H.T No: | | | | | | | | | | | **R22** **Course Code: B420301**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: Advanced Structural Mechanics

(Structural Engineering)

Date: 13.08.2024 AN **Time: 3 hours** **Max.Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark. **10x1=10M**

1. Write the shear center equation for channel section. 1 M
2. State the two reasons for unsymmetrical bending. 1 M
3. Write about correction of circumferential stress in curved beams. 1 M
4. Write about deflections in curved beams. 1 M
5. Write Euler formula for columns with pinned ends. 1 M
6. Write about Euler buckling of columns with linearly elastic end constraints. 1 M
7. Define flexibility matrix method. 1 M
8. Define stiffness matrix method. 1 M
9. Write direction cosines used in the direct stiffness method. 1 M
10. Write about Element Transformation Matrix. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). The cantilever beam in Fig. 1(a) has a channel section as shown in Fig. 2(b). A concentrated load P = 12 kN lies in the plane making an angle $\phi = \pi/3$ with the x-z plane. Load P lies in the plane of the cross section of the free end of the beam and passes through shear center C. Locate points of maximum tensile and compressive stresses in the beam and determine the stress magnitudes. 10M

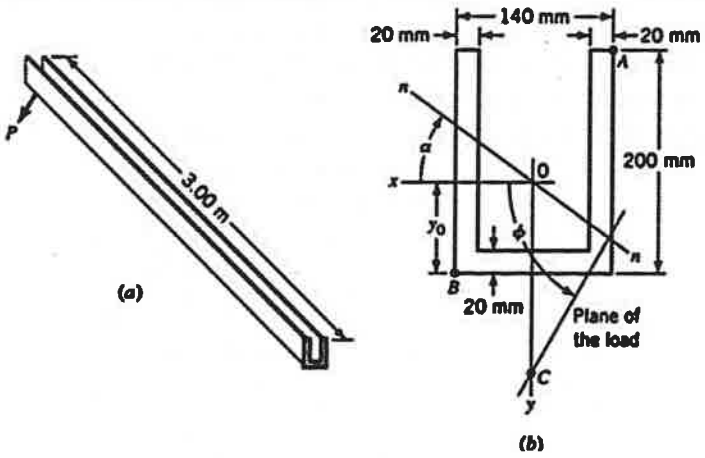

Fig. 1

OR

11. B). Derive the equation of Shear center for unequal I-section. 10M

(P.T.O..)

12. A). The curved beam in Fig. 2 is subjected to a load P = 120 kN. The dimensions of section BC are also shown. Determine the circumferential stress at B and radial stress at the junction of the flange and web at section BC. 10M

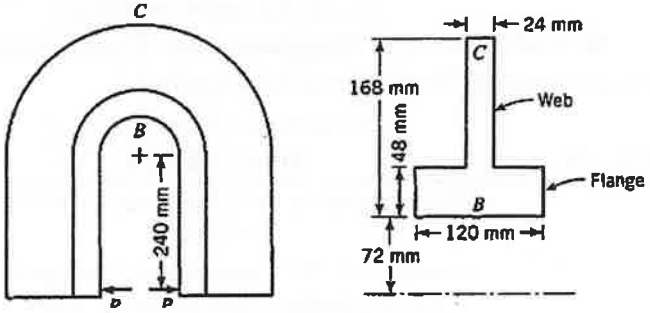

Fig. 2

OR

12. B). A glued laminated timber (glulam) beam is used in a roof system. The beam has simple span of 15 m and the middle half of the beam is curved with a mean radius of 10 m. The beam depth and width are both constant, d = 0.8 m and b = 0.13 m. Dead load is 2400 N/m and snow load is 4800 N/m. The geometry of the beam and assumed loading are shown Fig. 3. 10M

a. Determine the maximum circumferential and radial stresses in the beam.
b. Compare the maximum circumferential and radial stresses to the allowable stress limits are $\sigma_{\Theta\Theta\,(allow)}$=15.8 MPa, $\sigma_{rr(allow)}$=0.119 MPa.

