Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CE111

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

GEOTECHNICAL ENGINEERING

(Civil Engineering)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Write the major type of soils found in India?	1M	1	1
	ii.	Define shrinkage limit	1M	1	1
	iii.	Write the relationship between void ratio and porosity	1M	2	2
	iv	Define Residual Soils	1M	2	1
	v.	Write short note on organic soils	1M	3	1
	vi	Write the difference between the consolidation and compaction	1M	3	2
	vii.	If you pour sand on the ground, the angle made by the sand with respect to the horizontal is called as	1M	4	1
	viii.	What do you mean by factor of safety	1M	4	1
	ix.	Write the number of methods are available to analyze the F.S in embankment dams	1M	5	1
	x.	Write the relation between the factor of safely and Taylor's stability number Sn	1M	5	1
Q.2(A)		(i) Differentiate between 'residual' and 'transported' soils. (ii)What do you mean by Liquid Limit (iii)Define shrinkage limit (iv) Write the major type of soils found in India? (v) Write formula for Plastic index	10M	1	2
		OR			
Q.2(B)		$1m^3$ of wet soil weights 20KN. Its dry weight is 18 KN. Specific gravity of solids is 2.67. determine the water content, porosity, void ratio and the degree of saturation. Draw phase diagram	10M	1	3
Q.3(A)		A sample of saturated soil has a water content of 35%. The specific gravity ofsolids is 2.65. Determine its void ratio, porosity, saturated unit weight and dry unit weight.	10M	2	3
		OR			
Q.3(B)		The discharge of water collected from a constant head permeameter in a periodof 15 minutes is 500 ml. The internal diameter of the permeameter is 5 cm and the measured difference in head between two gauging points 15 cm vertically apart is 40 cm. Calculate the coefficient of permeability. If the dry weight of the 15 cm long sample is 4.86 N and the specific gravity of the solidsis 2.65, calculate the seepage velocity.	10M	2	3
Q.4(A)		(i) Explain the Mohr-Coulomb strength envelope (ii) Explain the principle of the direct shear test. What are the advantages of this test?	10M	3	2
		OR			

Q.4(B)	A fully saturated clay specimen placed in consolidometer and 2kg/cm^2 pressure is applied after some time, the pore pressure is found to be 0.70kg/cm^2 and change in thickness of the sample is found to be 1mm.Find the final settlement?	10M	3	3
Q.5(A)	Calculate the potential shear strength on horizontal plane at a depth of 3m below the surface in a formation of cohesionless soil when the water table is at a depth of 3.5m. the degree of saturation may be taken as 0.5 on the average. Void ratio = 0.5; specific gravity is 2.70, angle of internal friction 30 degrees. What will be the modified value of shear strength if the water table reaches the ground surface?	10M	4	2
	OR			
Q.5(B)	(i) Write Mohr- coulomb theory and explain the influencing parameters (ii)What is the shear strength in terms of effective stress on a plane within a saturated soil mass at a point where the total normal stress is 295kpa and the pore water pressure 120 Kpa. The effective shear strength parameters are C'=12kpa and $\varphi=30^0$.	10M	4	3
Q.6(A)	Explain in detail how to perform SPT test and how to find bearing capacity of soil. Mention their limitations	10M	5	2
	OR			
Q.6(B)	Explain in detail about different types of foundation and how to find the location and depth of foundation.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CE112

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

TRANSPORTATION ENGINEERING

(Civil Engineering)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Classify types of roads?	1M	1	1
	ii.	Define flexible and rigid pavement?	1M	1	1
	iii.	Define the terms SSD and OSD?	1M	2	1
	iv	What is the basic requirement of a highway alignment?	1M	2	2
	v.	Explain the terms speed and density?	1M	3	2
	vi	What do you mean by road safety audit?	1M	3	2
	vii.	What is impact test of aggregate?	1M	4	1
	viii.	What are the various types of intersection?	1M	4	1
	ix.	What is full form of AASHTO?	1M	5	1
	x.	What is vertical alignment of a road?	1M	1	1
Q.2(A)		Discuss the objectives of highway planning? What are different types of classification of road? Explain the methods of classification of roads.	10M	1	2
		OR			
Q.2(B)		Explain highway alignment and various requirements of an ideal road alignment? What are the controlling factors that need to keep in mind while deciding the alignment of a new highway, elaborate with neat sketch?	10M	1	3
Q.3(A)		Define transition curve? Discuss the importance of transition curve? How do you calculate the length of transition curve?	10M	2	3
		OR			
Q.3(B)		The speeds of overtaking and overtaken vehicles are 130 and 80 km/h Respectively on a two-way traffic road. If the acceleration of overtaking vehicle is 0.98 m/s. Calculate safe overtaking sight distance? Mention the minimum length of overtaking zone, draw a neat-sketch of the overtaking zone and show the positions of signposts.	10M	2	4
Q.4(A)		Explain in detail about the Principles of highway lighting.	10M	3	3
		OR			
Q.4(B)		Discuss in details the various types of signals?	10M	3	3
Q.5(A)		How to ensure the traffic safety in new design, reconstruction and operation	10M	4	5
		OR			
Q.5(B)		Explain in detail the seven principles of universal design?	10M	4	3
Q.6(A)		Discuss in detail about elements of harbour?	10M	5	3
		OR			
Q.6(B)		Explain various geometric design elements of Railway?	10M	5	3

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CE113

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

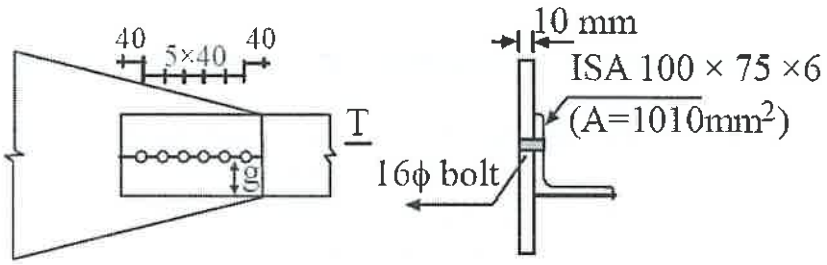
DESIGN OF STEEL STRUCTURES

(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.
IS 800 2007 and Steel Tables are permitted to use in the Exam.
Assume Suitable data if necessary

Q.No		Question	Marks	CO	BL
Q.1	i.	Write any two advantages and disadvantages of steel structures.	1M	1	1
	ii.	What is the difference between the pitch and gauge distance in the bolted joint?	1M	1	2
	iii.	Define laterally supported beam and laterally unsupported beam.	1M	2	1
	iv	What do you mean by 'formation of plastic hinge' in beams?	1M	2	2
	v.	Define slenderness ratio.	1M	3	1
	vi	Why lacing is provided in the columns?	1M	3	1
	vii.	In which situation the plate girder is most suitable instead of rolled steel section.	1M	4	2
	viii.	Write the equation to determine the economical depth of plate girder.	1M	4	2
	ix.	What are the forces acting on gantry girder?	1M	5	2
	x.	Write the deflection limits of gantry girder when it is carrying vertical loads as per IS 800: 2007.	1M	5	2
Q.2(A)		(i) Discuss about the various defects that may be present in the welding?	5M	1	2
		(ii) Calculate the strength of a 20 mm diameter bolt of grade 4.6 for a lap jointed connection. The main plates to be joined are 12 mm thick. Take Fe410 grade steel.	5M	1	4
		OR			
Q.2(B)		(i) Differentiate between welded joints and riveted joints.	5M	1	4
		(ii) The plates of a tank 8 mm thick are connected by a single bolted lap joint with 20 mmdiameter bolts at 50 mm pitch. Estimate the efficiency of the joint. Assume Fe 410 plateand grade 4.6 bolts.	5M	1	4
Q.3(A)		A simply supported steel joist with effective span of 5.0 m, carries a uniformly distributed load of 50 KN over its span inclusive of its self-weight. The beam is supportedlaterally throughout. Select a suitable section (f_y = 250 N/mm^2) and check it's safety.	10M	2	5
		OR			
Q.3(B)		A single unequal angle 100 × 75 × 6 mm is connected to a 10 mm thick gusset plate at theends with six 16 mm diameter bolts to transfer tension. Evaluate the design tensilestrength of the angle assuming that the yield and theultimate stress of steel used are 250MPa and 410 MPa if gusset plate is connected to the 75 mm leg. Take g = 40mm.	10M	2	5



Q.4(A)	Design a single angle discontinuous strut to carry a factored load of 80 kN. Assume that the distance between its joints is 2.8 m. Also assume f_y = 250 N/mm², f_u=410 N/mm², and E=2x10⁵ N/mm².	10M	3	4
	OR			
Q.4(B)	Design a laced column with two channel sections placed toe to toe of length 8 m to carry axial loaf of 600 KN. The column is restrained in position but not in direction atboth the ends.	10M	3	4
Q.5(A)	A plate girder of 20 m span is to be provided in an upcoming class room of MITS. The superimposed load, exclusive of self-weight is 80 kN. Design the flange. Also, draw the cross-section of girder. Take f_y = 250 MPa and assume that the plate girder to be laterally supported throughout.	10M	4	5
	OR			
Q.5(B)	Design a welded plate girder of span 24 m to carry an imposed load of 50 kN/m. Avoid to use bearing and intermediate stiffeners. Assume the material properties as follows: fy = 250 N/mm², fu=410 N/mm²,and E=2x10⁵ N/mm².	10M	4	4
Q.6(A)	Design a gantry girder as laterally supported beam to be used in an industrial building carrying a n\hand operated crane, for following data:	10M	5	4

Crane capacity	=	50 kN
Self-weight of crane girder excluding trolley	=	40 kN
Weight of trolley car	=	10 kN
Approximate minimum approach of the crane hook to gantry girder	=	1 m
Wheel base	=	3 m
c/c distance between gantry rails	=	14 m
c/c distance between columns	=	5.5 m
Self-weight of rail section	=	0.3 N/mm
Yield stress of steel	=	250 MPa

OR

Q.6(B)	(i) Explain step by step procedure to design gantry girder.	8M	5	2
	(Ii) Write down the uniqueness of gantry girder?	2M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20CE4M10

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

SAFETY IN CONSTRUCTION (MOOC)

(Civil Engineering)

