Hall Ticket No:

Question Paper Code: 20CE108

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
STRUCTURAL ANALYSIS
(Civil Engineering)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	What is the value of D_s & D_k for the Fixed Beam with a point load at the centre of the span?	1M	1	1
	ii.	Distinguish between Determinate and Indeterminate Structures.	1M	1	1
	iii.	Write the Three Moment Equation.	1M	2	1
	iv	Find the fixed end moments for the beam AB as shown in Figure below:	1M	2	2

	v.	Write the steps involved for solving portal frames without side sway by Slope deflection method.	1M	3	1
	vi	Write the Slope Deflection Equation for a two span continuous beam ABC.	1M	3	1
	vii.	Find the distribution factor for each member at joint A for the case shown below.	1M	4	1

|					
	viii.	What is the carry over moment (M') for the cases shown below? Moment is applied at end A.	1M	4	1

(a)   (b)

	ix.	Write the steps involved for solving portal frames without side sway by Kani's method.	1M	5	1
	x.	If the Distribution factor value of the joint BA is 0.6. What is the Rotation factor value (U_{BA}) for the same end?	1M	5	1
Q.2(A)		Find the Static Indeterminacy and Kinematic Indeterminacy for the following Pin Jointed Frames.	10M (2×5M)	1	5

(i)
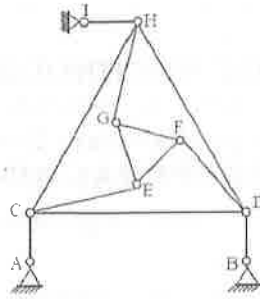
(ii)
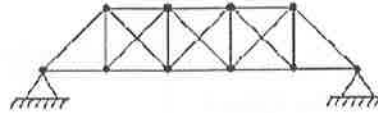
OR
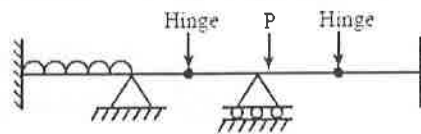
Q.2(B) Find the Static Indeterminacy and Degrees of Freedom for the following structures: 5M   1   5
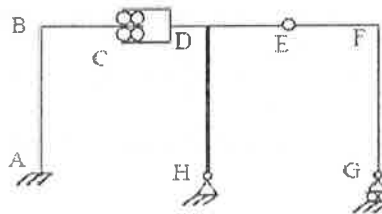
(i)

(ii)   5M

Q.3(A) A Continuous beam ABC covers two consecutive spans AB and BC of   10M   2   5
lengths 4 m and 6 m respectively. The span AB carries a point load of
40 kN at 1 m from A. The span BC carries a UDL of 10 kN/m. Find
the reactions at the supports and draw bending moment diagram
(BMD). Use **three moment theorem** Concept.
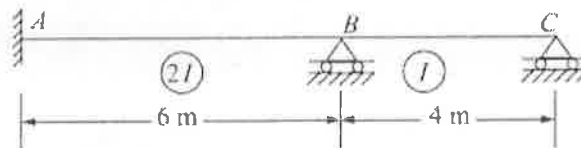
OR

Q.3(B) Using **three moment theorem**, analyze the continuous beam ABC   10M   2   5
as shown in below Figure, if the support B sinks by 10 mm. Take E =
200 GPa and I = 1×10^8 mm⁴. Draw BMD.
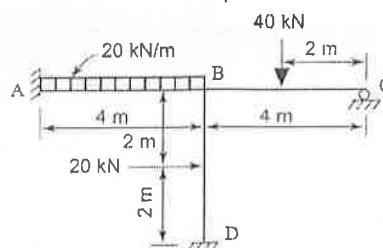

Q.4(A) Using **slope-deflection method**, analyse the frame shown in below   10M   3   5
Figure for moments at ends of members. EI is constant for all
members.

Q.4(B) Analyse the continuous beam shown in below Figure by **slope deflection method** and draw BMD. Take EI as constant.　　10M　3　5
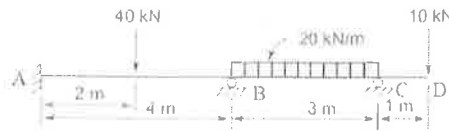
Q.5(A) Determine the internal moments at each support of the beam ABCD shown in Figure. Take EI as constant. Use the **moment distribution method**. Sketch the BMD.　　10M　4　5
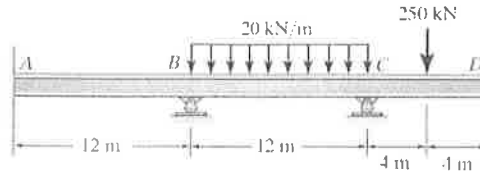
OR

Q.5(B) Determine the end moments of the members of the frame shown in the below Figure. EI is the same for all the members. Draw the bending moment diagram (BMD). Use **moment distribution method**.　　10M　4　'5
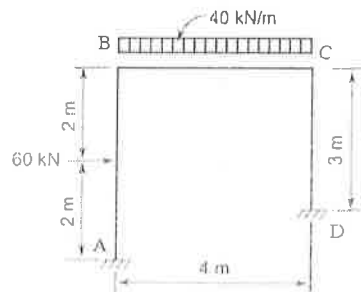
Q.6(A) Analyse the Continuous beam ABCD loaded as shown in Fig. by **Kani's Method**. Sketch the BMD.　　10M　5　5
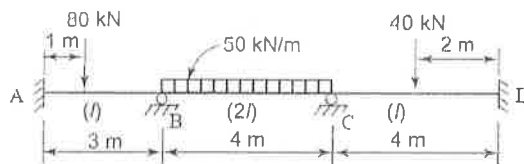
OR

Q.6(B) Analyse the Continuous beam ABCD loaded as shown in Figure by **Kani'sMethod**. Sketch the bending moment diagrams.　　10M　5　5
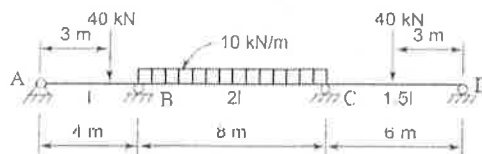
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MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
IRRIGATION ENGINEERING
(Civil Engineering)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

| Q.No		Question	Marks	CO	BL
Q.1	i.	Define Water Holding Capacity?	1M	1	1
	ii.	Define Gross Irrigation Requirement	1M	1	1
	iii.	Define efficiency of Modular Outlet of irrigation canal	1M	2	1
	iv	What is High Gravity Dam?	1M	2	1
	v.	What is Head Regulator?	1M	3	1
	vi	Under which circumstances a Syphon Aqueduct is used?	1M	3	1
	vii.	What is Trap Efficiency?	1M	4	1
	viii.	What is Density current in reservoir sedimentation?	1M	4	1
	ix.	What is load factor of a hydropower plant?	1M	5	1
	x.	Write an example of Impulse Turbine?	1M	5	1
Q.2(A)		How to estimate depth and frequency of irrigation in the field based on the soil moisture concept?	10M	1	3
		OR			
Q.2(B)		What are the ill effects of salinity and alkalinity in soil? What are the various methods of soil reclamation?	10M	1	2
Q.3(A)		Why canal fall is necessary?	2M	2	2
		What are the various types of canal falls used in practice? Draw and give brief details.	8M	2	
		OR			
Q.3(B)		Design a canal to carry a discharge of 65 cumec using kennedy's theory. Canal bed slope is 1 in 4000, Critical velocity ratio of soil is 1.15 and kutter's coefficient is 0.022	10M	2	5
Q.4(A)		Draw a neat sketch of a barrage, label the components and discuss each of them.	10M	3	2
		OR			
Q.4(B)		(i) What are the various types of reservoirs available?	5M	3	2
		(ii) Draw a neat sketch of a reservoir and indicate different zones of storage. Write in brief about them.	5M	3	
Q.5(A)		What are the different ways that an earthen dam can fail? Discuss sketches.	10M	4	2
		OR			
Q.5(B)		What are the different modes of failure of a solid gravity dam? Explain any three	10M	4	2
Q.6(A)		Classify and write in brief about different types of hydropower plants based on scheme and head?	10M	5	2
		OR			

Q.6(B) A common load is shared by two Hydel stations; one being a base load   10M   5   4
station with 30MW installed capacity and the other being a stand-by
station with 35MW capacity. The yearly output of the standby station is 9
x 10^6 kWh and that of the base load plant is 105 x 10^6 kWh. The peak
load taken by the standby station is 14MW and this station works for
2700 hours during a year. The base load station takes a peak of 18MW.
Find out:
(i) Annual load factors for both stations,
(ii) Plant use factors for both stations,
(iii) Capacity factors for both stations

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024

DESIGN OF CONCRETE STRUCTURES
(Civil Engineering)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	What is modular ratio? Determine the modular ratio at M15 grade concrete.	1M	1	1
	ii.	Write down the values of partial safety factor for concrete and steel.	1M	1	1
	iii.	Mention the difference between the singly and doubly reinforced sections.	1M	2	1
	iv	Define over reinforced section.	1M	2	1
	v.	What is bond stress. Write the factors affecting development of bond stress	1M	3	1
	vi	Define shrinkage.	1M	3	1
	vii.	Write the minimum secondary reinforcement to be provided for slab with respect to grade of steel as per IS 456 2000.	1M	4	1
	viii	What is a staircase? And classify the types of staircases.	1M	4	1
	ix.	Mention the minimum and maximum percentage of steel area to be provide for column as per IS code?	1M	5	1
	x.	Classify the different types of foundation.	1M	5	1
Q.2(A)		Write the differences between working stress method (WSD) and limit state design (LSD).	10M	1	2
		OR			
Q.2(B)		Explain the different design methods of reinforced concrete structural elements?	10M	1	2
Q.3(A)		A beam of rectangular section 260 mm wide and 420 mm deep to the centre of the tensile reinforcement provided with 3 bars of 16 mm diameter. Find the depth of neutral axis, section classification and determine the moment resistance of the given section. Use M25 concrete and Fe 500 steel.	10M	2	2
		OR			
Q.3(B)		Determine the area of steel required and limiting moment of resistance of the T-beam. T beam has to be designed as balanced section for the following data: breadth of flange bf=1040mm, depth of flange Df =120mm, rib width bw =285 mm, effective depth d=500 mm. Use M20 concrete and Fe 415 steel.	10M	2	5
Q.4(A)		(i) Singly reinforced rectangular beam 300 x 440 mm effective depth carries an UDL of 60 kN/m including its self-weight over a simply supported span of 6 m is reinforced beam with 6 numbers of 25 mm diameter. Design shear reinforcement using vertical stirrups. Assume grade of concrete and steel are M25 and Fe415 respectively.	6M	3	5
		Ii) Write short notes on development length and deflection	4M	3	2
		OR			

Q.4(B)	Design a rectangular beam of size 340 x 700 mm which is acted upon by a factored twisting moment of 170 kN-m in combination with a factored bending moment of 240 kN-m and ultimate shear force of 130 kN. Use M25 grade concrete and Fe415 steel. Adopt effective cover of 50 mm.	10M	3	5
Q.5(A)	Design a simply supported roof slab for the following: 1. Inside dimensions: 6.5m × 2.5m. 2. Supported on a bearing of 240mm. 3. Carries an imposed load of 4 KN/m² and a floor finish of 1 KN/m² 4. Concrete grade: M25. Steel grade: Fe415. 6. Provide 10 mm bars in the tension side with a clear cover of 20 mm 7. Assume a modification factor of 1.25 for the calculation of effective	10M	4	5

OR

Q.5(B)	Design a dog-legged stair for a building in which the vertical distance between the floors is 3.6 m. The stair hall measures 3m x 5m. The live load is taken as 2.5 kN/m². Use M20 grade and Fe 415 steel bars.	10M	4	5
Q.6(A)	Design a column of 7m unsupported length, restrained in position and direction at both the ends, to carry an axial load of 1500 kN. Use M25 concrete and Fe 415 steel.	10M	5	5