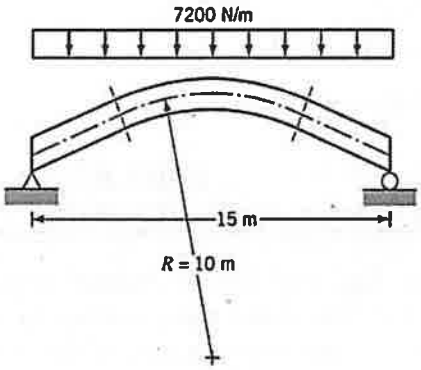

Fig. 3

13. A). An aluminum alloy (E = 72 GPa) extrusion has the cross section shown in Fig. 4. A 2 m length of the extrusion is used as a pin-end column. 10M

a. Determine the minimum radius of gyration for the column cross section and find the slenderness ratio of the column.
b. Determine the buckling load for the column.

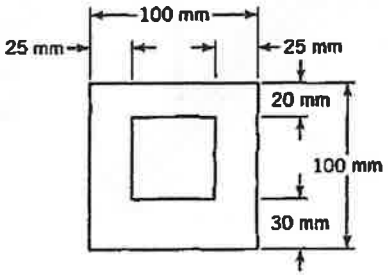

Fig. 4

OR

13. B). The design of a pinned-end A36 structural steel column required that the length be 2.2 m and the allowable load be 65 kN, with a factor of safety of 2.0 against buckling. 10M

a. Determine an appropriate equal-leg angle section of rolled steel that will satisfy the design requirements.
b. Determine whether or not the yield stress of the steel is exceeded. That is, will the column fail by yielding before it can fail by buckling.

14. A). Analyze the beam shown in Fig. 5 by stiffness method. 10M

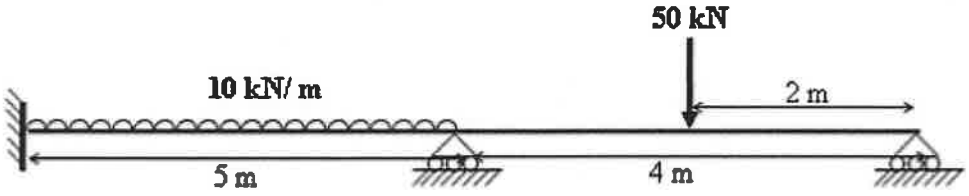

Fig. 5

OR

14. B). Analyze the truss shown in Fig. 6 by stiffness method. 10M

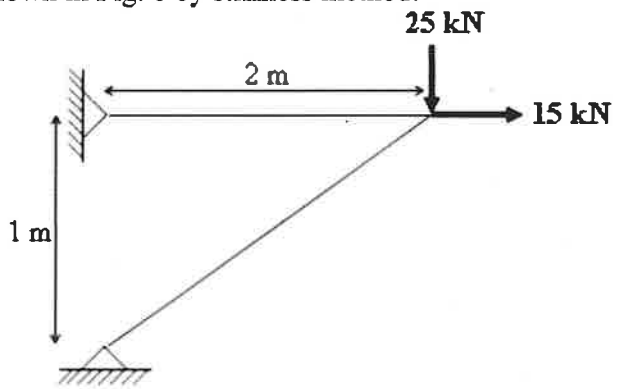

Fig. 6

15. A). Determine the slope at point B of the beam shown in Fig. 7. Also find support reactions and forces developed in the beam. Use the direct stiffness method. 10M

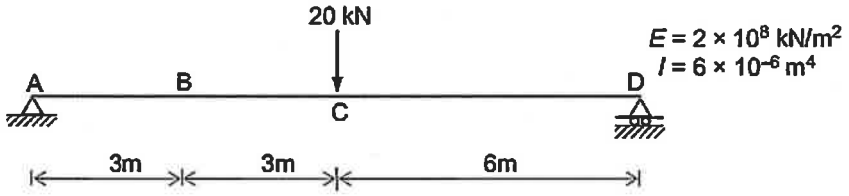

Fig. 7

OR

15. B). Analyze the plane frame shown in Fig. 8 using the direct stiffness method. 10M

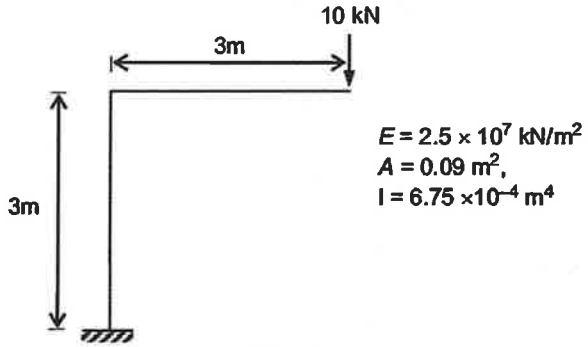

Fig. 8

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H.T No: | | | | | | | | | | | **R22** **Course Code: B420302**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: Theory of Elasticity and Plasticity

