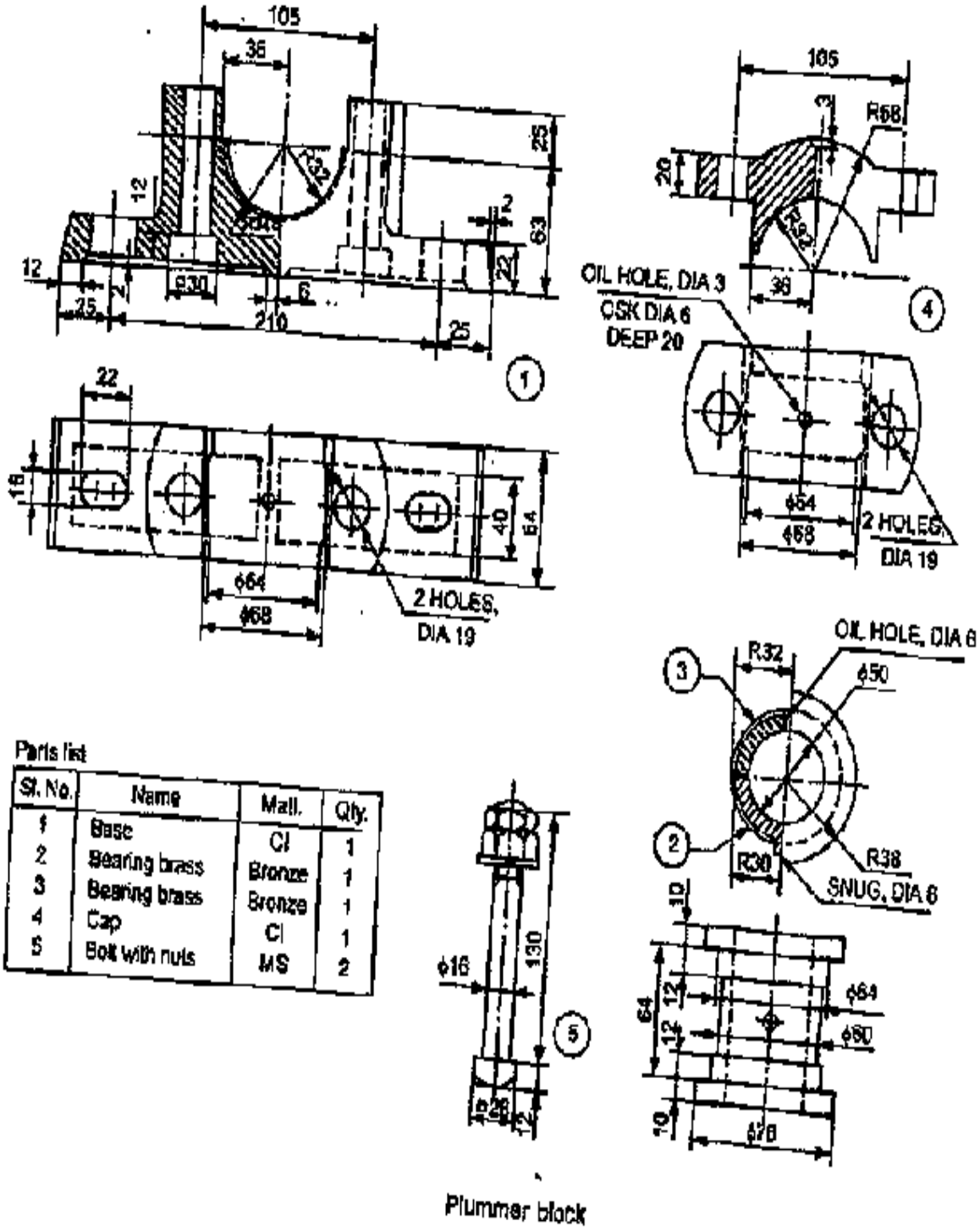
(2x15=30 Marks)

SECTION-A

1.	Draw (a) Sectional view from the front (b) View from above of the single riveted double strap butt joint to join plates of thickness 10mm.	**7M+8M**
2.	Draw sectional front view and side view of Cotter joint with socket and spigot ends taking d=30 mm.	**15M**
3.	Sketch the Eye bolt with proportions.	**15M**

SECTION-B

4. Figure 1 gives the part drawings of Plummer block. Assemble all the parts and draw the following assembled views. a) Sectional front view b) Top view.



Parts list

Sl. No.	Name	Matl.	Qty.
1	Base	CI	1
2	Bearing brass	Bronze	1
3	Bearing brass	Bronze	1
4	Cap	CI	1
5	Bolt with nuts	MS	2

Plummer block

Figutr-1

AR13 SET-2

Code: 13EC2010

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, February-2021

PULSE AND DIGITAL CIRCUITS

(Electronics and Communication Engineering)

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

PART-A

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

1. a) What is Linear Wave Shaping?
   b) When does a low-pass circuit preserve the pulse shape?
   c) What is the disadvantage of having a diode as a shunt element in a clipper?
   d) State the modified clamping theorem considering the source resistance.
   e) Define storage time and transition time.
   f) What do you mean by BV_{CEO}?
   g) Define stable state of a binary.
   h) How hysteresis can be eliminated in a Schmitt Trigger?
   i) What is the advantage of the Miller Integrator over the Bootstrap circuit?
   j) Give the relation between the slope error, the displacement error and the transmission error.

