

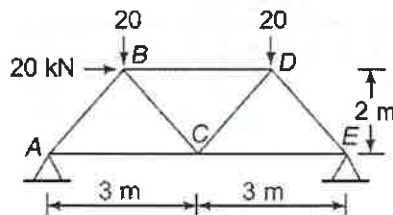
**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**  
 (UGC-AUTONOMOUS)  
**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**  
**STRUCTURAL ANALYSIS**  
 (Civil Engineering)

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 Part-A or B only

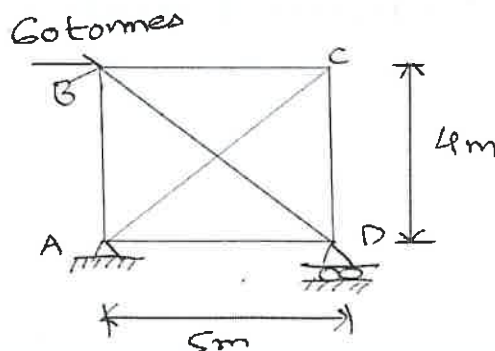
Q.No.	Question	Marks	CO	BL
Q.1	i. Define kinematic redundancy.	1M	1	1
	ii. What is meant by relative stiffness of a member?	1M	1	2
	iii. Write the different steps of Slope deflection method.	1M	2	2
	iv. What is meant by indeterminate structures?	1M	2	1
	v. Define distribution factor and carry over factor in moment distribution method.	1M	3	2
	vi. Give the mathematical expression for the degree of static indeterminacy of rigid jointed plane frames.	1M	3	2
	vii. Define static indeterminacy.	1M	4	1
	viii. Write the different steps of moment distribution method.	1M	4	2
	ix. Give the mathematical expression for the degree of internal indeterminacy of a continuous beam.	1M	5	2
	x. Write the different steps of Kani's method.	1M	5	1
Q.2(A)	Analyze the truss as shown in the figure below. The support A and E are hinged ends. Assume E as constant. The area of cross section of the members is also constant.	10M	1	5



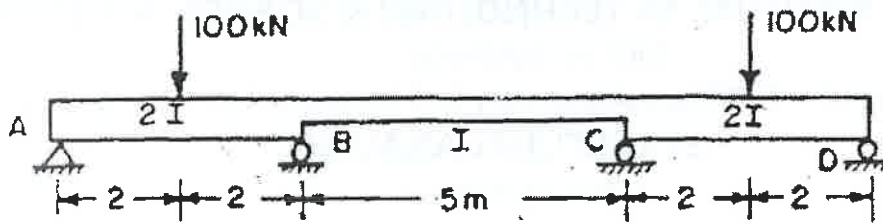
OR

Analyze the truss as shown in the figure below.  $E=2000t/cm^2$ . The area of cross-section of all the members is  $10cm^2$ .

Q.2(B)

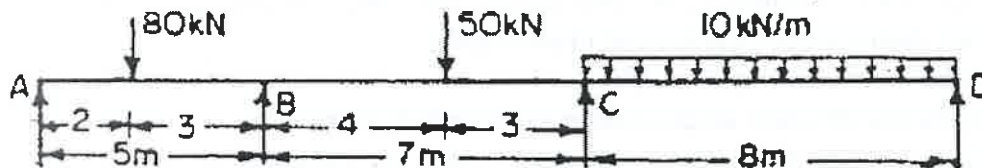


- Q.3(A) - For a three span beam shown in figure below find the reactions and support moments using theorem of three moments. 10M 2 5

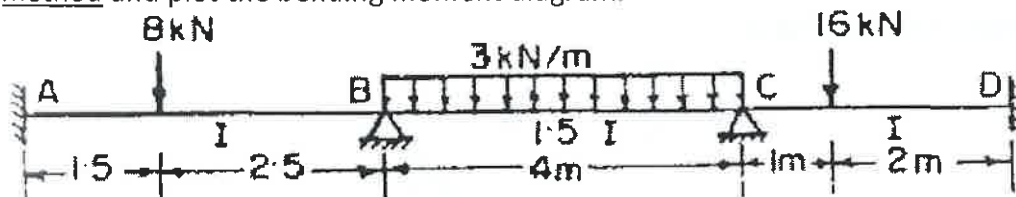


OR

- Q.3(B) A continuous beam ABCD (shown in the figure below), 20 m long is carried on supports at its end and is propped at the same level at points 5 m and 12 m from left end A. It carries two concentrated loads of 80 kN and 50 kN at 2 m and 9 m respectively from A and uniformly distributed load of 10 kN/m run over the span CD. The support B sinks by 10 mm below A and C. Moment of inertia for the whole beam =  $85 \times 10^5 \text{ mm}^4$  and  $E = 2.1 \times 10^6 \text{ N/mm}^2$ . Find the B.M. at the four supports using theorem of three moments. 10M 2 5

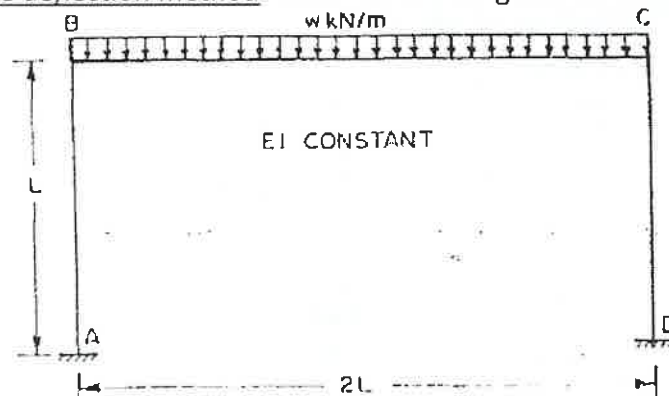


- Q.4(A) A continuous beam ABCD is fixed at ends A and D, and is loaded as shown in figure below. Determine the moments at these supports using slope deflection method and plot the bending moment diagram. 10M 3 5

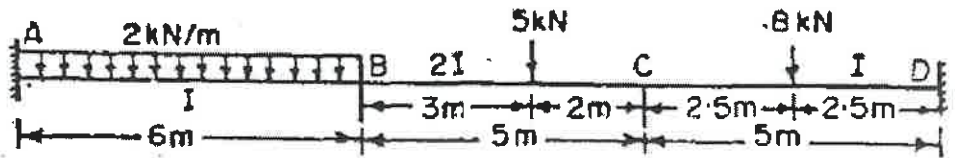


OR

- Q.4(B) A portal frame ABCD is fixed at A and D, and is loaded as shown in the figure below. Treating Joints B and C as rigid, calculate the moments at A, B, C and D using slope deflection method. Draw the bending moment diagram. 10M 3 5

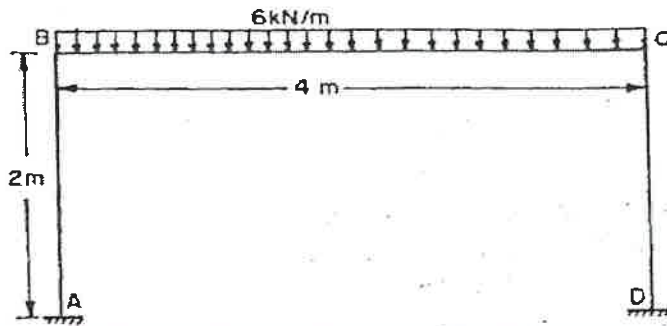


- Q.5(A) Analyze the continuous beam shown in the figure below using Moment Distribution Method. Supports A and D are fixed. Also draw the BMD. 10M 4 5

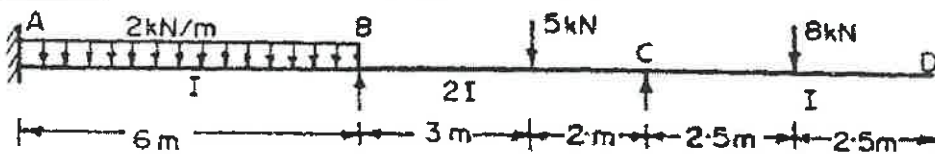


OR

- Q.5(B) Analyze the frame shown in figure below using Moment Distribution Method. Also draw the BMD. 10M 4 5

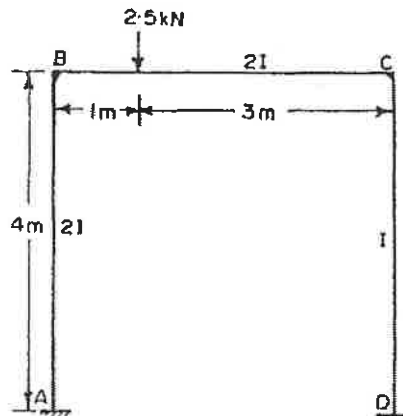


- Q.6(A) Analyze the continuous beam shown in the figure below using Kani's Method. Also draw the BMD. Support D is free. 10M 5 5



OR

- Q.6(B) Analyze the frame shown in the figure below using Kani's Method. Also draw the BMD. 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, July - 2023

### 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

S.No.	Question	Marks	CO	BL
Q.1	i. Define delta?	1M	1	1
	ii. Define field capacity?	1M	1	1
	iii. List the losses in canal?	1M	2	1
	iv. What are the advantages of canal lining?	1M	2	1
	v. What is catchment yield?	1M	3	1
	vi. Show the demand curves?	1M	3	1
	vii. Define a dam?	1M	4	1
	viii. How to select site for a dam?	1M	4	1
	ix. What are storage plants?	1M	5	1
	x. Define medium head hydroelectric scheme?	1M	5	1
Q.2(A)	Elaborately explain the factors affecting Duty?	10M	1	6
	OR			
Q.2(B)	Discuss the various remedial measures adopted for prevention of waterlogging?	10M	1	6
Q.3(A)	Explain about the Lacey's theory of regime channels?	10M	2	6
	OR			
Q.3(B)	Explain about the necessity and location of falls?	10M	2	4
Q.4(A)	Briefly explain the selection of suitable type of cross drainage work?	10M	3	2
	OR			
Q.4(B)	Analyze the various zones of storage in a reservoir?	10M	3	4
Q.5(A)	Illustrate the practical criteria for safe design of earth dams?	10M	4	2
	OR			
Q.5(B)	Discuss on types of spillways?	10M	4	6
Q.6(A)	Write a brief note on hydro power potential study?	10M	5	1
	OR			
Q.6(B)	How to Select the suitable type of turbine?	10	5	5

\*\*\* END\*\*\*

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****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

S.No.	Question	Marks	CO	BL
Q.1	i. State various design philosophies used for R.C.C .Design	1M	1	1
	ii. What are the partial safety factors for concrete and steel used in Limit state of serviceability?	1M	1	1
	iii. Write a note on behavior of concrete in tension	1M	2	2
	iv. Write the advantages of Doubly reinforced sections	1M	2	2
	v. When is shear reinforcement necessary?	1M	3	2
	vi. What is the flexural strength of M30 concrete as per IS 456:2000?	1M	3	1
	vii. What are the different types of staircases	1M	4	1
	viii. Why torsional reinforcements are provided in two-way slabs	1M	4	2
	ix. What are the critical sections for one-way and two-way shear in the design of footings?	1M	5	2
	x. Under what circumstances combined footings are adopted?	1M	5	1
Q.2(A)	Differentiate between the working stress method and the limit state method.	10M	1	4
<b>OR</b>				
Q.2(B)	Explain the balanced section, under-reinforced section, and over-reinforced section by using the strain profile.	10M	1	2
Q.3(A)	Determine the lever arm and moment of resistance of the beam section of size 275 X425mm. It is reinforced with 4 number of 16mm diameter bars with an effective cover of 35mm. Use M20 and Fe250 grades of concrete and steel respectively.	10M	2	4
<b>OR</b>				
Q.3(B)	Determine the ultimate moment of resistance of an L-beam for the following data: Width of the flange= 1200mm, Depth of the slab= 110mm Effective depth= 600mm, Width of the web= 300mm The characteristic strength of concrete obtained from test results is 22 N/mm <sup>2</sup> and the yield stress of steel is 460 N/mm <sup>2</sup> Area of the tension steel provided as 5 – 32 mm bars	10M	2	3