(Structural Engineering)

Date: 16.08.2024 AN **Time: 3 hours** **Max.Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark. **10x1=10M**

1. Define kinetics with suitable examples. 1 M
2. Define Octahedral stress. 1 M
3. What are the different components of strain? List them. 1 M
4. Define strain invariant. 1 M
5. What is axisymmetric idealization? 1 M
6. Define plane stress. 1 M
7. Write the 2nd order Airys stress function. 1 M
8. What is warping function in torsion? 1 M
9. Recall Mohr Coulomb theory. 1 M
10. What is Tresca's theory of plasticity? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). A body is subjected to three-dimensional forces and the state of stress at a point in it is represented as $\begin{matrix} 200 & 200 & 200 \\ 200 & -100 & 200 \\ 200 & 200 & -100 \end{matrix}$ MPa. Determine the normal stress, shearing stress and resultant stress on the octahedral plane. 10M

OR

11. B). Explain in detail the derivation of differential equations of equilibrium in polar coordinates. 10M

12. A). Elaborate in detail the derivation of strain invariants J1, J2 , J3. 10M

OR

12. B). Data taken from a 450 strain rosette reads as follows: ε_0 = 750 micrometres/m ε_{45} = -110 micrometres/m ε_{90} = 210 micrometres/m Calculate the magnitudes and directions of principal strains. 10M

13. A). Define plane strain. Derive the strain stress relationship for plane strain condition. 10M

OR

13. B). Compute the stress components for simply supported loaded at the midpoint. 10M

14. A). Derive the expression for stresses for a curved beam loaded at free end. 10M

OR

14. B). Derive the equations for torsion of circular cross section with usual notations also enlist the applications of torsional equations. 10M

15. A). Explain Mohr-coulomb and Rankines theory in plasticity. 10M

OR

15. B). Discuss the yield criteria and the flow rules for perfectly plastic and strain hardening materials. 10M

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H.T No: | | | | | | | | | | | R22 | Course Code: B420402

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: Computer Oriented Numerical Methods

(Structural Engineering)

Date: 19.08.2024 AN **Time: 3 hours** **Max.Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark. **10x1=10M**

1. In Triangularization method, the coefficient matrix of system of equations factorized into the product of which matrices? 1 M
2. What is the demerit of Cramer's rule? 1 M
3. If 2, 3, 6 are the eigen values of a matrix A, then what are the eigen values of A^2? 1 M
4. Define forward difference operator 1 M
5. Define the order of numerical differentiation method. 1 M
6. What is the error obtained in Trapezoidal rule? 1 M
7. Difference between numerical differentiation methods based on interpolating polynomials and method of undetermined coefficients? 1 M
8. State composite Trapezoidal rule of integration. 1 M
9. Write Taylor series expansion of a function u(t) about a point t_o. 1 M
10. Define boundary value problem. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Apply Gauss-Seidel method to solve the following equations: 10M

$2x - y = 7;\ -x + 2y - z = 1;\ -y + 2z = 1$

OR

11. B). Solve the equations $3x - y + z = -1;\ -x + 3y - z = 7;\ x - y + 3z = 7$ using SOR method. 10M

12. A). Determine the largest eigen value and corresponding eigen vector of $\begin{bmatrix} 4 & 1 & 0 \\ 1 & 20 & 1 \\ 0 & 1 & 4 \end{bmatrix}$ to 3 decimal places using Power method. 10M

OR

12. B). For the following data calculate the differences and obtain forward and backward difference polynomials. Interpolate at x = 0.25 and x = 0.35 10M

x	0.1	0.2	0.3	0.4	0.5
f(x)	1.40	1.56	1.76	2.00	2.28

(P.T.O..)

