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

Question Paper Code: 18HUM101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B. Tech II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

ECONOMICS AND FINANCIAL ACCOUNTING FOR ENGINEERS

(Common to CE, EEE and 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

			Marks	CO	BL
Q.1	i.	How would you classify the Economics?	1M	1	2
	ii.	Demonstrate law of supply	1M	1	2
	iii.	Outline variable cost	1M	2	2
	iv	Discuss ISO quant.	1M	2	2
	v.	What is international market?	1M	3	1
	vi	How can you determine market equilibrium?	1M	3	2
	vii.	What is meant by accounting?	1M	4	2
	viii.	Explain personal accounting	1M	4	2
	ix.	Outline of current ratio	1M	5	2
	x.	Outline capital budgeting techniques	1M	5	2
Q.2(A)	Explain the nature and scope of economics		10M	1	2
	OR				
Q.2(B)	What do you understand law of demand? Elaborate the assumptions and factors of demand.		10M	1	6
Q.3(A)	Explain economies and diseconomies of scale.		10M	2	4
	OR				
Q.3(B)	Sales 50000 units @ Rs. 10 per unit Variable cost per unit Rs 6 Fixed cost Rs.100000 Evaluate 1) P/V Ratio 2) Margin of safety and 3) BEP in Rs & units		10M	2	5
Q.4(A)	Distinguish between Monopoly and monopolistic		10M	3	4
	OR				
Q.4(B)	Explain features and price output determination under perfect competition		10M	3	3
Q.5(A)	Elucidate accounting concepts and conventions.		10M	4	4
	OR				
Q.5(B)	Explain accounting functions.		10M	4	4
Q.6(A)	What is funds flow statement? Explain advantages and disadvantages of it		10M	5	3
	OR				
Q.6(B)	Discuss capital budgeting techniques.		10M	5	3

*** END***

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

Question Paper Code: 18BIO101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B. Tech II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

LIFE SCIENCE FOR ENGINEERS

(Common to CE, EEE, 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

			Marks	CO	Bl
Q.1	i.	Which organelle is also known as "post office of the cell"?	1M	1	1
	ii.	What are Chemoautotrophs? Give an example.	1M	1	1
	iii.	Name the metal ion present in haemoglobin.	1M	2	1
	iv	Why are enzymes known as biocatalysts?	1M	2	1
	v.	Define glycolysis.	1M	3	1
	vi	Draw the structure of Neuron.	1M	3	1
	vii.	What is an allele?	1M	4	1
	viii.	Name any one application of recombinant DNA technology.	1M	4	1
	ix.	How would you relate K_{eq} to standard free energy?	1M	5	1
	x.	What are catabolic processes?	1M	5	1
Q.2(A)		Examine the animal cell structure in detail with neat sketch.	10M	1	4
		OR			
Q.2(B)		Compare the functioning of human eye and camera.	10M	1	5
Q.3(A)		Assess in detail the structure and functions of Proteins.	10M	2	5
		OR			
Q.3(B)		Illustrate the formation and functions of Starch and Cellulose.	10M	2	5
Q.4(A)		Discuss Krebs cycle with a neat diagram.	10M	3	5
		OR			
Q.4(B)		Explain neuromuscular junction (NMJ) in detail with a neat illustration.	10M	3	5
Q.5(A)		Discuss DNA Replication and Transcription processes in detail.	10M	4	6
		OR			
Q.5(B)		(i) What is the working principle of biosensor and biochip?	5M	4	2
		(ii) Compare Mitotic and Meiotic cell division.	5M	4	5
Q.6(A)		Discuss the mechanism of photosynthesis with neat diagram.	10M	5	6
		OR			
Q.6(B)		(i) Justify ATP as Energy currency of the cell.	6M	5	4
		(ii) Differentiate endergonic and exergonic reactions with example.	4M	5	2

***** END*****

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

Question Paper Code: 18CE101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

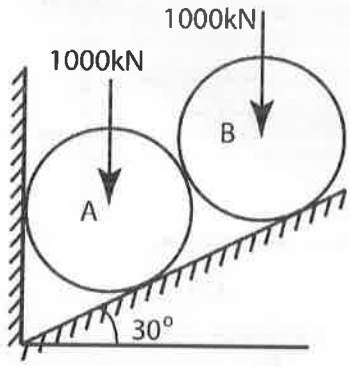
18CE101 FUNDAMENTALS OF ENGINEERING MECHANICS

(Civil Engineering)