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

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

Q.No.		Question	Marks	CO	BL
Q.1	i.	What is the purpose of the safety pyramid?	1M	1	1
	ii.	Name one theory of accident causation.	1M	1	1
	iii.	What is OSHA and its role in safety?	1M	2	1
	iv	What is the purpose of a job hazard analysis?	1M	2	1
	v.	What is the penalty for violating safety regulations?	1M	3	1
	vi	What are the different types of injuries?	1M	3	1
	vii.	Name one hazard associated with confined spaces.	1M	4	1
	viii.	What is BIM and its relation to safety?	1M	4	1
	ix.	What is the purpose of an accident investigation?	1M	5	1
	x.	What are the key considerations for fire safety?	1M	5	1
Q.2(A)		Explain the concept of a safety pyramid and its significance in safety management.	10M	1	2
		OR			
Q.2(B)		Discuss two theories of accident causation and provide examples to support your explanation.	10M	1	2
Q.3(A)		Outline the process of planning for a safety budget and discuss its importance in ensuring effective safety management.	10M	2	2
		OR			
Q.3(B)		Describe the role of stakeholders in safety management and how they contribute to creating a safe working environment.	10M	2	2
Q.4(A)		Explain the basic principles of OSHA regulations and their impact on workplace safety.	10M	3	3
		OR			
Q.4(B)		Discuss the importance of conducting job hazard analysis in construction and explain the steps involved in this process.	10M	3	3
Q.5(A)		Describe the process of accident investigation and explain how it helps in preventing future accidents..	5M	4	2
		OR			
Q.5(B)		Discuss the concept of violation and penalty in relation to accident indices and its implications for safety management.	10M	4	2
Q.6(A)		Describe the fire hazards typically encountered in construction sites and discuss the preventive measures to ensure fire safety.	10M	5	2
		OR			
Q.6(B)		Describe the key components of a safety culture and discuss its significance in promoting a safe work environment.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20EEE112

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations – January 2024

MEASUREMENTS AND TRANSDUCERS

(EEE)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Differentiate between the spring control and gravity control.	1M	1	1
	ii.	Define Indicating Instrumentation.	1M	1	1
	iii.	What is creeping in energy meters?	1M	2	1
	iv	State disadvantages of Dynamometer type wattmeter.	1M	2	1
	v.	What is Schering Bridge?	1M	3	1
	vi	State the applications and advantages of De Sauty bridge	1M	3	1
	vii.	Define digital multimeter.	1M	4	1
	viii.	What are the controls associated in DSO.	1M	4	1
	ix.	Mention types of Transducers.	1M	5	1
	x.	Define Photo Conductive Cell.	1M	5	1
Q.2(A)		With a neat diagram explain in detail the construction and working of Electrodynamometer type instruments. Also derive the expression for deflecting torques.	10M	1	3
		OR			
Q.2(B)		With a neat diagram explain in detail the construction of MI instrument and discuss the extension of rage using shunt and series resistance.	10M	1	2
Q.3(A)		Explain the double element and three-element wattmeter and derive the equations.	10M	2	3
		OR			
Q.3(B)		Explain the construction and working of three-phase power factor meter.	10M	2	3
Q.4(A)		With a neat diagram explain in detail the measurement of current and voltage by using Crompton potentiometer.	10M	3	2
		OR			
Q.4(B)		Obtain the expression for the measurement of resistance using Kelvin's double bridge with a neat circuit diagram.	10M	3	3
Q.5(A)		i) Explain the various types of Probes using in DSO	5M	4	2
		ii) Explain the loading and measurements effects.	5M	4	2
		OR			
Q.5(B)		Draw and explain the circuit diagram of digital frequency meter.	10M	4	2
Q.6(A)		Explain the construction and working of LVDT with a neat sketch and list its applications.	10M	5	2
		OR			
Q.6(B)		i) Write short notes on Thermistor	5M	4	2
		ii) Explain Photo Diode with diagram.	5M	4	2

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20EEE113

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations – January 2024

SIGNALS AND SYSTEMS

(EEE)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Define energy and power signals	1M	1	1
	ii.	Test the signal $x(n)$= u(n+2)-u(n-2) is causal or non-causal.	1M	1	4
	iii.	Write one example for the Static and Dynamic systems	1M	2	4
	iv	What is the equation for Convolution in continuous and discrete systems?	1M	2	3
	v.	What is FIR and IIR?	1M	3	1
	vi	Explain linearity property of DTFT.	1M	3	5
	vii.	Define Bilateral and Unilateral Laplace transform.	1M	4	1
	viii.	Define ROC in Laplace transform.	1M	4	1
	ix.	State the final value theorem of Z -transforms	1M	5	2
	x.	Find the Z transformation of $x(n) = -a^n u(-n-1)$.	1M	5	1
Q.2(A)		(i) Sketch the following signals (a) $u(t) - u(t-2)$ (b) $r(-0.5t + 2)$	5M	1	3
		(ii) Determine whether the following signal is periodic or not. If periodic, determine the fundamental period of the signal. $x(n) = cos\left(\frac{\pi}{3}n\right) + cos\left(\frac{\pi}{4}n\right)$	5M	1	3
		OR			
Q.2(B)		Justify whether the system $y(n) = a^n u(n)$ is (i) Static or dynamic (ii) Linear or nonlinear (iii) Time-invariant or time-variant (iv) Stable or unstable (v) Causal or non-causal	10M	1	5
Q.3(A)		Identify the output y(t) for a continuous time LTI system whose impulse response $h(t)$ and the input $x(t)$ are given by $x(t) = u(t) - u(t-3)$ and $h(t) = u(t) - u(t-2)$.	10M	2	3
		OR			
Q.3(B)		Graphically find out the convolution $y(t) = x(t) * h(t)$ for the following signals x(n)={1,2,3,2};h(n)={1,1,2}	10M	2	3
Q.4(A)		State and prove any four properties of Discrete Fourier Transform.	10M	3	5
		OR			
Q.4(B)		Find the trigonometric Fourier series for half wave rectified sine wave.	10M	3	1

Q.5(A)	Discuss the properties of ROC for Laplace transform.	10M	4	6
	OR			
Q.5(B)	State and prove the following properties of Z-transform. i) Convolution property ii) Correlation property iii) Time shifting property	10M	4	6
Q.6(A)	(i)What is meant by Up sampling and down sampling?	5M	5	5
	(ii) Explain signal reconstruction?	5M	5	5
	OR			
Q.6(B)	(i)Explain in detail of zero order hold?	5M	5	5
	(ii) What is the transfer function of zero order hold?	5M	5	5

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20EEE114

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations – January 2024

POWER SYSTEMS-II

(EEE)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Write the advantages of Per Unit system.	1M	1	1
	ii.	Define: Oriented graph of a network.	1M	1	1
	iii.	State the advantages of Newton Raphson Load Flow method over Gauss Seidel Load Flow method.	1M	2	1
	iv	In load flow studies, the PV bus is treated as PQ bus when ..... limit is violated.	1M	2	1
	v.	Define the fault level.	1M	3	1
	vi	What is the necessity of current limiting reactor?	1M	3	1
	vii.	Define: Unbalanced fault.	1M	4	1
	viii.	The negative sequence currents are present in all ..... Faults.	1M	4	1
	ix.	Write the expression for Critical clearing angle.	1M	5	1
	x.	State the methods to improve stability.	1M	5	1
Q.2(A)		Derive the expression for Ybus matrix using direct method or inspection method.	10M	1	2
		OR			
Q.2(B)		The parameters of a 3-bus system are as under, Find the bus admittance matrix using direct inspection method.	10M	1	2

Bus Code	Impedance (pu)	Half-line Charging admittance (pu)
1-2	0.06+j0.18	j0.005
1-3	0.02+j0.06	j0.006
2-3	0.04+j0.12	j0.005

Q.3(A)		Explain clearly the computational procedure for load flow solution using Newton-Raphson method, considering the generator reactive power limit.	10M	2	2
		OR			

Q.3(B)	The load flow data for the sample power system are given below (all values are in per unit). The voltage magnitude at bus 2 is to be maintained at 1.04 p.u. The maximum and minimum reactive power limits of the generator at bus 2 are 1.0 and 0.2 p.u. respectively. Determine the voltage solution of the power system at the end of first iteration using Gauss-Seidel method	10M	2	2

Impedance for sample system:

Bus code	*Impedance*	*Line charging admittance*
1–2	*0.08 + j0.24*	*0.0*
1–3	*0.02 + j0.06*	*0.0*
2–3	*0.06 + j0.18*	*0.0*

Schedule of generation and loads:

Bus code	*Assumed voltages*	*Generation*		*Load*	
		P	*Q*	*P*	*Q*
1	*1.06 + j0.0*	*0.0*	*0.0*	*0*	*0*
2	*1.0 + j0.0*	*0.2*	*0.0*	*0*	*0*
3	*1.0 + j0.0*	*0.0*	*0.0*	*0.6*	*0.25*

Q.4(A)	Write short notes on symmetrical fault analysis using bus impedance matrix	10M	3	2

OR

Q.4(B)	Form the Zbus matrix for the data given for the network using Zbus building algorithm.	10M	3	2

Bus code	Impedance (pu)
1-2	0.1
1-3	0.1
2-3	0.1
0-1	0.25
0-2	0.25

Q.5(A)	Derive the expression for sequence components in L-L fault.	10M	4	2

OR

Q.5(B)	A 25 MVA, 13.2 kV alternator with solidly grounded neutral has a sub-transient reactance of 0.25 p.u. The negative and zero sequence reactances are 0.35 and 0.1 p.u. respectively. Determine the fault current and the line-to-line voltages at the fault when a double line-to-ground fault occurs at the terminals of an unloaded alternator. Neglect resistance.	10M	4	2
Q.6(A)	Write down the step by step algorithm for solution of Swing equation.	10M	5	2

OR

Q.6(B)	Discuss the methods of improving stability of the power system network.	10M	5	2

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20ME4M06C

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations - January 2024

NON-CONVENTIONAL ENERGY RESOURCES

(EEE)

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

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

Q.No.		Question	Marks	CO	BL
Q.1	i.	Why does the presence of carbon dioxide gas in the atmosphere affect the global temperature?	1M	1	2
	ii.	State the significance of GDP in a nation.	1M	1	1
	iii.	A p-n junction semiconductor material is kept in the sunlight for some time. What will be the biasing condition of this junction?	1M	2	2
	iv	Which region of a p-n junction is critical to the capture of solar energy by preventing recombination?	1M	2	2
	v.	What is Betz limit?	1M	3	1
	vi	What are the most important requirements for the water photo-catalysis?	1M	3	1
	vii.	What is the disadvantage of dendrite growth in Lithium battery?	1M	4	2
	viii.	State the significance of equivalent circuit of solar cell	1M	4	1
	ix.	Draw the wind turbine power curve	1M	5	1
	x.	Write down the differences between capacitor and super capacitor.	1M	5	1
Q.2(A)		Describe the different kinds of energy sources available in India and discuss the energy consumption pattern.	10M	1	2
		OR			
Q.2(B)		Classify the different types of energy sources. Write about the worldwide consumption pattern of these sources.	10M	1	2
Q.3(A)		Write solar PV cell principal of operation and explain the IV characteristics, Isc, Voc and FF and their relations.	10M	2	2
		OR			
Q.3(B)		Describe in detail about the components of solar thermal energy systems in context with power generation.	10M	2	2
Q.4(A)		(i) Determine the power in the wind if the wind speed is 20 m/s and blade length is 50 m. Assume, Air density ρ = 1.23 kg/m. (5 Mark) (ii) What is the tip speed ratio (TSR) and write the formula. (5 Mark)	10M	3	2
		OR			
Q.4(B)		Discuss the working principle of horizontal axis wind turbine and vertical axis wind turbine in detail.	10M	3	2
Q.5(A)		Mention the various sources of biomass energy. What are the various crop residues used for biomass.	10M	4	2

