Subject Code: R16CE2201

II B.Tech II Semester Supple Examinations, May-2023
STRUCTURAL ANALYSIS-I
(CE)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Recall the three conditions of equilibrium.
   (b) Quote the expression for moment curvature relation.
   (c) Differentiate real and conjugate beam.
   (d) Elaborate the concept of Dummy unit load method.
   (e) Draw the neat sketch of three hinged arch by mentioning all its component parts.
   (f) State the purpose of ILD.

                                                                  [2+2+2+2+2+2]
PART-B   4 X 12 = 48

2. Analyse the given truss as shown in figure, by method of joints.
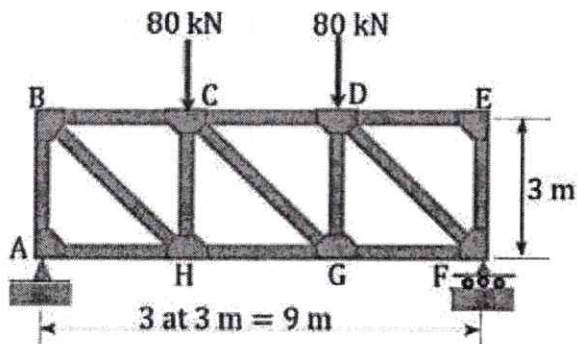
3. A simply supported beam of span 6 m, carrying a point load of 5 kN at a distance of 3 m from the left end and also subjected to UDL of intensity 5KN/m over its entire span . Find
(i) slope at the left support,
(ii) deflection under the load and
(iii) maximum deflection.
Take E= $2x10^5$ N/mm^2 and I = $1x10^8$ mm^4. Use macaulay's method.

4. Find the slope and deflection of cantilever beam of span L, carrying
i) A point load P at it's free end, ii) A U.D.L of w kN/m over the entire span. Using the moment area method.

5. (a) State and derive Castigliano's theorem.
   (b) Differentiate strain energy and complimentary energy.

6. A three hinged parabolic arch hinged at the crown has a span of 35m and a central rise of 6m. It carries a concentrated load of 40KN at 8.5m from the right support and a uniformly distributed load of 50KN/m over the left half of the portion. Determine the moment, normal thrust and radial shear at a section of 10m from the left support.

7. A u.d.l of 5 KN/m, covering a length of 15 m, crosses a girder of span 50m. Find the values of maximum shear force and bending moment at a section 10 m from the left-hand support.

Subject Code: R16CE2202
II B.Tech II Semester Supple Examinations, May-2023
HYDRAULICS AND HYDRAULIC MACHINERY
(CE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) List out the factors that affect Chezy's coefficient.
   (b) Define the terms: model, prototype, model analysis
   (c) Find the force exerted by a jet of water of diameter 50mm on stationary flat plate
   (d) Write the main function of a deflector in a Pelton wheel installation
   (e) Write the losses in the centrifugal pumps.
   (f) define load factor and capacity factor

PART-B

4 X 12 = 48

2. (a) Derive expression for the critical depth in a rectangular channel.
   (b) A rectangular channel of 5m wide carries water at a depth of 1.5 m. if the flow rate is 12m³/s , find critical depth and critical velocity .

3. (a) Explain the geometric, kinematic and dynamic similarities.
   (b) Assuming that the viscous force F ,exerted by a fluid on a sphere of diameter D depends on the viscosity μ, mass density of the fluid "ρ", and the velocity of the sphere v, obtain the expression for the viscous force.

4. (a) Show that the force exerted by a jet of water on an inclined fixed plate in the direction of the jet is given by, $F_x = \rho a V^2 \sin^2\theta$.
   (b) A jet of water of diameter 75 mm moving with a velocity of 25 m/s strikes a fixed plate in such a way that angle   between the jet and plate is 60⁰. Find the force exerted by the jet on the plate. i) in the direction normal to the plate,   ii) in the direction of the jet.

5. (a) Explain the different types of the efficiency of a turbine.
   (b) A pelton wheel has a mean bucket speed of 10m/s with a jet of water flowing at a rate of 0.7m³/s under a head of 30 m. the buckets deflect the jet through an angle of 160⁰. Calculate the power given by the water to the runner?