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

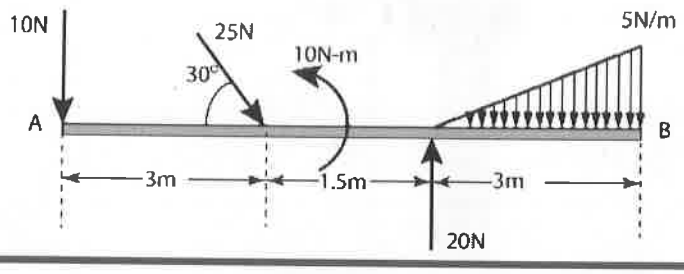
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either Part-A or B only

			Marks	CO	BL
Q.1	i.	Define Coplanar Non Concurrent forces	1M	1	1
	ii.	State Polygon law of forces	1M	1	1
	iii.	What is perfect truss?	1M	2	1
	iv	The friction experienced by a body, when in motion, is known as _____ (choose one of the following: rolling friction/dynamic friction/limiting friction/ static friction)	1M	2	2
	v.	Define area moment of inertia	1M	3	1
	vi	State parallel axis theorem of moment of inertia	1M	3	1
	vii.	Dynamic friction is **more/less** than static friction? (choose the correct option)	1M	2	2
	viii.	What is the difference between distance travelled and displacement?	1M	4	3
	ix.	State D'alembert's principle	1M	5	1
	x.	The tendency of rotation of the body along any axis is also called _____ (fill the blank)	1M	2	1
Q.2(A)		Two identical cylinders are resting on an inclined plane as follows: Find reactions at all contact points.	10M	1	5

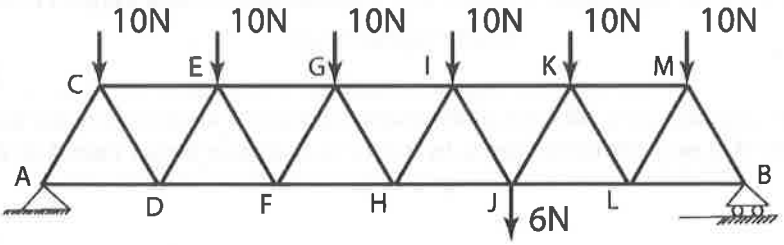


OR

Q.2(B)		Determine resultant force for the given beam AB.	10M	1	5

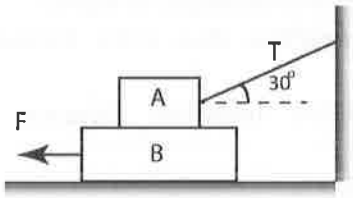


Q.3(A) Determine forces in members EG, FG and FH of the following truss. All sides of triangles are equal to 4m. 10M 2 5

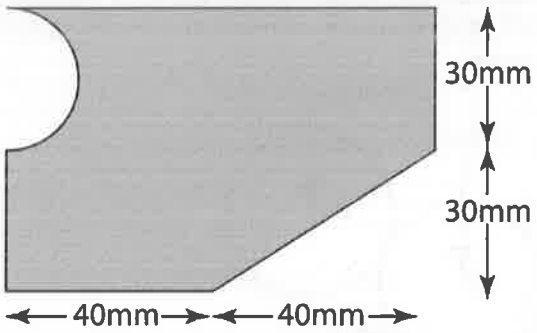


OR

Q.3(B) Two blocks A and B of weights 1 KN and 2 KN respectively are in equilibrium position as shown in Fig. If the coefficient of friction between the two blocks as well as the block B and the floor is 0.3, find the force (P) required to move the block B and tension in the string T. 10M 2 5