	OR			
Q.5(B)	Explain in detail about the geothermal power plant with neat diagram.	10M	4	2
Q.6(A)	A parallel plate capacitor has square plates of side 5 cm & separated by a distance of 1 mm a) Calculate the capacitance of this capacitor. b) If a 10 V battery is connected to the capacitor, what is the charge stored in any one of the plates?	10M	5	2
	OR			
Q.6(B)	Briefly explain the concept of flywheel energy storage system.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20ME112

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

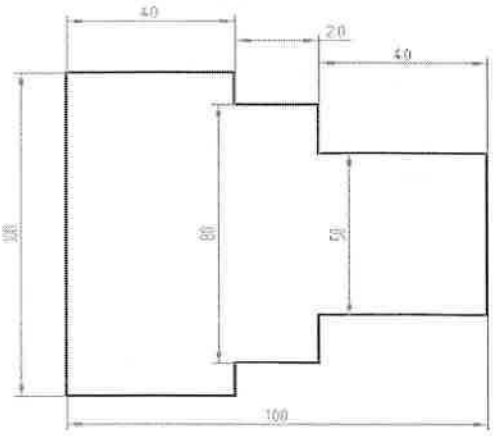
CAD/CAM

(Mechanical Engineering)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What is the role of computer in industries?	1M	1	1
	ii.	List the different input devices associated with CAD/CAM.	1M	1	2
	iii.	Name two methods of representing curves in computer graphics.	1M	2	1
	iv	What are the characteristics of non-parametric curves?	1M	2	1
	v.	What is automatic tool changer?	1M	3	1
	vi	List the advantages of qualified tool.	1M	3	2
	vii.	What is the significance of the workpiece zero position?	1M	4	1
	viii.	Name two types of G codes commonly used in turning and milling machining.	1M	4	2
	ix.	What are the technological justifications for implementing FMS in industries?	1M	5	1
	x.	What are some security considerations in Industry 4.0?	1M	5	1
Q.2(A)	What is cathode ray tube? Elaborate working principal, parts and advantages of cathode ray tube.		10M	1	2
	OR				
Q.2(B)	Write a short note on IGES, ACIS, DXF AND STL file CAD data exchange format.		10M	1	2
Q.3(A)	Describe wireframe modeling, surface modeling and solid modeling with advantages and limitations.		10M	2	2
	OR				
Q.3(B)	Discuss the role of geometry and topology in solid modeling and explain their significance in representing complex three-dimensional objects.		10M	2	3
Q.4(A)	What is NC, CNC and DNC system. Explain briefly with suitable diagram.		10M	3	2
	OR				
Q.4(B)	Explain major categories of CNC turning centres.		10M	3	2
Q.5(A)	Write an efficient CNC part program for turning operations as shown in Fig. All dimensions are in mm.		10M	4	3



OR

Q.5(B)	Elaborate the structure of an NC part program? Explain role of some of the commonly used G&M codes: G90, G91, M05, M06, M08, M09, G70,G71, G03, G04,	10M	4	3
Q.6(A)	Discuss the role of group technology (GT) in FMS and explain how it helps in organizing and optimizing manufacturing processes. Provide examples of its application.	10M	5	3

OR

Q.6(B)	Discuss the impact of Industry 4.0 on people/workers and society, including changes in job roles, skills requirements, and the overall socioeconomic landscape.	10M	5	3

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20ME113

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

AUTOMATION AND ROBOTICS

(Mechanical Engineering)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What is automation?	1M	1	1
	ii.	Define production rate	1M	1	2
	iii.	Enlist types of flow lines	1M	2	2
	iv	Define ideal cycle time	1M	2	2
	v.	Delineate line balancing	1M	3	1
	vi	What is the purpose of potentiometers?	1M	3	1
	vii.	Define Jacobian	1M	4	1
	viii.	Write about Skew motion	1M	4	1
	ix.	List-out the Robotic applications	1M	5	1
	x.	Define Dispensing	1M	5	1
Q.2(A)		Describe hardware components for automation and name three reasons for including a storage buffers in an automated production line	10M	1	2
		OR			
Q.2(B)		Explain the three basic elements of an automated system	10M	1	2
Q.3(A)		Assembling the product has been divided into minimum rational work elements. The industrial engineering department has developed time standards based on previous similar jobs. This information is given in the table below. In the right hand column are the immediate predecessors for each element as determined by precedence requirements? Assuming a cycle time of 1.0 min, find out the balance delay.	10M	2	5

Element No.	Work element description	T_e (mins)	Must be preceded by
1	Place frame on work holder and clamp	0.2	--
2	Assemble plug, grommet to power cord	0.4	--
3	Assemble brackets to frame	0.7	1
4	Wire power cord to motor	0.1	1,2
5	Wire power cord to switch	0.3	2
6	Assemble mechanism plate to bracket	0.11	3
7	Assemble blade to bracket	0.32	3
8	Assemble motor to bracket	0.6	3,4
9	Align blade and attach to motor	0.27	6,7,8
10	Assemble switch to motor bracket	0.38	5,8
11	Attach cover, inspect, and test	0.5	9,10
12	Place in tote pan for packing	0.12	11

OR

Q.3(B)	Discuss the various levels of automation	10M	2	2
Q.4(A)	Define Denavit-Hartenberg parameter of a robot with neat sketches	10M	3	2
	OR			
Q.4(B)	What are storage buffers and why are they sometimes used on a manual assembly line?	10M	3	4
Q.5(A)	Describe Lagrangian-Euler formulation.	10M	4	2
	OR			
Q.5(B)	A single-link robot with a rotary joint is motionless at θ = 15 degrees. It is desired to move the joint in a smooth manner to θ = 75 degrees in 3 seconds. Find the coefficients of a cubic which accomplishes this motion and brings the manipulator to rest at the goal.	10M	4	2
Q.6(A)	Describe types of actuators used in the robot	10M	5	2
	OR			
Q.6(B)	Nearly all actuators can be classified into one of three categories according to type of drive power. Describe all the three categories.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20ME4M08

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

OPERATIONS MANAGEMENT (MOOC)

(Mechanical Engineering)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What do you mean by Production?	1M	1	1
	ii.	Brief the steps of Life Cycle of a Product	1M	1	2
	iii.	What do you know about Routing?	1M	2	1
	iv	Define the term "operation management".	1M	2	1
	v.	What do you mean by Supply chain?	1M	3	1
	vi	List out the any four examples of line manufacturing in industry.	1M	3	1
	vii.	What are benefits Lean Manufacturing?	1M	4	1
	viii	Define Plant Location?	1M	4	2
	ix.	What is Load – Distance method?	1M	5	1
	x.	Is there any disadvantage of combined layout?	1M	5	2
Q.2(A)		Define Operations management. Explain the key concepts of Operations management with a suitable industry example.	10M	1	1
		OR			
Q.2(B)		Discuss about process analysis in manufacturing operations.	10M	1	2
Q.3(A)		What is Total Productive Maintenance (TPM)? What are its objectives? How it helps in improving the productivity and reducing the downtime of the organization?	10M	2	3
		OR			
Q.3(B)		A book binder has one printing press, one binding machine and manuscripts of 7 different books. The times required for performing printing and binding operations for different books are shown below.	10M	2	4

Book	1	2	3	4	5	6	7
Printing time (hours)	20	90	80	20	120	15	65
Binding time (hours)	25	60	75	30	90	35	50

Decide the optimum sequence of processing of books in order to minimize the total time required to bring out all the books.

Q.4(A)		Explain about need of production and operational management	10M	3	2
		OR			
Q.4(B)		What is meant by Plant Location? What are the factors to selection of location and explain any six factor.	10M	3	2
Q.5(A)		Explain the different types of hybrid layouts with suitable examples?	10M	4	2
		OR			
Q.5(B)		What is ISO? Bring out the benefits from getting ISO 14000 Certificate?	10M	4	2
Q.6(A)		Analyze the "operations" constitutes at (a) Industrial, (b) an educational institution, (c) a retail outlet	10M	5	4
		OR			
Q.6(B)		Find solution of Processing 5 Jobs Through 3 Machines Problem	10M	5	4

Job	1	2	3	4	5
Machine-1	9	8	6	7	11
Machine-2	5	6	2	3	4
Machine-3	4	9	8	6	5

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20ECE111

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations – January 2024

VLSI DESIGN

(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.	MOSFETs are said to be more efficient than BJTs. Justify the answer.	1M	1	4
	ii.	What is the importance of layout design rules?	1M	1	5
	iii.	What is pass transistor?	1M	2	2
	iv	List out the sources of static and dynamic power consumption.	1M	2	4
	v.	What is static latch?	1M	3	1
	vi	Mention the advantages of sense amplifier.	1M	3	3
	vii.	Draw a 1-bit DRAM cell.	1M	4	4
	viii.	Compare SRAM and DRAM (write any two).	1M	4	4
	ix.	What are the three main approaches used to Design for Testability?	1M	5	4
	x.	What is meant by IDDQ testing?	1M	5	5
Q.2(A)		Derive the drain current expression for n-channel MOSFET..	10M	1	4
		OR			
Q.2(B)		Discuss the DC characteristics of CMOS gate.	10M	1	4
Q.3(A)		Write short notes on: i) Pseudo nMOS logic ii) Dynamic logic	10M	2	4
		OR			
Q.3(B)		Implement 2-input XOR and XNOR gate using CVSL.	10M	2	5
Q.4(A)		Explain the operation of transmission gate based dynamic edge triggered registers.	10M	3	2
		OR			
Q.4(B)		Explain the operation of master slave edge triggered register with timing diagram.	10M	3	3
Q.5(A)		Design a 16-bit carry skip adder with block size of 4.	10M	4	5
		OR			
Q.5(B)		Discuss about 6T SRAM and memory array using SRAM cell.	10M	4	4
Q.6(A)		Explain in detail about boundary scan method.	10M	5	2
		OR			
Q.6(B)		Explain clearly about built in self-test.	10M	5	4