13. A). Apply Richardson extrapolation and the formula $f'(x) = \frac{f(x+h)-f(x-h)}{2h}$ with h = 0.4, 0.2, 0.1 to find f'(1.0) from the following values 10M

x	0.6	0.8	0.9	1.0	1.1	1.2	1.4
f(x)	0.707	0.860	0.926	0.984	1.034	1.075	1.128

OR

13. B). Calculate y'(0.1) as accurately as possible using the table below and with the aid of the approximation S(h). Give the error estimate. 10M

x	4.5	5	5.5	6	6.5	7	7.5
y	9.69	12.9	16.71	21.18	26.37	32.34	39.15

14. A). Evaluate the integral $\int_0^1 \int_0^1 e^{x+y}\, dx\, dy$ using Simpson's rule with h = k = 0.5. 10M

OR

14. B). Demonstrate Gauss-Legendre three point integration formula. 10M

15. A). Solve the initial value problem y' = x(y + x) – 2, y(0) = 2 at x = 1 with step size h = 0.2 using Euler's method. 10M

OR

15. B). Apply predictor-corrector method to find y(1.4) from $y' = x^2(1+y)$ y(1) = 1, y(1.1) = 1.233, y(1.2) = 1.548, y(1.3) = 1.979. 10M

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H.T No: | | | | | | | | | | | R22 | Course Code: B420404

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: Advanced Reinforced Concrete Design
(Structural Engineering)

Date: 21.08.2024 AN **Time: 3 hours** **Max.Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries ONE mark. **10x1=10M**

1. Write the merits of working stress method. 1 M
2. Give the types of load combinations. 1 M
3. Define bending moment envelope. 1 M
4. What are continuous beams? 1 M
5. Write the demerits of ribbed slabs. 1 M
6. Differentiate between one way and two way slabs. 1 M
7. Differentiate between yield line and strip line. 1 M
8. When the anchorage is used? 1 M
9. What are long columns? 1 M
10. What are slender columns? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). A rectangular beam 200 mm wide and 400 mm deep up to the centre of reinforcement has to resist a factored moment of 40 kNm. Calculate the reinforcement of the section. Use M25 concrete and Fe 415 steel. 10M

OR

11. B). A simply supported over an effective span of 8m carries a live load of 15KN/m. design the beam, using M20 concrete and Fe415 grade steel. Keep the width equal to half the effective depth. Use working stress method of design. 10M

12. A). Design a simply supported deep beam to the following data: 10M

Clear span	= 4.20 m
Bearing at each end	= 450 mm
Overall depth	= 3500 mm
Width of beam	= 250 mm
Supper imposed load	= 250 kN/m

Use M20 concrete and Fe415 steel

OR

12. B). Design a 3 span continuous deep beam carrying a characteristic load of 210 kN/m inclusive of its self weight for the beam, clear span is 4.5 m width of support 250 mm. thickness of the beam 230 mm and Overall depth of 2.7 m. the materials are M20 Grade concrete and and HYSD reinforced of grade Fe415. 10M

(P.T.O..)

13. A). Design an interior panel on a flat slab of size 5 m X 5 m without providing drop and column head. Size of column is 500 X 500 mm and live load on the panel is 4KN/m^2. Take floor finishing load as 1 KN/m^2.Use M20 Concrete and Fe 415 steel 10M

OR

13. B). Discuss in detail the analysis and design procedure for ribbed Slabs. 10M

14. A). Check for the development length at support of a doubly reinforced beam 400 mm X 750 m (effective) the clear span of the beam is 5.25m. The beam carries UDL of 46KN/m (including self-weight). The beam is reinforced with 8 bars of 20 mm diameter (4 bars are bent up near support) on tension side and 4 bars of 16 mm diameter on compression side. Adopt M20 grade of concrete and Fe415 HYSD bars. 10M

OR

14. B). Design torsional reinforcement in a rectangular beam section, 350mm wide 750mm deep, subject to an ultimate twisting moment of 140 kNm combined ultimate shear force of 110kN. Assume M-25 grade concrete, Fe415 grade steel and mild exposure condition. 10M

15. A). Discuss in detail the design procedure for slender column. 10M

OR

15. B). Design the reinforcement in a circular column of diameter 350mm with helical reinforcement of 8mm diameter to support a factored load of 1400kN. The column has an unsupported length of 3.5 m and is braced against side sway. Adopt M20 grade concrete and Fe415 steel bars. 10M

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H.T No: | | | | | | | | | | | R18 | Course Code: B30402

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: Theory of Elasticity

(Structural Engineering)

Date: 16.08.2024 AN | **Time: 3 hours** | **Max.Marks: 70**

(Note: Assume suitable data if necessary)

PART-A

Answer all FIVE questions (Compulsory)

Each question carries FOUR marks. **5x4=20M**

1. What is the Plane stress? Give examples. 4M
2. State Venants principle and its applications. 4M
3. Write short note on pure bending of curved bars. 4M
4. Explain the principle of super position. 4M
5. Discuss the effects of torsion in circular shafts. 4M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