6. (a) Derive equation for minimum speed for starting a centrifugal pump.
   (b) Explain about the operating characteristics of centrifugal pump.

7. (a) Explain how hydropower plants are classified.
   (b) Two turbo generators each of capacity 10000kW have been installed at a hydel power station. During a certain period the load on the hydel plant varies from 10000kW to 20000kW. Calculate i)Total installed capacity, ii) Load factor, iii) Plant factor, iv) Utilization factor

Subject Code: R16CE2204

II B.Tech II Semester Supple Examinations, May-2023
SURVEYING-II
(CE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) List out the major parts of Theodolite?
(b) List uses of Trigonometric levelling?
(c) What are the elements of a simple circular curve?
(d) Define Vertical curves?
(e) List the uses of Tachometry
(f) List applications of Total Station?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain the methods of measuring horizontal angles by repetition method and reiteration method using a Theodolite? [6]
   (b) Explain the temporary adjustment of Theodolite? [6]

3. (a) Distinguish clearly between closed traverse and open traverse? [6]
   (b) Explain how to calculate the height of object when base of object is inaccessible Using trigonometric levelling? [6]

4. (a) What is meant by degree of a curve? Derive a relationship between the degree of a curve and its radius? [6]
   (b) Define curve? Explain setting out of Simple horizontal circular curves? [6]

5. (a) Explain briefly types of transition curve?
   (b) A parabolic vertical curve is to be set out connecting two uniform grades of +0.8% and -0.9%. The chainage and reduced level of point of intersection are 1665 metres and 238 metres respectively. The rate of change of grade is 0.05% per chain of 20m. Calculate the reduced levels of the various station pegs

6. (a) Explain the advantages of Tachometric surveying? [6]
   (b) Explain Principle of tachometric Surveying and explain movable and fixed hair methods? [6]

7. (a) Describe about total station and state its advantage over other methods of Surveying?
(b) Explain Briefly Methods and applications of Hydrographical Survey? [6]

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NEC

Subject Code: R16EE2205

II B.Tech II Semester Supple Examinations, May-2023
ELECTRICAL MACHINES-II
(EEE)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) what is slip frequency of 3 phase Induction motor
   (b) what is the purpose of damper winding in synchronous motor
   (c) what is the purpose of pitch factor of armature winding.
   (d) what are the conditions to be satisfied before synchronous machine connected to infinite bus.
   (e) list out 2 starting methods of 3 phase Induction motor
   (f) list out 2 applications of capacitor start 1- phase Induction motor

                                                                      [2+2+2+2+2+2]

PART-B

                                                                      4 X 12 = 48

2. (a) Explain no load and blocked rotor tests and derive the equations to find out parameters of the equivalent circuit of 3 phase Induction Motor.   6M
   (b) A 100 KW, 3300V,50Hz, 3-Ø star connected induction motor has a synchronous speed of 500 rpm. A full load slip is 1.8% , full load pf is 0.85, stator cu loss is 2440W, iron loss is 3500W, rotational loss is 1200W. Calculate rotor cu loss, line current and full load efficiency.   6M

3. (a) Explain the speed control of 3-Ø induction motor by supply frequency control or V/f control method.
   (b) A squirrel cage induction motor has full load slip of 0.05 the motor starting current at rated voltage is 6 times its full load current. Find the tapping of auto transformer starter which should give full load torque at starting. Also find the line current at starting.   6M + 6M

4. (a) Explain and derive the expressions for the distribution factor and pitch factor.   6M
   (b) A 3-Φ, 50Hz star-connected alternator with 2-layer winding is running at 600 rpm. It has 12 turns/coil, 4 slots/pole/phase and a coil pitch of 10 slots. If the flux/pole is 0.035 wbsinusoidally distributed, calculate the phase and line emfs induced. Assume that the total turns/phase are series connected.   6M

5. (a) Explain Two reaction theory and draw the voltage phasor diagram of salient pole synchronous generator operating in lagging power factor.   6M
   (b) Explain EMF method of voltage regulation of alternator.   6M

6. (a) Explain the effect of changing excitation, keeping load constant on synchronous motor also draw V and inverted V curves of synchronous motor.   6M   +   6M
   (b) A 3300 V, star-connected synchronous motor is operating at constant terminal voltage and constant excitation. Its synchronous impedance is 0.8+ j5 Ω. It operates at a power factor of 0.8 leading when drawing 800 kW from the mains. Find its excitation voltage at this operation.