OR

Q.6(B)	Design a square footing for an axially loaded column of size 350 mm × 350 mm carrying 570 KN load. Use M 25 concrete and Fe 415 steel. Safe bearing capacity of soil is 180 kN/m². Sketch the details of reinforcement.	10M	5	5

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Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20CE402

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024
CONSTRUCTION PLANNING AND MANAGEMENT
(Civil Engineering)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	What role does resource requirement estimation play in ensuring the successful execution of work activities in construction projects?	1M	1	1
	ii.	Discuss the importance of coding systems in organizing and categorizing activities within a construction project plan.	1M	1	2
	iii.	In what scenarios is the Program Evaluation and Review Technique (PERT) most useful, and how does it complement the critical path method?	1M	2	1
	iv	Discuss the importance of accurate time estimates in construction scheduling, and how they influence project planning and execution.	1M	2	2
	v.	Discuss the challenges and benefits of integrating spatial data into construction project planning and design processes.	1M	3	2
	vi	In what ways do Communication and Computer Networks contribute to the seamless flow of information between on-site and off-site project stakeholders?	1M	3	2
	vii.	Describe the application of quality control by statistical methods in identifying and addressing variations in construction processes.	1M	4	2
	viii	How does Statistical Quality Control with Sampling by Attributes contribute to quality assurance in construction projects?	1M	4	1
	ix.	What is the relational model of databases, and how does it facilitate the efficient storage and retrieval of project-related data?	1M	5	1
	x.	Explore other conceptual models of databases commonly used in construction project management and their specific applications.	1M	5	2
Q.2(A)		Explore the relationship between technology selection and the optimization of construction methods for improved project outcomes.	10M	1	2
		OR			
Q.2(B)		How can the proper definition of work tasks enhance communication and coordination among project team members in the construction industry?	10M	1	2
Q.3(A)		Describe the concepts of mean, variance, and standard deviation in the context of time estimation for construction projects and their implications.	10M	2	2
		OR			

Q.3(B)	Analyze the role of probability distribution in construction scheduling and its impact on risk assessment and management.	10M	2	2	

Q.4(A)	In what ways can Information Technology enhance the transparency and accountability of construction projects, particularly through robust Database Management Systems?	10M	3	2	

OR

Q.4(B)	Analyze the role of Communication and Computer Networks in ensuring the security and integrity of sensitive construction project data throughout its lifecycle.	10M	3	2	

Q.5(A)	Evaluate the role of statistical methods in quality control wi construction industry and how they enhance the reliability of cor processes.	10M	4	2	

OR

Q.5(B)	Compare and contrast the use of statistical quality control techniques with sampling by attributes and sampling by variables in construction quality management.	10M	4	2	

Q.6(A)	Explain the principles and applications of the relational model of databases and its relevance in the context of construction project data.	10M	5	2	

OR

Q.6(B)	Compare and contrast various conceptual models of databases used in construction project management, highlighting their strengths and weaknesses.	10M	5	2	

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024

UNIVERSAL HUMAN VALUES

(Common to CE, EEE, ECE, and CST)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either Part-A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	What can you say about happiness.	1M	1	2
	ii.	Define Harmony.	1M	1	1
	iii.	What are the needs of the body, and how are they fully fulfilled?	1M	2	2
	iv.	Why do you think health is important for human beings?	1M	2	4
	v.	Differentiate between intention and competence	1M	3	2
	vi	Define Respect.	1M	3	1
	vii.	What would happen if pollution society.	1M	4	2
	viii	Mention one feature of space.	1M	4	2
	ix.	Define human values.	1M	5	1
	x.	Ethical Human Conduct of a Professional implies?	1M	5	3
Q.2(A)		List out the methods to fulfil human aspirations.	10M	1	2
		OR			
Q.2(B)		Briefly explain the differences between excitement and happiness? Describe examples of both.	10M	1	4
Q.3(A)		How would you apply knowledge of the mind-body connection in everyday life?	10M	2	3
		OR			
Q.3(B)		What are some basic physical needs essential for maintaining bodily harmony?	10M	2	2
Q.4(A)		Explain about personal experiences and biases influence one's ability to trust others?	10M	3	2
		OR			
Q.4(B)		Compare and contrast different cultural perspectives on the concept of harmony in society.	10M	3	4
Q.5(A)		Can you list examples of symbiotic relationships in nature?	10M	4	2
		OR			
Q.5(B)		Evaluate the effectiveness of current recycling practices in maintaining ecological balance.	10M	4	4
Q.6(A)		What are the basic human values that are universally accepted across cultures?	10M	5	2
		OR			
Q.6(B)		Identify the holistic criteria for evaluation of technologies, production systems and management models?	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – June 2024
POWER SYSTEMS-I
(EEE)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	What is plant capacity factor?	1M	1	1
	ii.	What do you understand by the HVDC System	1M	1	1
	iii.	Write about solid conductor and ACSR conductor, also compare them.	1M	2	1
	iv	What is the necessity of transposition?	1M	2	1
	v.	Define voltage regulation in transmission line.	1M	3	1
	vi	What is Ferranti effect?	1M	3	2
	vii.	Define string efficiency?	1M	4	1
	viii.	What is sag and tension?	1M	4	1
	ix.	The most commonly used insulation in high-voltage cables is.........	1M	5	1
	x.	List the types of various cables.	1M	5	1
Q.2(A)		i) Explain the following systems of distribution with neat diagram: (a) Radial system (b) Ring main system (c) Interconnected system.	5M	1	2
		ii) Explain primary and secondary distribution with neat diagram.	5M		
		OR			
Q.2(B)		Draw the schematic diagram of a nuclear power station and explain its operation.	10M	1	2
Q.3(A)		i) From the fundamentals derive an expression for inductance of a single-phase transmission system and also Find an expression for the flux linkages	5M	2	2
		ii) Explain the effect of power factor on efficiency and regulation of transmission line?	5M	2	3
		OR			
Q.3(B)		Determine the sending end voltage, current, power factor of a 1-phase 50 Hz, 76.2 kV transmission delivering a load of 12 MW at 0.8 p.f. The line constants are R = 25 ohm, inductance 200mH and capacitance between lines 2.5μF. Also determine the regulation and η of transmission. Use nominal-π method. Draw phasor diagram	10M	2	3
Q.4(A)		Apply rigorous method, derive expressions for sending end voltage and current for a long transmission line.	10M	3	3
		OR			

Q.4(B)	A single-phase 50 Hz generator supplies an inductive load of 5,000 kW at a power factor of 0.707 lagging by means of an overhead transmission line 20 km long. The line resistance and inductance are 0.0195 ohm and 0.63 mH per km. The voltage at the receiving-end is required to be kept constant at 10 kV. Find (i) the sending-end voltage and voltage regulation of the line; (ii) the value of the capacitors to be placed in parallel with the load such that the regulation is reduced to 50% of that obtained in part (i).	10M	3	3
Q.5(A)	Discuss the phenomenon of corona and the factors which effect the corona loss and write power loss formula.	10M	4	2
	OR			
Q.5(B)	Deduce an approximate expression for sag in overhead lines when i) Supports are at equal levels ii) Supports are at unequal levels.	10M	4	2
Q.6(A)	Explain in detail the different types of underground cable.	10M	5	2
	OR			
Q.6(B)	i) Explain the capacitance grading of cable. ii) Derive the equation for capacitance of a 3 core-cable.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – June 2024

POWER ELECTRONICS
(EEE)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	Define latching current.	1M	1	1
	ii.	What are the different types of power MOSFET?	1M	1	1
	iii.	Define the term holding current.	1M	2	1
	iv	Define firing angle.	1M	2	1
	v.	For a boost converter the typical values are D = 0.8, R = 100Ω, and f = 1000 kHz, calculate the value of critical inductance.	1M	3	1
	vi	Define duty ratio of a DC-DC converter.	1M	3	1
	vii.	List the various PWM techniques.	1M	4	1
	viii.	List out the various voltage control methods of single-phase inverters.	1M	4	1
	ix.	List some industrial applications of cycloconverter.	1M	5	1
	x.	What is the use of AC Voltage controller?	1M	5	1
Q.2(A)		Explain the constructional details and working of a power IGBT. Discuss its transfer and output characteristics with neat sketch.	10M	1	2
		OR			
Q.2(B)		Discuss the steady-state characteristics of a power transistor. Also, explain how transistor acts as a switch.	10M	1	2
Q.3(A)		Explain the principle of operation of single phase full controlled bridge rectifier feeding R-L-E load.	10M	2	2
		OR			
Q.3(B)		Explain the operation of three phase half wave controlled converter with inductive load. Sketch the associated waveforms.	10M	2	2
Q.4(A)		Describe the working principle of flyback converter with relevant waveforms.	10M	3	2
		OR			
Q.4(B)		Discuss the working principle of Boost converter with relevant waveforms in CCM and DCM.	10M	3	2
Q.5(A)		List out various voltage control methods of an inverter. Explain SPWM tecl used in singe-phase inverter.	10M	4	2
		OR			
Q.5(B)		Discuss the operation of a three-phase bridge inverter with resistive load in 180^0 conduction mode.	10M	4	2
Q.6(A)		Describe the basic principle of working of a three-phase to three-phase cycloconverter .	10M	5	2
		OR			
Q.6(B)		Explain the single-phase a.c. voltage regulator feeding a resistive load.	10M	5	2

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐ 　　　Question Paper Code: 20EEE111

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – June 2024
MICRO-CONTROLLERS AND INTERFACING
(EEE)

Time: 3Hrs 　　　　　　　　　　　　　　　　　　　　　　　　　　Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	What is Harvard architecture?	1M	1	1
	ii.	Find the suitable value for PSW register to access the register bank 2.1	1M	1	1
	iii.	What is the function of $\overline{EA}$ Pin?	1M	2	1
	iv	Difference between DPTR and PC.	1M	2	1
	v.	What is the difference between assembler and compiler?	1M	3	1
	vi	Mention any two-bit manipulation instructions in 8051.	1M	3	1
	vii.	What is the need for interfacing general purpose I/O to 8051micro-controller?	1M	4	2
	viii.	What is the difference between timers and counters?	1M	4	1
	ix.	Write down the names of different peripherals included in PIC microcontroller system.	1M	5	1
	x.	What is the function of watchdog timer?	1M	5	1
Q.2(A)		Differentiate microprocessor and microcontroller. Mention the advantages of microcontrollers over microprocessor in control applications.	10M	1	3
		OR			
Q.2(B)		Discuss the various special function registers of the 8085 microprocessor.	10M	1	2
Q.3(A)		Explain the I/O port structure of 8051 microcontroller in detail.	10 M	2	2
		OR			
Q.3(B)		(i) Explain about clock and reset circuits of 8051.	5M	2	2
		(ii) Briefly explain about the stack and stack pointer.	5M	2	2
Q.4(A)		Explain Logical Instructions used in 8051 microcontrollers with proper example.	10 M	3	2
		OR			
Q.4(B)		Write an 8051 assembly language program to multiply two 8-bit numbers kept in the external RAM addressed by 8000H and 8001H respectively. Store the result in the external RAM beginning from 7000H.	10M	3	2
Q.5(A)		a) Draw and explain the interfacing of ADC with 8051.	5M	4	2
		b) Explain the control word format of 8255.	5M	4	2
		OR			
Q.5(B)		With the help of proper steps design a µController system using 8051, 8k bytes of program ROM & 32k bytes of data RAM. Interface the memory such that starting address for ROM is 0000H & RAM is 8000H.	10M	4	3
Q.6(A)		(a) Explain about the SCON and SBUF registers used for serial communication.	5M	5	2
		(b) Write the steps to program the 8051 to transfer character bytes serially and write the program for it.	5M	5	3
		OR			
Q.6(B)		Explain about the interfacing of 16×2 LCD display with 8051 microcontroller.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – June 2024
SPECIAL ELECTRICAL MACHINES
(EEE)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	What are the different modes of excitation in a stepper motor?	1M	1	1
	ii.	Define resolution.	1M	1	1
	iii.	Define holding torque.	1M	2	1
	iv	Define pull out torque.	1M	2	1
	v.	What are the merits and demerits of split link converter?	1M	3	1
	vi	What are the different power controllers used for the control of SRM?	1M	3	1
	vii.	Why the PMBLDC motor is called electronically commutated motor?	1M	4	1
	viii.	What are the classifications of BLPM DC motor?	1M	4	1
	ix.	What are different types of rotors available in PMSM motor?	1M	5	1
	x.	What is load commutation?	1M	5	1
Q.2(A)		Explain in detail about power drive circuits of a stepper motor.	10M	1	2
		OR			
Q.2(B)		Explain the construction and various modes of excitation of PM stepper motor.	10M	1	2
Q.3(A)		Explain how hybrid motor can be used for servo control of very slow speed synchronous motor.	10M	2	2
		OR			
Q.3(B)		Explain the open loop controller for a 2-phase stepping motor.	10M	2	2
Q.4(A)		Derive the torque equation of SRM.	10M	3	3
		OR			
Q.4(B)		Draw and explain the general torque-speed characteristics of SRM.	10M	3	2
Q.5(A)		Sketch the structure of controller for PMBLDC motor and explain the funct various blocks.	10M	4	3
		OR			
Q.5(B)		Sketch and explain in detail about the torque – speed characteristics of a PMBLDC motor.	10M	4	3
Q.6(A)		Derive the emf equation of PMSM.	10M	5	2
		OR			
Q.6(B)		Derive the expressions for power input and torque of a PMSM. Explain how its torque - speed characteristics are obtained.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
DESIGN OF MACHINE ELEMENTS
(Mechanical Engineering)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	State the difference between static and dynamic loading in machine elements.	1M	1	1
	ii.	Define factor of safety.	1M	1	1
	iii.	Draw the SN curve for steel with labeling of important points.	1M	2	3
	iv.	State the significance of theories of failure.	1M	2	1
	v.	List the applications of knuckle joint.	1M	3	1
	vi.	Explain a way in which uniform strength can be achieved for all cross-sections along the length of a threaded bolt.	1M	3	3
	vii.	List the two-design basis used for designing shafts.	1M	4	1
	viii.	Draw the top and front views of a fillet joint between two plates.	1M	4	3
	ix.	Mention the applications of multi-leaf spring.	1M	5	1
	x.	Write the Buckingham equation for calculating the wear strength of a gear tooth.	1M	5	1
Q.2(A)		Explain the general steps involved in the design of a machine element with a flow chart.	10M	1	2