Q.4(A) A RC beam, 300 mm x 450 mm depth in cross section is reinforced with 3 No. 20 mm diameter bars of grade Fe 415 with an effective cover of 50 mm. The factored shear force at the section is 150 KN. Design shear reinforcement using only vertical stirrups for resisting shear. Assume concrete of grade M 25. 10M 3 3

OR

Q.4(B) A cantilever of 3.5m span is 300mm wide and 600mm deep. It is subjected to a maximum BM of 125 kNm due to uniformly distributed service loads out of which 50% moment is due to permanent loads. The beam is reinforced with 4 bars of 20mm diameter bars at an effective cover of 50mm in the tension zone. Check the beam for deflection using M20 and Fe 415 steel. Assume the age of the concrete as 28 days 10M 3 4

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Q.5(A) Design a dog-legged stair for a building in which the vertical distance between the floors is 3.6 m. The stair hall measures 2.5 m x 5m. The live load is taken as 2500 N/m<sup>2</sup>. Use M20 grade and Fe 415 steel bars. Create a bar bending schedule for the design with a neat sketch. 10M 4 3

OR

Q.5(B) Design a continuous R.C. slab for a classroom 7 m wide and 14 m long. The roof is to be supported on RCC beams spaced at 3.5 m intervals. The width of the beam should be kept 250 mm. The superimposed load is 3 KN/m<sup>2</sup> and the finishing load expected is 1 KN/m<sup>2</sup>. Use M 20 concrete and Fe 415 steel. 10M 4 4

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Q.6(A) Design as axialload-tied column 450 mm x 450 mm pinned at both ends with an unsupported length of 4.5 m for carrying a factored load of 300 KN. Use M20 grade of concrete and Fe 415 steel. 10M 5 4

OR

Q.6(B) Design a square footing for an axially loaded column of size 300 mm x 300 mm carrying 600 KN load. Use M 20 concrete and Fe 415 steel. The safe bearing capacity of soil is 180kN/m<sup>2</sup>. Sketch the details of reinforcement. 10M 5 4

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

**B.Tech. III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**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

S.No.	Question	Marks	CO	BL
Q.1	i. Define plant factor.	1M	1	1
	ii. List the various conventional source of energy.	1M	1	1
	iii. What is the skin effect?	1M	2	1
	iv. If $y$ is the number of layers in an ACSR conductor then write the formula to find its diameter	1M	2	2
	v. What is the surge impedance of a line? Also, give its mathematical expression.	1M	3	1
	vi. What is the Ferranti effect?	1M	3	1
	vii. What is sag and tension?	1M	4	1
	viii. What is corona?	1M	4	1
	ix. What is the necessity of using inter-sheath grading?	1M	5	1
	x. List the advantages of cables for power transmission.	1M	5	1
Q.2(A)	Explain the different topologies of the distribution system.	10M	1	1
<b>OR</b>				
Q.2(B)	There are three consumers of electricity have different load requirements at different times. Consumer 1 has a maximum demand of 5 kW at 6 p.m. and a demand of 3 kW at 7 p.m. and a daily load factor of 20%. Consumer 2 has a maximum demand of 5 kW at 11 a.m., a load of 2 kW at 7 p.m. and an average load of 1200 W. Consumer 3 has an average load of 1 kW and his maximum demand is 3 kW at 7 p.m. Determine: (a) the diversity factor, (b) the load factor and average load of each consumer, and (c) the average load and load factor of the combined load.	10M	1	3
Q.3(A)	Deduce an expression for the line to neutral capacitance for a 3-phase overhead transmission line when the conductors are (i) symmetrically placed (ii) unsymmetrically placed but transposed	10M	2	2
<b>OR</b>				
Q.3(B)	Derive an expression for the flux linkages of an isolated current-carrying conductor (i) due to internal flux (ii) due to external flux	10M	2	2

Q.4(A) Using the nominal- $\pi$  method, find the sending-end voltage and voltage regulation of a 250 km, three-phase, 50 Hz, transmission line delivering 25 MVA at 0.8 lagging power factor to a balanced load at 132 kV. The line conductors are spaced equilaterally 3 m apart. The conductor resistance is 0.11 ohm/km and its effective diameter is 1.6 cm. Neglect leaking.

OR

Q.4(B) A 220kV, three-phase transmission line is 60km long. The resistance is 0.15 $\Omega$ /Km and the inductance is 1.4 mH/Km. Use the short line model to find the voltage and power at the sending end and the voltage regulation and efficiency when the line is supplying a three-phase load of  
(a) 300 MVA at 0.8 pf lagging at 220 kV  
(b) 300 MVA at 0.8 pf leading at 220 Kv

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Q.5(A) Deduce an approximate expression for sag in overhead lines when  
(i) supports are at equal levels  
(ii) supports are at unequal levels.

OR

Q.5(B) Discuss the phenomenon of corona and the factors which affect the corona loss.

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Q.6(A) Explain in detail the different types of insulating materials.

OR

Q.6(B) In a 66 kV lead-sheathed paper insulated cable with one intersheath, the insulating material has a permissible potential gradient of 40 kV/cm. Calculate the maximum overall diameter of the cable and the voltage at which the intersheath must be maintained. What is the economic conductor diameter and overall diameter of a similar cable with no intersheath?

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Hall Ticket No:

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Question Paper Code: 20EEE111

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**MICROCONTROLLERS AND INTERFACING**

(Electrical & Electronics 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

S.No.	Question	Marks	CO	BL
Q.1	i. Compare between Full address (Absolute) & Partial address (Linear) Decoding.	1M	4	1
	ii. What is a stack pointer?	1M	1	1
	iii. Give an example of a 16-bit Microcontroller.	1M	2	1
	iv. Define interrupt.	1M	2	1
	v. Explain the following instructions. RRC A	1M	3	2
	vi. Write down the differences between compiler and assembler.	1M	3	1
	vii. What is absolute decoding?	1M	4	1
	viii. What is the function of Latch in memory interfacing?	1M	4	1
	ix. What is a watchdog timer?	1M	5	1
	x. Write down one application of USART.	1M	5	2
Q.2(A)	Explain the role of microcontrollers in embedded systems with the example of speed controllers of motors.	10M	1	3
	OR			
Q.2(B)	Explain about bus communication process in 8085 microprocessors.	10M	1	2
Q.3(A)	Enlist the various flags in the PSW register. Discuss the function of RSO and RS1 bits in PSW.	10M	2	3
	OR			
Q.3(B)	Enlist the various flags in the PSW register. Discuss the function of RSO and RS1 bits in PSW.	10M	2	3
Q.4(A)	Explain different types of Arithmetic instructions used in 8051 microcontrollers with suitable examples.	10M	3	2
	OR			
Q.4(B)	Explain different types of instruction sets used in the 8051 Microcontroller with proper examples.	10M	3	2
Q.5(A)	Explain the I/O ports of 8051 microcontrollers with a neat, labeled diagram.	10M	4	2
	OR			
Q.5(B)	Design a Microcontroller system using 8051. Interface the external RAM of size 16k x 8.	10M	4	3

Q.6(A) Explain the architecture of PIC microcontroller with proper block diagram. 10M 5 3

OR

Q.6(B) Discuss the peripherals features of the PIC microcontroller. 10M 5 2

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**POWER ELECTRONICS**

(Electrical & Electronics 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

		Marks	CO	BL
Q.1	i. Which is the most effective method of turning ON of an SCR?	1M	1	2
	ii. Define reverse recovery time of the power diode.	1M	1	1
	iii. In a single phase full wave controlled bridge rectifier, at what firing angle minimum output voltage is obtained?	1M	2	2
	iv. Write the output voltage equation of single-phase half bridge rectifiers.	1M	2	1
	v. Which grade of thyristors is required to design a chopper?	1M	3	1
	vi. Define duty ratio of a DC-DC converter.	1M	3	2
	vii. What is pulse width modulation?	1M	4	1
	viii. Write the applications of current source inverters.	1M	4	1
	ix. What should be the range of turn-off time of thyristors for application in cycloconverter circuitry?	1M	5	1
	x. List some industrial applications of cycloconverter.	1M	5	1
Q.2(A)	Define commutation? Classify various methods to commutate a SCR. Explain any three methods of commutation with relevant sketches. OR	10M	1	2
Q.2(B)	(i) Discuss the switching characteristics of a power MOSFET (ii) Compare power MOSFET with BJT.	10M	1	2
Q.3(A)	With necessary circuit and waveforms, explain the principle of operation of single phase full controlled bridge rectifier feeding R-L-E load and derive the expression for the average output dc voltage. OR	10M	2	2
Q.3(B)	Explain the working of a 3-phase full bridge converter feeding R load with its output voltage waveforms for a firing angle of (a) $30^\circ$ (b) $60^\circ$ (c) $90^\circ$ . Also derive the expression for the average output DC voltage.	10M	2	3
Q.4(A)	What is the name of the DC-DC converter whose voltage gain ratio is $\frac{V_o}{V_s} = D$ . Here, $V_o$ is the average output voltage, $V_s$ is the input voltage and D is the duty ratio of the converter. Describe the working of the converter OR	10M	3	2
Q.4(B)	Describe the working principle of Boost converter with relevant waveforms in CCM and DCM. Also, derive an expression for the output voltage in terms of input voltage and duty cycle.	10M	3	3

Q.5(A) With the help of neat circuit diagram and waveforms, explain briefly the operation of a three-phase bridge inverter with resistive load in 120° conduction mode. 10M 4 3

**OR**

Q.5(B) Explain the principle of operation of the single-phase full bridge inverter with RL load along with suitable waveforms. Also write the appropriate expressions. 10M 4 2

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Q.6(A) For a single-phase a.c. voltage regulator feeding a resistive load, draw the waveforms of source voltage, gating signals, output voltage, output current and voltage across SCRs. Describe its working with reference to the waveforms drawn. 10M 5 2

**OR**

Q.6(B) Describe the basic principle of working of a three-phase to three-phase cycloconverter along with the help of schematic diagram and basic circuit. 10M 5 2

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**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****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

S.No.	Question	Marks	CO	BL
Q.1	i. Define step angle in a stepper motor. Write its formulated expression.	1M	1	1
	ii. What is mean by lead angle in stepper motor.	1M	1	1
	iii. What is synchronism in stepper motor?	1M	2	1
	iv. Define holding torque.	1M	2	1
	v. What are the advantages of switched reluctance motor?	1M	3	1
	vi. Name two rotor position sensing schemes those use sensors in switched reluctance motor.	1M	3	1
	vii. Why is the PMBLDC motor called electronically commutated motor?	1M	4	1
	viii. What is the permeance coefficient?	1M	4	1
	ix. What are types of PMSM?	1M	5	1
	x. Write few applications of permanent magnet synchronous motor.	1M	5	1
Q.2(A)	Explain the constructional features of a Permanent Magnet Stepper Motor with 4-phase and 6 rotor teeth.	10M	1	2
	<b>OR</b>			
Q.2(B)	Explain with proper diagram the control of VR stepper using 8051 Microcontroller in 2 phase mode.	10M	1	2
Q.3(A)	Discuss sensor less control of switched reluctance motor with proper diagram.	10M	2	2
	<b>OR</b>			
Q.3(B)	Derive the per phase torque equation for variable reluctance stepper motor	10M	2	2
Q.4(A)	Explain with a neat diagram the constructional details and working of rotary switched reluctance motor.	10M	3	2
	<b>OR</b>			
Q.4(B)	Write short notes on following rotor position sensing mechanisms used in SRM drive i) Optical position sensing scheme, ii) Hall effect sensing scheme.	10M	3	1
Q.5(A)	Derive the EMF equation of PMBLDC motor.	10M	4	2
	<b>OR</b>			
Q.5(B)	Discuss about power converter circuits in PMBLDC motor.	10M	4	2
Q.6(A)	Explain the construction and operation of a permanent magnet synchronous motor.	10M	5	2
	<b>OR</b>			
Q.6(B)	Explain Torque/speed characteristics of the sine wave motor.	10M	5	2