7. (a) Explain double field revolving theory in the operation of 1 phase Induction Motor. 6M
   (b) Explain the operation of capacitor start 1-Ø induction motor and give two applications. 6M

Subject Code: R16ME2202

II B.Tech II Semester Supple Examinations, May-2023
THEORY OF MACHINES-I
(ME)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Explain the term kinematic link. Give the classification of kinematic link.
   (b) What do you understand by the instantaneous centre of rotation in kinematic of machines?
   (c) What is a CAM? Give the classification of CAM.
   (d) Define gyroscope and a gyroscopic couple.
   (e) Define effort and power of a governor
   (f) State the law of gearing.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2 (a) List the various inversions of a slider crank and explain any one with neat sketch. [6]

   (b) Discuss the differences between a Machine and a Structure. [6]

3 (a) Locate all the instantaneous centres of the slider crank mechanism as shown in [6]
   Fig.1. The lengths of crank OB and connecting rod AB are 100 mm and 400 mm
   respectively. If the crank rotates clockwise with an angular velocity of 10 rad/s,
   find: 1. Velocity of the slider A, and 2. Angular velocity of the connecting rod AB.

Fig.1.

   (b) Explain with sketch the instantaneous centre method for determination of [6]
   velocities of links and mechanisms.

4. A cam is to be designed for a knife edge follower with the following data: [12]
   1. Cam lift = 40 mm during 90^0 of cam rotation with simple harmonic motion. **2.**
   Dwell for the next 30^0. **3.** During the next 60^0 of cam rotation, the follower returns
   to its original position with simple harmonic motion. **4.** Dwell during the
   remaining 180^0.
   Draw the profile of the cam when: **(a)** the line of stroke of the follower passes
   through the axis of the cam shaft, and **(b)** the line of stroke is offset 20 mm from
   the axis of the cam shaft. The radius of the base circle of the cam is 40 mm.
   Determine the maximum velocity and acceleration of the follower during its ascent
   and descent, if the cam rotates at 240 r.p.m.

5   (a)   The turbine rotor of a ship has a mass of 8 tonnes and a radius of gyration 0.6 m. It   **[6]** rotates at 1800 r.p.m. clockwise, when looking from the stern. Determine the gyroscopic couple, if the ship travels at 100 km/hr and steer to the left in a curve of 75 m radius.

  (b)   The turbine rotor of a ship has a mass of 3500 kg. It has a radius of gyration of   **[6]** 0.45 m and a speed of 3000 r.p.m. clockwise when looking from stern. Determine the gyroscopic couple and its effect upon the ship:
1. when the ship is steering to the left on a curve of 100 m radius at a speed of 36 km/h.
2. when the ship is pitching in a simple harmonic motion, the bow falling with its maximum velocity. The period of pitching is 40 seconds and the total angular displacement between the two extreme positions of pitching is 12 degrees.

6   (a)   Explain the centrifugal governor with neat sketch.   **[6]**

  (b)   A Porter governor has equal arms each 250 mm long and pivoted on the axis of   **[6]** rotation. Each ball has a mass of 5 kg and the mass of the central load on the sleeve is 25 kg. The radius of rotation of the ball is 150 mm when the governor begins to lift and 200 mm when the governor is at maximum speed. Find the minimum and maximum speeds and range of speed of the governor.

7   (a)   A pinion having 30 teeth drives a gear having 80 teeth. The profile of the gears is   **[6]** involute with 20^0 pressure angle, 12 mm module and 10 mm addendum. Find the length of path of contact, arc of contact and the contact ratio.