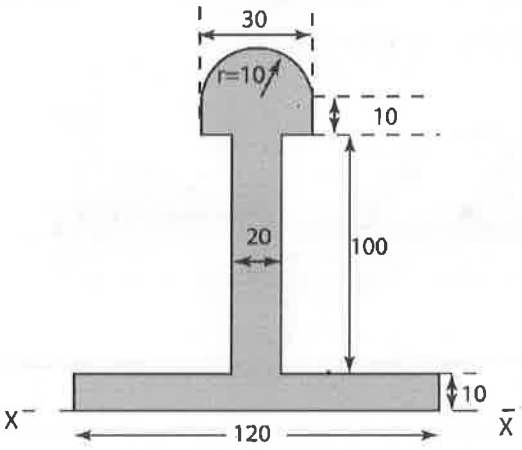


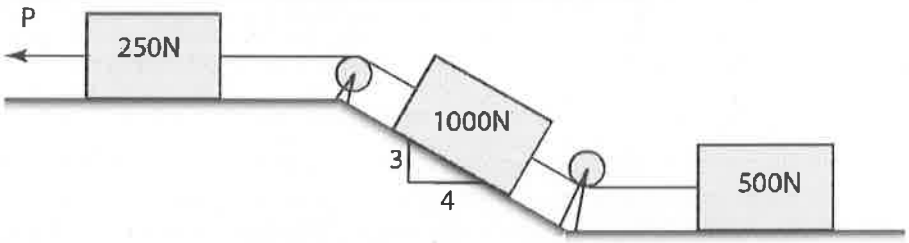
Q.4(A) Find Centroid of the following section: 10M 3 5



OR

Q.4(B) Find moment of inertia of the following surface about axis X-X. All dimensions are in mm. 10M 3 5



Q.5(A) (i)	A car moves along a straight line whose equation of motion is given by $s = 12t + 3t^2 - 2t^3$, where (s) is in meter and (t) is in seconds. Calculate (i) velocity and acceleration at start, and (ii) acceleration, when the velocity is zero.	5M	4	5
(ii)	A stone is thrown vertically upwards with a velocity of 29.4 m/s from the top of a tower 34.3 m high. Find the total time taken by the stone to reach the foot of the tower.	5M	4	5
	OR			
Q.5(B)	An aero plane is flying on a straight level course at 200 km per hour at a height of 1000 meter above the ground. An anti-aircraft gun located on the ground fires a shell with an initial velocity of 300 m/s, at the instant when the plane is vertically above it. At what inclination, to the horizontal, should the gun be fired to hit the plane? What time after firing, the gun shell will hit the plane? What will then be the horizontal distance of the plane from the gun?	10M	4	5
Q.6(A) (i)	A body of mass 10 kg is moving over a smooth surface, whose equation of motion is given by the relation. $s = 5t + 2t^2$ Where (s) is in meter and (t) in seconds. Find the magnitude of force responsible for the motion.	5M	5	5
(ii)	A machine gun of mass 25 kg fires a bullet of mass 30 gram with a velocity of 250 m/s. Find the velocity with which the machine gun will recoil (move backward).	5M	5	5
	OR			
Q.6(B)	Calculate the constant force P that will give the system of connected bodies a velocity of 3m/s after a distance of 4.5m from rest. Coefficient of friction between the blocks and the surface is 0.3 	10M	5	5

*** END***

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

Question Paper Code: 18CE102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

SURVEYING AND GEOMATICS

(Civil Engineering)

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

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

			Marks	CO	BL
Q.1	i.	Define the following terms: (a) Fore sight (b) Back sight	1M	1	1
	ii.	List the types of Coordinate System.	1M	1	1
	iii.	List different types of controls used in setting out.	1M	2	1
	iv	What are horizontal and vertical curves?	1M	3	1
	v.	Define (a) raster data (b) vector data.	1M	5	1
	vi	What are the different temporary adjustments in a theodolite?	1M	2	1
	vii.	What do you mean by Intersection angle in curves?	1M	3	1
	viii.	What is the full form of GPS?	1M	4	1
	ix.	Define the wavelength.	1M	4	1
	x.	List different types of resolutions in a remote sensing dataset.	1M	5	1
Q.2(A)		(i) Convert the following WCB into Reduced bearing: (a) 49° (b) 240° (c) 133° (d) 335° (e) 180°.	5M	1	4
		(ii) Discuss benchmark and its types.	5M		
		OR			
Q.2(B)		(i) Discuss the uses of different accessories used in Plane Table.	5M	1	3
		(ii) Differentiate between Geographic coordinate system and Projected Coordinate system.	5M		
Q.3(A)		(i) What do you mean by direct and deflection angles.	5M	2	2
		(ii) Discuss the method of measuring vertical angle using theodolite.	5M		
		OR			
Q.3(B)		State in your words about the repetition and reiteration methods of measuring horizontal angles in theodolite.	10M	2	2
Q.4(A)		Define the following terms: (i) Back tangent (ii) Forward tangent (iii) Vertex or point of intersection (iv) Mid-ordinate (v) Length of curve.	10M	3	2
		OR			
Q.4(B)		(i) What is a transition curve? What are the advantages of a transition curve?	5M	3	3
		(ii) What are different types of horizontal circular curves?	5M	3	2