\*\*\* END\*\*\*

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

**B.Tech. III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**DESIGN OF MACHINE ELEMENTS**

(Mechanical Engineering)

Time: 3Hrs

Max Marks: 60

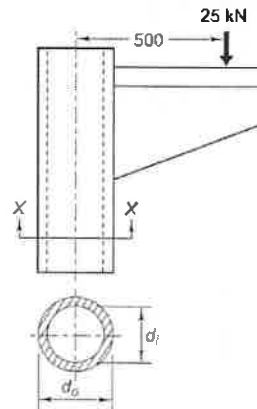
Attempt all the questions. All parts of the question must be answered in one place only.  
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

S.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. Draw a diagram detailing the terminology of a screw thread with proper labeling.	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**

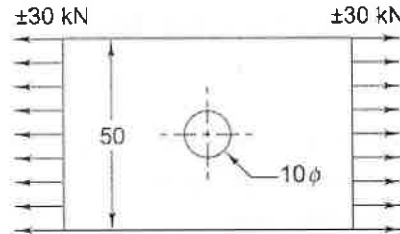
Q.2(B) A hollow circular column carries a projecting bracket, which supports a load of 25 kN as shown in Figure. The distance between the axis of the column and the load is 500 mm. The inner diameter of the column is 0.8 times of the outer diameter. The column is made of steel FeE 200 ( $S_{yt} = 200 \text{ N/mm}^2$ ) 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



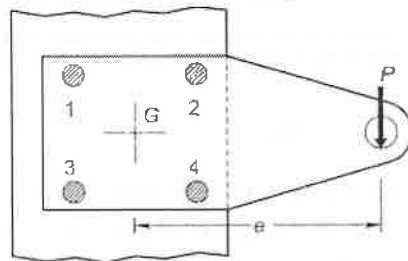
Q.3(A) A mild steel shaft of 50 mm diameter is subjected to a bending moment of  $2 \times 10^6$  N mm and a torque T. If the yield point of the steel in tension is 200 MPa, find the maximum value of this torque without causing yielding of the shaft according to: (i) Maximum principal stress theory and (ii) Maximum shear stress theory. 10M 2 3

OR

Q.3(B) A plate made of steel 20C8 ( $S_{ut} = 440$  N/mm<sup>2</sup>) 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



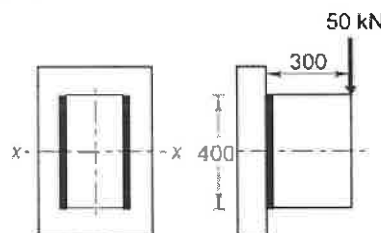
Q.4(A) The structural connection shown in Figure is subjected to an eccentric force P of 10 kN with an eccentricity of 500 mm from the CG of the bolts. The centre-distance between bolts 1 and 2 is 200 mm, and the centre distance between bolts 1 and 3 is 150 mm. All the bolts are identical. The bolts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



OR

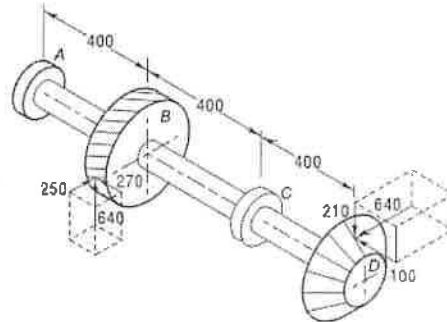
Q.4(B) It is required to design a knuckle joint to connect two circular rods subjected to an axial tensile force of 50 kN. The rods are co-axial and a small amount of angular movement between their axes is permissible. Design the joint and specify the dimensions of its components. Take Yield strength as 400 N/mm<sup>2</sup> 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/mm<sup>2</sup>. 10M 4 3



OR

- Q.5(B) A transmission shaft supporting a helical gear B and an overhung bevel gear 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  $S_{yt} = 380 \text{ N/mm}^2$ ). 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 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  $1050 \text{ N/mm}^2$  and modulus of rigidity of  $81370 \text{ N/mm}^2$ . The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Design the spring and calculate
- Wire diameter;
  - Mean coil diameter;
  - Number of active coils;
  - Total number of coils;
  - Solid length of the spring;
  - Free length of the spring.

OR

- Q.6(B) It is required to design a pair of spur gears with  $20^\circ$  full-depth involute 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 ( $S_{ut} = 600 \text{ N/mm}^2$ ). The factor of safety can be taken as 1.5. Design the gears, specify their dimensions and suggest suitable surface hardness for the gears.

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**MANUFACTURING TECHNOLOGY-II**

(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

S.No.	Question	Marks	CO	BL
Q.1	i. Mention the major limitation of the machining process.	1M	1	1
	ii. List the differences between oblique cutting and orthogonal cutting.	1M	1	1
	iii. Name the mechanism used for tool feed in the shaper machine.	1M	2	1
	iv. State the principal of broaching operation.	1M	2	1
	v. Describe the function of electrolytes in electro chemical machining.	1M	3	2
	vi. Why abrasive particles are not reused in abrasive jet machining?	1M	3	1
	vii. Mention the significance of economic considerations in machining.	1M	4	1
	viii. List the advantages of employing robots in industrial work.	1M	4	1
	ix. State the definition of Talysurf.	1M	5	1
	x. Describe the use of bevel protractor in metrology.	1M	5	2
Q.2(A)	Explain the different types of tool wear. Also, describe the stages of tool wear during machining.	10M	1	2
	<b>OR</b>			
Q.2(B)	Derive an expression to establish the relationship between shear angle, rake angle and chip thickness ratio for orthogonal cutting operation.	10M	1	3
Q.3(A)	With a neat sketch explain the crank and slotted link mechanism for shaper.	10M	2	2
	<b>OR</b>			
Q.3(B)	Briefly explain cutting speed, feed and depth of cut of a turning operation. Furthermore, consider a case in which a mild steel rod having 50 mm diameter and 500 mm length is to be turned on a lathe. Determine the machining time to reduce the rod to 45 mm in one pass when cutting speed is 30 m/min and a feed of 0.7 mm/rev is used.	10M	2	2
Q.4(A)	Explain the working principle, construction, advantages, limitation and application of electro-discharge machining with a suitable diagram.	10M	3	2
	<b>OR</b>			
Q.4(B)	Explain the working principle, construction, advantages, limitations and application of laser beam machining with a suitable diagram.	10M	3	2
Q.5(A)	Derive the expression for determining the optimum cutting speed for minimum cost of production in turning operation.	10M	4	3
	<b>OR</b>			
Q.5(B)	Describe briefly three basic type of motion control system used in numeric control system. Also, explain absolute coordinate system and incremental coordinate system in CNC programming.	10M	4	2

Q.6(A) Explain the difference between surface roughness and waviness. Also, explain the principal of profilograph for measurement of roughness. 10M 5 2

**OR**

Q.6(B) Describe the alignment test on lathe machine with a neat sketch. 10M 5 2

**\*\*\* END\*\*\***

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July – 2023****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. Whymetals are good for keeping hot water while poor conductors are good for cold water?	1M	1	1
	ii. What is lumped heat capacity analysis?	1M	1	1
	iii. Why are heat transfer coefficients for natural convection much less than those in forced convection?	1M	2	1
	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	1
	v. What would happen to the temperature of boiling water if you added energy?	1M	3	1
	vi. Under what conditions will the temperature rise of the cold fluid in a heat exchanger be equal to the temperature drop of the hot fluid?	1M	3	1
	vii. Why houses are painted white in hot country?	1M	4	1
	viii. Why is shiny foil blanket wrapped around marathon runner at the end of race?	1M	4	1
	ix. Why the insulations on the chilled water lines always are wrapped with vapor barrier jackets?	1M	5	1
	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	1
Q.2(A)	Derive general heat conduction equation in Cartesian coordinates.	10M	1	2
OR				
Q.2(B)	A furnace wall consists of three layers. The inner layer of 10 cm thickness is made of firebrick ( $k = 1.04 \text{ W/mK}$ ). The intermediate layer of 25 cm thickness is made of masonry brick ( $k = 0.69 \text{ W/mK}$ ) followed by a 5 cm thick concrete wall ( $k = 1.37 \text{ W/mK}$ ). When the furnace is in continuous operation the inner surface of the furnace is at 800°C while the outer concrete surface is at 50°C. Calculate the rate of heat loss per unit area of the wall, the temperature at the interface of the firebrick and masonry brick and the temperature at the interface of the masonry brick and concrete.	10M	1	3
Q.3(A)	A steam pipe 80mm in diameter is covered with 30mm thick layer of insulation which has a surface emissivity of 0.94. The insulation surface temperature is 85°C and the pipe is placed in atmospheric air at 15°C. If the heat is lost both by radiation and free convection, find (i) the heat loss from 5m length of the pipe, (ii) the overall heat transfer coefficient, and (iii) heat transfer coefficient due to radiation.	10M	2	3

OR

Q.3(B) Briefly explain velocity profiles in laminar, transition and turbulent boundary layers in a flow over a flat plate. 10M 2 2

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Q.4(A) 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

OR

Q.4(B) Draw the boiling curve and identify the different boiling regimes. Also, explain the characteristics of each. 10M 3 2

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Q.5(A) 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

OR

Q.5(B) Emissivities of two large parallel plates maintained at 800°C and 300°C are 0.3 and 0.5 respectively. Find net radiant heat exchange per square metre for these plates. Find the percentage reduction in heat transfer when a polished aluminium radiation shield of emissivity 0.06 is placed between them. Also find the temperature of the shield. 10M 4 3

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Q.6(A) Two large tanks, maintained at the same temperature and pressure are connected by a circular 0.15m diameter duct, which is 3m in length. One tank contains a uniform mixture of 60 mole % ammonia and 40 mole % air and the other tank contains a uniform mixture of 20 mole % ammonia and 80 mole % of air. The system is at 273 K and  $1.013 \times 10^5$  Pa. Determine the rate of ammonia transfer between the two tanks. Assuming a steady state mass transfer. 10M 5 3

OR

Q.6(B) A pan of 40mm deep, is filled with water to a level of 20mm and is exposed to dry air at 30°C. Calculate the time required for all the water to evaporate. Take mass diffusivity as  $0.25 \times 10^{-4}$  m<sup>2</sup>/s. 10M 5 3

\*\*\* END\*\*\*

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**PRODUCTION PLANNING AND CONTROL**

(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**

S.No.	Question	Marks	CO	BL
Q.1	i. Write about economics of new design.	1M	1	1
	ii. What types of competitive advantages are expected from PPC?	1M	1	1
	iii. What is work study?	1M	2	1
	iv. List various work measurement techniques.	1M	2	1
	v. Define Routing.	1M	3	1
	vi. Define the term process capability.	1M	3	1
	vii. Why forecasting is needed?	1M	4	1
	viii. Define MPS	1M	4	1
	ix. List any four objectives of inventory control.	1M	5	1
	x. What is ABC analysis?	1M	5	1
Q.2(A)	What are different types of production systems? Explain their characteristics.	10M	1	2
<b>OR</b>				
Q.2(B)	Write a detailed note on break even analysis with mathematical formulation and graph.	10M	1	2
Q.3(A)	Define method study? Explain different types of process chart symbols with examples.	10M	2	2
<b>OR</b>				
Q.3(B)	Explain stop watch procedure for collecting time study data. Also explain various rating techniques with their mathematical expressions.	10M	2	2
Q.4(A)	Explain value analysis and its procedure in detail.	10M	3	2
<b>OR</b>				
Q.4(B)	Summarize the pre-requisite information needed for process planning with the steps involved in process planning.	10M	3	2
Q.5(A)	What are different forecasting techniques? Define and explain "forecast by past average" and "forecasting from last period sales".	10M	4	2
<b>OR</b>				
Q.5(B)	A manufacturing facility has five jobs to be scheduled on a machine. Their sequence of arrival, processing time and due date are given in the table below	10M	4	2

Job (in sequence of arrival)	Processing time (Days)	Due date (i.e., days from now)
A	7	8
B	4	3

C	5	7
D	2	9
E	6	6

Schedule the jobs using (i) FCFS, (ii) SPT, (iii) LCFS, and (iv) STR rules. Also compare the results (using the performance measures of total completion time, average completion time and average lateness).