  (b)   The speed ratio of the reverted gear train, as shown in *Fig.2.*, is to be 12. The   **[6]** module pitch of gears A and B is 3.125 mm and of gears C and D is 2.5 mm. Calculate the suitable numbers of teeth for the gears. No gear is to have less than 24 teeth.
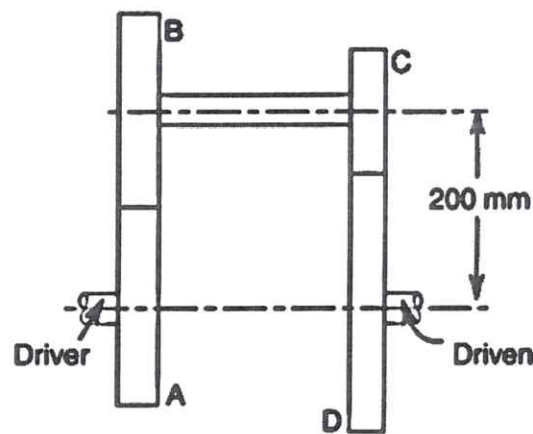

Fig.2.

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Subject Code: R16ME2203

II B.Tech II Semester Supple Examinations, May-2023
APPLIED THERMODYNAMICS
(ME)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Define Volumetric Efficiency? Can it be greater than 100%, if yes When?
   (b) Write any four principle differences between supercharging and turbocharging.
   (c) What's is Diesel Knock? How is it different from Knocking in SI Engines?
   (d) Define Indicated power, Brake power and mention their formulae.
   (e) What do you mean by multi-stage compression? State its advantages.
   (f) What is Slip factor, and power input factor in a rotary compressor?

   [2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Define Time loss Factor, Heat Loss Factor, Exhaust Blow down loss in air-cycles?   [6]
   (b) Compare Air standard and actual cycles and mention their advantages and disadvantages. [6]

3. (a) Draw the Valve timing diagram of a four stroke SI engine and CI engine mention the stages. [6]
   (b) How are injection systems classified? Describe them briefly. [6]

4. (a) How turbulence in CI engine Combustion chamber helps in efficient combustion? What are the
       different types of Combustion chambers used in CI engines.   [6]
   (b) What is abnormal combustion in SI engines? Explain Pre-ignition and Knocking in SI Engines. [6]

5. (a) How do you conduct a Heat balance test on a SI engine? Write the detailed procedure.   [6]
   (b) What are the performance parameters to be considered while comparing two engines. Explain in
       detail about each parameter. [6]

6. (a) A single cylinder, single acting air compressor has a cylinder diameter of 15.25 cm and a stroke of
       22.8 cm. Air is drawn into the cylinder at a pressure of 1.013 bar and a temperature of 15.6^0 C. It is
       compressed adiabatically to 6.1 bar. Calculate the theoretical power required to drive the compressor if
       it runs at 100 rpm and the mass of air compressed per minute.   [12]

7. (a) Describe with a neat sketch, the working of a vane blower compressor and show its p-v diagram.
       For what applications, it is used?   [6]
   (b) A centrifugal compressor with 70% isentropic efficiency delivers 20 kg of air per minute at a
       pressure of 3 bar. If the compressor receives air at 20^0 C and at a pressure of 1 bar, find the actual
       temperature of the air at exit. Also find the power required to run the compressor, if its mechanical
       efficiency is 95%. Take γ and Cp for air as 1.4 and 1 kJ/kg K respectively. [6]

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Subject Code: R16ME2205

II B.Tech II Semester Supple Examinations, May-2023
MANUFACTURING TECHNOLOGY
(ME)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Write two advantages and disadvantages of sand casting.
   (b) List the different types of patterns.
   (c) Define weldability and also classify the welding process.
   (d) State the difference between soldering and brazing process.
   (e) Why is the surface finish of a rolled product better in cold rolling than in hot rolling?
   (f) Name the various defects in the parts produced by drawing process.

   [2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Describe the various pattern allowances used in moulding process.
   (b) Explain briefly the shell moulding with neat sketch.

3. List the different types of gates? Explain any two of them with the help of sketches stating the relative merits and demerits of each.

4. (a) Explain the working principle of arc welding process.
   (b) Describe the equipment's used in oxy acetylene gas welding process.

5. (a) Explain briefly the resistance spot welding with suitable neat sketch.
   (b) With help of neat sketch explain the working of plasma arc welding and also mention is applications.