***** END*****

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20ECE112

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations – January 2024

ANTENNA AND MICROWAVE ENGINEERING

(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.	Define antenna radiation efficiency.	1M	1	1
	ii.	What are the types of antenna array?	1M	1	2
	iii.	Write the Friis transmission equation.	1M	2	1
	iv	Mention any two advantages of antenna arrays.	1M	3	1
	v.	List the effects of microwaves on human body.	1M	4	1
	vi	List advantages of microwaves.	1M	4	1
	vii.	List the properties of E plane TEE	1M	4	1
	viii.	What is S parameter?	1M	5	1
	ix.	What is the principle of operation of GUNN diode?	1M	5	2
	x.	What is velocity modulation?	1M	5	2
Q.2(A)		i) Distinguish the antenna types based on the radiation pattern with suitable diagram.	5 M	1	2
		ii) The radiation resistance of an antenna is 100 Ω and loss resistance is 20Ω. Calculate the Directivity of an Antenna if Power gain is 20.	5 M		
		OR			
Q.2(B)		Briefly write about the following antenna parameters i. Radiation Pattern iii. Half Power Beam Width ii. Radiation Intensity iv. Directivity	10M	2	2
Q.3(A)		What do you mean by an end fire array of antenna? Derive an expression for array factor of N element uniform linear array.	10M	3	6
		OR			
Q.3(B)		What do you mean by array synthesis? Briefly discuss any one method of array synthesis.	10M	3	4
Q.4(A)		i. Specify various bands of microwave spectrum with suitable diagram. ii. What are the safety measures to be followed while using microwaves?	5 M 5 M	4	3
		OR			
Q.4(B)		Explain how microwaves can be used in Civil and Military applications.	10M	4	2
Q.5(A)		What is an insertion loss filter? Explain the microwave filter design by insertion loss method.	10M	5	3
		OR			
Q.5(B)		Draw the schematic of Rat Race coupler and explain its operation.	10M	5	2
Q.6(A)		What is "S" parameter and why do we use S-parameter at microwave frequencies? Write the properties of S-Matrix.	10M	5	2
		OR			
Q.6(B)		With suitable diagram explain the working principle of two cavity Klystron amplifier.	10M	5	3

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20ECE113

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations – January 2024

DIGITAL 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.	Define Nyquist rate.	1M	1	1
	ii.	What is the main difference in DPCM and DM	1M	1	1
	iii.	Illustrate the uses of line coding techniques	1M	2	2
	iv	Define Unipolar RZ code	1M	2	1
	v.	Define QPSK	1M	3	1
	vi	Why is PSK always preferable over ASK in coherent detection	1M	3	1
	vii.	Write the importance of Probability of error	1M	4	1
	viii.	What do you mean by the term 'bandwidth SNR trade off'?	1M	4	1
	ix.	Mention the uses of equalization	1M	5	1
	x.	Identify the widely used carrier synchronisation circuitry.	1M	5	3
Q.2(A)		Define Companding and explain different types of companding techniques used in digital communication system	10M	1	1
		OR			
Q.2(B)		With a neat block diagram, explain the operation of delta modulation system	10M	1	2
Q.3(A)		Describe the optimum receiver model for the AWGN channel.	10M	2	
		OR			
Q.3(B)		Explain the generation and detection of 8-PSK with block diagram and constellation diagram.	10M	2	2
Q.4(A)		i) The bit stream 001010011010 is to be transmitted using BFSK. Sketch the transmitted waveform ii) Explain the generation of binary PSK	5+5M	3	3,2
		OR			
Q.4(B)		With necessary block diagram and waveforms sketch and explain about the Amplitude Shift Keying	10M	3	2
Q.5(A)		Derive an expression for the PSK system's probability of error.	10M	4	4
		OR			
Q.5(B)		A binary data is transmitted over an AWGN channel using binary PSK at a rate of 1Mbps. It is desired to have average probability of error Pe $<10^{-4}$. Noise power spectral density is $N_0/2 = 10^{-12}$ W/Hz. Determine the average carrier power required at the receiver input, if the detector is of coherent type.	10M	4	3
Q.6(A)		Give a thorough explanation of fixed and adaptive equalisation.	10M	5	1
		OR			
Q.6(B)		Explain the Nyquist criterion for distortion less transmission	10M	5	2

***** END*****

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20ECE4M03

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations - January 2024

COMPUTER NETWORKS AND INTERNET PROTOCOL (MOOC)

(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 Part-A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	How many layers are there in OSI model?	1M	1	1
	ii.	Who defines the Internet architecture?	1M	1	1
	iii.	What are User Agents in SMTP?	1M	2	1
	iv	What is the full form of HTTP?	1M	2	1
	v.	What is congestion avoidance?	1M	3	1
	vi	What is Super-netting?	1M	3	1
	vii.	What is the header length of the IPV6 datagram?	1M	4	1
	viii.	Expand DHCP.	1M	4	2
	ix.	Which tool can you use to capture and inspect network packets?	1M	5	1
	x.	What is the full form of CSMA/CD?	1M	5	1
Q.2(A)		Explain in detail about Network Protocol stack by defining each layer.	10M	1	2
		OR			
Q.2(B)		Describe the necessity of DNS in internet with the help of full resolver block diagram.	10M	1	2
Q.3(A)		Illustrate in detail how connection establishment will do through Transport Layer and what are its challenges?	10M	2	2
		OR			
Q.3(B)		Explain the need of Band Width Delay Product, Implication on Window Size and on Protocol Design size.	10M	2	1
Q.4(A)		Write in detail about the Congestion Control in TCP/IP.	10M	3	2
		OR			
Q.4(B)		Explain the concept of sliding window protocol in the context of data communication.	10M	3	2
Q.5(A)		Explain about CIDR and its addressing format.	10M	4	4
		OR			
Q.5(B)		Discuss about Router Hardware and its Internal block diagram	10M	4	4
Q.6(A)		Write about Per Packet Processing – Basic Architectural Components with neat diagram.	10M	5	2
		OR			
Q.6(B)		Describe Address Resolution Protocol (ARP) in detail.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20ECE4M06

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations - January 2024

COMMUNICATION NETWORKS (MOOC)

(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 Part-A or B only

Q. No		Question	Marks	CO	BL
Q.1	i.	What is the difference between Circuit Switching & Packet Switching?	1M	1	1
	ii.	What is the role of Space switching?	1M	1	2
	iii.	Mention the advantage of CSMA / CD	1M	2	3
	iv.	What is Bridges?	1M	2	2
	v.	What is Subnet?	1M	3	2
	vi.	What is ARP?	1M	3	2
	vii.	Describe the characteristics of different queuing models (e.g., M/M/1, M/M/c) and their applicability to circuit networks.	1M	4	1
	viii.	List any two limitations of Service Process	1M	4	1
	ix.	Define cognitive network.	1M	5	2
	x.	Expansion of NFV?	1M	5	1
Q.2(A)		Draw the structure of switch and explain the circuit switching in detail.	10M	1	2
		OR			
Q.2(B)		Describe the different components used in packet switch	10M	1	4
Q.3(A)		Briefly discuss some of the collision avoidance strategies in CSMA/CA. What is the purpose of NAV in CSMA/CA?	10M	2	4
Q.3(B)		What is ALOHA & Explain in detailed about Slotted Aloha	10M	2	3
Q.4(A)		Discuss about the Distance Vector Routing protocol.	10M	3	3
Q.4(B)		Explain in detail about the three way handshake protocol for connection establishment in TCP.	10M	3	3
Q.5(A)		Explain in detail about Discrete-Time Markov Chain (DTMC)?	10M	4	2
		OR			
Q.5(B)		State and prove the Little's Theorem.	10M	4	4
Q.6(A)		Explain design Open Flow switching based networking application.	10M	5	2
		OR			
Q.6(B)		What is Cognitive Network & explain in detailed about Software-Defined Networking (SDN)?	10M	5	3

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CSE13

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

COMPILER DESIGN

(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.	Write a regular expression for an identifier.	1M	1	1
	ii.	What are the operations on languages?	1M	1	1
	iii.	Define ambiguous grammar.	1M	2	1
	iv	Mention the basic issues in parsing.	1M	2	1
	v.	What is an operator precedence parser?	1M	3	1
	vi	Mention the types of LR parser.	1M	3	1
	vii.	List the Intermediate Languages.	1M	4	1
	viii.	What are the types of three-address statements?	1M	4	1
	ix.	Define DAG.	1M	5	1
	x.	Define Peephole optimization.	1M	5	1
Q.2(A)		Discuss about various phases of a compiler and write down the output of each phase for theexpression a:= b*c-d.	10M	1	3
		OR			
Q.2(B)		Explain in detail about the Input buffering technique with algorithm.	10M	1	2
Q.3(A)		Explain the following with suitable example a) Left Recursive b) Left Factoring	10M	2	2
		OR			
Q.3(B)		Whether the given grammar is LL(1) or not. S→ a | ^ | (T) T→ T,S | S	10M	2	4
Q.4(A)		Construct SLR parsing table for the following grammar. E → E+T | T T → T*F | F F → (E) | id	10M	3	4
		OR			
Q.4(B)		Construct LALR parsing table for the given grammar. S→CC C→ cC / d	10M	3	4
Q5(A)		Explain in detail about Intermediate code representations.	10M	4	2
		OR			
Q5(B)		Explain in detail about Storage allocation strategies.	10M	4	2
Q6(A)		Explain in detail about principle sources of optimization.	10M	5	2

OR

Q6(B)	What is Code Generation? Explain the issues in the design of a Code Generator.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CSE114

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

INTERNET OF THINGS

(Computer Science & Engineering)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What is IOT?	1M	1	1
	ii.	Define microcontroller.	1M	1	1
	iii.	Mention the use of AREF pin on Arduino UNO board.	1M	2	2
	iv	What is Plug Computing?	1M	2	1
	v.	Write the list of GPIO pins.	1M	3	1
	vi	What are the applications of Raspberry PI board?	1M	3	1
	vii.	Differentiate between TCP and UDP.	1M	4	2
	viii.	List out the application layer protocols.	1M	4	1
	ix.	What is API?	1M	5	1
	x.	Define Polling.	1M	5	1
Q.2(A)		Elaborate design Principles for Connected Devices.	10M	1	2
		OR			
Q.2(B)		Illustrate the building blocks of IoT device with a neat diagram.	10M	1	3
Q.3(A)		Demonstrate about Arduino and developing on Arduino with a case study.	10M	2	3
		OR			
Q.3(B)		Explain different factors that need to be considered while choosing your platform.	10M	2	2
Q.4(A)		Demonstrate an application of LED blinking with Raspberry Pi Programme.	10M	3	3
		OR			
Q.4(B)		Illustrate in detail about Arduino Uno board with pin diagram	10M	3	3
Q.5(A)		How Internet connectivity principles are used in IoT? Discuss.	10M	4	3
		OR			
Q.5(B)		Illustrate the process of The IP Protocol Suite layer with a neat diagram.	10M	4	3
Q.6(A)		Discuss in detail about COAP and XMPP.	10M	5	2
		OR			
Q.6(B)		Explain in detail about Extensible Messaging andPresence Protocol.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20CSE115