OR

Q.2(B)	A hollow circular column carries a projecting bracket, which supports a load of 25 kN as shown in Figure. The distance between the axis of the column and the load is 500 mm. The inner diameter of the column is 0.8 times of the outer diameter. The column is made of steel FeE 200 (S_{yt}= 200 N/mm^2) and the factor of safety is 4. The column is to be designed on the basis of maximum tensile stress and compression is not the criterion of failure. Determine the dimensions of the cross-section of the column.	10M	1	3
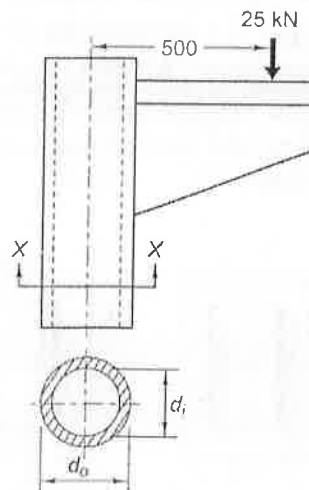
| | | | 10M | 2 | 3 |

Q.3(A) Explain the theories of failure for static loading, namely: Maximum principal stress theory; maximum shear stress theory and maximum Distortion energy theory. 10M 2 3

OR

Q.3(B) A plate made of steel 20C8 (S_{ut} = 440 N/mm²) in hot rolled and normalized condition is shown in Fig. It is subjected to a completely reversed axial load of 30 kN. The notch sensitivity factor 'q' can be taken as 0.8 and the expected reliability is 90%. The size factor is 0.85. The factor of safety is 2. Determine the plate thickness for infinite life. 10M 2 3

±30 kN   ±30 kN

50

—10φ
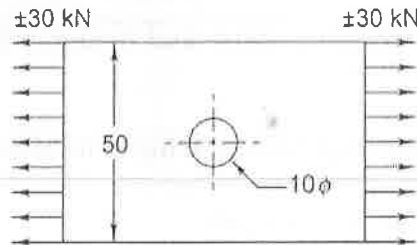
Q.4(A) The structural connection shown in Figure is subjected to an eccentric force P of 10 kN with an eccentricity of 500 mm from the CG of the bolts. The centre-distance between bolts 1 and 2 is 200 mm, and the centre distance between bolts 1 and 3 is 150 mm. All the bol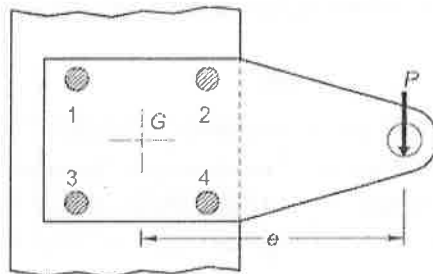ts are identical. The bolts are made from plain carbon steel 30C8 (Syt = 400 N/mm²) and the factor of safety is 2.5. Determine the size of the bolts. 10M 3 3

1   G   2

3   4

|←   e   →|

OR

Q.4(B) It is required to design a knuckle joint to connect two circular rods subjected to an axial tensile force of 50 kN. The rods are co-axial and a small amount of angular movement between their axes is permissible. Design the joint and specify the dimensions of its components. Take Yield strength as 400 N/mm² and factor of safety as 5. 10M 3 4

Q.5(A) A bracket is welded to the vertical plate by means of two fillet welds as shown in Figure. Determine the size of the welds, if the permissible shear stress is limited to 70 N/mm². 10M 4 3

50 kN

300

X — — X   400
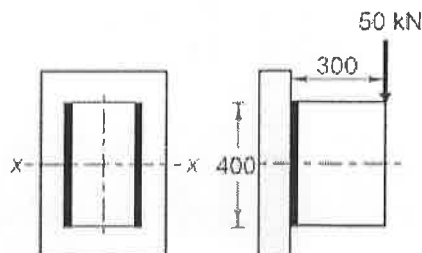
OR

Q.5(B)　A transmission shaft supporting a helical gear B and an overhung bevel gear 　10M　4　3
D is shown in Fig. The shaft is mounted on two bearings, A and C. The pitch
circle diameter of the helical gear is 450 mm and the diameter of the bevel
gear at the forces is 450 mm. Power is transmitted from the helical gear to
the bevel gear. The gears are keyed to the shaft. The material of the shaft is
steel 45C8 (S_{ut}= 600 and S_{yt}= 380 N/ mm^2). The factors k_b and k_t of ASME
code are 2.0 and 1.5 respectively. Determine the shaft diameter using the
ASME code.
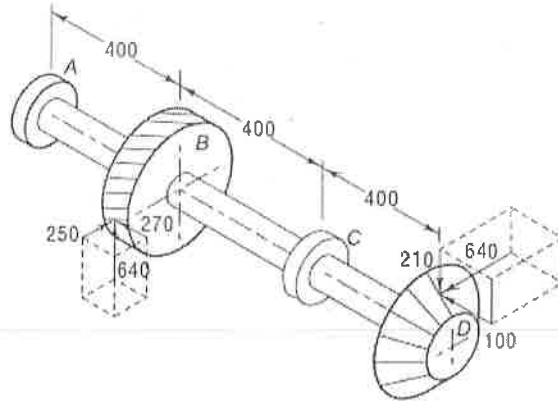
Q.6(A)　A helical compression spring, made of circular wire, is subjected to an axial 　10M　5　3
force, which varies from 2.5 kN to 3.5 kN. Over this range of force, the
deflection of the spring should be approximately 5 mm. The spring index
can be taken as 5. The spring has square and ground ends. The spring is
made of patented and cold-drawn steel wire with ultimate tensile strength
of 1050 N/mm² and modulus of rigidity of 81370 N/mm². The permissible
shear stress for the spring wire should be taken as 50% of the ultimate
tensile strength. Design the spring and calculate
(i) Wire diameter;(ii) Mean coil diameter;(iii) Number of active coils;
(iv) Total number of coils;(v) Solid length of the spring;
(vi) Free length of the spring.

OR

Q.6(B)　It is required to design a pair of spur gears with 20° full-depth involute 　10M　5　4
teeth based on the Lewis equation. The velocity factor is to be used to
account for dynamic load. The pinion shaft is connected to a 10 kW, 1440
rpm motor. The starting torque of the motor is 150% of the rated torque.
The speed reduction is 4:1. The pinion as well as the gear is made of plain
carbon steel 40C8 (S_{ut} = 600 N/mm²). The factor of safety can be taken as
1.5. Design the gears, specify their dimensions and suggest suitable surface
hardness for the gears.

*** END***

Hall Ticket No: ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚ Question Paper Code: 20ME111

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024

HEAT TRANSFER
(Mechanical Engineering)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	Which is the fastest method of heat transfer–conduction, convection, or radiation? Justify your answer.	1M	1	2
	ii.	Addition of insulation to the inside surface of a pipe always reduces heat transfer rate and critical radius concept has no significance. Justify this statement.	1M	1	2
	iii.	Distinguish between heat capacity and specific heat capacity.	1M	2	2
	iv	An iron ball requires 9000 J heat energy to raise its temperature by 10°C. Calculate the heat capacity of the iron ball.	1M	2	2
	v.	What is the effect of increase of pressure on the boiling point?	1M	3	2
	vi	Is it possible that hot fluid temperature inlet & outlet temperatures are the same in a heat exchanger?	1M	3	2
	vii.	Why houses are painted white in hot country?	1M	4	2
	viii	Why are thermometers that are used in weather stations shielded from the sunshine? What does a thermometer measure if it is shielded from the sunshine and if it is not?	1M	4	2
	ix.	Consider two identical cups of coffee, one with no sugar and the other with plenty of sugar at the bottom. Initially, both cups are at the same temperature. If left unattended, which cup of coffee will cool faster?	1M	5	2
	x.	In the analogy between heat and mass transfer, what is a mechanism of heat transfer that does not have an analogous counterpart in mass transfer, and why?	1M	5	2
Q.2(A)		Derive general heat conduction equation in Cartesian coordinates.	10M	1	3
		OR			
Q.2(B)		A copper fin (k=396 W/mK) 0.25 cm in diameter protrudes from a wall at 95°C into ambient air at 25°C. The heat transfer coefficient by free convection is equal to 10W/m2K. Calculate the heat loss if (i) the fin is infinitely long, (ii) the fin is 2.5 cm long and the coefficient at the end is the same as around the circumference.	10M	1	3
Q.3(A)		Briefly explain velocity profiles in laminar, transition and turbulent boundary layers in a flow over a flat plate.	10M	2	3
		OR			
Q.3(B)		A thin 80cm long and 8cm wide horizontal plate is maintained at a temperature of 130°C in large tank full of water at 70°C. Estimate the rate of heat input into the plate necessary to maintain the temperature of 130°C.	10M	2	3
Q.4(A)		Water is to be boiled at atmospheric pressure in a polished copper pan by means of electric heater. The diameter of pan is 0.38m and is kept at 115°C. Calculate the following. (i) Power required to boil the water, (ii)Rate of evaporation, and (iii)Critical heat flux.	10M	3	3
		OR			

Q.4(B)	A condenser is to be designed to condense 600kg/hr of dry saturated steam at a pressure of 0.12bar. A square array of 400 tubes, each 8mm diameter is to be used. The tube surface is maintained at 30°C. Calculate the heat transfer co-efficient and the length of each tube.	10M	3	3
Q.5(A)	Find the relative heat transfer between two large planes at temperature 1000K and 300K when they are (i) Black bodies, and (ii) Grey bodies with emissivities of each surface is 0.7.	10M	4	3