6. (a) Discuss the advantages and limitation of hot working and cold working.
   (b) Explain briefly the principle and mechanism of rolling.

7. (a) List the advantages, limitations and applications of extrusion process
   (b) Explain briefly with a neat sketch a 'wire drawing' process

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II B.Tech II Semester Supple Examinations, May-2023
SWITCHING THEORY AND LOGIC DESIGN
(ECE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Convert the binary data 1010110101 to gray code?

   (b) State the limitations of karnaugh map.

   (c) Distinguish between encoder and multiplexer.

   (d) Compare PROM, PLA and PAL.

   (e) Write the difference between latches and flip-flops.

   (f) What are the limitations of Finite- State machine?

                                                                      [2+2+2+2+2+2]

PART-B

                                                                      4 X 12 = 48

2. (a) Discuss the Subtraction of two numbers using radix complement and diminished radix complement forms.

   (b) Construct a hamming code for 4 bit message 1011 for an odd parity.

3. (a) Prove the following expression using Boolean algebra and De-Morgan's theorems.

   $Y'Z'+W'X'Z'+W'XY+WYZ'=Z'$

   (b) Minimize the following function using the Quine-McCluskey method.

   $F = \sum m(1,2,5,8,9,10,12,13,16,18,24,25,26,28,29,31)$

4. (a) Draw and Explain the working of a carry-look ahead adder.

   (b) What is a decoder? Explain a 4:16 decoder with a truth table and logic diagram.

5. (a) Compare PAL and PLA with respect to various performance features.

   (b) Design a combinational circuit using PROM that accepts 3-bit binary number and generates it's Equivalent excess-3 code.

6. (a) Construct a JK flip-flop using a D flip-flop, a two-to-one-line multiplexer, and an inverter.

   (b) Design mod-5 synchronous up counter using T flip flops.

7. (a) Explain the terms state diagram and state table with suitable example.

   (b) Draw the logic diagram of Mealy and Moore models and also explain their operation with examples.

Subject Code: R16EC2202

II B.Tech II Semester Supple Examinations, May-2023
ELECTRONIC CIRCUIT ANALYSIS
(ECE)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What are the benifits of h – parameter.
   (b) Define hybrid pi – capacitance.
   (c) What is non-linear distortion?
   (d) Define De-sensitivity of a feedback amplifier
   (e) State Barkhausen criterion
   (f) What are the advantages of push pull amplifier.

   [2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain the concept of Analysis of CE amplifier with Emitter follower along with circuit diagram. (6M+6M)
   (b) Sketch the small signal model of a CD FET amplifier and derive equation for the voltage gain.

3. (a) Derive an expression for Voltage gain, input resistance, output resistance of a source follower at high frequencies. (6M+6M)
   (b) Draw the circuit diagram of Common Emitter Transistor Π Model and explain its operation.

4. (a) Differentiate between direct and capacitive coupling of multiple stages of amplifiers. (4M)
   (b) What are the merits and demerits of a cascade amplifier over a simple Common Emitter amplifier? (4M+4M)
   (c) Reason out the causes and results of Phase & Frequency distortions in transistor amplifiers.

5. (a) Draw the block diagrams of four types of negative feedback amplifier circuits and explain the advantages and disadvantages with necessary derivations. (6M)
   (b) Draw the circuit diagram of Current Shunt Feedback amplifier. (6M)

6. (a) . Draw the circuit diagram and explain the working of Hartley oscillator. Also derive the expression for frequency of oscillation and condition for sustained oscillation. (6M)
   (b) Explain why RC Phase shift oscillators are not used at high frequencies. (6M)

7. (a) List the advantages of complementary-symmetry configuration over push pull configuration.
   (b) Derive the expression for maximum conversion efficiency for a simple series fed Class A power amplifier. (4M+6M+2M)
   (c) What are the drawbacks of transformer coupled power amplifiers?

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Subject Code: R16EC2203

II B.Tech II Semester Supple Examinations, May-2023
PULSE AND DIGITAL CIRCUITS
(ECE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Define a Differentiator? If 10sinωt is applied as input to the differentiator, then estimate the output?

    (b) What is synchronized clamping?