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

SOFTWARE ENGINEERING

(Computer Science & Engineering)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	List the process maturity levels in SEI' s CMM.	1M	1	1
	ii.	Write the features of Scrum.	1M	1	1
	iii.	What is meant by feasibility study?	1M	2	1
	iv	Define Data Dictionary.	1M	2	1
	v.	What are the different levels of abstraction?	1M	3	1
	vi	State the three golden rules on interface design.	1M	3	1
	vii.	List out the possible errors of Black Box Testing?	1M	4	1
	viii.	Distinguish between Alpha and Beta testing.	1M	4	1
	ix.	What are the objectives of Formal Technical Reviews?	1M	5	1
	x.	Define Software Quality Assurance.	1M	5	1
Q.2(A)		Explain waterfall and spiral model for software life cycle and discuss various activities in each phase.	10M	1	2
		OR			
Q.2(B)		Discuss about Crystal methods in Agile Development.	10M	1	2
Q.3(A)		Elucidate about Software Requirements Specifications with an example.	10M	2	3
		OR			
Q.3(B)		Explain in detail about Behavioral models with an example.	10M	2	3
Q.4(A)		Explain about the various design concepts considered during software design.	10M	3	2
		OR			
Q.4(B)		Design and implement the following diagram with an example: a) Class diagram b) Interaction diagrams	10M	3	3
Q.5(A)		Explain Black-Box and White-Box testing with examples.	10M	4	3
		OR			
Q.5(B)		Discuss the metric for Testing with an example.	10M	4	3
Q.6(A)		Discuss about Software Reviews.	10M	5	2
		OR			
Q.6(B)		Explain in detail about Software reliability.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20CSE4M08 /20CSO4M08

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

CLOUD COMPUTING & DISTRIBUTED SYSTEMS (MOOC)

(Common to CSE and CSE-IOT)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What is meant by live migration of VM?	1M	1	1
	ii.	Is cloud computing a distributed computing model? State True or False.	1M	1	1
	iii.	In a Classical Algorithm of Ring Election, what will be the message complexity for N labeled processes.	1M	2	1
	iv	"Leader Election problem represents a general class of non symmetry-breaking problems." State True or False.	1M	2	1
	v.	State the assumptions of Synchronous distributed system	1M	3	1
	vi	State Lost messages.	1M	3	2
	vii.	Define HBase db.	1M	4	1
	viii.	Is Apache Cassendra a massively scalable SQL or NoSQL database?	1M	4	1
	ix.	Which P2P system uses a 1 hop Lookup DHT (Distributed Hash Table)?	1M	5	1
	x.	What are the characteristic of P2P network?	1M	5	2
Q.2(A)		Compare cloud and distributed computing in detail. Brief note on utility computing.	10M	1	3
		OR			
Q.2(B)		Demonstrate in detail about various types of virtualization in cloud computing?	10M	1	4
Q.3(A)		Explain about software defined network and discuss about its evolution and challenges.	10M	2	4
		OR			
Q.3(B)		Describe Geo-distributed Cloud Data Centers with real time example.	10M	2	4
Q.4(A)		Brief note on Snapshot Recording Algorithm and discuss about global state.	10M	3	3
		OR			
Q.4(B)		Describe few algorithms responsible for performing mutual exclusion in cloud.	10M	3	3
Q.5(A)		Explain in detail about Failures & Recovery Approaches in Distributed Systems	10M	4	3
		OR			
Q.5(B)		Describe about cloud storage - NoSQL databases such as Apache Cassendra.	10M	4	4
Q.6(A)		Demonstrate Peer to Peer Systems in Cloud Computing?	10M	5	4
		OR			
Q.6(B)		Illustrate Map Reduce - cloud application with real time example.	10M	5	3

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CST111

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

CRYPTOGRAPHY AND NETWORK 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.	What is the role of decryption key in cryptography?	1M	1	1
	ii.	Define Reply and Modification of messages attacks.	1M	1	1
	iii.	Find GCD of (12,33) using Euclid method	1M	2	5
	iv	State Fermet's theorem	1M	2	2
	v.	What is content modification	1M	3	1
	vi	Define Repudiation	1M	3	1
	vii.	What is kerberos	1M	4	1
	viii	Define web security	1M	4	1
	ix.	Define a Intruder	1M	5	1
	x.	What are Spammer and Flooders	1M	5	1
Q.2(A)		Explain OSI Security Architecture in Detail with Diagram.	10M	1	1
		OR			
Q.2(B)		Explain play fair cipher and polyalphabetic cipher with example.	10M	1	1
Q.3(A)		Explain Chinese Reminder theorem and solve X===2(mod3) X===3(mod5) X===2(mod7)	10M	2	3
		OR			
Q.3(B)		Explain Diffie Hellman key exchange in Detail.	10M	2	1
Q.4(A)		Explain about Digital signature and authentication protocols	10M	3	1
		OR			
Q.4(B)		Explain briefly MAC and HMAC	10M	3	1
Q.5(A)		Explain X.509 Authentication Services	10M	4	1
		OR			
Q.5(B)		Explain in detail about IP security with corresponding applications	10M	4	1
Q.6(A)		Explain in detail Virus and related threats	10M	5	1
		OR			
Q.6(B)		Explain the practical implementation of cryptography and security	10M	5	1

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 18CST112

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

CLOUDCOMPUTING

(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 are the drawbacks of on-premise infrastructure?	1M	1	1
	ii.	What are the advantages of using cloud computing?	1M	1	2
	iii.	What are the different levels of SLA?	1M	2	1
	iv	List out the steps in SLA life cycle.	1M	2	1
	v.	What is the difference between Type 1 and Type 2 hypervisors?	1M	3	2
	vi	What are machine images in virtualization?	1M	3	2
	vii.	What is the GrepTheWeb application?	1M	4	2
	viii.	How does MapReduce enable distributed data processing?	1M	4	2
	ix.	What are some key architectural services provided by Amazon Web Services (AWS), Google App Engine, and Microsoft Azure?	1M	5	2
	x.	How do the cost models of Amazon Web Services (AWS), Google App Engine, and Microsoft Azure differ?	1M	5	4
Q.2(A)		Explain the evolution of cloud computing.	10M	1	1
		OR			
Q.2(B)		Discuss the advantages of using cloud computing over traditional on-premise infrastructure.	10M	1	2
Q.3(A)		Explain the three-delivery based categorization of cloud computing.	10M	2	2
		OR			
Q.3(B)		List out the steps involved in SLA life cycle. How various aspects like security, data encryption, privacy etc. can be included in SLA?	10M	2	2
Q.4(A)		Describe the purpose and characteristics of machine images, and explain how they are used to create and manage instances in virtualized environments.	10M	3	2
		OR			
Q.4(B)		Discuss the key considerations and strategies for managing instances in a virtualized infrastructure. Explain how techniques like load balancing, auto-scaling, and monitoring contribute to efficient instance management.	10M	3	4
Q.5(A)		Explain the fundamental concepts of MapReduce and how it enables parallel and distributed data processing.	10M	4	2
		OR			
Q.5(B)		Describe the GrepTheWeb application, its goals, and the challenges it addresses. Explain how cloud computing principles, such as scalability, fault tolerance, and distributed processing, are utilized in the GrepTheWeb application.	10M	4	4

Q.6(A)	Compare and contrast Amazon Web Services (AWS), Google App Engine, and Microsoft Azure from the perspective of architecture, compute, storage, and communication services.	10M	5	4
	OR			
Q.6(B)	Discuss the cost models of AWS, Google App Engine, and Microsoft Azure. Compare and contrast their pricing structures, including pay-as-you-go, reserved instances, and pricing tiers.	10M	5	4

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CST113

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

INTERNET AND WEB PROGRAMMING

(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 Internet?	1M	1	1
	ii.	Write the structure of URL.	1M	1	2
	iii.	Define XML markup.	1M	2	1
	iv	Differentiate between XSL and XSLT.	1M	2	2
	v.	What is DOM?	1M	3	1
	vi	What is Regular Expression?	1M	3	2
	vii.	What is regular expression?	1M	4	1
	viii.	Define Session and Cookies.	1M	4	1
	ix.	What is VPN?	1M	5	1
	x.	Draw a structure of packet filter.	1M	5	2
Q.2(A)		Discuss in detail about features of HTTP. Discuss the HTTP Request and Response message structure.	10M	1	2
		OR			
Q.2(B)		Illustratethe functioning of Web Browsers and Web Servers with an Architecture. .	10M	1	3
Q.3(A)		Write an HTML script to manage personal details of a student like name, class, qualifications, photo, address etc., using tables and other suitable tags	10M	2	3
		OR			
Q.3(B)		Describe the basic structure of HTML5. Write and discuss a program in HTML using table tag, font tag,hyperlinktag.	10M	2	2
Q.4(A)		Explain about integration of Ajax and PHP with an example.	10M	3	2
		OR			
Q.4(B)		Explain about the types of Arrays in PHP with an example.	10M	3	2
Q.5(A)		Develop a PHP program to fetch data from the MYSQL database.	10M	4	3
		OR			
Q.5(B)		Write a PHP Script to find the Fibonacci sequence upto a given number.	10M	4	3
Q.6(A)		Explain in detail about NAT applications.	10M	5	2
		OR			
Q.6(B)		Illustrate the functioning of Packet filtering and Network Address Translation with examples.	10M	5	3

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20CST4M08 /20CAI4M08//20CSD4M08//20CSC4M08

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

PRIVACY AND SECURITY IN ONLINE SOCIAL MEDIA (MOOC)

(Common to CST, CAI, CSD, and CSC)

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 does Velocity specify in 5 V's of social media?	1M	1	1
	ii.	Which network is considered as the regional language micro blogging website?	1M	1	1
	iii.	Which features perform better to distinguish fake and legitimate tweets?	1M	2	1
	iv	Tweet about, "Floods in McDonalds at Virginia Beach" is related to which misinformation news spreads?	1M	2	1
	v.	Name the pair of social platforms that are adopted by different Police departments to engage with people.	1M	3	2
	vi	An adjacency matrix and XML file format are preferably for representing what kind of data?	1M	3	1
	vii.	Which Centrality measure is appropriate for finding the most popular person in the friendship network?	1M	4	1
	viii.	What is the legit way to identify the popularity of a web page?	1M	4	5
	ix.	Give an example for location based social networks.	1M	5	2
	x.	Name the term used for generating the user names and monetizing.	1M	5	1
Q.2(A)		Discuss the different types of social media in an online network.	10M	1	2
		OR			
Q.2(B)		Explain 5 V's of online social media.	10M	1	2
Q.3(A)		Elaborate with an example about the location based social network.	10M	2	2
		OR			
Q.3(B)		Describe the terminologies of Twitter.	10M	2	1
Q.4(A)		What do you know by Semantic Attacks? Explain in detail.	10M	3	3
		OR			
Q.4(B)		Write in detail about the different types of Phishing Attacks.	10M	3	5
Q.5(A)		With suitable graph diagram, explain Network Analysis of Fake Accounts.	5M	4	2
		OR			
Q.5(B)		Discuss in detail about Westin's 3 categories.	10M	4	2
Q.6(A)		How do Whisper users interact in an anonymous environment?	10M	5	2
		OR			
Q.6(B)		Explain Gephi Network Visualization.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CSO113