OR

Q.5(B)	Two parallel plates of size 3m×2m are placed parallel to each other at a distance of 1m. One plate is maintained at a temperature of 550°C and the other at 250°C and the emissivities are 0.35 and 0.55 respectively. The plates are located in a large room whose walls are at 35°C. If the plates exchange heat with each other and with the room, calculate (i) Heat lost by plates, and (ii) Heat received by the room.	10M	4	3
Q.6(A)	Hydrogen gases at 3 bar and 1 bar are separated by a plastic membrane having thickness 0.25mm. The diffusion co-efficient of hydrogen in the plastic is 9.1×10^{-8} m^2/s. The solubility of hydrogen in the membrane is 2.1×10^{-3} kg-mole/m^3 bar. An uniform temperature condition of 20°C is assumed. Calculate the following. (i) Molar concentration of hydrogen on both sides, (ii) Molar flux of hydrogen, and (iii) Mass flux of hydrogen.	10M	5	3

OR

Q.6(B)	Dry air at 30°C and one atmospheric pressure flows over a flat plate of 600 mm long at a velocity of 55 m/s. Calculate the mass transfer co-efficient at the end of the plate.	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024
FUNDAMENTALS OF AUTOMOTIVE ENGINEERING
(Mechanical Engineering)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	What is the use of air filters?	1M	1	1
	ii.	Differentiate between chassis and frame of an automobile.	1M	1	1
	iii.	What is meant by carburetion?	1M	2	2
	iv	What is catalytic converter?	1M	2	1
	v.	What is the function of fluid wheel?	1M	3	1
	vi	What are the functions of universal joint?	1M	3	1
	vii.	Define ABS system.	1M	4	2
	viii	What is the major function of braking system?	1M	4	1
	ix.	What is fuel cell?	1M	5	1
	x.	What is the benefit of bio-ethanol?	1M	5	1
Q.2(A)		Discuss transmission system of an automobile. Explain the working principle of CVVT.	10M	1	2
		OR			
Q.2(B)		Draw the layout of an automobile and explain the various components.	10M	1	1
Q.3(A)		Discuss about Single-point and multi-point fuel injection system.	10M	2	1
		OR			
Q.3(B)		Explain the working principle of turbo charger and super charger with neat sketch.	10M	2	2
Q.4(A)		Explain the working of a constant mesh gear box and need of universal joint in automobile with neat schematic diagrams.	10M	3	1
		OR			
Q.4(B)		Explain the working principle and applications of centrifugal clutch.	10M	3	1
Q.5(A)		Discuss the force distribution of electronic brake briefly.	10M	4	1
		OR			
Q.5(B)		What is suspension system? State the function, advantages and limitations.	10M	4	1
Q.6(A)		What is a hybrid vehicle? List the advantages of hydrogen fuel used in automobiles.	10M	5	1
		OR			
Q.6(B)		Discuss the alternative source of energy sources. Explain briefly about engine modification required in automobiles.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations, June – 2024
MANUFACTURING TECHNOLOGY
(Mechanical Engineering)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	What are the various types of chip breakers?	1M	1	1
	ii.	How do you define tool wear?	1M	1	3
	iii.	How is a shaping machine specified?	1M	2	3
	iv	List out the types of boring machine.	1M	2	2
	v.	Distinguish between dressing and truing.	1M	3	3
	vi	Define lapping.	1M	3	1
	vii.	What is the principle of Ultrasonic machining?	1M	4	1
	viii.	What are the applications of ECM?	1M	4	1
	ix.	Write down the formula for calculating the machining time per unit.	1M	5	2
	x.	List the main components of a NC machine tool.	1M	5	2
Q.2(A)		How is tool life affected by variations in the feed rate and depth of cut? Explain.	10M	1	3
		OR			
Q.2(B)		Show schematically the Merchant's force circle. Derive the expression for shear force in terms of the metal properties and cutting process parameters.	10M	1	2
Q.3(A)		List and explain various drilling operations with sketch.	10M	2	2
		OR			
Q.3(B)		List the various methods of indexing. Explain any two methods in detail.	10M	2	2
Q.4(A)		i) Explain the principle of grinding process. ii) Discuss various variables of grinding process.	10M	3	3
		OR			
Q.4(B)		Explain the following terms: i) Dressing, ii) Truing, iii) Loading and iv) Glazing of a grinding wheel.	10M	3	3
Q.5(A)		With the help of neat sketch explain the process of electron beam machining. What are the merits and demerits of EBM?	10M	4	3
		OR			
Q.5(B)		With the help of neat sketch explain the process of electric discharge machining. What are the merits and demerits of EDM?	10M	4	3
Q.6(A)		List the main components of a CNC machine tool and explain their functions.	10M	5	2
		OR			
Q.6(B)		Derive the expression for determining the optimum cutting speed for minimum cost in turning operation.	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – June 2024

ELECTROMAGNETIC FIELDS AND TRANSMISSION LINES
(ECE)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	If there is a charge of 10μC over a filament length of 0.5 m, find its line charge density.	1M	1	1
	ii.	Electrostatic field is conservative in nature. Justify the statement.	1M	1	1
	iii.	What are different types of magnetic materials?	1M	2	1
	iv	State any two differences between diamagnetic and paramagnetic material.	1M	2	1
	v.	If a wave with a frequency of 100 MHz propagates in free space, find the propagation constant.	1M	3	1
	vi	Find the intrinsic impedance of an electromagnetic wave propagating in a medium characterized by $\varepsilon_r=4$, $\mu_r=1$.	1M	3	2
	vii.	A lossless transmission line used in a TV receiver has a capacitance of 50 pF/m and an inductance of 200 nH/m. Find the characteristic impedance of the line.	1M	4	2
	viii.	State the conditions of a lossless and distortion less transmission line	1M	4	1
	ix.	What is stub matching?	1M	5	1
	x.	State any two advantages of Smith Chart.	1M	5	1
Q.2(A)		State and prove Gauss's law in electrostatics. Using Gauss's law, derive an expression for electric field intensity **E** due an infinite plane sheet of charge.	10M	1	3

OR

Q.2(B)	i)	State the relation between electric field **E** and electric potential V.	10M	1	3
	ii)	Potential due to a charge Q is given by $V=2[(x+1)\,(y+2)\,(Z+3)]^2$ Volts in free space. Calculate the following at point P (2, -1,4)
		a) Electric Potential V
		b) Electric Field Intensity **E**
		c) Flux Density **D**
		d) Volume charge distribution ρ_v

Q.3(A)		Explain the concept of	10M	2	2
	i)	Scalar magnetic potential.
	ii)	Vector magnetic potential.

OR

Q.3(B)	Illustrate the physical significance of Gauss's law in magnetostatics. Magnetic field intensity in free space is given by $H = 20(x\alpha_x + y\alpha_y)/(x^2 + y^2)$ A/m i) Show that $\nabla \cdot \mathbf{B} = 0$ ii) Find the current density $\mathbf{J}$	10M	2	3
Q.4(A)	Derive the expression for attenuation and phase constants of uniform plane wave propagating in a lossy medium.	10M	3	3
	OR			
Q.4(B)	Derive the general expression for reflection coefficient and transmission coefficient for **E** and **H** fields when an electromagnetic wave is incident normally on a boundary separating two different conducting media.	10M	3	3
Q.5(A)	Derive the relationship between secondary constant and primary cor ants of a transmission line.	10M	4	3
	OR			
Q.5(B)	A 50 ohms transmission line is terminated to load of 25+j50.The length of the transmission line is 3.3 λ. Find (i) Reflection coefficient (ii) VSWR (iii) Input impedance (iv) Input admittance	10M	4	2
Q.6(A)	Why is it desirable to achieve an impedance match in a transmission line? Explain different methods of impedance matching.	10M	5	3
	OR			
Q.6(B)	Design a stub to match a transmission line which is connected to a load impedance of Z_L = (450-j600) Ω. The characteristic impedance of the line is 300 Ω. The operating frequency is 20 MHz.	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – June 2024

ANALOG COMMUNICATION
(ECE)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	Why is random process important to you, the communication Engineers?	1M	1	1
	ii.	Write the expressions for mean and variance of a random variable.	1M	1	1
	iii.	What is image frequency?	1M	2	1
	iv.	Compare different types of amplitude modulation in terms of their bandwidth requirements.	1M	2	1
	v.	Express the Carson's rule Bandwidth.	1M	3	1
	vi.	What is the need for pre-emphasis and de-emphasis?	1M	3	1
	vii.	State sampling theorem.	1M	4	1
	viii.	Mention the key process involved in converting an analog signal into digital signal.	1M	4	1
	ix.	Define entropy of an information.	1M	5	1
	x.	State Shannon's channel capacity theorem.	1M	5	1
Q.2(A)		Probability density function (PDF) is given by the expression $f_X(x) = ae^{-b\|x\|}$. Here X is a random variable whose values lie in the range $x = -\infty$ to $x = +\infty$, Determine the following: i) The relationship between a and b. ii) Cumulative Distribution Function (CDF) iii) The probability that outcome lies between 1 and 2.	10M	1	4
		OR			
Q.2(B)		Discuss the significance of various CDFs and PDFs with relevant expressions and sketches.	10M	1	3
Q.3(A)		Draw and explain the architecture of Superheterodyne AM receiver. Also, write advantages and disadvantages of this receiver.	10M	2	3
		OR			
Q.3(B)		Write the drawback of the filter method used for the generation of SSB AM. Explain the phase discrimination method and coherent detection for the generation and detection of SSB AM respectively.	10M	2	3
Q.4(A)		a) An angle-modulated signal with carrier frequency $\omega_c = 2\pi \times 10^5$ is described by the equation $s_{FM}(t) = 10\cos(\omega_c t + 10\sin 2000\pi t)$ i. Find the power of the modulated signal. ii. Find the modulation index, β_{FM} iii. Find the frequency deviation, Δf. iv. Estimate the bandwidth of the FM wave.	10M	3	4

b) A carrier wave of frequency 100 MHz is frequency modulated by a sinusoidal wave of amplitude 20V and frequency 100 kHz. The frequency sensitivity of the modulator is 25 kHz/V.

    i.   Determine the approximate bandwidth of the FM wave using Carson's rule.

    ii.   Recalculate the bandwidth when the amplitude of modulating signal is doubled.

OR

Q.4(B)	Discuss the pre-emphasis and de-emphasis in FM communication.	10M	3	2

Q.5(A)	Twenty-four voice signals are sampled uniformly and then time division multiplexer PAM/TDM. The highest frequency of each voice signal is 3.4 KHz and sampling rate of fs = 8kHz.
	
	  a) Calculate the transmission bandwidth of TDM channel.
	  b) Calculate the sampling interval.
	  c) Calculate the time allotted to each channel.
	  d) Calculate the pulse rate (signaling rate).
		10M	4	3

OR

Q.5(B)	With suitable diagram and sketches, explain the Modulation and Demodulation of PAM signal	10M	4	3

Q.6(A)	A voice grade channel of the telephone network has a bandwidth of 3.4 KHz. a) Calculate channel capacity of the telephone channel for signal to noise ratio of 30 dB. b) Calculate the minimum SNR required to support information transmission through the telephone channel at the rate of 4800 bits/sec.	10M	5	3

OR

Q.6(B)	Draw the state diagram, tree diagram and trellis diagram for the K=3, rate=1/3 convolutional encoder described by vectors g1= [1 0 1] and g2= [0 1 1].	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – June 2024

DIGITAL SIGNAL PROCESSING
(ECE)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	List the difference between DFT and DTFT.	1M	1	1
	ii.	Draw and write the radix 2 structure of DIT-FFT and DIF-FFT.	1M	1	1
	iii.	Write any two properties of Butterworth Lowpass Filter.	1M	2	1
	iv	Write the formula for Bilinear Transformation.	1M	2	1
	v.	What is Gibbs phenomenon?	1M	3	1
	vi	Write the different types of windowing techniques of FIR filter.	1M	3	1
	vii.	List down the different addressing modes of the TMS320C6713 processor.	1M	4	1
	viii.	Define Interrupts.	1M	4	1
	ix.	What are the different stages in pipelining?	1M	5	1
	x.	What is an anti- aliasing filter?	1M	5	1
Q.2(A)		i) Find the 4 Point DFT of the sequence x(n) = {1,2,0,1} using matrix method. ii) State and prove linearity property of DFT.	10M	1	3

OR

Q.2(B)	Compute the DFT for the sequence x(n) = {1,1,0,0,-1,-1,0,0} using DIT-FFT algorithm.	10M	1	3
Q.3(A)	Calculate the order & poles of low pass butterworth Filter that has 3 dB attenuation at 500Hz and an attenuation of 40 dB at 1000Hz?	10M	2	4

OR

Q.3(B)	Determine H(z) that results when the bilinear transformation is applied to	10M	2	3

$$H(s) = \frac{s^2 + 4.525}{s^2 + 0.692s + 0.504}$$

Q.4(A)	The desired frequency response of low pass filter is given by	10M	3	3

$$H\left(e^{j\omega}\right) = \begin{cases} e^{-3j\omega} & -\frac{3\pi}{4} \le \omega \le \frac{3\pi}{4} \\ 0 & \frac{3\pi}{4} \le \omega \le \pi \end{cases}$$

Determine the frequency response of the FIR if Hamming window is used with N=7.