Q.5(A)	Define the following terms: (i) Cycle (ii) Wavelength (iii) Frequency (iv) Period (v) Refractive Index ratio.	10M	4	2
	OR			
Q.5(B)	What is GPS? Discuss in detail about the different segments of a GPS.	10M	4	2
Q.6(A)	What is scattering? Explain the different types of scattering.	10M	5	2
	OR			
Q.6(B)	Classify the elements of Visual Photo Interpretation and state their uses with example.	10M	5	3

*** END***

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

Question Paper Code: 18CE103

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

MECHANICS OF FLUIDS

(Civil Engineering)

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

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

			Marks	CO	BL
Q.1	i.	What is specific gravity?	1M	1	1
	ii.	Define turbulent flow.	1M	2	1
	iii.	If $\left(\frac{\partial v}{\partial s}\right)_{t=constant} = 0$, then the types of fluid flow is called as.....	1M	3	2
	iv	What will be the ratio of maximum velocity(u_{max}) to average velocity ($\overline{u}$)for viscous flow?	1M	4	1
	v.	Define boundary layer thickness	1M	5	1
	vi	Define capillarity.	1M	1	1
	vii.	What is absolute Pressure?	1M	2	1
	viii.	What will be rate of flow for the liquid passing through a circular pipe of 10cm diameter with 10m/s of velocity of flow?	1M	3	3
	ix.	Define sub-critical flow.	1M	4	1
	x.	What is Magnus effect.	1M	5	1
Q.2(A)		What is Newtons Law of Viscosity? Discuss in detail the types of fluid.	10M	1	2
		OR			
Q.2(B)		The capillary rise in the glass tube used for measuring water level is not to exceed 0.5mm. Determine its minimum size, given that surface tension for water in contact with air = 0.07112N/m	10M	1	3
Q.3(A)		Explain is Reynolds's experiment. Also classify the types of fluid flow.	10M	2	3
		OR			
Q.3(B)		The velocity velocity distribution for flow over a flat plate is given by $u = \frac{3}{2}y - y^{\frac{3}{2}}$, Where u is the point velocity in meter per second at a distance y metre above the plate. Determine the shear stress at $y = 9cm$. Assume dynamic viscosity =8 poise.	10M	2	4

Q.4(A)	Derive the Bernoulli's equation from Euler's equation. Also write the assumptions made to derive this.	10M	3	4
	OR			
Q.4(B)	Derive the expression for following for a free liquid Jet coming out of the nozzle- (a) Maximum height attained (b) Horizontal range (c) Time of Flight (d) Value of θ for maximum range	10M	3	4
Q.5(A)	Construct the expression $h_f = \frac{4fLV^2}{2gd}$ to compute the head loss due to friction in a given length of pipe.	10M	4	4
	OR			
Q.5(B)	A trapezoidal channel has side slope 3 horizontal to 4 vertical and slope of the bed is 1 in 2000. Determine the optimum dimensions of the channel, if it has to carry water at 0.5 m^3/s. take Chezy's constant C=80.	10M	4	4
Q.6(A)	What is boundary layer thickness? Discuss in detail energy thickness.	10M	5	3
	OR			
Q.6(B)	compute the displacement thickness, momentum thickness and energy thickness for the velocity distribution in the boundary layer given by $\frac{u}{U} = \frac{y}{\delta}$ Where u is the velocity at a distance y from the plate and $u = Uaty = \delta$ where δ is boundary layer thickness. Also calculate the value of $\delta \ /\theta$.	10M	5	5

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

Question Paper Code: 18EEE102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech. II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