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech. III Year II Semester (R20) Supplementary End Semester Examinations – January 2024

EMBEDDED SYSTEMS

(IoT)

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 Embedded System?	1M	1	1
	ii.	Distinguish between Microprocessor and Microcontroller.	1M	1	4
	iii.	What is the necessity of Overflow flag in Intel 8051?	1M	2	1
	iv	Distinguish between LJMP, SJMP and AJMP instructions of 8051.	1M	2	4
	v.	Determine the no. of steps per revolution for a step-angle of 7.5°	1M	3	5
	vi	List out the advantages of Multiplexed Display System.	1M	3	1
	vii.	Recall the conditions for the occurrence of Dead Lock.	1M	4	1
	viii.	What is a Semaphore?	1M	4	1
	ix.	Recall the flags present in CPSR of ARM Processor.	1M	5	1
	x.	List out the five stages in the pipeline of ARM 9.	1M	5	1
Q.2(A)		Summarize the characteristics and quality attributes of an embedded system.	10M	1	2
		OR			
Q.2(B)		Outline about the various classifications of memories.	10M	1	2
Q.3(A)		Summarize the addressing modes of Intel 8051 microcontroller.	10M	2	2
		OR			
Q.3(B)		Analyze the Interrupt Structure of Intel 8051 microcontroller.	10M	2	4
Q.4(A)		Summarize the concepts of Emulator and Debugger.	10M	3	2
		OR			
Q.4(B)		Explain about interfacing a keyboard using the Ports of Intel 8051 microcontroller.	10M	3	2
Q.5(A)		Explain about the Task Synchronization Techniques in detail.	10M	4	2
		OR			
Q.5(B)		Discuss about Process and Threads with neat sketches.	10M	4	6
Q.6(A)		Summarize the architecture of ARM processor with a diagram.	10M	5	2
		OR			
Q.6(B)		Analyze about classifications of instructions used in ARM Processor.	10M	5	4

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20CSO115

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

BIG DATA ANALYTICS

(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.	Name four big data platforms.	1M	1	1
	ii.	List the characteristics of big data.	1M	1	2
	iii.	What is a bloom filter?	1M	2	1
	iv	What are the major issues in stream processing?	1M	2	1
	v.	What are the mandatory and optional phases of Hadoop MapReduce framework?	1M	3	2
	vi	List the types of logs which are supported by Hadoop.	1M	3	2
	vii.	What are regions in HBase and how they contribute to scalability?	1M	4	2
	viii.	How does Pig handle schema flexibility and evolving data structures?	1M	4	2
	ix.	What is predictive analytics?	1M	5	1
	x.	What is the use of the property ready State in XMLHttpRequest object?	1M	5	2
Q.2(A)		(i) What is analysis and reporting? Compare between analysis and reporting.	5M	1	2
		(ii) Describe any five big data platforms.	5M		
		OR			
Q.2(B)		(i) Compare and contrast conventional data and big data.	5M	1	3
		(ii) Explain the properties and types of data.	5M		
Q.3(A)		Explain about counting distinct elements in a stream using Flajolet-Martin algorithm	10M	2	2
		OR			
Q.3(B)		Explain the decaying windows problem in streams.	10M	2	2
Q.4(A)		Depict and illustrate in detail the shuffle and sort approach of MapReduce.	10M	3	3
		OR			
Q.4(B)		(i) What is Cluster? Explain the setting up a Hadoop cluster.	5M	3	3
		(ii) Examine java interfaces to HDFS basics.	5M		
Q.5(A)		Discuss about the applications on big data using pig & hive.	10M	4	2
		OR			
Q.5(B)		(i)List out the applications of IBM BigInsights and infosphere streams	5M	4	2
		(ii) What is Zookeeper? Explain its features with applications	5M	4	
Q.6(A)		Describe frameworks and Python libraries for data visualization	10M	5	2
		OR			
Q.6(B)		Illustrate the predictive analytics process and its application in various domains	10M	5	3

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CSD114 /20CAI114

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

DEEP LEARNING

(Common to CSE (DS) and CSE (AI))

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

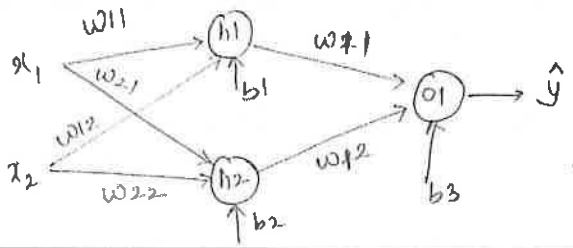
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	Define scalar with an example.	1M	1	1
	ii.	Find the inverse of 2x2 matrix given below: $A = \begin{bmatrix} 5 & 6 \\ -2 & 9 \end{bmatrix}$	1M	1	1
	iii.	Compare linear regression and logistic regression.	1M	2	1
	iv	Define Regression.	1M	2	1
	v.	Identify the equation of cross-entropy for binary classification.	1M	3	1
	vi	Depict the architecture of Artificial Neuron.	1M	3	1
	vii.	Define dropout layer with an example.	1M	4	1
	viii.	.Define valid convolution?	1M	4	1
	ix.	Explain about the components of RNN.	1M	5	1
	x.	List out the applications of RNN	1M	5	1
Q.2(A)		Evaluate eigen values and eigen vectors for the given matrix. $A=\begin{bmatrix} 0 & 1 \\ -2 & -3 \end{bmatrix}$	10M	1	2
		OR			
Q.2(B)		Explain gradient descent with momentum and discuss about exponentially weighted moving average with various hyper parameters β.	10M	1	3
Q.3(A)		Discuss in detail about maximum likelihood with example	10M	2	2
		OR			
Q.3(B)		Apply linear regression model on the following data and find the loss function f(m,c).	10M	2	3

X	Y
1	2
3	4

Q.4(A)		Discuss about any 4 activation functions in detail with appropriate diagram	10M	3	2
		OR			

Q.4(B)	Derive the mathematical equations of Feed Forward Neural Network for the following example using sigmoid activation function on both hidden and output layers?	10M	3	4



Q.5(A)	Discuss about types of layers in Convolutional Neural Network (CNN) with an example.	10M	4	3
	OR			
Q.5(B)	Construct VGG-16 architecture with your own hyper parameters and explain its pattern	10M	4	2
Q.6(A)	Explain about layers of RNN with an example.	10M	5	2
	OR			
Q.6(B)	Discuss in detail about the problem of exploding and vanishing gradients	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20CST4M08 /20CAI4M08//20CSD4M08//20CSC4M08

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

PRIVACY AND SECURITY IN ONLINE SOCIAL MEDIA (MOOC)

(Common to CST, CAI, CSD, and CSC)

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 does Velocity specify in 5 V's of social media?	1M	1	1
	ii.	Which network is considered as the regional language micro blogging website?	1M	1	1
	iii.	Which features perform better to distinguish fake and legitimate tweets?	1M	2	1
	iv	Tweet about, "Floods in McDonalds at Virginia Beach" is related to which misinformation news spreads?	1M	2	1
	v.	Name the pair of social platforms that are adopted by different Police departments to engage with people.	1M	3	2
	vi	An adjacency matrix and XML file format are preferably for representing what kind of data?	1M	3	1
	vii.	Which Centrality measure is appropriate for finding the most popular person in the friendship network?	1M	4	1
	viii.	What is the legit way to identify the popularity of a web page?	1M	4	5
	ix.	Give an example for location based social networks.	1M	5	2
	x.	Name the term used for generating the user names and monetizing.	1M	5	1
Q.2(A)		Discuss the different types of social media in an online network.	10M	1	2
		OR			
Q.2(B)		Explain 5 V's of online social media.	10M	1	2
Q.3(A)		Elaborate with an example about the location based social network.	10M	2	2
		OR			
Q.3(B)		Describe the terminologies of Twitter.	10M	2	1
Q.4(A)		What do you know by Semantic Attacks? Explain in detail.	10M	3	3
		OR			
Q.4(B)		Write in detail about the different types of Phishing Attacks.	10M	3	5
Q.5(A)		With suitable graph diagram, explain Network Analysis of Fake Accounts.	5M	4	2
		OR			
Q.5(B)		Discuss in detail about Westin's 3 categories.	10M	4	2
Q.6(A)		How do Whisper users interact in an anonymous environment?	10M	5	2
		OR			
Q.6(B)		Explain Gephi Network Visualization.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CAI115

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

DATA SCIENCE

(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.	List the steps involved in Life cycle of Data Science	1M	1	1
	ii.	What is pre-processing? Why do we need pre-processing?	1M	1	1
	iii.	Define Correlation	1M	2	1
	iv	Differentiate between Bar graph and Histogram	1M	2	2
	v.	What is class independence and class dependence with suitable example	1M	3	1
	vi	Define Baye's Theorem	1M	3	1
	vii.	How Underfitting and Overfitting are connected to bias and variance?	1M	4	2
	viii.	Distinguish between supervised and unsupervised learning	1M	4	2
	ix.	List any two applications of K-means Clustering	1M	5	1
	x.	Find Murkowski &Euclidean Distance between points (4,4) & (8,6)	1M	5	2
Q.2(A)		Explain in detail about the Life cycle of Data science and also applications of Data science	10M	1	2
		OR			
Q.2(B)		i. What are the key skills required for the data scientist? Justify your answer.	5M		
		ii. What is data Discretization? Explain any two methods with suitable example.	5M	1	2
Q.3(A)		A survey is conducted on different age group to determine whether more people prefer cars with automatic or manual transmission. According to the below survey result what is your conclusion?			