OR

Q.4(B)	Obtain the direct form I & direct form II, cascade & parallel form realization of FIR system given as:	10M	3	3

y(n) = -3/8 y(n-1) + 3/32 y(n-2) + 1/64 y(n-3) + x(n) + 3x(n-1) + 2x(n-2)

Q.5(A)	i) With neat diagram, Explain the Harvard architecture used in DSP Processor ii) Discuss the IEEE double pression format.	10M	4	2
	OR			
Q.5(B)	Draw and Explain in details about the architecture of TMS320C67xDsp processor.	10M	4	3
Q.6(A)	Explain in detail about poly-phase decomposition of FIR filters and draw the structure diagram of decimator & interpolator.	10M	5	2
	OR			
Q.6(B)	Given the transfer function of an FIR filter $H(z) = 0.2 + 0.7z^{-1} + 0.8z^{-2} + 0.15z^{-3} + 0.6z^{-4} + 0.32z^{-5} + 0.5z^{-6} + 0.4z^{-7} + 0.9z^{-8}$ perform poly-phase decomposition of H(z) to decompose into **a)** 2-Sections **b)** 3-Sections **c)** 4-Sections.	10M	5	4

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐ Question Paper Code: 20ECE403

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – June 2024
BIO-MEDICAL ELECTRONICS
(ECE)

Time: 3Hrs Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	Classify Physiological Systems in Human body.	1M	1	1
	ii.	Differentiate sensors and actuators.	1M	1	1
	iii.	Draw and label a normal ECG.	1M	2	1
	iv	EMG stands for _____.	1M	2	1
	v.	List the types of Blood Pressure Measurements.	1M	3	1
	vi	Distinguish between stationary anode X-ray tube and rotating anode X-ray tube.	1M	3	1
	vii.	What is MRI use and purpose?	1M	4	1
	viii.	What are the advantages of CT scan over Xray?	1M	4	1
	ix.	Define fibrillation.	1M	5	1
	x.	Why do you need a cardiovascular pacemaker?	1M	5	1
Q.2(A)		With a neat sketch explain Cardio- Vascular System in detail.	10M	1	2
		OR			
Q.2(B)		Describe the piezo electric principle and elaborate how this principle with transducer works for measuring as velocity transducer.	10M	1	2
Q.3(A)		What is EEG? Explain the different frequency bands associated with the respective electrode arrangement.	10M	2	2
		OR			
Q.3(B)		Fully explain the mechanism of the polarization, depolarization, and repolarization of the cell membrane	10M	2	2
Q.4(A)		What is the suitable transducer used for temperature measurement of human body, Explain the principle with neat diagrams	10M	3	2
		OR			
Q.4(B)		What are the different methods used for blood cell counting? Explain the principle of any one method.	10M	3	2
Q.5(A)		How 3D ultrasounds images constructed are, Explain the principle.	10M	4	2
		OR			
Q.5(B)		What is the basic principle of CT? Explain it with the help of a diagram.	10M	4	2
Q.6(A)		What is the purpose of the defibrillator machine? Discuss in detail about Defibrillators.	10M	5	2
		OR			
Q.6(B)		Explain about the working principle of Heart lung machine with neat block diagram	10M	5	2

** END***

Question Paper Code: 20ECE404

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – June 2024

ADVANCED DIGITAL SYSTEM DESIGN USING VERILOG HDL
(ECE)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	Why flip-flops are preferred when compared with latches?	1M	1	1
	ii.	Define encoder and decoder.	1M	1	1
	iii.	Write Verilog code for the half adder.	1M	2	1
	iv	What is the difference between $monitor and $display?	1M	2	1
	v.	Define Procedural and Continuous Assignment Statements.	1M	3	1
	vi	Differentiate between FPGA and ASIC?	1M	3	1
	vii.	Define resource sharing.	1M	4	1
	viii.	What is the role of IOB's in FPGA?	1M	4	1
	ix.	Define global routing?	1M	5	1
	x.	What are the advantages and disadvantages of FPGA?	1M	5	1
Q.2(A)		(i) Design a 3:8 decoder and explain briefly.	5M	1	3
		(ii) Design a 3 bit even parity generator.	5M	1	3
		OR			
Q.2(B)		(i) Explain 16:1 Multiplexer with a neat sketch.	7M	1	2
		(ii) Differentiate between combinational and sequential circuits.	3M	1	2
Q.3(A)		Design and write the Verilog code for 2-bit comparator using behavioral model and data flow model.	10M	2	3
		OR			
Q.3(B)		Write a Verilog HDL code for 4 bit right to left and left to right shift register.	10M	2	3
Q.4(A)		What is meant by resource sharing and explain briefly about logic synthesis and RTL synthesis?	10M	3	3
		OR			
Q.4(B)		(i) What is the difference between RTL synthesis and logic synthesis?	5M	3	2
		(ii)Explain the steps involved in VLSI design flow.	5M	3	3
Q.5(A)		Explain in brief about the architecture of FPGA.	10M	4	2
		OR			
Q.5(B)		Discuss in detail about SRAM based programming technology.	10M	4	3
Q.6(A)		What is the FPGA design flow, and how does it differ from traditional ASIC or microcontroller design flows?	10M	5	2
		OR			
Q.6(B)		What are the primary tools and methodologies used for debugging FPGA designs, including hardware and software solutions?	10M	5	2

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 20CSE110

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
FORMAL LANGUAGES AND AUTOMATA THEORY
(Computer Science & Engineering)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	List any three applications of Automata Theory.	1M	1	1
	ii.	Design FA to check whether given unary number is divisible by three.	1M	1	2
	iii.	State regular expression.	1M	2	1
	iv	Show that $(r*)* = r*$ for a regular expression r.	1M	2	3
	v.	Define a derivation tree for CFG.	1M	3	1
	vi	Construct a CFL from the given grammar S→ aaA, A→S / a	1M	3	2
	vii.	Define GNF.	1M	4	1
	viii.	What are the different ways of language acceptances by a PDA and define them.	1M	4	2
	ix.	Define Instantaneous description of TM.	1M	5	1
	x.	Explain the Class of Grammars.	1M	5	2
Q.2(A)		Let M = ({q0, q1, q2, q3}, {0,1}, δ, q0, {q2, q3}) be NFA. Where δ (q0, 0) = {q0, q1}, δ (q0, 1) = {q1}, δ (q1, 0) = {q2, q3}, δ (q1, 1) = {q0, q1}, δ (q2, 0) = {q2}, δ (q2, 1) = {q0, q3}, δ (q3, 0) = {q3}, δ (q3, 1) = {q2, q3}, Construct its equivalent DFA.	10M	1	4

OR

Consider the Mealy machine described by the transition table given below.
To construct a Moore machine, this is equivalent to mealy machine.

		a = 0		a = 1				
	Present State	Next State	Output	Next S tate	Output			
Q.2(B)	→q1	q3	0	q2	0	10M	1	5
	q2	q1	1	q4	0			
	q3	q2	1	q1	1			
	q4	q4	1	q3	0			

Q.3(A)	Construct the e-NFA for the given regular expression using Thompson's construction method. (00+11)*1(0+1)*	10M	2	6

OR

Q.3(B)	a) Show that L= {a^p ; p is prime number} is not regular.	5M	2	3
	b) List the closure properties of regular languages.	5M	2	2
Q.4(A)	a) Construct Right Linear Grammar from the given Finite Automata.			
		5M	3	4
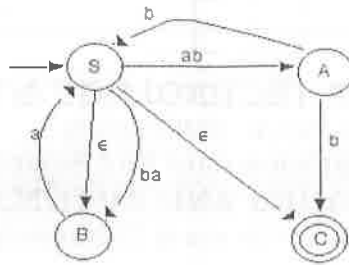
b) Construct a Finite Automata from the given Right Linear Grammar   5M   3   5

  S → A / B / ε
  A → 0S/1B/0
  B → 0S/1A/1

OR

Q.4(B) Let the production of the grammar be
  S → 0B / 1A,
  A → 0 / 0S / 1AA,
  B → 1 / 1S / 0BB and the string 0110.   10M   3   3
  a. Find the left most derivation and associated derivation tree.
  b. Find the right most derivation and associated derivation tree.
  c. Find the G is ambiguous or not.

Q.5(A) Consider the Grammar G = ({S,A,B},{a,b}, P, S} as the productions
  S → AB
  A → BS / b   10M   4   5
  B → SA / a   Convert it into GNF.

OR

Q.5(B) Construct a PDA that accepts the following languages
  L = {ww^R ; w ∈ $(0+1)^*$} by empty stack or final state.   10M   4   4

Q.6(A) Design a TM to recognize the language L ={$a^n b^n$; n>0} and test whether the   10M   5   4
  strings "aabb" is accepts or not.

OR

Q.6(B) Explain the properties of Recursive and Recursively enumerable languages   10M   5   2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024

COMPUTER NETWORKS

(Computer Science & Engineering)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	Define Router.	1M	1	1
	ii.	What is Switching and state the types of switching?	1M	1	1
	iii.	How does the data link layer works?	1M	2	1
	iv	List the types of transmission modes?	1M	2	1
	v.	What is IP addressing and state its types.	1M	3	1
	vi	What is meant by Quality of Service (QoS)?	1M	3	2
	vii.	Summarize the services and elements of transport layer.	1M	4	2
	viii.	How would you compare TCP and UDP?	1M	4	2
	ix.	List the protocols used in Application Layer.	1M	5	1
	x.	Rephrase the meaning for DNS.	1M	5	2
Q.2(A)		Categorize the various layers of TCP/IP Protocol in detail with neat sketch.	10M	1	4
		OR			
Q.2(B)		What is Switching? Classify and explain the types of switching.	10M	1	4
Q.3(A)		a. Discuss on CRC technique with an example.	5M	2	6
		b. Discuss on Checksum approach with an example.	5M		
		OR			
Q.3(B)		What is the need for framing? Explain Character Stuffing and Bit Stuffing in framing.	10M	2	5
Q.4(A)		Discuss about any two Routing algorithms with an example.	10M	3	6
		OR			
Q.4(B)		Explain in detail about the following.			
		a. An Interior Gateway Routing Protocol	5M	3	5
		b. The Exterior Gateway Routing Protocol	5M		
Q.5(A)		Assess the various Congestion Control Policies.	10M	4	5
		OR			
Q.5(B)		a. With the frame format would you explain the UDP protocol?	5M	4	5
		b. With the frame format would you explain the SCTP protocol?	5M		
Q.6(A)		Determine about Domain Name System.	10M	5	2
		OR			
Q.6(B)		Explain the Server side and client-side web page generation.	10M	5	5