    (c) The current I_c discharged from maximum to 90% at 1 msec and fall to 10% at 5 msec. calculate the fall time?

    (d) What are commutating capacitors? Why are they required?

    (e) Calculate the gate width of a monostable multivibrator R=10KΩ and C=10µF?

    (f) Why the time base generators are called sweep circuits?

    [2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain the response of RLC series circuit for step input with suitable waveforms? (7M)

    (b) A symmetrical square wave is applied to a high-pass circuit having R=20 kΩ and C= 0.05 µF. If the frequency of the input signal is 1KHz and the signal swings between +5 V and -5 V, Draw the output waveform and indicate the voltages.   (5M)

3. (a) Design a diode clamper to restore a DC level of +5 V to an input signal of peak-to-peak value of 15 V. Assume the drop across the diode as 0.7 V.   (6M)

    (b) Explain transfer characteristics of the emitter coupled clipper and derive the necessary equations.   (6M)

4. (a) Compare DTL, TTL and ECL circuits?   (6M)

    (b) Define rise time, storage time, fall time in the case of transistor as a switch with suitable waveforms.   (6M)

5. (a) What are different types of multivibrators? Explain the stable state and quasi stable state of a multivibrator.   (5M)

    (b) Design collector coupled fixed-bias Bistable Multivibrator to operate from ±6V supply. Given I_C(sat) = 1mA, h_{FE} =35. Assume Si transistor.   (7M)

6. (a) Explain the working emitter coupled Monostable multivibrator.   (5M)

    (b) Design a collector coupled astable multivibrator using NPN silicon transistors with h_{fe}=40, r_{bb}=200Ω supplied with V_{cc}=10V and circuit component values are R_c=1.2KΩ and C=270 pF.   (7M)

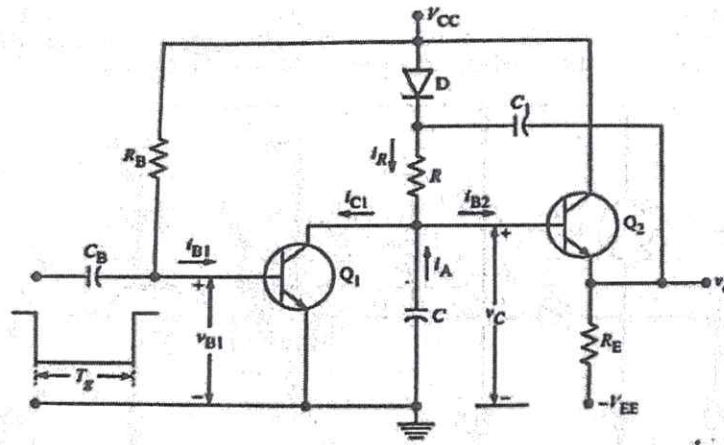7. (a)   Figure (a)

The transistor bootstrap circuit shown in Figure (a) has the following parameters, $V_{CC}=10$ V, $V_{EE}=-10$ V, $R_B= 30$ KΩ, R= 10 KΩ, $R_E= 5$KΩ, C=0.002 μF, $C_1= 0.25$ μF and C_B may be taken as arbitrarily large. The input gate has an amplitude of 1 V and a width of 50 μs. the transistor parameters are $h_{FE}=h_{fe}=60$, $h_{ie}=2$kΩ,$1/h_{oe}=10$ KΩ, $h_{re}=10^{-4}$, $I_{CBO}=0$, and the forward biased junction voltages are negligible. The diode is ideal. Evaluate the sweep speed and the amplitude of the sweep at its maximum value, the time it takes to discharge C at the end of the sweep.

(7M)

(b) With the help of neat circuit diagram explain the working of four diode sampling gate.

(5M)

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NEC

Subject Code: R16EC2204

II B.Tech II Semester Supple Examinations, May-2023
ANALOG COMMUNICATIONS
(ECE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What is the Need of Modulation?

   (b) Draw the frequency spectrum of DSBSC signal?

   (c) What is the Transmission bandwidth of FM wave?

   (d) Define noise and write types of Noises?