6. A). Derive the differential equation of equilibrium for two dimensional problems. 10M

OR

6. B). The state of stress at a point in a strained material is given by $\sigma_x = -10$, $\sigma_y = +20$, $\sigma_z = +30$ & $\tau_{xy} = \tau_{yz} = \tau_{zx} = -40$ Mpa. Determine the normal and tangential stresses with respect to point on a surface and whose direction cosine matrix with respect to x.y.z axes are given by $D = \{\frac{1}{\sqrt{2}}, -\frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}}\}$.Determine state of stress if the original axis is rotated by 30^0 about Z axis. 10M

7. A). Find out the stress components of two dimensional problems in rectangular coordinates by solution of polynomial. 10M

OR

7. B). Derive the displacement corresponding to stresses and strains produced on the bending of the cantilever beam loaded at end. 10M

8. A). Derive the stress function for Circular and elliptical Cross section bar. 10M

OR

8. B). Derive the solution for bending of a prismatic cantilever bar. 10M

9. A). Determine the Magnitude and directions of the principal stresses for the three dimensional element. 10M

OR

9. B). Find out the differential equations of equilibrium for rectangular parallelepiped in three dimensional problems. 10M

10. A). A square bar of size 75mmx75mm is subjected to a twisting moment of 200 Nm at the ends. Find the maximum shear stress and angle of twist taking G as 82 Gpa. 10M

OR

10. B). Explain in detail about Prandt's membrane analogy of analysis of thin walled membrane under torsion. 10M

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H.T No: | | | | | | | | | | | R22 | Course Code: B443401

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: Machine Modeling and Analysis
(Power Electronics)

Date: 13.08.2024 AN **Time: 3 hours** **Max.Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries ONE mark. **10x1=10M**

1. What are the advantages of Primitive 2-axis machine? 1 M
2. Write the voltage equations of DC Compound motor in state variable form. 1 M
3. Draw the two axis model of Induction motor. 1 M
4. Write advantages of phase transformation. 1 M
5. Write the voltage equation of Induction motor in Rotor Reference frame. 1 M
6. What is Stator Reference frame? 1 M
7. Write the Voltage and Current equations of Synchronous motor in state space variable form. 1 M
8. Write the Torque equation of Synchronous motor. 1 M
9. Write applications of BLDC motor. 1 M
10. Write advantages of Permanent Magnet Synchronous motor. 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Derive the mathematical model of a separately excited DC motor by considering Generalized Machine theory. 10M

OR

11. B). Obtain the transfer function of a separately excited DC motor by considering armature inductance La & load torque T_L. 10M

12. A). Obtain the identical transformations for currents from a rotating balanced 3-phase (a, b, c) winding to a rotating balanced 2-phase (α, β) winding. 10M

OR

12. B). Explain the dq model based DOL Starting of Induction motor with neat diagram. 10M

13. A). Derive the dynamic model of a 3-φ induction motor in synchronizing rotating reference frame in state variable form and represent them in matrix form. 10M

OR

13. B). Obtain the state space model of a 3-φ induction motor with i) Stator reference frame ii) Rotor reference frame. 10M

14. A). Explain the Circuit model of Synchronous motor with neat diagram. 10M

OR

14. B). Draw the equivalent circuit of synchronous motor in rotor reference frame. Derive the voltage equations for synchronous motor in terms of flux linkages. 10M

15. A). Obtain the voltage and torque equations for modeling of PM Synchronous motor. 10M

OR

15. B). Explain the Modelling of BLDC motor with neat diagram. 10M

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H.T No: | | | | | | | | | | | R22 | Course Code: B443408

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: Electric Vehicles and Design
(Power Electronics)

Date: 16.08.2024 AN **Time: 3 hours** **Max.Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries ONE mark. **10x1=10M**