Q.6(A) a). Define: Lead time, stock out, buffer stock, inventory carrying cost. 10M 5 2  
b). Distinguish between in-process inventory and safety stock inventory.

**OR**

Q.6(B) The annual demand for an item is 4600 units. The unit cost is Rs. 8 and the inventory carrying charges are estimated as 28% per annum. If the cost of one procurement is Rs. 160, determine 10M 5 3  
(i) Economic order quantity.  
(ii) Number of orders per year.  
(iii) Time between two consecutive orders.  
(iv) Optimal cost.

**\*\*\* END\*\*\***

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****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

S.No.	Question	Marks	CO	BL
Q.1	i. What is the function of the chassis?	1M	1	1
	ii. What are vehicle aerodynamic forces?	1M	1	1
	iii. What is the intake for the turbochargers?	1M	2	1
	iv. Name the catalysts present in the catalytic converter.	1M	2	1
	v. How single a plate clutch different from a multi-plate clutch?	1M	3	1
	vi. What is the requirement for transmission systems in automobile?	1M	3	2
	vii. What is the function of the electronic control unit in ABS?	1M	4	1
	viii. What is the major function of braking system?	1M	4	1
	ix. Name two various forms of natural gas.	1M	5	1
	x. What is the benefit of bio-ethanol?	1M	5	1
Q.2(A)	What is VVT? How is theoretical VVT different from practical VVT, explain with a neat sketch.	10M	1	2
<b>OR</b>				
Q.2(B)	Explain the working principle of two-stroke and four-stroke engines with a neat sketch	10M	1	2
Q.3(A)	What are BS and Euro norms? Discuss the emission norms in India. How emissions from automobiles are controlled?	10M	2	2
<b>OR</b>				
Q.3(B)	How is a turbocharger different from a supercharger? Explain its working principle with neat sketch	10M	2	2
Q.4(A)	What do you understand by transmission systems in automobiles? List its components and advantages.	10M	3	2
<b>OR</b>				
Q.4(B)	Sketch & explain the working of synchromesh and constant mesh gearboxes.	10M	3	2
Q.5(A)	Sketch and explain various steering geometries.	10M	4	2
<b>OR</b>				
Q.5(B)	Discuss the force distribution of electronic brake briefly.	10M	4	2
Q.6(A)	What is a hybrid vehicle? List the advantages of hydrogen fuel used in automobiles.	10M	5	2
<b>OR</b>				
Q.6(B)	What is a hybrid vehicle? List the advantages of hydrogen fuel used in automobiles.	10M	5	2

\*\*\* END\*\*\*

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – July 2023**  
**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. Find the dot product of $\vec{A} = (3i + 2j + 3k)$ and $\vec{B} = (-4i + j - k)$	1M	1	2
	ii. Write the cylindrical coordinate system.	1M	1	1
	iii. Write the vector form of electric field intensity.	1M	2	1
	iv. What is electric dipole and dipole moment?	1M	2	1
	v. State the Faraday's law.	1M	3	1
	vi. State and write the expression the divergence's theorem with regard to EM fields.	1M	3	1
	vii. Write the expression of velocity of EM wave in the medium.	1M	4	1
	viii. State Poynting Theorem	1M	4	1
	ix. Why Impedance Matching Technique is required?	1M	5	1
	x. Why S-parameter is required for microwave circuits?	1M	5	1
Q.2(A)	Derive the expression for Electric field intensity at any point due to infinite length line charge with suitable sketches.	10M	1	2
<b>OR</b>				
Q.2(B)	By applying Gauss's law, estimate the electric field due to uniformly infinite charged sheet	10M	1	1
Q.3(A)	If the magnetic field intensity in free space is given by	10M	2	2
$\vec{H} = \frac{20}{x^2 + y^2} (x\vec{a}_x + y\vec{a}_y) \frac{A}{m}$				
(i) Then show that $\nabla \cdot \vec{B} = 0$ and				
(ii) Find the current density J.				
<b>OR</b>				
Q.3(B)	Starting with Ampere's law, derive Maxwell's equation in integral form. Obtain the corresponding relation by applying the Stoke's theorem.	10M	2	1
Q.4(A)	Derive relation between E&H in uniform plane wave propagation and define intrinsic impedance and give its physical significance.	10M	3	2
<b>OR</b>				
Q.4(B)	Derive suitable relations for integral and point forms of poynting theorem.	10M	3	1
Q.5(A)	Derive the one dimensional general wave equation and find the solution equation.	10M	4	1

**OR**



Q.5(B) A distortionless transmission line has attenuation constant  $\alpha=1.15 \times 10^{-3}$  Np/m and capacitance of 0.1 nF/m. The characteristics resistance  $\sqrt{\frac{L}{C}} = 50 \Omega$ . Find the resistance, inductance and conductance per meter. 10M 4 3

Q.6(A) i) What is reflection co-efficient and VSWR of transmission line. 10M 5 2  
 ii) A transmitter represents by voltage source of 50V ( $V_{in}$ ) in series with transmission line. The characteristics impedance ( $Z_0$ ) of transmission line is given  $50 \Omega$ . The transmitter is connected to an antenna being represented by a complex load ( $Z_L$ ) impedance ( $200-j50$ )  $\Omega$ . Find reflection co-efficient and VSWR.

**OR**

Q.6(B) A  $50 \Omega$  transmission line is terminated to a load of  $(25+50j) \Omega$ . The length of the transmission line is  $3.3\lambda$ . Find the value of 10M 5 2  
 1. Reflection co-efficient  
 2. VSWR  
 3. Input impedance at distance of  $3.3\lambda$  from the load towards generator side.  
 4. Input admittance at distance of  $3.3\lambda$ .  
 By theoretical and by smith chart.

**\*\*\* END\*\*\***

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – July 2023**

**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. State central limit Theorem.	1M	1	1
	ii. Define ergodic random processes.	1M	1	1
	iii. What is thermal noise?	1M	2	1
	iv. Give the formula for bandwidth f SSB.	1M	2	1
	v. Give the formula for average power in FM wave.	1M	3	1
	vi. Why pre-emphasis and de-emphasis is needed?	1M	3	1
	vii. What is aliasing effect?	1M	4	1
	viii. Define pulse amplitude modulation.	1M	4	1
	ix. Define hamming distance.	1M	5	1
	x. State shanon-hartley capacity theorem.	1M	5	1
Q.2(A)	Consider a binary symmetric channel (BSC) with error probability as $P_e$ . The probability of transmitting 1 is $Q$ , and that of transmitting 0 is $1 - Q$ . Determine the probabilities of receiving 1 and 0 at the receiver.	10M	1	5
<b>OR</b>				
Q.2(B)	A network consists of 10 links $s_1, s_2, \dots, s_{10}$ in cascade manner. If any one of the links fails, the entire system fails. All links are independent, with equal probability of failure $p = 0.01$ . Determine the probability of failure of the network? The reliability of a network is the probability of not failing. If the system reliability is required to be 0.99, what must be the failure probability of each link?	10M	1	5
Q.3(A)	i) Explain the operation of coherent detection of DSB-SC modulating wave and show that the overall output $V_o(t) = 1/2 A_c \cos \phi_m(t)$ . ii) A 400 W carrier is modulated to a depth of 75%. Calculate the total power in the modulated wave for full AM wave.	(6+4) M	2	2
<b>OR</b>				
Q.3(B)	Discuss the following AM receiver's characteristics. i) Sensitivity ii) Selectivity iii) Fidelity iv) Double spotting.	(2+2+3 +3)M	2	1
Q.4(A)	An angle modulated signal is defined by $s(t) = 10 \cos(2\pi 106t + 0.2 \sin 2000\pi t)$ volts. Find the following i) The power in modulated signal ii) The frequency deviation $\Delta f$ iii) Transmission bandwidth.	(3+3+ 4)M	3	5

OR

- Q.4(B) i) Derive the expression for NBFM if message is  $m(t)$  and carrier is  $A_c \cos \omega_c t$ . (6+4) 3 2  
M  
ii) Draw the corresponding phasor diagram of NBFM and compare it with AM wave

- 
- Q.5(A) Write a short note on PAM modulation and its generation with neat sketches. 10M 4 1

OR

- Q.5(B) Explain how a PPM signal can be generated from a PWM signal? 10M 4 2

- 
- Q.6(A) Consider a (5,1) linear block code defined by the generator matrix (5+5) 5 5  
M

$$\vec{G} = [1 \ 1 \ 1 \ 1 \ 1]$$

- i) Find the decoding table for the linear block code (consider single bit errors only).  
ii) Draw the hardware syndrome generator diagram.  
Suppose  $c = [1 \ 1 \ 1 \ 1 \ 1]$  is sent and  $r = [0 \ 1 \ 1 \ 1 \ 1]$  is received. Show how the code can correct this error.

OR

- Q.6(B) An analog signal having bandwidth of 4 kHz is sampled at 1.25 times the Nyquist rate, with each sample encoded to 8-bits of binary. Assume all samples are equally likely. (2+2+3+3)M 5 5  
i) What is information rate of this source?  
ii) Can the output of this source be transmitted without error over an AWGN channel with bandwidth of 10 kHz and SNR of 20 dB?  
iii) Find SNR required for error free transmission for part (ii).  
iv) Find bandwidth required for an AWGN channel for error free transmission if SNR happens to be 20 dB.

\*\*\* END\*\*\*

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – July 2023**

**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. What is the DFT of $x(n) = \delta(n) + \delta(n-2)$ ?	1M	1	1
	ii. How many computations are required for finding 1024 point DFT using FFT?	1M	1	2
	iii. How one can design digital filters from analog filters?	1M	2	2
	iv. Draw the direct form-I realization structure of IIR filter.	1M	2	3
	v. Mention two advantages of FIR filter.	1M	3	2
	vi. Write the procedure for FIR system design by frequency sampling method.	1M	3	2
	vii. What is meant by floating point number?	1M	4	2
	viii. What are the advantages of VLIW over Von-Neuman architecture?	1M	4	2
	ix. What is decimation? Sketch a signal and its signal decimated by 2	1M	5	3
	x. Mention few applications of multi rate signal processing.	1M	5	2
Q.2(A)	Determine the linear convolution of the following sequences using overlap-add method $x(n) = \{1, -1, 2, 1, 3, 1, 2, -1, 2\}$ , $h(n) = \{1, 2, 1\}$ .	10M	1	3
<b>OR</b>				
Q.2(B)	Compute the 8-point DFT of $x(n) = \{2, 2, 2, 2, 1, 1, 1, 1\}$ by using Radix-2 DIT FFT algorithm.	10M	1	4
Q.3(A)	Determine the system function $H(z)$ of the lowest order Chebyshev IIR digital filter with the following specifications: 3dB ripple in pass band $0 \leq \omega \leq 0.2\pi$ 25 dB attenuation in stopband $0.45\pi \leq \omega \leq \pi$	10M	2	4
<b>OR</b>				
Q.3(B)	Explain Design procedure of Chebyshev and Butterworth IIR filter.	10M	2	3
Q.4(A)	Design a linear phase FIR high pass filter using Hamming Window, with a cutoff frequency, $\omega_c = 0.8\pi$ rad/sample and $N = 7$ $H_d(e^{j\omega}) = e^{-j\omega\alpha}$ ; $-\pi \leq \omega \leq -\omega_c$ and $+\omega_c \leq \omega \leq \pi$ $= 0$ ; otherwise	10M	3	4
<b>OR</b>				
Q.4(B)	Explain the finite word length effects in FIR filters.	10M	3	3
Q.5(A)	Explain in detail about the VLIW architecture with a neat diagram	10M	4	3
<b>OR</b>				
Q.5(B)	Discuss the various addressing modes of a digital signal processor TMS320C6713.	10M	4	3
Q.6(A)	Let $x(n) = \{1, 3, 2, 5, -1, -2, 2, 3, 2, 1\}$ , find (a) Up sample by 2 times and down sample by 4 times (b) Down sample by 4 times and up sample by 2 times.	10M	5	4
<b>OR</b>				
Q.6(B)	Explain the applications of Multi Rate Signal Processing.	10M	5	3