PART– B

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

UNIT-I

2. a) Derive an expression for the percentage tilt of the output of a high-pass RC circuit with large time constant excited by a symmetrical square wave with zero average value. [6M]
   b) A square wave whose peak-to-peak amplitude is 2V extends ± IV with respect to ground. The duration of the positive section is 0.1 sec and that of the negative section 0.2 sec. If this waveform is impressed upon an RC integrating circuit whose time constant is 0.2 sec, what are the steady – state maximum and minimum values of the output waveform? [6M]

(OR)

3. Derive the response RC high pass filter for square input . [12 M]

UNIT - II

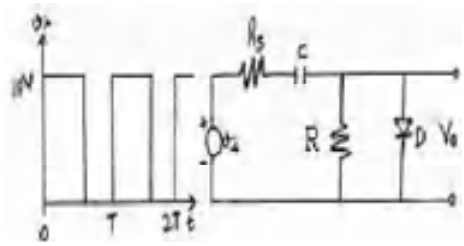
4. Explain the operation of clipping circuit with neat diagram [12 M]

(OR)

AR13 SET-2

Code: 13EC2010

5. For the circuit shown in figure, $R_s = R_f = 100$ ohms, R = 10 K, C= 1.0 μF. At t=0 symmetrical square wave is applied with an amplitude of 10V and a frequency of 5 KHz, sketch the output wave form for the first two cycles. [12M]



UNIT- III

6. (a) Briefly discuss the switching times of transistor. [6M]

   (b) Explain how transistor acts as switch. [6M]

(OR)

7. The fixed-bias bistable multivibrator uses n-p-n transistors with $h_{FE} = 20$. The circuit parameters are $V_{CC} = 12$ V, $V_{BB} = 3$ V, $R_C = 1$ K, $R_1 = 5$ K, $R_2 = 10$ K , $V_{CE(sat)} = 0.4$ V and $V_{BE(sat)} = 0.8$ V. Find the stable state voltages and currents. [12M]

UNIT- IV

8. Explain the operation of Astable multivibrator and derive the expression for time period. [12M]

(OR)

9. a) Define the terms slope error, displacement error and transmission error. How are they related for an exponential sweep circuit? Define the relation between them. [6M]
   b) With the help of a neat circuit diagram, explain the working of a transistor current time- base generator. [6M]

UNIT -V

10. a) Explain the operation of bi-directional sampling gate with neat sketches. [6M]

    b) Illustrate a method for reduction of pedestal in gate circuits. [6M]

(OR)

11. a) Explain the operation of base timing monostable blocking oscillator. [6M]

    b) Sketch a neat diagram of four diode sampling gate and explain its operation. [6M]

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AR13

CODE: 13CS2007 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
II B.Tech II Semester Supplementary Examinations, February-2021

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) Define Database Management System.
   b) What is difference between instance of a database and database schema
   c) What is the difference between Weak Entity set and Strong Entity set?
   d) Mention the major components of ER diagram.
   e) Mention Aggregate functions.
   f) Which operator can be used on strings for pattern matching?
   g) What are properties of a transaction?
   h) Define Normalization.
   i) Mention the types of failures that may occur in a system.
   j) What are the possible ways of organizing records in files

PART-B

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

UNIT-I

2. a) Explain the advantages of using DBMS. **6 M**
   b) Explain the subsystems of a database system. **6 M**

(OR)

3. a) What are five main functions of a database administrator? **6 M**
   b) With neat diagram explain 3 schema architecture for database systems. **6 M**

UNIT-II

4. a) Consider the following schema: **6 M**
   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 relational algebra
   (i) Find the names of suppliers who supply some red part
   (ii) Find the sids of suppliers who supply some red or green part
   (iii) Find the sids of suppliers who supply some red part or are at 221 Packer Street
   b) Explain the distinctions among the terms primary key, candidate key , and super key. **6 M**

(OR)

5. With a neat diagram, explain the ER diagram for a banking enterprise and construct the corresponding set of relational schemas. **12 M**

UNIT-III

6. a) Explain set operations Union, Intersect, and Except in SQL with examples. **6 M**

b) Consider the following schema. **6 M**

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 or a green boat
(ii) Find the names of sailors who have reserved both a red and a green boat.
(iii)Find the sids of sailors who have reserved red boats but not green boats..

(OR)

7. What are nested queries. How would you use the operators IN,EXISTS,UNIQUE, ANY and ALL in writing nested queries. **12 M**

UNIT-IV

8. a) What is locking protocol? Describe the Strict Two-Phase locking protocol. **9 M**

b) Describe the problems caused by Redundancy. **3 M**

(OR)

9. a) When are two schedules conflict equivalent? What is a conflict serializable schedule? What is a strict schedule? **6 M**

b) Define 1^{st}, 2^{nd}, & 3^{rd} Normal Forms. Explain with examples. **6 M**

UNIT-V

10. a) What are the major differences between ARIES and other advanced recovery algorithms. **6 M**

b) How a data is organized in a hash-based index? **6 M**

(OR)

11. a) Explain the operating system role in Buffer Management. **6 M**

b) How is data organized in a tree-based index? **6 M**

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