1.	What are disadvantages of a conventional vehicle?	1 M
2.	Define grading resistance.	1 M
3.	What is hybrid vehicle?	1 M
4.	Mention the types of configurations in hybrid drive trains.	1 M
5.	List out the components in electric propulsion sub system.	1 M
6.	Define drive system efficiency.	1 M
7.	What is energy storage?	1 M
8.	Define fuel cell.	1 M
9.	What are types of energy management strategies?	1 M
10.	Mention the issues in energy management of electric vehicles.	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Describe the factors affecting the performance of vehicle.	10M
	OR	
11. B).	Discuss the vehicle transmission characteristics with sketch.	10M
12. A).	Explain the importance of hybrid and electric vehicle with respect to social and environmental aspect with diagram.	10M
	OR	
12. B).	Describe the power flow control in parallel hybrid configuration.	10M
13. A).	Discuss the configuration and control of induction motor drives in electric vehicle.	10M
	OR	
13. B).	Analyze the control of permanent magnet motor drives in electric vehicles.	10M
14. A).	Discuss in detail about fuel cell based energy storage in electric vehicle.	10M
	OR	
14. B).	Explain the super capacitor based energy storage in electric vehicle.	10M
15. A).	Define the energy management and also disscuss comparisons of different energy management strategies.	10M
	OR	
15. B).	Analyze the Designing a of a Hybrid Electrical Vehicle with neat diagram.	10M

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H.T No: | | | | | | | | | | | **R22** **Course Code: B443301**

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: Advanced Power Electronic Converter-I

(Power Electronics)

Date: 19.08.2024 AN **Time: 3 hours** **Max.Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark. **10x1=10M**

1.	How does a MOSFET differ from an IGBT in terms of operation?	1 M
2.	IGBT is a voltage controlled device, justify?	1 M
3.	List the different power factor improvement techniques.	1 M
4.	How does a single-phase dual converter differ from a single-phase full-wave rectifier?	1 M
5.	Why diodes should be connected in anti-parallel with thyristors in inverter circuits?	1 M
6.	What is the significance of PWM control?	1 M
7.	What are the methods of reduction of harmonic content?	1 M
8.	List the different voltage control methods of three phase inverters?	1 M
9.	How does the number of voltage levels in a multi-level inverter affect its harmonic distortion performance?	1 M
10.	What are the key challenges in controlling multi-level inverters?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain the working of MOS Turn off Thyristor with a relevant circuit diagram.	10M
	OR	
11. B).	Draw the symbolic representation and equivalent circuit of Integrated Gate- Commutated Thyristor and explain its operation in detail.	10M
12. A).	Discuss extinction angle control method for power factor improvement of a single-phase full-converter.	10M
	OR	
12. B).	A three-phase, half wave converter is operated from a 3-phase, Y-connected 440 V, 50 Hz supply and the load resistance is R = 20 Ω. If it is required to obtain an average output voltage of 50% of the maximum possible output voltage, calculate: i. Firing angle, ii. Rectification efficiency and iii. Input power factor.	10M
13. A).	Explain in brief about the performance parameters for the single phase inverters.	10M
	OR	
13. B).	A single-phase full-bridge inverter has a switching sequence that produces a square wave voltage across a series RL load. The switching frequency is 60 Hz, Vdc =100V, R= 10 Ω and L = 25 mH. Determine the amplitudes of the Fourier series terms for the square wave load voltage, load current, and the power absorbed by the load.	10M

(P.T.O..)

14. A). Explain the principle of space vector PWM applied to three phase inverter using the space vector diagram. 10M

OR

14. B). With neat sketches, explain the operation of three phase voltage source inverter. Draw phase and line voltage waveforms on the assumption that each thyristor conducts for 120° and the resistive load is star connected. 10M

15. A). Describe the 1-Φ phase flying capacitors multilevel inverter operation? Compare its features with 1-Φ phase diode-clamped multilevel inverter? 10M

OR

15. B). i) Briefly explain the classification of multi-level inverters. 5M

ii) Illustrate dc-link capacitor voltage unbalance with necessary expressions. 5M

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H.T No: | | | | | | | | | | | R22 | Course Code: B455301

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: Digital System Design with FPGAs
(Embedded Systems)

Date: 13.08.2024 AN **Time: 3 hours** **Max.Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries ONE mark. **10x1=10M**