ELECTRICAL CIRCUIT ANALYSIS

(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 Part-A or B only

			Marks	CO	BL
Q.1	i.	State superposition theorem.	1M	1	1
	ii.	From a linear network with DC Voltage source, the maximum power transferred to a load is 100 W. When the load is shorted, 2A DC current flows. Find the thevenin's resistance..	1M	1	2
	iii.	If an R-C load is drawing 8 kW at a power factor of 0.8 (leading) from a single-phase A.C. supply, find the apparent power drawn by the load.	1M	2	2
	iv	What is the average power delivered to an impedance (4+j3)Ω by a current $5\cos(314t+60^0)$	1M	2	2
	v.	Define time constant?	1M	3	1
	vi	Write the current expression in series R-L circuit (initially relaxed) with DC excitation.	1M	3	1
	vii.	Why impedance parameters also called as open circuit parameters?	1M	4	1
	viii.	Write equations defining transmission parameters.	1M	4	1
	ix.	What the transfer function?	1M	5	1
	x.	Find the inverse Laplace transform of X(s) = 1.	1M	5	2
Q.2(A)		Find the Thevenin equivalent circuit (between *a* and *b*) for the network shown in Fig. 1.	10M	1	3

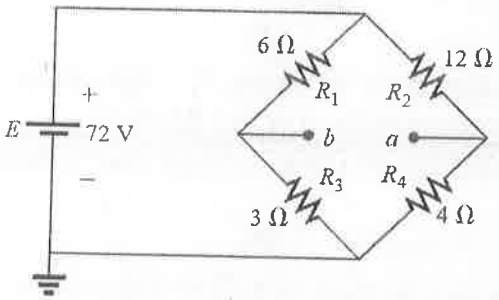

Fig. 1

OR

Q.2(B)		State and explain the procedural steps to solve Maximum Power Transfer theorem with neat diagram. Also derive the condition for maximum power.	10M	1	3
Q.3(A)		A Voltage of 120 V at 50 Hz is applied to a resistance R in series with a capacitance C. The current drawn is 2 A and power loss in the resistance is 100 W. Calculate the (i) Resistance (ii) Capacitance and (iii) Power factor of the circuit	10M	2	3

OR

Q.3(B)	i)	Write the Advantages of three phase system.	4M	2	1
	ii)	Derive the relation between line voltage and phase voltage in star connection with the help of phasor diagram.	6M	2	2

Q.4(A) For the series RLC Circuit shown in Fig. 2, with the capacitor initially charged to voltage of 1 V as indicated. Find the expression for i(t) using time domain analysis. 10M 3 3

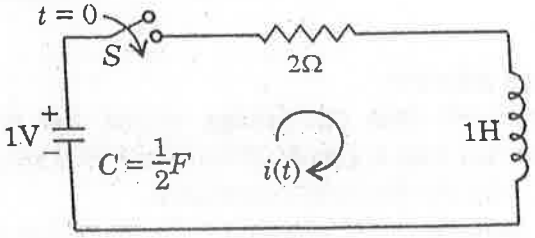

Fig. 2

OR

Q.4(B) Derive the expression for transient current for a RL & RC circuit with DC voltage source. 10M 3 2

Q.5(A) Find the short circuit parameter of the circuit shown in below Fig. 3 10M 4 3

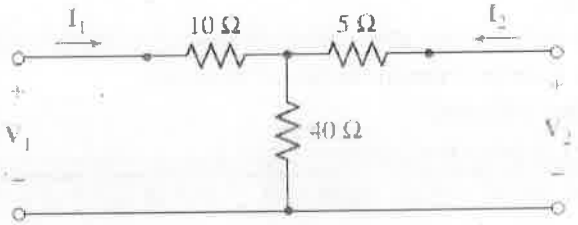

Fig. 3

OR

Q.5(B) Derive transmission parameters in terms of open circuit impedance parameters and h-parameters. Also verify that AD-BC=1. 10M 4 2

Q.6(A) Derive the Laplace transform of some common forcing functions with neat sketch. 10M 5 2

OR

Q.6(B) Using Laplace method, find the value of *Vc(t)* for t>0 in the circuit shown in Fig. 4. Assume initial condition *Vc(0⁻)* = 9 V. 10M 5 3