\*\*\* END\*\*\*

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations – July 2023**  
**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. Write the principle of Piezo electric transducer.	1M	1	2
	ii. Draw the block diagram of the Biomedical Instrumentation System.	1M	1	1
	iii. Draw the graph of Depolarization and Repolarization.	1M	2	4
	iv. Examine Bioelectric potential.	1M	2	4
	v. What is meant by pneumograph?	1M	3	2
	vi. Draw the graph of respiratory system measurement.	1M	3	1
	vii. How are X-rays produced?	1M	4	2
	viii. What are the advantages of an ultrasound imaging system?	1M	4	2
	ix. What are the types of waveforms used for defibrillator?	1M	5	1
	x. List the types of electrodes system used in implantable pacemakers	1M	5	3
Q.2(A)	Explain about Cardio- Vascular System with neat sketch including its parts.	10M	1	2
<b>OR</b>				
Q.2(B)	Explain the function of human respiratory system in detail with a neat sketch.	10M	1	2
Q.3(A)	Explain with necessary diagram how action potential is generated in human body.	10M	2	1
<b>OR</b>				
Q.3(B)	Elaborate the steps for the typical recording setup of EMG and ECG with diagram.	10M	2	4
Q.4(A)	Elaborate in detail on various blood cell counting techniques.	10M	3	3
<b>OR</b>				
Q.4(B)	Discuss in detail about various types of Respiratory system measurements.	10M	3	2
Q.5(A)	Explain, with the help of a block diagram the construction of a CT Scanner	10M	4	2
<b>OR</b>				
Q.5(B)	Explain the working of an X-ray machine with the help of a block diagram.	10M	4	2
Q.6(A)	Discuss in detail about Pacemakers.	10M	5	2
<b>OR</b>				
Q.6(B)	Discuss in detail about various safety accepts should be followed in bio medical instruments.	10M	5	2

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**  
**FORMAL LANGUAGES AND AUTOMATA THEORY**

(Computer Science & Engineering)

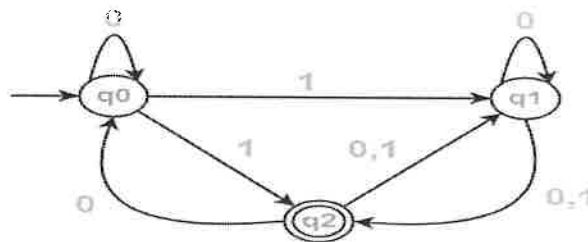
Time: 3Hrs

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. Define Moore machine.	1M	1	1
	ii. State the relations among regular expression, deterministic finite automata, non-deterministic finite automaton and finite automaton with epsilon transition	1M	1	1
	iii. Explain the closure properties of regular sets.	1M	2	1
	iv. Design a regular expression over {a,b} where the length of the string is exactly 2	1M	2	1
	v. Define linear grammar.	1M	3	1
	vi. Write the closure properties of CFG.	1M	3	1
	vii. List the rules in conversion of CFG to PDA	1M	4	1
	viii. Define PDA with example.	1M	4	1
	ix. Define universal Turing machines.	1M	5	1
	x. Explain PCP.	1M	5	1

Q.2(A) Convert the following Non-Deterministic Finite Automata (NFA) to Deterministic Finite Automata (DFA)



OR

Q.2(B) Construct the Moore machine to determine residue mod 3 and convert into mealy machine. 10M 1

Q.3(A) i) show that  $L=\{a^{2^n}/n < \infty\}$  is regular 10M 2  
ii) Construct NFA equivalent to the regular expression  $10(0+11)0^*1$

OR

Q.3(B) i) Construct finite automata for the regular expression  $R=(a+b)^*a(a+b)^*$  10M 2  
ii) explain closure proportions of regular sets.

Q.4(A) i) Construct CFG for the regular expression  $(011+1)^*(01)^*$  10M 3  
ii) Define ambiguity. Check whether the following grammar is ambiguous or not  $S \rightarrow a|abSb|aAb, A \rightarrow bS|aAAb$

OR

- Q.4(B) i) Convert the following right linear grammar to left linear grammar 10M 3  
 $S \rightarrow 10A \mid 1, A \rightarrow 0A \mid 00$
- ii) Explain about unrestricted grammar with example.
- 
- Q.5(A) Convert the following grammar into Chomsky normal form  $S \rightarrow abAB, A \rightarrow bAB \mid \epsilon$  10M 4  
 $B \rightarrow Baa \mid \epsilon$
- OR
- Q.5(B) Construct PDA to accept the language  $L = \{a^n b^{n+m} c^m, \text{ where } n, m > 0\}$  10M 4
- 
- Q.6(A) i) Design a TM to accept the language  $L = \{WW^R, \text{ where } W \in (a, b)^+\}$  10M 5  
 ii) define universal Turing machine
- OR
- Q.6(B) i) Consider the grammar  $S \rightarrow aBAb \mid Aac, Ab \rightarrow c, BC \rightarrow acb$ . The string is  $W = aacb$ . 10M 5  
 Convert the derivation to generate the string to MPCP.  
 ii) Explain about undecidability.

\*\*\* END\*\*\*

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**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. What are the advantages of having layered architecture?	1M	1	1
	ii. What is Switching and state the types of switching?	1M	1	1
	iii. Sketch the taxonomy of Media Access Control.	1M	2	1
	iv. Define DLC Services	1M	2	1
	v. What is meant by congestion?	1M	3	1
	vi. How would you contrast Ipv4 with ipv6?	1M	3	1
	vii. What we need for storage if TCP process may not write and read data at the same speed?	1M	4	1
	viii. How would you contrast between TCP and UDP?	1M	4	1
	ix. What is the use of FTP?	1M	5	1
	x. State in your words about WWW.	1M	5	1
Q.2(A)	Categorize the various layers of TCP/IP Protocol in detail with neat sketch	10M	1	3
	OR			
Q.2(B)	Discuss the various topologies of the network	10M	1	3
Q.3(A)	What are the different types of error detection methods? Explain the CRC error detection technique using generator polynomial $x^4 + x^3 + 1$ and data 11100011.	10M	2	2
	OR			
Q.3(B)	Discuss about the various Channelization protocols in Media Access Control.	10M	2	3
Q.4(A)	i) Summarize the goals of IPV6. ii) With the help of a diagram explain the IPv4 header format.	10M	3	2
	OR			
Q.4(B)	Explain the terms OSPF, BGP, RIP.	10M	3	4
Q.5(A)	Discuss about connection establishment and connection release in TCP with neat diagram.	10M	4	3
	OR			
Q.5(B)	Elaborate on the elements of Transport Protocols	10M	4	2
Q.6(A)	Explain the Server side and client-side web page generation.	10M	5	4
	OR			
Q.6(B)	What is SNMP? Briefly discuss the SNMP model components	10M	5	2

\*\*\* END\*\*\*



**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**  
(UGC-AUTONOMOUS)**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****MACHINE LEARNING**

(Computer Science &amp; 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 a scalar and a vector?	1M	1	1										
	ii. Define an Outlier data?	1M	1	1										
	iii. What are the two types of Hierarchical Clustering?	1M	2	1										
	iv. Which algorithm takes more number of scans of the data – Apriori Algorithm or FP Growth Algorithm	1M	2	2										
	v. Where back propagation training algorithm is used?	1M	3	2										
	vi. Is Supervised learning can be used for clustering or classification?	1M	3	1										
	vii. What are clustering indices?	1M	4	1										
	viii. What is false positive and false negative?	1M	4	1										
	ix. What is one-hot representation?	1M	5	1										
	x. What is the purpose of Graph Spectral Analysis?	1M	5	1										
Q.2(A)	2 dice are rolled simultaneously 108 times a) Find the probability that 3 times both dice were 6. b) Probability that at least 3 times both dice are 6.	10M	1	3										
OR														
Q.2(B)	a) Write the expression for Minkowski distance between two vectors of d-dimensions? b) What are Manhattan distance and Euclidean distance between two vectors $\vec{X}$ and $\vec{Y}$ c) What are L1 and L2 norms of a vector $\vec{X}$ of dimension d?	10M	1	4										
Q.3(A)	For the following transaction data, find the association rules and corresponding confidence.	10M	2	4										
<table border="1" style="margin: auto; border-collapse: collapse;"><thead><tr><th>Transaction ID</th><th>Items</th></tr></thead><tbody><tr><td>001</td><td>A B C D</td></tr><tr><td>002</td><td>B C E</td></tr><tr><td>003</td><td>A B C E</td></tr><tr><td>004</td><td>B C F</td></tr></tbody></table>					Transaction ID	Items	001	A B C D	002	B C E	003	A B C E	004	B C F
Transaction ID	Items													
001	A B C D													
002	B C E													
003	A B C E													
004	B C F													
OR														
Q.3(B)	What is a fuzzy set? Explain with an example. Explain the difference between k-means algorithm and fuzzy c-means with diagram	10M	2	2										
Q.4(A)	Explain Reinforcement Learning with a proper example? Is it a supervised, unsupervised or semi-supervised algorithm? Why is reinforcement learning so difficult?	10M	3	2										

OR

- Q.4(B) i) What is the convergence criterion of a learning algorithm? 10M 3 2  
ii) Is Regression analysis a learning algorithm? If yes, why yes. If no, why no.  
iii) What is the difference between linear regression and logistic regression?  
iv) Is Ridge regression used for univariate or multivariate data?
- 

- Q.5(A) What are training, testing and validation data sets? Explain with an example we use Leave-one-out and when K-fold cross validation? 10M 4 2

OR

- Q.5(B) Explain Regularization technique. 10M 4 2
- 

- Q.6(A) What is topic modelling? Explain with an example. 10M 5 2

OR

- Q.6(B) What is the purpose of rank reduction of the matrix? Name and explain one method of rank Reduction. 10M 5 2

\*\*\* END\*\*\*

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**  
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**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**ARTIFICIAL INTELLIGENCE**

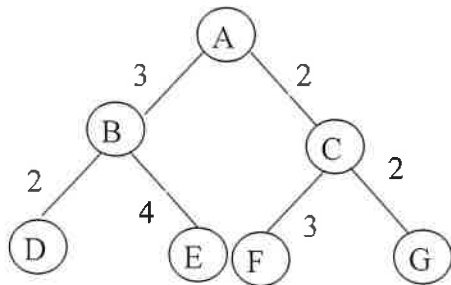
(Computer Science & Engineering)

Time: 3Hrs

Max Marks: 60

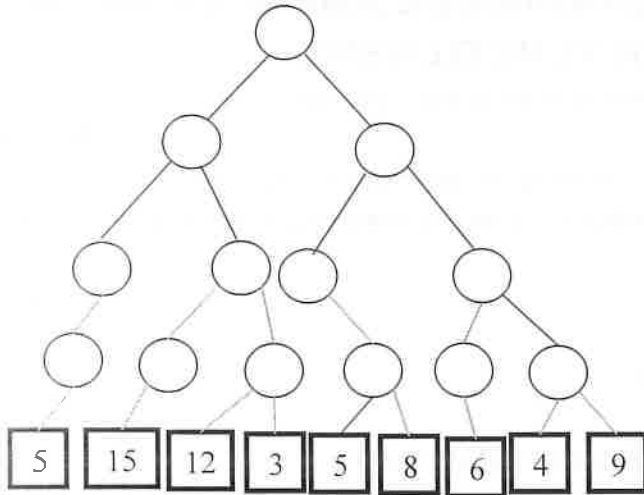
Attempt all the questions. All parts of the question must be answered in one place only.  
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either Part-A or B only