   (e) List the Advantages of RF amplifier

   (f) Discuss the Advantages and Disadvantages of PWM

   [2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) A modulating signal $m(t)=10\cos(2\pi\times10^3 t)$ is amplitude modulated with a carrier signal $c(t)=50\cos(2\pi\times10^5 t)$. Find the Modulation Index, Carrier Power and the power required for transmitting AM wave. [6M]

   (b) Explain with the help of neat sketch the operation of Square law modulator [6M]

3. (a) Explain the Frequency discrimination method for generating SSB [6M]

   (b) Explain in detail about COSTAS Loop [6M]

4. (a) Explain the Generation of FM Waves using Armstrong Method

   (b) Discuss in detail about Detection of FM Waves using Foster-Seely discriminator

5. (a) Discuss about noise effect in AM and obtain necessary expression for Figure of merit [6M]

   (b) Explain in detail about Pre-emphasis & de-emphasis [6M]

6. (a) Describe about Phase modulated FM Transmitter [6M]

   (b) Explain Super heterodyne receiver with neat diagram. [6M]

7. (a) What is Multiplexing and explain FDM with neat block Diagram [6M]

   (b) Discriminate PAM, PWM and PPM systems [6M]

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Subject Code: R16EC2205

II B.Tech II Semester Supple Examinations, May-2023
ELECTROMAGNETIC WAVES AND TRANSMISSION LINES
(ECE)

Time: 3 hours   **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Define Electric Potential
   (b) State Ampere's law
   (c) What is Displacement current density?
   (d) Define conductors
   (e) What is Total Internal Reflection?
   (f) List primary constants of a Transmission line

                                                                    [2+2+2+2+2+2]

PART-B

                                                              4 X 12 = 48

2. (a) State and explain Coulomb`s law? Explain the importance of Coulombs law in
       Electrostatic fields   6M
   (b) Point charges 5nC and -2nC are located at (2, 0, 4) and (-3, 0, 5) respectively   6M
       i) Determine the force on a 1nC point charge located at (1,-3,7)
       ii) Find the electric field E at (1,-3, 7)

3. (a) Explain Biot-Savarts law with relevant expressions to determine the direction of magnetic
       field intensity   12M

4. (a) Elucidate on the inconsistency of Ampere's law and determine a Maxwell's expression of
       $\nabla \times H$ for Time Varying EM fields?   8M
   (b) Summarize understanding on Maxwell's equations with relevant expressions   4M

5. (a) With a neat diagram explain Poynting vector and Poynting theorem   12M

6. (a) Derive the reflection coefficient and transmission coefficient when the EM wave incident
       on perfect dielectric with normal incidence.   8M
   (b) Express the significance of boundary conditions   4M

7. (a) Derive the transmission line equation   8M
   (b) Review the Distortion concept   4M

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Subject Code: R16EC2206

II B.Tech II Semester Supple Examinations, May-2023
DATABASE MANAGEMENT SYSTEMS
(ECE)

Time: 3 hours　　　　　　　　　　　　　　　　　　**Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What are the applications of database?
(b) Write short note on E- R diagram and why it is useful?
(c) Write about different DML statements.
(d) What is the importance of null values?
(e) What is dirty read?
(f) What is the significance of clustered index?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) What is data model? List and explain different data models.
(b) What is data independence? Explain how implement data independence in DBMS?

3. (a) Explain in-detail about the representation of total participation and multivalued attribute in an E-R diagram.
(b) Explain the representation of cardinalities, roles, weak entities and weak relations in E-R diagram

4. (a) What is nested query, co-related nested query ? Explain with suitable examples.
(b) Discuss various types of Joins available in SQL with examples.

5. (a) Explain different integrity constraints over relations.
(b) What is assertion? Explain the differences between assertions and triggers.

6. (a) Explain the problems caused by redundantly storing information.
(b) What is functional dependency? Explain the way to compute the minimal cover for a set of functional dependencies with an example.

7. (a) Explain two phase locking for ensuring serializability
(b) Write in-detail about secondary indexes.