*** END***

Hall Ticket No: ⬜⬜⬜⬜⬜⬜⬜⬜⬜⬜   Question Paper Code: 20CSE112

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
MACHINE LEARNING
(Computer Science & Engineering)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	Define Machine learning.	1M	1	1
	ii.	Compare supervised Vs unsupervised learning algorithms.	1M	1	2
	iii.	What is the need of Fuzzy C means algorithm?	1M	2	1
	iv	Write the basic principle of DBSCAN algorithm.	1M	2	1
	v.	Define bayes theorem.	1M	3	1
	vi	What is the need of Ridge regression?	1M	3	1
	vii.	What are the advantages of k-fold cross validation?	1M	4	1
	viii.	Define confusion matrix.	1M	4	1
	ix.	Define latent semantic analysis.	1M	5	1
	x.	What are the advantages of recommendation systems?	1M	5	1
Q.2(A)		Explain in detail about 2-class classification and multi class-classification with examples.	10M	1	2

<div align="center">OR</div>

Q.2(B)	Find the eigen values of A=$\begin{bmatrix} 5 & 4 \\ 1 & 2 \end{bmatrix}$. Show that the sum of eigen values is equal to the trace of the matrix.	10M	1	3

Q.3(A)		10M	2	4

Illustrate in detail about the working mechanism of k-medoids clustering algorithm and construct the graph for the following data:

i	x	y
0	5	6
1	4	5
2	4	6
3	6	7
4	7	8

<div align="center">OR</div>

Q.3(B)	Generate the association rules using Apriorialgorithm. Assume that minimum support (s = 2) and Minimum confidence=50%.	10M	2	4

TID	Items
T1	I1, I3, I4
T	I2,I3,I5,I6
T3	I1, I2, I3, I5
T4	I2, I5
T5	I1, I3, I5

Q.4(A)	Illustrate in detail about the working mechanism of support vector machine with a neat diagram.	10M	3	2

<div align="center">OR</div>

Q.4(B)	The following table contains training examples that helps to predict whether a patient is likely to have a heart attack or not.	10M	3	4

PATIENT ID	CHEST PAIN?	MALE?	SMOKES?	EXERCISES?	HEART ATTACK?
1.	yes	yes	no	yes	yes
2.	yes	yes	yes	no	yes
3.	no	no	yes	no	yes
4.	no	yes	no	yes	no
5.	yes	no	yes	yes	yes
6.	no	yes	yes	yes	no

Note: Construct the decision Tree for the above Training Data

Q.5(A)	Explain in detail about the need of confusion matrix. Give the formula for accuracy, precision, recall and F-score of machine learning model.	10M	4	2

OR

Q.5(B)	A picture contains 100 face images out of which 70 faces are girls and 30 faces are boys. A classifier classifies 65 as girls. Out of 65 classified as girls, 60 are actually girls. Out of 35 classified as boys only 25 are actually boys. Draw the confusion matrix. Calculate precision, recall and F1 score.	10M	4	4

Q.6(A)	Explain in detail about the working principle of Singular Value Decomposition method and interpret about latent semantic analysis technique with examples.	10M	5	3

OR

Q.6(B)	Classify different types of matrix rank reduction techniques with examples.	10M	5	3

*** END***

Question Paper Code: 20CSE404

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024
WEB TECHNOLOGIES
(Computer Science & Engineering)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	Define web browser.	1M	1	1
	ii.	What is the difference between TCP and UDP?	1M	1	2
	iii.	What is CSS padding?	1M	2	1
	iv	Define javascript array.	1M	2	1
	v.	State the difference between GET and POST methods.	1M	3	1
	vi	Define Event Handling in DOM.	1M	3	1
	vii.	State the difference between JSP and Servlet.	1M	4	1
	viii.	What is JSTL?	1M	4	1
	ix.	What are the elements of WSDL?	1M	5	1
	x.	What is Web Services?	1M	5	1
Q.2(A)		Explain in detail about TCP/IP and UDP protocols.	10M	1	2
		OR			
Q.2(B)		Write a HTML program to display a student registration form.	10M	1	3
Q.3(A)		Elaborate in detail the CSS Box model with an example.	10M	2	2
		OR			
Q.3(B)		Describe about JavaScript Operators and Functions with an example.	10M	2	2
Q.4(A)		What are the various levels of DOM? Explain each of them in detail.	10M	3	2
		OR			
Q.4(B)		Explain in detail about Servlet Architecture.	10M	3	2
Q.5(A)		Discuss about XMLHttp Request method with suitable examples.	10M	4	3
		OR			
Q.5(B)		Explain in detail about JSTL tags with suitable examples.	10M	4	2
Q.6(A)		Explain the role of XML schema in building web services in detail.	10M	5	2
		OR			
Q.6(B)		Discuss about the following: a) SOAP b) WSDL	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024

ARTIFICIAL INTELLIGENCE

(Computer Science & Engineering)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	What is Artificial Intelligence?	1M	1	1
	ii.	Define state-space search.	1M	1	1
	iii.	Differentiate between Breadth First Search, and Depth First Search.	1M	2	2
	iv	List out Uninformed search strategies.	1M	2	1
	v.	Differentiate between A* and AO*.	1M	3	2
	vi	Write a short note on Alpha-Beta Cut offs.	1M	3	1
	vii.	What is Inference?	1M	4	1
	viii	What is the syntax of first-order logic in BNF?	1M	4	1
	ix.	Define planning.	1M	5	1
	x.	What is fuzzy logic?	1M	5	1
Q.2(A)		Explain the state space representation of Water – Jug problem.	10M	1	2
		OR			
Q.2(B)		Explain in detail about Nature of Environments and it's Properties.	10M	1	2
Q.3(A)		Illustrate in detail about Bidirectional search strategy with example.	10M	2	3
		OR			
Q.3(B)		Compare sensor less problems with Contingency problems. Provide suitable example.	10M	2	3
Q.4(A)		Explain the basis of Proof by resolution in Propositional logic.	10M	3	2
		OR			
Q.4(B)		Illustrate the process of Hill Climbing search with an algorithm.	10M	3	3
Q.5(A)		Explain the syntax & semantics of First order Logic.	10M	4	2
		OR			
Q.5(B)		Summarize the resolution method in the context of logical inference with its strengths and limitations.	10M	4	3
Q.6(A)		Elaborate the architecture of fuzzy logic system with a neat sketch.	10M	5	3
		OR			
Q.6(B)		Express the following statements using semantic nets. i) Every student has been hit by every teacher (atleast once) ii) Every student has been hit by some teacher (or the other) iii) Some students have been hit by some teachers.	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
AUTOMATA THEORY AND COMPILER DESIGN
(Computer Science &Technology)

Time: 3Hrs

Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	Differentiate NFA and DFA.	1M	1	1
	ii.	Design an NFA with $\sum$ = {0, 1} accepts all string in which the third symbol from the right end is always 0.	1M	1	1
	iii.	Define PDA.	1M	2	1
	iv	Define Pumping Lemma for Context Free Language.	1M	2	1
	v.	Differentiate compiler and interpreter.	1M	3	1
	vi	Define token, lexeme and pattern.	1M	3	1
	vii.	Write the rules for left factoring of the grammar.	1M	4	1
	viii.	Differentiate Top down and Bottom up parser.	1M	4	1
	ix.	What is dead code elimination? Explain with an example.	1M	5	1
	x.	What is algebraic simplification? Explain with an example.	1M	5	1
Q.2(A)		i) Design DFA with $\sum$ = {0, 1} accepts even number of 0's and even number of 1's. ii) Design an NFA with $\sum$ = {0, 1} accepts all string in which the fourth symbol from the right end is always 0.	10M	1	3
		OR			
Q.2(B)		Find the DFA for the following regular expression (a/b)*abb .	10M	1	3
Q.3(A)		i) Show that the following grammar is ambiguous for the string (a+a*a). E->E+E | E-E | E*E | a | (E) ii) Construct a PDA that accepts L = {$0^n 1^n$ | n >= 0}.	10M	2	3
		OR			
Q.3(B)		Design a TM to compute the proper subtraction of two unary numbers. The proper subtraction function f is defined as follows $f(m,n)= \begin{cases} m-n & if\ m > n \\ 0 & otherwise \end{cases}$	10M	2	3
Q.4(A)		Discuss about the various phases of the compiler. Write down the output of each phase for the expression position = initial + rate * 60.	10M	3	3
		OR			
Q.4(B)		Explain the role of Lexical analyzer in compiler.	10M	3	2
Q.5(A)		Construct SLR parsing table for the following grammar. E->E+T, E->T, T->T*F, T->F, F->(E) / id	10M	4	3
		OR			
Q.5(B)		Construct the Predictive parsing table for the following grammar. S->iEtS | iEtSeS|a E->b	10M	4	3

Q.6(A) i) Eliminate the common sub expression from the following basic block.   10M   5   4
            a:=b+c
            b:=a-d
            c:=b+c
            d:=a-d
        ii) Construct and explain the DAG for the following basic block.
            d:= b * c
            e:= a+ b
            b:=b*c
            a:=e-d

OR

Q.6(B) Explain in detail about the issues in the design of code generator.   10M   5   3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024

AI TOOLS, TECHNIQUES AND APPLICATIONS

(Computer Science & Technology)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	What is artificial intelligence?	1M	1	1
	ii.	Differentiate the supervised and unsupervised learning algorithm.	1M	1	1
	iii.	Define K-Means.	1M	2	1
	iv	List the applications of unsupervised learning.	1M	2	1
	v.	Define Single Layer perceptron.	1M	3	1
	vi	State the purpose of confusion matrix.	1M	3	2
	vii.	What is Term frequency?	1M	4	1
	viii.	Mention the use of Semantic analysis.	1M	4	1
	ix.	Specify the types of Image segmentation?	1M	5	3
	x.	Define Deep Neural Network.	1M	5	3
Q.2(A)		How does the Hypothesis testingworks? Explain the Null and alternate hypothesis with example.	10M	1	3
		OR			
Q.2(B)		How would you solve the Wumpus World Environment problem?	10M	1	3
Q.3(A)		Examine the K-Means clustering algorithm with an example.	10M	2	2
		OR			
Q.3(B)		What do you mean by reinforcement learning, explain practical applications of RL?	10M	2	2
Q.4(A)		Illustrate K-Nearest Neighbor classifier with an example?	10M	3	4
		OR			
Q.4(B)		Specify the different types of evaluation classifier performance in detail.	10M	3	3
Q.5(A)		Distinguish the difference between Term frequency and inverse document frequency in detail.	10M	4	2
		OR			
Q.5(B)		List various components of natural language understanding process. Describe syntactic analysis and semantic analysis in brief.	10M	4	2
Q.6(A)		Apply the Gaussian filter and median filter to remove the image noise.	10M	5	3
		OR			
Q.6(B)		Specify the Convolution Neural Network utilization in image processing? Explain thc working process of CNN.	10M	5	5

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
SOFTWARE ENGINEERING
(Computer Science & Technology)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	What is COCOMO Model?	1M	1	1
	ii.	What do you meant by web engineering?	1M	1	1
	iii.	How the CASE tools are classified?	1M	2	1
	iv	What do you meant by client server software engineering?	1M	2	1
	v.	List out the dual role of software.	1M	3	2
	vi	What is SDLC?	1M	3	1
	vii.	Outline various Structural and Behavioural diagrams of UML.	1M	4	1
	viii.	List out the notations used in Data flow diagram.	1M	4	2
	ix.	What are functional and non-functional requirements?	1M	5	1
	x.	What are the types of software maintenance?	1M	5	2
Q.2(A)		Explain SEI-Capability Maturity model in detail.	10M	1	2
		OR			
Q.2(B)		Explain Spiral model and Incremental in Software Development Life Cycle. List out its advantages and disadvantages with neat diagrams.	10M	1	2
Q.3(A)		Discuss about object-oriented design of software with example and neat sketch.	10M	2	2
		OR			
Q.3(B)		Explain the design principles of software Engineering.	10M	2	3
Q.4(A)		Discuss in detail about white box testing with its types and define what is Regression testing.	10M	3	3
		OR			
Q.4(B)		What is black box testing? Explain the different types of black box testing strategies with example?	10M	3	3
Q.5(A)		Explain briefly about taxonomy of CASE tools in detail.	10M	4	3
		OR			
Q.5(B)		Discuss the process of functional point analysis. Explain the function point analysis with sample cases for components of different complexity.	10M	4	3
Q.6(A)		Discuss the characteristics of recent tools in software engineering in detail.	10M	5	2
		OR			
Q.6(B)		Explain in detail about various emergency Trends in Software Engineering.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024