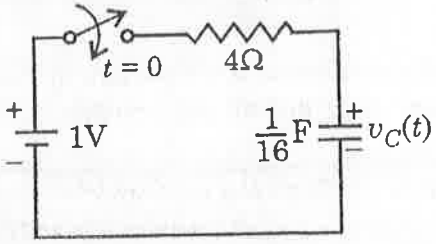

Fig. 4

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

Question Paper Code: 18EEE103

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech. II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

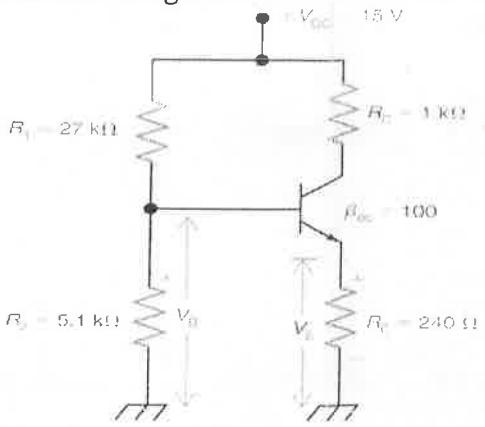
ANALOG ELECTRONICS

(EEE)

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

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

			Marks	CO	BL
Q.1	i.	Write the expression for PN diode current.	1M	1	1
	ii.	What is stability factor in Bipolar Junction Transistor?	1M	1	1
	iii.	Define trans conductance in JFET	1M	2	1
	iv	What are the ideal dc characteristics of an operational amplifier?	1M	2	1
	v.	What is programmable gain amplifier?	1M	3	1
	vi	Draw the circuit diagram for integrator. write its output voltage equation.	1M	3	2
	vii.	Draw the I order low pass active filter using operation amplifier.	1M	4	2
	viii.	What are the Barkhausen condition for oscillator?	1M	4	1
	ix.	How many resisters are required in a 12 bit weighted resister DAC.	1M	5	1
	x.	How many comparators required for 3 bit flash type ADC?	1M	5	1
Q.2(A)	i) Explain the voltage divider bias for CE- Bipolar Junction Transistor and hence derive stability factor and operation quiescent point		5M	1	2
	ii) Explain the input and output characteristics of CE- Bipolar Junction Transistor and compare its characteristics, applications with CE and CC		5M	1	2
	OR				
Q.2(B)	(i)Explain the Fixed bias circuit for BJT and hence derive the stability factor		4M	1	2
	(ii)Compute the Q point and hence find the value of stability factor for the voltage divider bias shown in figure		6M	1	3



Q.3(A)	(i) Explain the construction and operation of Junction Field Effect Transistor (JFET) and hence discuss its drain and Transfer characteristics. Also write relationship between drain current and Gate to source voltage		8M	2	2
	(ii) Explain the small signal mode for JFET		2M	2	2

OR

Q.3(B)	i) Explain the operation of enhancement MOSFET and hence draw its drain and transfer characteristics.	5M	2	2
	ii) Explain the following characteristics of Operational amplifier 1. CMRR 2. Bandwidth 3. Slew rate 4. Gain bandwidth Product 5. Input and output resistance	5M	2	2
Q.4(A)	(i) Explain in detail about Sample and Hold circuit using 2 operational amplifiers	5M	3	2
	(ii) Explain the operation of Schmitt trigger and draw transfer characteristics showing hysteresis.	5M	3	2
	OR			
Q.4(B)	(i) Explain integrator and differentiator using op-amp with circuit diagram.	5M	3	2
	(ii) Explain instrumentation amplifier and derive the output voltage expression for three op-amp instrumentation amplifier.	5M	3	2
Q.5(A)	(i) Draw the II order active - high pass filter and derive its transfer function.	7M	4	2
	(ii) Design above circuit of Butterworth LPF at a high cutoff frequency of 1KHZ. Assume capacitor C= 0.01 μF.	3M	4	6
	OR			
Q.5(B)	(i) With circuit diagram, Explain Wien bridge oscillator and derive expression for oscillating frequency.	6M	4	2
	(ii) Design an astable multivibrator using 555 IC to provide a 1 KHz output with a duty cycle of approximately 50 %. Assume capacitor C=0.01 μF.	4M	4	6
Q.6(A)	Explain the operation of (i) Flash type ADC	5M	5	2
	(ii) successive approximation ADC	5M	5	2
	OR			
Q.6(B)	(i) Explain the operation of weighted resistor DAC?	5M	5	2
	(ii) What output voltage would be produced by a D/A converter whose output range is 0 to 10V and whose input binary number is 1. 11(for a 2bit D/A converter 2.0110(for a 4 bit DAC) 3.10111100(for a 8 bit DAC)	5M	5	3