1.	What is a GAL Device?	1 M
2.	What is SPLD?	1 M
3.	What is meant by state table?	1 M
4.	Define state graph.	1 M
5.	What is Simulation?	1 M
6.	Define comparator.	1 M
7.	Define Single Stuck at fault.	1 M
8.	What is random testing?	1 M
9.	Discuss about fault diagnosis in sequential circuits.	1 M
10.	What is Standard Variance of Fault Samples?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain the various architectures of Xilinx Cool Runner CPLDs.	10M
	OR	
11. B).	What is meant by programmable logic device? Draw and explain the basic architectures of CPLD and FPGA. Give the salient features, applications of the same.	10M
12. A).	Describe the Analysis by signal timing charts	10M
	OR	
12. B).	Explain about Alphanumeric state graph notation.	10M
13. A).	Describe the role of Synchronization in sequential circuit design.	10M
	OR	
13. B).	Give an overview on Simulation and testing of Sequential circuits.	10M
14. A).	Explain the procedure how to find fault detection and location in sequential circuits.	10M
	OR	
14. B).	Discuss briefly the Kohavi algorithm.	10M
15. A).	Write about the State identification and fault detection experiment.	10M
	OR	
15. B).	Explain about the Design of fault detection experiment.	10M

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H.T No: | | | | | | | | | | | R22 | Course Code: B455302

CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: System Design with Embedded Linux
(Embedded Systems)

Date: 16.08.2024 AN **Time: 3 hours** **Max.Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)
Each question carries ONE mark. **10x1=10M**

1.	Write about Real time Operating System.	1 M
2.	Define Inter Process Communication.	1 M
3.	What are the services of Kernel?	1 M
4.	Differentiate between user space and kernal Space.	1 M
5.	Define Device Drivers.	1 M
6.	Differentiate between I2C and SPI bus.	1 M
7.	Explain about Real Time Linux.	1 M
8.	What are the applications of Real Time Linux?	1 M
9.	Explain the need for debugging in Embedded Applications.	1 M
10.	What are BootLoaders ?	1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A).	Explain the Characteristics of Real Time Operating System.	10M
	OR	
11. B).	What is Task Scheduling? Explain the various scheduling Algorithms.	10M
12. A).	Explain with a neat sketch Kernel Architecture.	10M
	OR	
12. B).	What is IPC? Explain the various IPC mechanisms in RTOS?	10M
13. A).	What is Kernel? Explain the types of Kernel and memory space.	10M
	OR	
13. B).	Explain the functioning of I2C bus with the help of neat diagram.	10M
14. A).	Explain the applications of Embedded Real time Linux.	10M
	OR	
14. B).	Differentiate between Soft Real Time Linux and Real Time Linux.	10M
15. A).	Explain about system Integration and debugging In Embedded Systems.	10M
	OR	
15. B).	Explain about Bootloaders importance from Kernel point of View.	10M

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H.T No: | | | | | | | | | | | R22 | Course Code: B455405

CMR COLLEGE OF ENGINEERING & TECHNOLOGY

(UGC AUTONOMOUS)

M.Tech I Semester Supplementary Examinations August-2024

Course Name: Advance Computer Architecture

(Embedded Systems)

Date: 21.08.2024 AN **Time: 3 hours** **Max.Marks: 60**

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries ONE mark. **10x1=10M**

1. Give an example of register indirect addressing mode. 1 M
2. State Amdahl's law. 1 M
3. Which location within a cache can a block be placed? 1 M
4. How is CPU execution time calculated? 1 M
5. What role does branch-prediction buffer play in a CPU? 1 M
6. What is the definition of Instruction-Level Parallelism? 1 M
7. What are the two main factors driving the development of Multiple Instruction, Multiple Data multiprocessors? 1 M
8. Explain briefly about the term 'Snooping' refer to in computing. 1 M
9. What is the method for determining the total latency of a message? 1 M
10. How is a cluster defined in the context of computing? 1 M

PART-B

Answer the following. Each question carries TEN Marks. **5x10=50M**

11.A). Explain how factors like time, volume, commodification, and packaging affect the cost of a computer. 10M

OR

11. B). Explain the core principles that govern the design of an instruction set. 10M

12. A). Explain in detail about the concept of virtual memory. 10M

OR

12. B). What are the primary challenges of pipelining, and how do they affect processor efficiency? 10M

13. A). Explain the complete procedure how hardware supports for exposing more parallelism at compile time? 10M

OR

13. B). How can dynamic scheduling techniques help resolve data hazards? Provide an explanation. 10M

14. A). What are the fundamental hardware primitives needed to implement synchronization in a multiprocessor system? 10M

OR

14. B). Discuss the concept of systematic shared-memory architecture. 10M

15. A). Analyze the fallacies of using Intel IA-64 architecture in the mobile market and its implications. 10M

OR

15. B). What are the practical issues involved in interconnecting networks, and how can they be illustrated? 10M

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