PRINCIPLES OF CYBER SECURITY
(Computer Science & Technology)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	State Fermat's theorem.	1M	1	1
	ii.	Define modular arithmetic	1M	1	1
	iii.	Differentiate between Stream cipher and Block cipher.	1M	2	2
	iv	What is RSA?	1M	2	1
	v.	What is digital signature?	1M	3	1
	vi	How MAC value differs from Hash value?	1M	3	2
	vii.	What is cybercafé ?	1M	4	1
	viii	List out the planning steps followed by the attackers.	1M	4	1
	ix.	Differentiate between DoS and DDoS attacks.	1M	5	2
	x.	What is a security policy?	1M	5	1
Q.2(A)		Explain the importance of discrete logarithm problem in the context of modern cryptography.	10M	1	2
		OR			
Q.2(B)		Provide a simple example of solving a system of congruences using the Chinese Remainder Theorem.	10M	1	3
Q.3(A)		Illustrate the functioning of DES algorithm with a neat sketch	10M	2	3
		OR			
Q.3(B)		Explain Diffie-Hellman Key exchange protocol with a flow chart and an example.	10M	2	2
Q.4(A)		Illustrate in detail about the round function of SHA-512 algorithm.	10M	3	3
		OR			
Q.4(B)		Demonstrate usage of Cryptographic hash functions for Message Authentication code.	10M	3	2
Q.5(A)		Illustrate DoS and DDoS attacks	10M	4	3
		OR			
Q.5(B)		Discuss in detail about social engineering based cyber crimes.	10M	4	2
Q.6(A)		Elaborate the concept of identity theft by including its types and Techniques.	10M	5	2
		OR			
Q.6(B)		Explain the Password Cracking methods in detail.	10M	5	2

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐ Question Paper Code: 20CST401

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024
INTRODUCTION TO MACHINE LEARNING
(Computer Science & Technology)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	Define Reinforcement learning.	1M	1	1
	ii.	What is the use Direct feedback in machine learning process?	1M	1	1
	iii.	Mention the applications of Multi-layer perceptron.	1M	2	2
	iv	What is meant by activation function?	1M	2	1
	v.	What is the difference between Factor Analysis and Principal Component Analysis?	1M	3	1
	vi	What is the use of ISOMAP?	1M	3	1
	vii.	How does SVM handle the curse of dimensionality in high-dimensional feature spaces?	1M	4	1
	viii.	How does SVM handle outliers in the training data?	1M	4	1
	ix.	What is Genetic Programming?	1M	5	1
	x.	List out Genetic Operators in the context of Genetic Algorithms.	1M	5	1
Q.2(A)		Demonstrate how concept learning is applied in the context of searching.	10M	1	2
		OR			
Q.2(B)		Summarize the key steps involved in the Candidate Elimination Algorithm.	10M	1	2
Q.3(A)		Construct an Artificial Neural Network with a specific architecture consisting of two hidden layers.	10M	2	3
		OR			
Q.3(B)		Explain the types ofperceptron'swith an example.	10M	2	2
Q.4(A)		How does interpolation work in the context of Radial Basis Function Networks? Provide an example to illustrate the interpolation process.	10M	3	3
		OR			
Q.4(B)		Explain the concept of Independent Component Analysis (ICA) and its application in dimensionality reduction with a real-world example.	10M	3	5
Q.5(A)		Interpret how SVM regression is more suitable than traditional regression methods.	10M	4	5
		OR			
Q.5(B)		Explain how SVM can be extended for multi-class classification.	10M	4	2
Q.6(A)		Discuss the significance of crossover and mutation operators in Genetic Algorithms. Provide examples to illustrate their impact on the search space.	10M	5	4
		OR			
Q.6(B)		Explore three real-world applications where Genetic Algorithms have been successfully employed.	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
COMPUTER NETWORKS
(CSE - AI)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	What is the computer network definition?	1M	1	1
	ii.	What is network topology?	1M	1	1
	iii.	What is CSMA?	1M	2	1
	iv.	What is Error Control?	1M	2	1
	v.	How does NAT work in networking?	1M	3	1
	Vi	What is difference between IPv4 vs IPv6?	1M	3	1
	vii.	What is flow control?	1M	4	1
	viii.	What are the factors affecting network performance?	1M	4	1
	ix.	What is TELNET?	1M	5	1
	x.	What do you mean by Domain Name System?	1M	5	1
Q.2(A)		What are the seven layers of ISO-OSI model and explain those layers.	10M	1	3
		OR			
Q.2(B)		Discuss the transmission media and explain those types.	10M	1	2
Q.3(A)		What are 3 error detection techniques and explain them.	10M	2	3
		OR			
Q.3(B)		Describe HDLC and PPP protocols How do they differ?	10M	2	2
Q.4(A)		What are the designing issues of network layer?	10M	3	2
		OR			
Q.4(B)		Explain the different routing algorithms.	10M	3	2
Q.5(A)		What are the transport services in computer networks?	10M	4	2
		OR			
Q.5(B)		Explain the elements of the transport layer.	10M	4	2
Q.6(A)		What are the applications of client-server architecture?	10M	5	2
		OR			
Q.6(B)		Classify the main function of the application layer?	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
DATABASE MANAGEMENT SYSTEMS
(CSE-Artificial Intelligence)

Time: 3Hrs

Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	What is DBMS?	1M	1	1
	ii.	What are the advantages of DBMS?	1M	1	1
	iii.	How many types of database languages are?	1M	2	1
	iv.	Define a Relation Schema and a Relation.	1M	2	1
	v.	What is 1NF?	1M	3	1
	vi.	Explain ACID properties.	1M	3	1
	vii.	What is Transaction processing?	1M	4	1
	viii.	Explain Concurrency control	1M	4	1
	ix.	What is DBMS attack?	1M	5	1
	x.	Explain SQL injection .	1M	5	1
Q.2(A)		What are the characteristics and benefits of a database?	10M	1	2
		OR			
Q.2(B)		Explain the difference between file system and database system.	10M	1	2
Q.3(A)		What are in keys in DBMS? and Explain 7 Types of Keys in DBMS.	10M	2	2
		OR			
Q.3(B)		Explain about join operations in relational algebra.	10M	2	2
Q.4(A)		Describe the dependency in normalization.	10M	3	2
		OR			
Q.4(B)		What are Armstrong axioms of functional dependencies?	10M	3	2
Q.5(A)		What is the difference between OLTP and OLAP with examples?	10M	4	2
		OR			
Q.5(B)		Describe the ACID properties of DBMS.	10M	4	2
Q.6(A)		What is the most effective database attack?	10M	5	2
		OR			
Q.6(B)		What is SQL injection, explain with an example?	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024

MACHINE LEARNING

(CSE-Artificial Intelligence)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	What are the challenges in Machine Learning?	1M	1	1
	ii.	Depict a diagram which shows hierarchical relationship between AI, Machine Learning and Deep learning.	1M	1	1
	iii.	What is Multioutput classification?	1M	2	1
	iv	Define support vectors.	1M	2	1
	v.	Write the formula for Bayesian Classifier.	1M	3	1
	vi	What is meant by Ensembling algorithm.	1M	3	1
	vii.	Write the steps for TensorFlow installation.	1M	4	1
	viii	List various stakeholders in cloud computing.	1M	4	1
	ix.	Why do we need CUDA?	1M	5	1
	x.	Define GPU computing.	1M	5	1
Q.2(A)		With the help of neat diagram, explain different steps involved in machine learning process with a suitable example.	10M	1	2
		OR			
Q.2(B)		Describe the following terms with an example: i. Hypothesis Space ii. Version Space iii. Instance space iv. VC Dimension v. Data Set	10M	1	2
Q.3(A)		Explain binary classification and Multiclass classification with suitable examples.	10M	2	3
		OR			
Q.3(B)		Suppose 10000 patients get tested for flu out of them, 9000 are actually healthy and 1000 are actually sick. For the sick people, a test was positive for 620 and negative for 380. For the healthy people, the same test was positive for 180 and negative for 8820. Construct a confusion matrix for the data and compute the precision and recall for the data.	10M	2	4
Q.4(A)		Discuss in detail about CART algorithm.	10M	3	2
		OR			
Q.4(B)		Explain the significance of pruning in decision tree. What are different pruning techniques and explain how it avoids overfitting?	10M	3	2
Q.5(A)		i.With a neat diagram ,explain the architecture of Tensorflow.	5M	4	2
		ii.Describe key characteristics of cloud computing.	5M	4	2
		OR			

Q.5(B)	Illustrate any case study on Healthcare in the cloud using machine learning.	10M	4	2
Q.6(A)	Discuss about various CUDA tools.	10M	5	2

OR

Q.6(B)	How Parallel programming is achieved with CUDA? Explain.	10M	5	2

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20CSD112

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
MACHINE LEARNING
(CSE-data Science)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	What is meant by target function of a learning program?	1M	1	1
	ii.	Define useful perspective on machine learning.	1M	1	1
	iii.	Why tree pruning useful in decision tree induction?	1M	2	1
	iv	Define support vector in SVM.	1M	2	1
	v.	Define entropy.	1M	3	1
	vi	Recall the role of regression model in exploratory data analysis.	1M	3	1
	vii.	What are the types of tensors available in TensorFlow?	1M	4	1
	viii	Define cloud.	1M	4	1
	ix.	What is the use of constant memory?	1M	5	1
	x.	What is the advantage of shared memory in CUDA?	1M	5	2
Q.2(A)		Classify the ingredients of machine learning in detail.	10M	1	2
		OR			
Q.2(B)		Examine the elements of reinforcement learning.	10M	1	4
Q.3(A)		Construct multioutput classification with an example of your own.	10M	2	3
		OR			
Q.3(B)		Explain the difference between linear and logistics regression with Example.	10M	2	2
Q.4(A)		What is the role of kernels? Classify the different type of Kernel.	10M	3	4
		OR			
Q.4(B)		Explain weighted K-nearest Neighbor algorithm.	10M	3	2
Q.5(A)		What do you mean by cloud delivery models? Explain in detail.	10M	4	2
		OR			
Q.5(B)		What statistical distribution functions are provided by Tensor Flow? Explain.	10M	4	2
Q.6(A)		What are warps, threads, thread blocks, and grids? Describe their relationships/hierarchy.	10M	5	3
		OR			
Q.6(B)		Explain the various library function of CUDA used in machine learning.	10M	5	2