	Age 16 to 20	Age 20 to 35	Age 35 to 50	Age > 50
Automatic	80% of 100 Users	90% of 200Users	70% of 300 Users	30% of 100 Users
Manual	60% of 400 Users	90% of 100 Users	40% of 100 Users	50% of 200 Users

	Justify your answer with Simpson's Paradox	10M	2	2
	OR			
Q.3(B)	i. Write on any four methods of 'Data Sampling'	5M	2	3
	ii. Give any four Correlation Caveats	5M		
Q.4(A)	Explain in detail about the steps involved in Modern Munging Operation with suitable example.	10M	3	2
	OR			

Q.4(B)	Write short note on the following: i. Normal Distribution ii. Central Limit Theorem iii. Bayes theorem	3M 4M 3M	3	2
Q.5(A)	Explain in detail about five Feature Engineering tasks to perform data science with suitable example	10M	4	3
	OR			
Q.5(B)	Discuss in detail about the Categories of machine learning algorithms	10M	4	2
Q:6(A)	Construct distance matrix using the given points and draw dendrogram using single linkage and complete linkage clustering algorithm.P1(2,9), P2(5,8), P3(4,3), P4(8,3) and P8(9,4).	10M	5	5
	OR			
Q.6(B)	Discuss in detail about the different types of Collaborative filtering technique with suitable examples.	10M	5	4

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20CSC115

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January - 2024

AI TOOLS, TECHNIQUES AND APPLICATIONS

(CSE - Cyber Security)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Define is AI?	1M	1	1
	ii.	Differentiate the Knowledge representation and reasoning?	1M	1	1
	iii.	Define Self-Organizing Map?	1M	2	1
	iv	List the applications of unsupervised learning?	1M	2	1
	v.	Specify the uses of Supervised Learning?	1M	3	1
	vi	Define Decision tree?	1M	3	2
	vii.	Distinguish the difference between Term Frequency (TF), Inverse Document Frequency (IDF)?	1M	4	2
	viii.	What are the steps involved in document classification?	1M	4	1
	ix.	Define Convolution Neural Networks?	1M	5	1
	x.	What is Image processing?	1M	5	1
Q.2(A)		Explain about Hypothesis testing? Explain the Null and alternate hypothesis with example.	10M	1	3
		OR			
Q.2(B)		What is Machine Learning? Explain about Supervised and Unsupervised Learning?	10M	1	3
Q.3(A)		Examine the K-Means clustering algorithm with an example.	10M	2	2
		OR			
Q.3(B)		What do you mean by Semi-Supervised Learning? Explain about Reinforcement Learning?	10M	2	2
Q.4(A)		Illustrate K-Nearest Neighbour classifier with an example?	10M	3	4
		OR			
Q.4(B)		Distinguish the difference between the Multi-Layer Perceptron (MLP) and Back-Propagation Training?	10M	3	3
Q.5(A)		Distinguish the difference between Term Frequency and Inverse Document frequency?	10M	4	2
		OR			
Q.5(B)		Explain the working principle of speech recognition with hidden Markov model?	10M	4	3
Q.6(A)		Summarize the various types of image noises. Specify the process to remove the noises from the images?	10M	5	4
		OR			
Q.6(B)		Explain about Noise Removal, Image Enhancement?	10M	5	4

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20ECE301

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations - January 2024

BIO MEDICAL ELECTRONICS

(Open Elective-II)

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.	LVDT stand for _____	1M	1	1
	ii.	What are the physiological parameters that can be measured piezo electric transducers?	1M	1	1
	iii.	Draw ECG waveform and name its parts.	1M	2	1
	iv	Define Lead. Name the type of leads used for ECG	1M	2	1
	v.	What are indirect BP measurement techniques used	1M	3	1
	vi	Differentiate between systolic and diastolic pressure.	1M	3	1
	vii.	Write the drawbacks of conventional X-ray Imaging system	1M	4	2
	viii.	What is Half life time	1M	4	1
	ix.	What is the purpose of a pacemaker?	1M	5	1
	x.	MRI stands for_____	1M	5	1
Q.2(A)		With a block diagram, discuss in detail about man-instrumentation system and explain the functions of each block.	10M	1	2
		OR			
Q.2(B)		Discuss about Capacitive Transducers and its types for measuring displacement with the help of diagrams	10M	1	3
Q.3(A)		Discuss in detail about bio-potential amplifiers for EMG Measurement.	10M	2	2
		OR			
Q.3(B)		Explain about 10-20 EEG electrode configuration	10M	2	2
Q.4(A)		What are the different methods for measuring respiration rate? Explain the impedance pneumography method in detail	10M	3	2
		OR			
Q.4(B)		Demonstrate about the principle of thermistor transducer for measuring temperature in human body with neat diagrams.	10M	3	3
Q.5(A)		Compare and contrast the imaging techniques of X-ray, Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and Ultrasound Imaging in terms of principles of operation and image generation.	10M	4	4
		OR			
Q.5(B)		Explain, with the help of a block diagram the construction of a CT Scanner	10M	4	2
Q.6(A)		What is the need of using Defibrillator? Discuss in detail about Defibrillators.	10M	5	2
		OR			
Q.6(B)		Explain the working principle and clinical applications of an artificial kidney in the treatment of kidney failure.	10M	5	3

***** END*****

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20CSE301

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

JAVA PROGRAMMING

(Open Elective - II)

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 an array? How arrays are declared and initialized?	1M	1	2
	ii.	Describe the role of JVM.	1M	1	2
	iii.	Differentiate between Classes and Interface.	1M	2	2
	iv	Define method overriding.	1M	2	1
	v.	List out some of the exceptions in Java.	1M	3	1
	vi	Why do we use multi threading in Java?	1M	3	2
	vii.	Define byte stream?	1M	4	1
	viii.	Define Vector with syntax.	1M	4	1
	ix.	What is Event Listeners?	1M	5	2
	x.	Define Jbutton, JLabel.	1M	5	1
Q.2(A)		Illustrate the concepts of Object Oriented Programming and Write a Java program to print the value from 0 to 100 using while loops.	10M	1	3
		OR			
Q.2(B)		Explain about the Constructor.Write a constructor in the Car class that initializes the brand class field with the string"Ford".Call the getBrand() method in the main method of the Sample class and store the value of the brand in a variable, and print the value.	10M	1	3
Q.3(A)		Demonstrate the process of defining and creating a package with suitable examples.	10M	2	3
		OR			
Q.3(B)		State the uses of abstract and final keyword in Java with examples.	10M	2	3
Q.4(A)		Differentiate between Checked and Unchecked Exceptions with examples.	10M	3	2
		OR			
Q.4(B)		Define thread and multi thread. Explain the way of creating a thread in Java by using Thread Class.	10M	3	2
Q.5(A)		Illustrate the advantage of collection classes and give example for HashSet, ArrayList, TreeSet.	10M	4	3
		OR			
Q.5(B)		Explain ArrayList. Write a java program to convert an ArrayList to an Array.	10M	4	3
Q.6(A)		What is the role of event listeners in event handling? List the Java event listeners.	10M	5	2
		OR			
Q.6(B)		Explain in detail about the types of drivers in JDBC. Develop a JDBC application for updating data.	10M	5	3

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CST301

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

OPERATING SYSTEMS

(Open Elective - II)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What do you mean by Time-sharing systems?	1M	1	1
	ii.	Define Process.	1M	1	1
	iii.	How to represent the Process scheduling?	1M	2	1
	iv	List Fields of Process Control Block.	1M	2	1
	v.	What are the various scheduling criteria for CPU Scheduling?	1M	3	1
	vi	What are the methods for Handling Deadlocks?	1M	3	1
	vii.	Define page fault.	1M	4	1
	viii.	How is memory protected in a paged environment?	1M	4	1
	ix.	What is a single-level directory?	1M	5	1
	x.	Difference between primary storage and secondary storage.	1M	5	2
Q.2(A)		Discuss in detail structure of an operating system with neat diagram.	10M	1	2
		OR			
Q.2(B)		Explain briefly about system calls with suitable examples.	10M	1	2
Q.3(A)		What is critical section problem? Explain with example.	10M	2	2
		OR			
Q.3(B)		What is Semaphore? How can we achieve the synchronization using semaphore for producer consumer problem?	10M	2	2
Q.4(A)		Consider the following four processes, with the length of the CPU burst time given in the following:	10M	3	4

Process	Arrival Time(ms)	Burst Time (ms)
P1	0	7
P2	2	4
P3	4	1
P4	5	4

Find Average Waiting Time and Turnaround time for given Process using SJF Algorithms?

		OR			
Q.4(B)		Definition of Dead Lock? What are the Methods for Handling Deadlocks with Examples?	10M	3	2
Q.5(A)		What is virtual memory? Discuss the benefits of virtual memory techniques.	10M	4	2
		OR			
Q.5(B)		Given page reference string: 5, 1, 2, 3, 2, 14, 3, 5, 6, 3, 1, 3, 6, 1, 2, 4, 3. Compare the number of page faults for LRU, FIFO algorithm.	10M	4	2
Q.6(A)		What is directory? Explain directory operation in details.	10M	5	2
		OR			
Q.6(B)		Explain briefly file system architecture & file management function.	10M	5	3

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CE302

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

ENVIRONMENTAL IMPACT ASSESSMENT

(Open Elective - II)

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 categories of land use in a map.	1M	1	1
	ii.	Write the name of different environmental Parameters	1M	1	2
	iii.	Give one example for direct and indirect impact of land cleaning project on water.	1M	2	2
	iv	What are the different types of impact induced by any project activity?	1M	2	1
	v.	Mention the reasons for deforestation.	1M	3	2
	vi	Define deforestation	1M	3	1
	vii.	What is Environmental management systems audit?	1M	4	2
	viii.	What is liability (or transactional) audit?	1M	4	2
	ix.	Give one example for direct and indirect impact of land cleaning project on water.	1M	5	2
	x.	What is Policy compliance audit?	1M	5	2
Q.2(A)		Explain in detail the salient feature and key elements of EIA process.	10M	1	3
		OR			
Q.2(B)		Explain in detail about EIA procedure.	10M	1	2
Q.3(A)		Discuss in detail about the "Assessment of Soil and Ground Water Pollution".	10M	2	3
		OR			
Q.3(B)		Describe the systematic approach for the study of impacts on soil and groundwater.	10M	2	4
Q.4(A)		Discuss in detail the causes and effect of deforestation	10M	3	3
		OR			
Q.4(B)		Discuss in detail the systematic approach for evaluating biological impacts	10M	3	4
Q.5(A)		Explain and define audit in the context of EIA in detail.	10M	4	4
		OR			
Q.5(B)		What is audit protocol? Discuss the Stages in an Environmental Audit	10M	4	4
Q.6(A)		Discuss a case study and the preparation of Environmental Impact assessment statement for dairy industry.	10M	5	4
		OR			
Q.6(B)		Discuss in detail the Prevention & Control of pollution Act	10M	5	5

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20ME301

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

MATERIAL SCIENCE FOR ENGINEERS

(Open Elective - II)