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Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CS2201

II B.Tech II Semester Supple Examinations, May-2023
STATISTICAL PROGRAMMING WITH R
(CSE)

Time: 3 hours   Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Write the formula for Chi-Square Test.
   (b) Define Correlation and Covariance.
   (c) Write the Disadvantages of R Programming language.
   (d) How do I set default value in R?
   (e) Give an example to access list elements in R.
   (f) Explain about set operations in R.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Why use R programming for your statistical work?.   6M
   (b) Define binomial distribution. Explain with suitable example.   6M

3. (a) Discuss about Null and Alternative Hypothesis.   6M
   (b) If only 5 percent kids can secure A grade in a paper, find the probability of at   6M
       most 2 out of 10 kids getting A grade in that paper.

4. (a) Discuss about vectors in R with examples.   6M
   (b) Explain in detail about matrices in R with examples.   6M

5. (a) Write about control statements in R.   6M
   (b) What is recursion? Explain recursion concept with example.   6M

6.   Explain in detail T-Tests and ANOVA.   12M

7. (a) How do I read and write a file in R? Give example.   6M
   (b) What are functions for statistical distributions? Explain.   6M

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Subject Code: R16CS2203

II B.Tech II Semester Supple Examinations, May-2023
FRONT END WEB TECHNOLOGIES
(CSE)

Time: 3 hours

Max Marks: 60

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) What is the use of AUDIO and VIDEO elements?
   (b) List the types of Style sheets.
   (c) List the features of JavaScript
   (d) Distinguish between DTD and XSD.
   (e) How to load jQuery library file?
   (f) Write the syntax for JQuery UI Auto-Opening the Dialog

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) How to create a table. Explain with relevant example
   (b) Define Form tag. Design a Registration page by using all Form controls

3. (a) Write the syntax for defining CSS. Explain how to insert CSS in an HTML Document.
   (b) Explain about Creating Editable content, Checking Spelling Mistakes, Exploring Custom Data Attributes using CSS.

4. (a) Briefly explain the control flow statements in Java script with example.
   (b) What are events ? Explain various events used in JavaScript with example

5. (a) Explain about External DTD and their categorization with examples
   (b) What is an XML DOM. How DOM parses the XML file.

6. (a) How HTML elements are used in JQuery with example.
   (b) Explain about filtering selections on Arrays.

7. (a) Create a HTML drag and drop using JQuery
   (b) Explain about Date Picker in JQuery

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Narasaraopeta Engineering College (Autonomous)

NEC Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CS2204

II B.Tech II Semester Supple Examinations, May-2023
DATABASE MANAGEMENT SYSTEMS
(CSE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B**.
Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B
All questions carry equal marks of 12.

PART-A

1. (a) Define instances and schemas of database?
   (b) Demonstrate how to add a NOT NULL column to a table?
   (c) Write about REVOKE command in SQL?
   (d) Distinguish between key and super key?
   (e) What are two pitfalls (problem) of lock-based protocols?
   (f) Differentiate static and dynamic hashing?

                                                                    [2+2+2+2+2+2]

PART-B

                                                                    4 X 12 = 48

2. (a) Draw and Explain the Architecture of Database?   [8]
   (b) Distinguish between database systems and file systems?   [4]

3. (a) Construct an ER diagram for a University Database. Determine the entities and
       relationships, participation constraints in the E-R diagram? [6]
   (b) Consider following relations and write SQL queries for given statements. [6]
       Assume suitable constrains.
       Instructor(ID, Name, Dept_name , Salary)
       Teaches(ID, Course_id, Sec_id, Semester(even/odd),Year)
       i) Find the average salary of the instructors in computer department.
       ii) Find the number of instructors in each department who teach a course in
           even semester of 2021.
       iii) Find the names of instructor with salary amounts between 30000 and 50000

4. (a) Write about Views? Explain how views are created, updated and deleted with examples? [6]
   (b) Why are stored procedures important? How do we declare stored procedures? [6]

5. (a) Define multivalued dependencies. Describe Fourth Normal form with an example? [6]
   (b) What are integrity constraints? Define the terms primary key constraint and foreign
       key constraint. How are these constraints expressed in SQL? [6]

6. (a) Write motivation for concurrent execution of transactions. Explain with example,
       serializable schedule? [8]
   (b) What is meant by log-based recovery? [4]

7. (a) Write in detail about Hash based Indexing and Tree based Indexing? [6]
   (b) Explain in detail about B+ Trees with examples? [6]

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