S.No.	Question	Marks	CO	BL
Q.1	i. Define rational agent.	1M	1	1
	ii. What is production system?	1M	1	2
	iii. What is space complexity?	1M	2	2
	iv. How size of the graph affects the DFS algorithm?	1M	2	2
	v. What is the disadvantage of Hill Climbing algorithm?	1M	3	2
	vi. What is a global minimum?	1M	3	2
	vii. When a sentence is called satisfiable?	1M	4	2
	viii. How complex sentences are represented?	1M	4	2
	ix. State Bayes theorem.	1M	5	1
	x. What is membership function?	1M	5	2
Q.2(A)	Explain the utility agent, its functions and program with respect to vacuum cleaner world.	10M	1	2
OR				
Q.2(B)	Narrate the different types of Knowledge Representation.	10M	1	2
Q.3(A)	Write the Iterative Deepening Search algorithm and demonstrate the working of the algorithm with suitable example.	10M	2	2
OR				
Q.3(B)	Explain the searching process in nondeterministic and sensor less problem.	10M	2	2
Q.4(A)	Apply Best First Search algorithm for the following tree and produce the result.	10M	3	3



OR

Q.4(B) Consider the following minmax graph, assume the Max player makes the first move. What will be result of the game? Write the values of the intermediate and root nodes. 10M    3    3




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Q.5(A) Write and explain the backward chaining algorithm. 10M    4    2

OR

Q.5(B) Explain assertion, queries, and domain in FOL. 10M    4    2

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Q.6(A) With suitable example, explain semantic network. 10M    5    2

OR

Q.6(B) Explain Statistical Reasoning. 10M    5    2

\*\*\* END\*\*\*

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****WEB TECHNOLOGIES**

(Computer Science &amp; 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 HTML and XHTML?	1M	1	2
	ii. How do you insert comments in HTML?	1M	1	1
	iii. List out the CSS Pseudo selector class methods?	1M	2	1
	iv. Write an Inline CSS to show a paragraph in a web page with font size of 28?	1M	2	3
	v. State the difference between GET and POST methods?	1M	3	2
	vi. List out the phases of Servlet?	1M	3	1
	vii. Define XML Http Request method?	1M	4	1
	viii. List out the phases of JSP Lifecycle?	1M	4	1
	ix. State the significance of WSDL document?	1M	5	2
	x. What is Web Services?	1M	5	1
Q.2(A)	Write a HTML program to display a feedback form from the user after attending an event?	10M	1	3
	OR			
Q.2(B)	Design and develop a webpage using HTML for registration of Net banking facility in a bank?	10M	1	5
Q.3(A)	Write a JavaScript program to find the factorial of a given number?	10M	2	3
	OR			
Q.3(B)	Explain in detail about control statements in JavaScript with suitable examples?	10M	2	2
Q.4(A)	Discuss about the following: a) Cookies    b) URL Rewriting	10M	3	2
	OR			
Q.4(B)	Explain in detail about the Servlet Life Cycle?	10M	3	2
Q.5(A)	Write a XSLT program to display employee details in table format from XML?	10M	4	3
	OR			
Q.5(B)	Write a HTML program to receive Username and Password fields and authenticate using JSP?	10M	4	2
Q.6(A)	Write a complete query application for book database using Servlets with JDBC connectivity?	10M	5	3
	OR			
Q.6(B)	Explain in detail about WSDL and show how they are used to create, publish, test and describe the web services?	10M	5	2

**\*\*\* END\*\*\***

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**AUTOMATA THEORY AND COMPILER DESIGN**

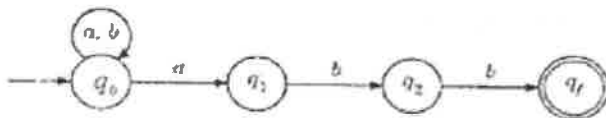
(Computer Science & Technology)

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

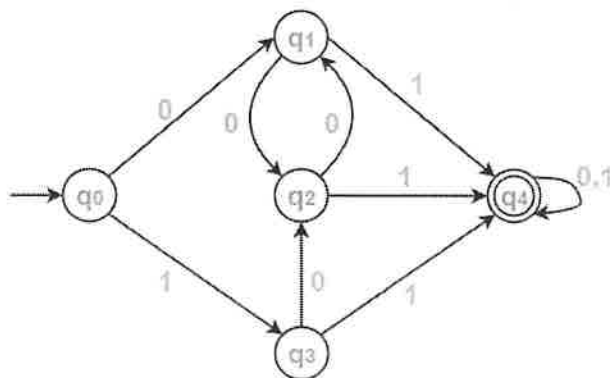
Q.No	Question	Marks	CO	BL
Q.1	i. Draw a DFA for the language accepting strings ending with '11' over input alphabets $\Sigma = \{0, 1\}$ .	1M	1	2
	ii. Define Pumping Lemma of Regular Language.	1M	1	1
	iii. Derive the string 0100110 from the following grammar $S \rightarrow OS/1AA$ , $A \rightarrow 0/1A/0B$ , $B \rightarrow 1/0BB$ .	1M	2	2
	iv. Sketch the block diagram of PDA.	1M	2	1
	v. Differentiate between compiler and Interpreter.	1M	3	1
	vi. List the compiler construction tools.	1M	3	1
	vii. Write actions in shift reduce parser.	1M	4	1
	viii. Consider the following grammar and eliminate left recursion- $E \rightarrow E + E / E * E / a$ .	1M	4	3
	ix. What are the issues in the design of code generator?	1M	5	1
	x. What is meant by peephole optimization.	1M	5	1
Q.2(A)	Write the procedure to convert NFA into DFA. Construct a DFA equivalent to the NFA given below.	10M	1	3



OR

Write the procedure for minimization of DFA. Find the Minimized DFA for the following DFA.

Q.2(B)



Q.3(A)	Consider the following Context Free Grammar. $S \rightarrow aB \mid bA, A \rightarrow a \mid aS \mid bAA, B \rightarrow b \mid bS \mid aBB.$ Find Left Most Derivation and Right Most Derivation for (the string) $w = aabbabba.$	10M	2	3
OR				
Q.3(B)	Construct a Turing Machine to recognize the Language $\{ a^n b^n c^n / n \geq 1 \}.$	10M	2	4
Q.4(A)	Explain in detail about the reorganization of the tokens. Write the transition diagram for token relational operators.	10M	3	2
OR				
Q.4(B)	Discuss in detail about the LEX tool with an example.	10M	3	2
Q.5(A)	Consider the following grammar $S \rightarrow (L) \mid a$ $L \rightarrow L, S \mid S$ Parse the input string $( a , ( a , a ) )$ using a shift-reduce parser.	10M	4	3
OR				
Q.5(B)	Check Whether the following grammar is LL(1) or not. $S \rightarrow (L) \mid a$ $L \rightarrow L, S \mid S$ and show whether the string $(a,(a,(a,a)))$ will be accepted or not.	10M	4	3
Q.6(A)	How to eliminate common sub expressions and dead code in code optimization techniques? Explain with example.	10M	5	2
OR				
Q.6(B)	Discuss about peephole optimization with examples.	10M	5	2
*** END***				

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**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 linear regression and logistic regression.	1M	1	2
	iii. List the applications of unsupervised learning.	1M	2	1
	iv. Define competitive learning.	1M	2	1
	v. Specify the uses of KNN in classification problems.	1M	3	1
	vi. What are the advantages and disadvantages of Decision tree?	1M	3	1
	vii. What are the two components of NLP?	1M	4	1
	viii. What is the need of semantic analysis?	1M	4	1
	ix. Specify the type of image segmentation.	1M	5	2
	x. Define Deep Neural Network.	1M	5	1
Q.2(A)	Define knowledge representation. Describe the knowledge representation and reasoning with Wumpus world problem. OR	10M	1	3
Q.2(B)	How does the Hypothesis testing works? Explain the Null and alternate hypothesis with suitable example.	10M	1	3
Q.3(A)	Describe the core concept of self-organizing map (SOM) with a neat architecture. OR	10M	2	2
Q.3(B)	Illustrate an algorithm for detecting anomalies in given dataset.	10M	2	3
Q.4(A)	List out the various types for evaluation of classifier performance and explain. OR	10M	3	3
Q.4(B)	Discuss in detail about the MLP architecture.	10M	3	2
Q.5(A)	Distinguish the difference between Term Frequency and Inverse Document frequency. OR	10M	4	3
Q.5(B)	Analyze the Latent semantic analysis and indexing in NLP.	10M	4	4
Q.6(A)	Apply the Gaussian filter and median filter to remove the image noise. OR	10M	5	3
Q.6(B)	Demonstrate the working process of Boltzmann Machine model.	10M	5	2

\*\*\* END\*\*\*



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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**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. List two deficiencies in waterfall model. Which process model do you suggest to overcome each deficiency?	1M	1	1
	ii. Mention the Advantage and Disadvantage of waterfall model.	1M	1	1
	iii. Outline various Structural and Behavioral diagrams of UML.	1M	2	1
	iv. What are functional and non-functional requirements?	1M	2	1
	v. What are the types of software maintenance?	1M	3	1
	vi. What is Regression Testing?	1M	3	1
	vii. What are the advantages and disadvantages of size measure?	1M	4	1
	viii. List any 4 categories of CASE tools.	1M	4	1
	ix. What do you mean by web engineering?	1M	5	1
	x. How the CASE tools are classified?	1M	5	1
Q.2(A)	Explain SEI-Capability Maturity model in detail.	10M	1	2
OR				
Q.2(B)	Describe the various life cycle models in software development.	10M	1	2
Q.3(A)	Explain the concept of coupling and cohesion, which leads to a good software design.	10M	2	2
OR				
Q.3(B)	Discuss in detail about user Interface design process and specify the need to go for a proper UI design.	10M	2	2
Q.4(A)	What are the various testing strategies to software testing? Illustrate them briefly.	10M	3	3
OR				
Q.4(B)	Demonstrate about debugging Process with examples.	10M	3	3
Q.5(A)	Discuss on the various software cost estimation techniques.	10M	4	2
OR				
Q.5(B)	Explain briefly about taxonomy of CASE tools in detail.	10M	4	2
Q.6(A)	Explain briefly about clean room software engineering and Justify the necessity to go for the defect prevention rather defect avoidance concepts.	10M	5	3
OR				
Q.6(B)	Demonstrate client server architecture with neat diagram.	10M	5	3

\*\*\* END\*\*\*

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**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. Write the steps involved in Designing a learning system.	1M	1	1
	ii. Write about artificial neuron.	1M	1	2
	iii. What is Linear Separability?	1M	2	1
	iv. What is Perceptron?	1M	2	1
	v. What is Dimensionality Reduction?	1M	3	1
	vi. Write about variables in Factor analysis.	1M	3	2
	vii. What are types of Support vector machine (SVM)?	1M	4	1
	viii. Define Support vectors in SVM.	1M	4	1
	ix. What is evolutionary learning?	1M	5	1
	x. Write the applications of Evolutionary learning.	1M	5	2
Q.2(A)	Differentiate Supervised and Unsupervised learning in Machine learning.	10M	1	2
OR				
Q.2(B)	Write the various perspectives and Issues in Machine learning.	10M	1	2
Q.3(A)	Discuss the concept of Linear separability. Give some examples which shows Linear separability.	10M	2	4
OR				
Q.3(B)	How Multilayer perceptron is used in Business? Explain.	10M	2	3
Q.4(A)	Why training is needed for Radial Basis Function (RBF) network. Explain.	10M	3	3
OR				
Q.4(B)	Describe about Isomap in Dimensionality reduction.	10M	3	4
Q.5(A)	Describe the concept of Non-linear SVM with the help of examples.	10M	4	2
OR				
Q.5(B)	Explain the working principle of Multi-Class classification with the extension of SVM.	10M	4	2
Q.6(A)	How Multiple objective functions can be derived in Evolutionary learning. Explain with example.	10M	5	3
OR				
Q.6(B)	Write various applications of Evolutionary learning algorithms.	10M	5	2