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 ANY THREE examples of ceramics.	1M	1	1
	ii.	What is composite?	1M	1	1
	iii.	What are called biomaterials?	1M	2	1
	iv	What is unit cell.?	1M	2	2
	v.	Define crystal.	1M	3	2
	vi	What is the APF?	1M	3	1
	vii.	The SI unit of the electric field is_____	1M	4	1
	viii.	What are hard magnetic materials?	1M	4	1
	ix.	Explain Superconductor.	1M	5	2
	x.	What are the components of photonics?	1M	5	1
Q.2(A)		Define packing of atoms. Discuss elaborately	10M	1	2
		OR			
Q.2(B)		Categorize metallic structures in crystallography.	10M	1	5
Q.3(A)		Elaborately write about surface defects.	10M	2	5
		OR			
Q.3(B)		Explain the types of point defects.	10M	2	4
Q.4(A)		Analyse temperature dependence of carrier concentration.	10M	3	5
		OR			
Q.4(B)		What is known as HALL EFFECT? Explain it with an expression.	10M	3	2
Q.5(A)		Briefly categorize the semiconductor types.	10M	4	3
		OR			
Q.5(B)		Differentiate Ferromagnetism and Ferrimagnetism.	10M	4	5
Q.6(A)		Write about the Emission of electromagnetic radiation and devices.	10M	5	2
		OR			
Q.6(B)		What is the Photon absorption Devices? Explain in detail.	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20EEE302

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations - January 2024

INTRODUCTION TO MEMS

(Open Elective-II)

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.	Microactuator convers_____ into _____.	1M	1	1
	ii.	Draw the block diagram of the microsystem.	1M	1	1
	iii.	The fundamental working principle of the actuator is to convert_____.	1M	2	1
	iv	Write the advantages and disadvantages of the piezo resistive pressure sensor.	1M	2	1
	v.	Give the formula of Fick's law.	1M	3	1
	vi	What is the meaning of "class-10 clean room"?	1M	3	1
	vii.	What are the different types of MEMS simulation?	1M	4	1
	viii.	Write the advantages of piezoresistive type pressure sensors.	1M	4	1
	ix.	Which is the most suitable material used for micro-optical instrument.	1M	5	1
	x.	What is the use of a phase shifter?	1M	5	1
Q.2(A)		Discuss the evolution of MEMS and its industry perspectives in detail.	10M	1	2
		OR			
Q.2(B)		Explain the scaling laws of miniaturization in detail.	10M	1	2
Q.3(A)		Describe any two types of actuators with suitable sketch.	10M	2	2
		OR			
Q.3(B)		Explain the Capacitive type of pressure sensor.	10M	2	2
Q.4(A)		Explain the oxidation process in detail.	10M	3	2
		OR			
Q.4(B)		Give the LIGA process in detail.	10M	3	2
Q.5(A)		Discuss the various steps of designing a microsensor in detail.	10M	4	2
		OR			
Q.5(B)		Describe the designing aspects of the MEMS type of microgripper in detail.	10M	4	2
Q.6(A)		Give the working principle of the microfluidic sensor for turbulence measurement.	10M	5	2
		OR			
Q.6(B)		Discuss the MEMS switches in detail with a suitable diagram.	10M	5	2

***** END*****

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20CE301

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

GROUND IMPROVEMENT TECHNIQUES

(Open Elective - II)

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 role of ground improvement in foundation engineering?	1M	1	1
	ii.	Define dewatering and its purpose.	1M	1	1
	iii.	Define dynamic compaction.	1M	2	1
	iv	What is a stone column?	1M	2	1
	v.	Define ground stabilization.	1M	3	1
	vi	What are the different chemicals used in the stabilization of soil?	1M	3	1
	vii.	Write the concept behind soil reinforcement.	1M	4	1
	viii.	Define Geosynthetics.	1M	4	1
	ix.	What is expansive soil?	1M	5	1
	x.	How to improve the expansive soil?	1M	5	1
Q.2(A)		Explain in brief the Classification of ground improvement techniques.	10M	1	2
		OR			
Q.2(B)		What is dewatering on a construction site? Explain in detail with a neat sketch the method of dewatering using any two methods.	10M	1	2
Q.3(A)		Explain the various types of vertical drains used in ground improvement techniques.	10M	2	2
		OR			
Q.3(B)		Explain the various types of ground modification for in-situ treatment of Fine grained soils.	10M	2	2
Q.4(A)		What is the stabilization of soil? Write short notes on the following: (a) Bituminous stabilization. (b) Mechanical stabilization	10M	3	2
		OR			
Q.4(B)		What is the stabilization of soil? Write short notes on the following: (a) Bituminous stabilization. (b) Cement stabilization	10M	3	2
Q.5(A)		With neat sketches explain in detail the various applications and benefits of reinforced earth for ground improvement.	10M	4	2
		OR			
Q.5(B)		Explain in detail the behaviour of soil on reinforcing with Geotextiles.	10M	4	2
Q.6(A)		Explain the methodology and foundation techniques for stabilization on expansive soils.	10M	5	2
		OR			
Q.6(B)		(i) How to increase load bearing capacity of Under reamed pile?	4M	5	2
		(ii) Write the applications of Under reamed pile with neat sketch.	6M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20MAT301

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations, January – 2024

ADVANCED NUMERICAL METHODS

(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.	Find the relative error, when the true value of π is 3.1415926 and approximated value is 3.1428571.	1M	1	2
	ii.	Define the Interval Halving method formula.	1M	1	1
	iii.	Arrange the matrix $A=\begin{bmatrix}7 & -2 & -1\\ -1 & -2 & 7\\ 0 & -7 & 1\end{bmatrix}$ by diagonally dominate rule	1M	2	2
	iv.	Compute the Frobenius norm of $A=\begin{bmatrix}0.2 & 0.1\\ 0.1 & 0.2\end{bmatrix}$	1M	2	2
	v.	Write the formula for interpolating the polynomial with x- values are unevenly spaced.	1M	3	1
	vi.	Find the Lagrangian polynomial formula for the table x: 2, 4, 7 $y=f(x)$: -12, 7, 10	1M	3	2
	vii.	Define Taylor series formula for $y=f(x)$ about the point $x=x_0$	1M	4	1
	viii.	Explain shooting method process	1M	4	1
	ix.	When the general second order linear partial differential equation is said to elliptic.	1M	5	1
	x.	Define heat equation in one dimension	1M	5	1
Q.2(A)		Find a root of $f(x)=3x+\sin x-e^x$ by secant method	10M	1	3
		OR			
Q.2(B)		Obtain a root of $f(x)=x^3-2x^2-x+1$ by using Iteration method.	10M	1	3
Q.3(A)		Evaluate 1, 2 and ∞- norms of the matrix $A=\begin{bmatrix}5 & -9 & 6\\ 2 & -7 & 4\\ 1 & 5 & 8\end{bmatrix}$.	10M	2	4
		OR			
Q.3(B)		Solve the system of simultaneous algebraic linear equations $10x_1-5x_2-2x_3=3;\ 4x_1-10x_2+3x_3=-3;\ x_1+6x_2+10x_3=-3$ by Gauss-Seidel method	10M	2	3
Q.4(A)		Evaluate $\int_{0.2}^{2.6} e^{-x^2}dx$ with the proper number of sub intervals by using a) Simpson's $\frac{1}{3}$ rule and b) Simpson's $\frac{3}{8}$ rule	10M	3	3

OR

Q.4(B)	Obtain $f(4)$ from the following data using Lagrange's interpolation formula				10M	3	3

x	0	2	3	6
$f(x)$	-4	2	14	158

Q.5(A)	Use the Talyor series method to get solutions to $\frac{dy}{dx} = x + y - xy, y(0) = 1$ at $x = 0.1$, $x = 0.2$ and $x = 0.3$				10M	4	3

OR

Q.5(B)	An insulated rod is 20 cm long and is of uniform cross section. It has its right end held at 100^0 while its left end loses heat to the surroundings, which are at 20^0. The rod has a thermal conductivity k, of $0.52\,cal/\sec.cm.^0C$, and the heat transfer coefficient, H is $0.073\,cal/\sec.cm^2.^0C$. Use the finite difference to form the augmented matrix for the problem with eight subintervals.				10M	4	3

Q.6(A)	Classify the equations a) $u_{xx} + 2u_{xy} + u_{yy} = 0$ b) $u_{xx} + 4u_{xy} + (x^2 + 4y^2)u_{yy} = \sin xy$ c) $x^2 f_{xx} + (1 - y^2) f_{yy} = 0$ d) $(1 + x^2)u_{xx} + (5 + 2x^2)u_{xt} + (4 + x^2)u_{tt} = 0$				10M	5	2

OR

Q.6(B)	Solve the heat conduction problem $\frac{\partial u}{\partial t} = \frac{\partial^2 u}{\partial x^2}$ subject to the conditions $u(x,0) = \sin \pi x$, $0 \le x \le 1$ and $u(0,t) = u(1,t) = 0$ with $h = 0.2$ and $l = 0.04$. Find the value of $u(0.6, 0.04)$.				10M	5	4

*** END***

Hall Ticket No: | | | | | | | | | | |

Question Paper Code: 20ECE302

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech III Year II Semester (R20) Supplementary End Semester Examinations - January 2024

VLSI DESIGN

(Open Elective-II)

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 three operating regions of MOSFET?	1M	1	1
	ii.	Find the logical effort of static CMOS inverter.	1M	1	1
	iii.	Implement NOT gate using pseudo-NMOS logic.	1M	2	1
	iv	What is meant by lateral scaling?	1M	2	1
	v.	What is meant by static latch?	1M	3	1
	vi	List the advantages of sense amplifier.	1M	3	1
	vii.	Draw a bit line conditioning circuit for DRAM cell.	1M	4	2
	viii.	List the shifting operations of funnel shifter.	1M	4	1
	ix.	Mention any two basic building blocks of FPGA.	1M	5	1
	x.	What is meant by IDDQ testing?	1M	5	1
Q.2(A)		Find the output capacitance for 3 input NAND gate using RC delay model.	10M	1	4
		OR			
Q.2(B)		Derive the drain current expression for N channel MOSFET.	10M	1	3
Q.3(A)		Design a 2 input AND/NAND gate using CPL.	10M	2	4
		OR			
Q.3(B)		Sketch CMOS logic for Y = (AB + CD)'. (Note: ' denotes complementary)	10M	2	4
Q.4(A)		Discuss in detail about dynamic edge triggered registers.	10M	3	4
		OR			
Q.4(B)		Discuss in detail about multiplexer based latches with timing diagram.	10M	3	4
Q.5(A)		Design a 4-bit array multiplier.	10M	4	4
		OR			
Q.5(B)		Design a 4 × 4-barrel shifter with examples	10M	4	4
Q.6(A)		Explain in detail about built in self-test (BIST).	10M	5	3
		OR			
Q.6(B)		Explain in detail about boundary scan test technique.	10M	5	3

***** END*****