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20CSD404

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024
WEB TECHNOLOGIES
(CSE-Data Science)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	Define website.	1M	1	1
	ii.	What is the major difference between XHTML and HTML5?	1M	1	1
	iii.	Write the JavaScript code to print "Good Day" using IF-ELSE condition.	1M	2	1
	iv	How local and global functions can be written using java script.	1M	2	2
	v.	List the application of servlets.	1M	3	1
	vi	Compare the difference between JSP and servlet.	1M	3	5
	vii.	List the rules for creating variables in PHP.	1M	4	1
	viii.	List any two advantages of XML document.	1M	4	1
	ix.	Identify the role of a callback function in performing a partial page update in an AJAX application.	1M	5	4
	x.	Rewrite the definition for UDDI.	1M	5	2
Q.2(A)		Give the structure of HTTP request and response message.	10M	1	2
		OR			
Q.2(B)		Develop an interactive web page for student registration using HTML form elements.	10M	1	5
Q.3(A)		Explain the way in which java script handles arrays with example.	10M	2	2
		OR			
Q.3(B)		(i) Write the JavaScript to display the sort array elements.	5M	2	2
		(ii) Write the JavaScript to reverse a number given.	5M		
Q.4(A)		Describe in detail the session handling in server-side programming.	10M	3	2
		OR			
Q.4(B)		Develop a JSP program to display the grade of a student by accepting the marks of five subjects.	10M	3	5
Q.5(A)		Design simple calculator using PHP.	10M	4	5
		OR			
Q.5(B)		List and explain the XML syntax rules in detail. Explain how a XML document can be displayed on a browser.	10M	4	2
Q.6(A)		Describe briefly about the elements of WSDL.	10M	5	2
		OR			
Q.6(B)		Summarize Ajax client server architecture in detail.	10M	5	4

*** END***

..ADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024
SOFTWARE ENGINEERING
(CSE-Data Science)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	List out any four agile frame works?	1M	2	1
	ii.	What are the different types of software's?	1M	1	1
	iii.	Name any four functional requirements in software engineering?	1M	2	1
	iv	Differentiate user requirements and system requirements?	1M	2	1
	v.	Briefly describe component level design?	1M	3	2
	vi	What are the Golden rules in user interface design?	1M	3	1
	vii.	Differentiate verification and validation?	1M	4	1
	viii.	Write about product metrics?	1M	4	1
	ix.	Define software quality assurance?	1M	5	1
	x.	Compare the various software reviews?	1M	5	4
Q.2(A)		List several software process paradigms. Explain how both waterfall model and incremental model can be accommodated in the spiral process model.	10M	1	2
		OR			
Q.2(B)		What is Agile process model? Explain any two frame works of agile in detail.	10M	1	2
Q.3(A)		Explain the ways and means for collecting the software requirements and how are they organized and represented?	10M	2	2
		OR			
Q.3(B)		(i) Distinguish functional and non-functional requirements. (ii) Give the steps involved in initiating requirement sengineering.	10M	2	3
Q.4(A)		What are the differences between Data flow diagram and Entity relationship diagram? Explain it.	10M	3	3
		OR			
Q.4(B)		(i) Explain about the various design concepts considered during design? (ii) Write short notes on user interface Analysis and design process?	10M	3	2
Q.5(A)		Discuss the differences between black box and white box testing models.	10M	4	3
		OR			
Q.5(B)		What do you mean by system testing? Discuss how these testing models may be used together to test a program schedule.	10M	4	3
Q.6(A)		Briefly describe the ISO 9000 quality standards in relation to software development.	10M	5	2
		OR			
Q.6(B)		What is software Quality and Explain about Principles of Software Process Change in detail.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June – 2024
COMPUTER NETWORKS
(CSE-Cyber Security)

Time: 3Hrs   Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	Define Data Communication?	1M	1	1
	ii.	Differentiate the Half duplex and Full duplex.	1M	1	1
	iii.	Define Ethernet.	1M	2	1
	iv	List the available protocols in network layer.	1M	2	1
	v.	Define unicast routing.	1M	3	1
	vi	State the purpose of IPv6 with respect to IPv4.	1M	3	2
	vii.	What is Socket?	1M	4	1
	viii.	Mention the use of TCP protocol in transport layer.	1M	4	1
	ix.	Define Peer to Peer Networks.	1M	5	3
	x.	What is the use of firewalls?	1M	5	3
Q.2(A)		Explain the layers of OSI model with neat architecture.	10M	1	3
		OR			
Q.2(B)		Explain the core concept of CRC and check sum error detection method with example.	10M	1	3
Q.3(A)		Explain the factors to be considered to build the Bluetooth.	10M	2	2
		OR			
Q.3(B)		Summarize the network layer protocols with adequate block diagram	10M	2	2
Q.4(A)		Explain the link state routing and dynamic routing protocols with example.	10M	3	3
		OR			
Q.4(B)		Differentiate the Intradomain and Intradomain protocols with appropriate example.	10M	3	3
Q.5(A)		Summarize the role of Transmission control protocol in transport layer and explain their services.	10M	4	2
		OR			
Q.5(B)		Explain the State Transmission diagram and explain in detail.	10M	4	2
Q.6(A)		Explain the core concept of WWW, HTTP, DNS in application layer.	10M	5	4
		OR			
Q.6(B)		Determine the need for cryptography and network security in application layer.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024

ROADMAP FOR PATENT CREATION
(MOOC Course- Open Elective)

Time: 3Hrs   Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	What do you mean by Innovation Capital?	1M	1	1
	ii.	Define Patent Portfolio.	1M	1	1
	iii.	What is the use of Patent Searching?	1M	2	1
	iv	How we can file patent in multiple Countries.	1M	2	2
	v.	Which Country is indicated with the patent code "CH"?	1M	3	2
	vi	Define INID.	1M	3	1
	vii.	Whether the Genetically Engineered organisms should be patented in India?	1M	4	1
	viii.	Define Family Patent.	1M	4	1
	ix.	What is meant by FER?	1M	5	1
	x.	List out the members in patent expert team.	1M	5	1
Q.2(A)		List and explain in detail about the Intellectual Property- Tangible and Intangible Assets.	10M	1	3
		OR			
Q.2(B)		Describe about Patent Granting Criteria's in detail.	10M	1	3
Q.3(A)		Illustrate about the IP and Future Areas to Explore.	10M	2	3
		OR			
Q.3(B)		Explain briefly about Non-Obviousness.	10M	2	4
Q.4(A)		What is Patent Searching and Analysis? Elaborate in detail.	10M	3	3
		OR			
Q.4(B)		Explain in detail about IP Audit Framework.	10M	3	3
Q.5(A)		Write short notes on Patentability Tools.	10M	4	3
		OR			
Q.5(B)		Explain in detail about different types of patent.	10M	4	3
Q.6(A)		Describe about International Patent Classification.	10M	5	4
		OR			
Q.6(B)		Describe in detail about Statutory Differences Between India, Europe and USA.	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024

ENERGY CONVERSION TECHNOLOGIES (BIOMASS AND COAL)
(MOOC Course- Open Elective)

Time: 3Hrs

Max Marks: 60

> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	What is conventional and non-conventional energy source?	1M	1	1
	ii.	Define heating value of a fuel.	1M	1	1
	iii.	What is carbonization?	1M	2	1
	iv	What is bio-char?	1M	2	1
	v.	Define transesterification.	1M	3	1
	vi	What is Combustion stoichiometry?	1M	3	1
	vii.	What is co-digestion plant concept?	1M	4	1
	viii.	List the uses of bio-additives.	1M	4	1
	ix.	Define pour point and cloud point.	1M	5	1
	x.	What is torrefaction?	1M	5	1
Q.2(A)		Discuss in detail about various primary and secondary energy sources. List their applications.	10M	1	2
		OR			
Q.2(B)		Discuss in detail about heating value, density, specific gravity, viscosity, flash point, ignition temp, pour point, ash composition of liquid fuels.	10M	1	2
Q.3(A)		Explain in detail about the properties of feedstock and explain with neat sketch about preparation of fuel pellets using bio-additives, carbonization, torrefaction.	10M	2	2
		OR			
Q.3(B)		With neat sketch explain in detail about simultaneous biochar and bio-oil production and their applications.	10M	2	2
Q.4(A)		Explain in detail about the hydrothermal liquefaction of bio-based feedstocks.	10M	3	2
		OR			
Q.4(B)		Compare in detail about sub-supercritical water gasification process with plasma gasification process.	10M	3	2
Q.5(A)		Explain in detail about single/two-stage anaerobic digestion along with wet and dry fermentation.	10M	4	2
		OR			
Q.5(B)		With neat layout explain in detail about distillation, combined biogas and bioethanol production process.	10M	4	2
Q.6(A)		Explain in detail about different types of feedstocks, extraction process and mechanisms of transesterification.	10M	5	2
		OR			
Q.6(B)		Explain in detail about coal classification, properties and storage of coal and coal carbonization.	10M	5	2

*** END***

Question Paper Code: 20CE3M04

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024
SAFETY IN CONSTRUCTION
(MOOC Course- Open Elective)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	Define the term "safety culture."	1M	1	1
	ii.	What are accident patterns?	1M	1	2
	iii.	What are the key considerations for fire safety?	1M	2	1
	iv	What is the penalty for violating safety regulations?	1M	2	1
	v.	Name one hazard associated with confined spaces.	1M	3	1
	vi	What are the different types of injuries?	1M	3	1
	vii.	Name one type of electrical hazard.	1M	4	1
	viii.	How does steel construction differ from masonry and concrete construction?	1M	4	1
	ix.	What are the main components of a site safety program?	1M	5	1
	x.	What is BIM and its relation to safety?	1M	5	2
Q.2(A)		Discuss two theories of accident causation and provide examples to support your explanation.	10M	1	3
		OR			
Q.2(B)		Describe the role of stakeholders in safety management and how they contribute to creating a safe working environment.	10M	1	2
Q.3(A)		Discuss the importance of conducting job hazard analysis in construction and explain the steps involved in this process.	10M	2	2
		OR			
Q.3(B)		Describe the process of accident investigation and explain how it helps in preventing future accidents.	10M	2	2
Q.4(A)		Explain the hazards associated with temporary structures in construction and suggest preventive measures.	10M	3	3
		OR			
Q.4(B)		Discuss the safe handling, disposal, and proper use of materials in construction sites.	10M	3	3
Q.5(A)		Explain the hazards associated with working in confined spaces and outline the safety measures that should be implemented to protect workers.	10M	4	4
		OR			
Q.5(B)		Describe the key components of a safety culture and discuss its significance in promoting a safe work environment.	10M	4	2
Q.6(A)		Discuss the safety measures and precautions involved in steel construction.	10M	5	3
		OR			
Q.6(B)		Discuss electrical safety in the construction industry, highlighting common hazards and safety practices to prevent electrical accidents.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, June– 2024
INTELLECTUAL PROPERTY RIGHTS AND COMPETITION LAW
(MOOC Course- Open Elective)

Time: 3Hrs   **Max Marks: 60**

Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	List out the Importance of IPR and Competition Law.	1M	1	1
	ii.	What is the term of copyright for an Author of a book?	1M	1	1
	iii.	How long do patents usually last for?	1M	2	1
	iv.	If a company develops a new technology that improves its main product, what type of intellectual property can they use to stop others from copying their invention?	1M	2	2
	v.	Give two examples of Non – Patentable inventions.	1M	3	2
	vi	What are the legislations covering IPRs in India?	1M	3	1
	vii.	If an employee in a company develops a program, would this employee own the copyright?	1M	4	1
	viii	What is Infringement of trademark?	1M	4	1
	ix.	Who are responsible for administration of IPRs in the country?	1M	5	1
	x.	List few patent offices in India.	1M	5	1
Q.2(A)		Briefly trace the history of IPR.	10M	1	3
		OR			
Q.2(B)		Explain the different forms of Intellectual Property Rights.	10M	1	3
Q.3(A)		Bring Out the inventions not patentable as laid down in the Indian Patent Act, 1970.	10M	2	3
		OR			
Q.3(B)		Explain about the Trade Marks and rights arising from trade mark registration.	10M	2	4
Q.4(A)		Examine the need for intellectual property laws in a developing country like India.	10M	3	3
		OR			
Q.4(B)		Explain the Cyber Property Rights and How to ensure the enforcement of IPR Laws.	10M	3	3
Q.5(A)		Describe about the unfair competition in IPR and also discuss the legalities involved in protecting against unfair competition.	10M	4	3
		OR			
Q.5(B)		What is Digital Rights? What are the ways to protect the digital rights?	10M	4	3
Q.6(A)		Discuss any one case study on patents, copyright and related rights.	10M	5	4
		OR			
Q.6(B)		What are the current issues on Intellectual property Rights? Explain them in detail.	10M	5	3

*** END***