\*\*\* END\*\*\*

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**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. Define Congruence?	1M	1	1
	ii. State Euclidian algorithm.	1M	1	1
	iii. What is Block cipher?	1M	2	1
	iv. List various key distribution techniques?	1M	2	1
	v. What is Digital signature algorithm?	1M	3	1
	vi. List the properties of Hash Function.	1M	3	1
	vii. What is Reconnaissance?	1M	4	1
	viii. What is passive attack?	1M	4	1
	ix. What is Spywares?	1M	5	1
	x. How SQL injections are a security threat.	1M	5	1
Q.2(A)	State and prove the Fermat's and Euler's theorem with example.	10M	1	2
	OR			
Q.2(B)	Explain the properties of Modular Arithmetic in detail.	10M	1	2
Q.3(A)	Differentiate between Stream Cipher and Block Cipher.	10M	2	2
	OR			
Q.3(B)	Illustrate AES Algorithm.	10M	2	3
Q.4(A)	Explain the Design of Hash Algorithm in detail.	10M	3	2
	OR			
Q.4(B)	Describe the MD5 Algorithm.	10M	3	2
Q.5(A)	Explain in Detail about the Cyber Stalking and Cyber Spoofing.	10M	4	2
	OR			
Q.5(B)	What is Social Engineering? Explain its types.	10M	4	2
Q.6(A)	Describe DoS and DDoS attack.	10M	5	2
	OR			
Q.6(B)	Write about the Cybercrimes Security policies.	10M	5	2

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

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**

**SENSORS AND SIGNAL CONDITIONING**

(CSE (Internet of Things))

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.	Questions	Marks	CO	BL
Q.1	i. Define instrumental error.	1M	1	1
	ii. What is an Analog transducer?	1M	1	1
	iii. Mention the advantages and disadvantages of a potentiometer.	1M	2	2
	iv. What is young's modulus?	1M	2	1
	v. What is an inductance transducer?	1M	3	1
	vi. Mention the advantages and disadvantages of LVDT.	1M	3	1
	vii. Mention the various types of synchros system.	1M	4	1
	viii. List the disadvantages of a thermocouple-based measuring system.	1M	4	2
	ix. What is a vibrating cylinder sensor?	1M	5	2
	x. What are the suitable materials for piezoelectric transducer?	1M	5	2
Q.2(A)	Discuss the static and dynamic characteristics of a measurement system.	10M	1	2
	OR			
Q.2(B)	Discuss the static and dynamic characteristics of a measurement system.	10M	1	2
Q.3(A)	User A has to design a joystick for 2 – dimensional movements in a game. Explain the necessary components needed to design the hardware. Also, explain the working of the designed joystick.	10M	2	2
	OR			
Q.3(B)	Design a system to measure the angular position of a car wiper using rotary potentiometer.	10M	2	3
Q.4(A)	Explain the working principle of an Inductive proximity Sensor.	10M	3	2
	OR			
Q.4(B)	Explain the construction and working principle of a Tacho-generator.	10M	3	2
Q.5(A)	Explain the various types of photoelectric transducers.	10M	4	2
	OR			
Q.5(B)	Define thermoelectric effect also explain the three laws of thermocouples.	10M	4	2
Q.6(A)	What are Encoders? Explain the principle of measuring speed implementing Absolute shaft Encoders.	10M	5	2
	OR			
Q.6(B)	With neat diagrams, explain the principle of operation of vibration cylinder sensors.	10M	5	2

\*\*\* END\*\*\*

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****COMPUTER ARCHITECTURE AND ORGANIZATION**

(CSE (Internet of Things))

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 methodologies are used to achieve the computer performance.	1M	1	2
	ii. Mrs. Jannet has run a program in computer A and it takes the running time is 40 seconds. The same program she is running in computer B and it takes the running time 60 seconds. Which system is faster and How much faster?	1M	1	2
	iii. Represent $-(39.427)_{10}$ into single precision format	1M	3	2
	iv. Convert 10.564 into binary	1M	3	2
	v. What is meant by data path element?	1M	2	1
	vi. Define Branch Prediction with example	1M	4	1
	vii. What is Flynn's classification?	1M	4	1
	viii. What is meant by loop unrolling?	1M	4	1
	ix. What are the different cache mapping techniques available?	1M	5	1
	x. What are the various memory technologies?	1M	5	1
Q.2(A)	Our favorite program runs in 12 seconds on a Computer A, which has 2GHz clock. We are trying help a computer designer build a Computer B, which will run this program in 6 seconds. The designer has determined that a substantial increase in the clock rate is possible, but this increase will affect the rest of the CPU design, causing computer B to require 1.2 times as many clock cycles as computer A for this program. What clock rate should we tell the designer to target?	10M	1	5
	OR			
Q.2(B)	Suppose we have two implementations of the same instruction set architecture. Computer A has a clock cycle time of 250 ps and a CPI of 2.0 for some program, and computer B has a clock cycle time of 500 ps and a CPI of 1.2 for the same program. Which computer is faster for this program and by how much?	10M	1	5
Q.3(A)	Illustrate the Booth's multiplication with a suitable flowchart and example?	10M	3	2
	OR			
Q.3(B)	Explain the multiplication algorithm for floating point numbers and also Multiply $1.010 \times 2^{-1}$ with $-1.110 \times 2^{-2}$	10M	3	5
Q.4(A)	What is pipelining, and discuss about pipelined data path and control.	10M	4	2
	OR			
Q.4(B)	What are control hazards? Explain the methods for dealing with the control hazards.	10M	4	2

Q.5(A)	Explain Instruction level parallelism with suitable example.	10M	4	2
	OR			
Q.5(B)	What is hardware Multithreading? Explain with neat sketch.	10M	4	1
<hr/>				
Q.6(A)	Explain Memory Technologies.	10M	5	1
	OR			
Q.6(B)	Discuss in detail any two I/O techniques	10M	6	2

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**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****DATA SCIENCE FOR IOT**

(CSE (Internet of Things))

**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 Science.	1M	1	1
	ii. Define data. Differentiate between structured and unstructured data	1M	1	1
	iii. Write source code to print the transpose of the following 2D array: [[1,2],[3,4],[5,6],[7,8],[9,10]].	1M	2	2
	iv. Write the source code to create a Numpyndarray object from a tuple.	1M	2	2
	v. Define Ranking. Write the syntax to find the rank of a series and a dataframe.	1M	3	1
	vi. Name the data structure used in Pandas to work with 3D data. Write the syntax to create the same	1M	3	1
	vii. Define outlier.	1M	4	1
	viii. Name the package used to plot in pandas. Write it's syntax	1M	4	1
	ix. Draw the schematic representation of Training in Machine learning.	1M	5	2
	x. Recall the term confusion matrix and write how it helps to evaluate the performance of a machine	1M	5	2
Q.2(A)	Explain in detail:	5M	1	2
	i) Data Cleaning	3M		
	ii) Data Management	2M		
	iii) Data Manipulation			
OR				
Q.2(B)	Elaborate on how a data scientist will work with data.	10M	1	3
Q.3(A)	i.) Create a universal function with function name as your name and write the source code of it. How to create a universal function?	5M	2	5
	ii) What are universal functions? Give two examples on it.	5M		
OR				
Q.3(B)	i) Elaborate on Numpy array joining.	3M	2	
	ii.) Illustrate with example concatenate () and stack() attributes in numpy.	4M		
	iii.) Differentiate with example on hstack(),vstack() and dstack() attributes.	3M		
Q.4(A)	i) Simplify on different data structures in pandas.	5M	3	4
	ii) Create series data structure from 3 different data.	5M		
OR				

Q.4(B)	i) Analyze the syntax for <i>drop()</i> attribute in pandas. ii) Create a dataframe from the given data below and perform the following operations: <i>d={'Name':['Alisa','raghu','jodha','jodha','raghu','Cathrine','Alisa','Bobby','Bobby','Alisa','raghu','Cathrine'],'Age':[26,23,23,23,23,24,26,24,22,26,23,24],'Score':[85,31,55,55,31,77,85,63,42,85,31,np.nan]}</i> a) Simply drop a row or observation b) Drop a row or observation by condition c) Drop a row or observation by index d) Drop a row or observation by position e) Drop Duplicate rows of the dataframe in pandas f) Delete a single column using just the column name Delete a single column with column index	3M 7M	3	4
Q.5(A)	i) Is, outlier an extremely high or extremely low value in the dataset? Justify your answer. ii) Elaborate on detection of outlier and how to exclude outliers. OR	3M 7M	4	3
Q.5(B)	Dissect on the following: i) Write in detail on data transformation process. How to transform data? ii) What are the challenges of transforming data? iii) What are the benefits of transforming data?	4M 3M 3M	4	3
Q.6(A)	i) Define KNN algorithm. ii) Design a machine to implement k-Nearest Neighbour algorithm to classify the iris data set. Print both correct and wrong predictions using Python ML library classes. OR	2M 8M	5	3
Q.6(B)	i) Define linear regression? ii) Design a machine to demonstrate Linear Regression analysis with residual plots on a given data set	2M 8M	5	4

\*\*\* END\*\*\*



**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****IoT ARCHITECTURE AND PROTOCOLS**

(CSE (Internet of Things))

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 sensors and actuators.	1M	1	1
	ii. What is solution domain?	1M	1	1
	iii. What are the different non-functional requirements available?	1M	2	1
	iv. What is hop-by-hop communication?	1M	2	1
	v. Define 6TiSCH network.	1M	3	1
	vi. What is the IEEE 802.11 protocol?	1M	3	1
	vii. Why MQTT is used in IoT?	1M	4	1
	viii. Differ TLS and DTLS connection.	1M	4	1
	ix. Compare OMA and BBF.	1M	5	4
	x. What is an instance of a database?	1M	5	1
Q.2(A)	Explain about the knowledge management in IoT.	10M	1	3
OR				
Q.2(B)	Sketch IoT architecture and explain about the different standard considerations of IoT architecture.	10M	1	2
Q.3(A)	Illustrate the real-world design constraints of IoT.	10M	2	3
OR				
Q.3(B)	Explain in detail about the IoT reference architecture functional view.	10M	2	2
Q.4(A)	Discuss about the ICMP and CARP protocol in detail.	10M	3	2
OR				
Q.4(B)	Explain in detail about the IEEE 802.15 architecture and its types.	10M	3	2
Q.5(A)	Write in detail about the CoAP and XMPP.	10M	4	3
OR				
Q.5(B)	Write about the constrained application protocol and message queuing telemetry transport in detail.	10M	4	3
Q.6(A)	Derive a case study on environment monitoring system using IoT.	10M	5	5
OR				
Q.6(B)	Draw and explain about the DBMS architecture 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, July - 2023**  
**COMPUTER NETWORKS**  
(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 Cross layering?	1M	1	1
	ii. Define PPP protocols	1M	1	1
	iii. What is a HUB?	1M	2	1
	iv. What is the use of NAT in networking?	1M	2	1
	v. What are the Channelization protocols?	1M	3	1
	vi. What are the Differences of IPV4 and IPV6?	1M	3	1
	vii. What is RIP protocol and how it works?	1M	4	1
	viii. What is congestion control and its types?	1M	4	1
	ix. What is client Server Programming?	1M	5	1
	x. What is WWW and FTP?	1M	5	1
Q.2(A)	Explain about packet switching in computer networks?	10M	1	1
OR				
Q.2(B)	What is the role of the protocol layers in a network system?	10M	1	1
Q.3(A)	Discuss the error detection and correction procedure using hamming code?	10M	2	2
OR				
Q.3(B)	What is MAC in Data link layer and discuss its types?	10M	2	2
Q.4(A)	Explain the Congestion control algorithms.	10M	3	1
OR				
Q.4(B)	Explain the IP addressing and its types?	10M	3	1
Q.5(A)	Discuss the factors that affecting network performance?	10M	4	1
OR				
Q.5(B)	Explain the shortest path algorithm with a suitable example?	10M	4	1
Q.6(A)	Explain the elements of the transport layer.	10M	5	1
OR				
Q.6(B)	Classify the protocols and functions 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, July - 2023****DATA VISUALIZATION**

(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 the various tools of analytics in tableau.	1M	1	1
	ii. Define coordinate system.	1M	1	1
	iii. State the three fundamental use cases of color in data visualization.	1M	2	2
	iv. Why do we need error bars?	1M	2	1
	v. Define density plot	1M	3	1
	vi. What is meant by correlation coefficient?	1M	3	1
	vii. Write the principle of proportional link.	1M	4	1
	viii. State data-ink ratio.	1M	4	1
	ix. When do we call a work as repeatable?	1M	5	2
	x. What are the most used image formats?	1M	5	1
Q.2(A)	Illustrate how scales map data values on to aesthetics. OR	10M	1	1
Q.2(B)	Compare and contrast Cartesian and polar coordinate system.	10M	1	4
Q.3(A)	When do we need sequential color scale and accent color scale? Explain with example. OR	10M	2	2
Q.3(B)	Differentiate between histogram and density plot with an example.	10M	2	1
Q.4(A)	Write a detailed note on dimension reduction. OR	10M	3	1
Q.4(B)	Demonstrate how would you visualize proportions	10M	3	3
Q.5(A)	List and explain the common pitfalls of color use. OR	10M	4	2
Q.5(B)	Explain the purpose of direct labeling.	10M	4	3
Q.6(A)	Why is it important to use a consistent visual language across figures? Explain with an example. OR	10M	5	2
Q.6(B)	Explain lossless compression and lossy compression of bitmap graphics.	10M	5	2

\*\*\* END\*\*\*

Hall Ticket No: 

Question Paper Code: 20CAI403 &amp; 20CSD404

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****WEB TECHNOLOGIES**

(Common to CSE (Artificial Intelligence) and 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. Tabulate the differences between TCP and UDP	1M	1	1
	ii. What is CSS? What are its types?	1M	1	1
	iii. What is server-side and client-side programming?	1M	2	1
	iv. List the different methods defined in document and window object of JavaScript.	1M	2	1
	v. Sketch the Servlet life cycle.	1M	3	2
	vi. Formulate the three methods that are central to the life cycle of the servlet.	1M	3	6
	vii. Analyze about Query String in PHP.	1M	4	4
	viii. Evaluate the process of displaying XML document in browser.	1M	4	5
	ix. Summarize the need of SOAP and show its structure.	1M	5	2
	x. Define WSDL.	1M	5	1
Q.2(A)	Explain in detail about the working principle of the TCP/IP and HTTP protocols.	10M	1	2
	OR			
Q.2(B)	How do you create frames in HTML? Why do you need them? Develop an application to explain the same.	10M	1	1
Q.3(A)	Describe the functions and objects used in JavaScript and explain with an example.	10M	2	2
	OR			
Q.3(B)	Write the JavaScript to display square and cube of 10 numbers in a table.	10M	2	1
Q.4(A)	Demonstrate the procedure of installing and configuring ApacheTomcat.	10M	3	2
	OR			
Q.4(B)	Explain JSP scripting elements with examples.	10M	3	1
Q.5(A)	Explain about control statements and data types in PHP with examples.	10M	4	2
	OR			
Q.5(B)	Explain in detail about the XML DTD with student database example.	10M	4	6
Q.6(A)	Explain in detail with an example of Java Web Services.	10M	5	2
	OR			
Q.6(B)	Explain in details about XMLHttpRequest and Response Object with example.	10M	5	1

\*\*\* END\*\*\*

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**  
(UGC-AUTONOMOUS)  
**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**  
**AUTOMATA THEORY AND COMPILER DESIGN**  
(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. Find the $\epsilon$ closure of states $q_0$ , $q_1$ and $q_2$ in the following NFA with $\epsilon$ transition. <div style="text-align: center;"><pre>graph LR     q0((q0)) -- a --&gt; q0     q0 -- epsilon --&gt; q1((q1))     q1 -- b --&gt; q1     q1 -- epsilon --&gt; q2(((q2)))     q2 -- c --&gt; q2</pre></div>	1M	1	2
	ii. Define Pumping Lemma of Regular Language.	1M	1	1
	iii. Define Turing Machine.	1M	2	1
	iv. Consider the grammar- $S \rightarrow A1B$ $A \rightarrow 0A / \epsilon$ $B \rightarrow 0B / 1B / \epsilon$ For the string $w = 00101$ , find the Leftmost derivation	1M	2	2
	v. Define Assembler.	1M	3	1
	vi. Define Three address code.	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	2
	ix. List out the issues in the design of code generator.	1M	5	1
	x. Define peephole optimization.	1M	5	1
Q.2(A)	Find the Minimized DFA for the following regular expression $(a/b)^*abb$ . OR	10M	1	3
Q.2(B)	i) Prove that the language $L = \{ww^R \mid w \in \{a,b\}^*\}$ is not regular. ii) Design an NFA with $\Sigma = \{0, 1\}$ accepts all string in which the fourth symbol from the right end is always 0.	5M	1	3
Q.3(A)	Design PDA to accept the language $L = \{a^n b^n \mid n \geq 0\}$ and check the input string $w = aabb$ is accepted or not. OR	10M	2	3
Q.3(B)	Construct Turing Machine for the language $L = \{0^n 1^n 2^n\}$ where $n \geq 1$ .	10M	2	3
Q.4(A)	Describe the various phases of compiler and trace it with the program segment	10M	3	3

Position = initial + rate \* 60

OR

Q.4(B) Explain in detail about the LEX tool with an example. 10M 3 2

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Q.5(A) Construct the Predictive parsing table for the following grammar. 10M 4 3

S->iEtS | iEtSeS | a  
E->b

OR

Q.5(B) Check whether the following grammar is SLR(1) or not. 10M 4 3

S->L=R  
S->R  
L->\*R  
L->id  
R->L

---

Q.6(A) Explain in detail about the issues in the design of code generator. 10M 5 2

OR

Q.6(B) Explain about peephole optimization with examples. 10M 5 2

\*\*\* END\*\*\*

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**  
(UGC-AUTONOMOUS)  
**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023**  
**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. What is Data Communication?	1M	1	1
	ii. Give an example for Half duplex and Full duplex communication.	1M	1	1
	iii. What is meant by Packet switching?	1M	2	1
	iv. What is the use of ICMP?	1M	2	1
	v. Define multicast routing.	1M	3	1
	vi. What is count to infinity problem?	1M	3	1
	vii. What is 3-Way Handshake?	1M	4	1
	viii. Define the role of Socket in computer Networks.	1M	4	1
	ix. Abbreviate SMTP.	1M	5	1
	x. What happens in client-server programming?	1M	5	1
Q.2(A)	Explain the layers of TCP/IP model with a neat architecture.	10M	1	2
OR				
Q.2(B)	List out the Error Detection techniques.	10M	1	1
Q.3(A)	Explain in detail about Ethernet and the evolution from wired to wireless connection.	10M	2	2
OR				
Q.3(B)	Explain briefly about various IP classes with its range.	10M	2	2
Q.4(A)	With a neat diagram illustrate IPV6 and its components.	10M	3	2
OR				
Q.4(B)	Compare Intra-domain and Inter-domain protocols.	10M	3	4
Q.5(A)	Summarize the various congestion control techniques in TCP?	10M	4	2
OR				
Q.5(B)	Discuss the state-of-art services, Header format and features of UDP.	10M	4	5
Q.6(A)	Explain the working principle of DNS in application layer.	10M	5	2
OR				
Q.6(B)	Determine the need for cryptography and network security in application layer.	10M	5	5

\*\*\* END\*\*\*

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****SAFETY IN CONSTRUCTION (MOOC)**

(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

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

**B.Tech III Year I Semester Regular & Supplementary End Semester Examinations –2023**

**ROADMAP FOR PATENT CREATION (MOOC)**

(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 Part-A or B only

Q.No.	Question	Marks	CO	BL
Q.1	i. Which report is important before filing the patent application	1M	1	1
	ii. What happens if the patent Expires?	1M	1	1
	iii. How we can file Incomplete Specifications.	1M	2	1
	iv. Mention the method to identify potential IP.	1M	2	2
	v. What is the time limit to file Paris convention in other countries?	1M	3	2
	vi. Define Cognate Patent.	1M	3	1
	vii. What is meant by Backward citation?	1M	4	1
	viii. When the classification of patent is granted?	1M	4	1
	ix. Differentiate Pre-IP and Post-IP Stage.	1M	5	1
	x. Mention the patent Fee for Individual Patent Filing.	1M	5	1
Q.2(A)	Explain briefly about the Parts of Patent Document.	10M	1	3
	OR			
Q.2(B)	Write in detail about IPR.	10M	1	3
Q.3(A)	Explain in detail about Terminologies and Codes used in a Patent Document.	10M	2	3
	OR			
Q.3(B)	Describe Patent creation process with the case study - how a single patent can provide competitive advantage to build an organization.	10M	2	4
Q.4(A)	Explain briefly about the Public Patent Databases.	10M	3	3
	OR			
Q.4(B)	Write in detail about IP Identification Tools.	10M	3	3
Q.5(A)	Explain the steps involved in Patent Filing Procedure in India in detail.	10M	4	3
	OR			
Q.5(B)	Explain in detail about Demonstration - Research/Project Planning.	10M	4	3
Q.6(A)	How we can Develop our Own IP System. Explain in detail.	10M	5	4
	OR			
Q.6(B)	Elaborate the Procedure for Patent Filing-Forms and Fees.	10M	5	3

\*\*\* END\*\*\*

**MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE**

(UGC-AUTONOMOUS)

**B.Tech III Year I Semester (R20) Supplementary End Semester Examinations, July - 2023****PLASTIC WASTE MANAGEMENT (MOOC)**

(Open Elective)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.

In Q.no 2 to 6 answer either Part A or Part B only.

Q.No	Question	Marks	CO	BL
Q.1	i. Define plastic.	1M	1	1
	ii. List out any four types of Plastic.	1M	1	2
	iii. Mention any four sources of Plastic Waste.	1M	2	1
	iv. What is mean by non-biodegradable wastes:	1M	2	1
	v. Mention any four Plastic Waste Management Rules 2016	1M	3	2
	vi. Why Feedstock Recycling is importance?	1M	3	1
	vii. What is meant by solid waste?	1M	4	1
	viii. List out the Bio based Plastic Products	1M	4	2
	ix. Define Pyrolysis.	1M	5	1
	x. Mention the Possible Alternate Materials to Plastics.	1M	5	2
Q.2(A)	Explain the sources and types of plastic wastes. How to reduced plastic waste?	10M	1	1
	OR			
Q.2(B)	Define Plastic Waste management? Give the Indian Plastic Waste Management Rules with meaning.	10M	1	2
Q.3(A)	Explain Plastic Bans - China Sword Policy Impacts.	10M	2	3
	OR			
Q.3(B)	How to control the Plastic Pollution: Health and Environmental Impact consideration.	10M	2	2
Q.4(A)	Explain in detail: Mechanical and Feedstock Recycling method how to control the pollution	10M	3	2
	OR			
Q.4(B)	What is meant by plastic pollution control? How the pollutants are categorized and mention the common plastic pollution control devices used in conjunction with incinerator.	10M	3	2
Q.5(A)	Enumerate the various methods of Plastic Pollution Impacts on Marine and Wildlife explain with suitable example	10M	4	3
	OR			
Q.5(B)	What is mean by Landfilling, what are the factors consider landfilling?	10M	4	2
Q.6(A)	Explain the Use of Waste Plastics in Road Construction.	10M	5	4
	OR			
Q.6(B)	With examples, explain the energy recovery technique used in the chemical and biological transformation of plastic waste	10M	5	4

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