*** END***

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

Question Paper Code: 18EEE104

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

DC MACHINES & TRANSFORMERS

(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 Part-A or B only

			Marks	CO	BL
Q.1	i.	What is linear magnetic circuit?	1M	1	1
	ii.	What is the reluctance?	1M	1	1
	iii.	What is armature reaction?	1M	2	1
	iv	An 8-pole, wave-connected armature has 600 conductors and is driven at 625 rev/min. If the flux per pole is 20 mWb, determine the generated e.m.f.	1M	2	2
	v.	What is the use of commutator in DC motor?	1M	3	1
	vi	Why the shaft torque is always less than that developed by the armature of a motor?	1M	3	1
	vii.	Distinguish between voltage ratio and current ratio.	1M	4	1
	viii.	The primary current of a transformer _____ (increases/ decreases/ becomes unchanged) when the secondary current increases.	1M	4	1
	ix.	What advantage has the star-connection over delta connection?	1M	5	1
	x.	What are the types of tap changing transformer?	1M	5	1
Q.2(A)	i.	With net diagrams explains that a bar magnet is an inherent dipole source.	7M	1	2
	ii.	Explain the difference between linear and nonlinear magnetic circuit.	3M	1	2
		OR			
Q.2(B)		An iron ring of mean length 50 cm has an air gap of 1 mm and winging of 200 turns. If the relative permeability of iron is 400, when a current of 1 A flows in the winding. Determine the flux density neglecting leakage and fringing.	10M	1	3
Q.3(A)	i.	With the representation of all the circuit parameters draw the circuit diagram of a shunt, short-shunt and long-shunt DC generators. Write the relevant node and loop equations of current and voltage respectively.	6M	2	2
	ii.	A D.C. generator running at 30rev/s generates an e.m.f. of 200V. Determine the percentage increase in the flux per pole required to generate 250 V at 20 rev/s.	4M	2	3
		OR			
Q.3(B)	i.	What is field circuit critical resistance?	2M	2	1
	ii.	A shunt generator gave the following results in the OCC test at a speed of 800 rpm.	8M	2	3

I_f (A) :	0	0.5	1	2	3	4	5
E_o (V):	10	50	100	175	220	245	262

Find the critical resistance of shunt field circuit. If the field circuit resistance is changed to 75 Ω, what will be the critical speed for the machine to build up.

Q.4(A)	i.	How may the direction of rotation of a dc shunt motor be reversed?	4M	3	2
	ii.	Derive an expression for the speed of a dc motor in terms of back emf and flux per pole.	6M	3	2
		OR			
Q.4(B)		Derive an expression for the torque of a dc motor. Hence, draw torque vs current (or load) characteristics of dc shunt and series motor.	10M	3	2
Q.5(A)	i.	Why is the transformer core loss substantially independent of load current?	2M	4	2
	ii.	A 20 kVA, 250V/2500V, 50 Hz, 1-ph transformer gave the following test result; SC Test: 120 V, 8 A, 320 W OC Tect: 250 V, 1.4 A, 105 W Find the circuit parameters and draw the equivalent circuit of the transformer referred to LV winding.	8M	4	3
		OR			
Q.5(B)		Voltage regulation of a transformer varies with pf, validate the statement with suitable derivations. At what power factor will the regulation be (i) maximum (ii) zero? Does the maximum efficiency of the transformer also depends on pf?	10M	4	2
Q.6(A)		Explain, how voltage can be controlled by using on load tap changing transformer with net sketch.	10M	5	2
		OR			
Q.6(B)		Two transformers A and B are connected in parallel to a load of 2 + j 1.5 Ω. The impedances in secondary are Z_A = 0.15 + j 0.5 Ω and Z_B = 0.1 + j 0.6 Ω. Their no load terminal voltages are E_A = 207 V and E_B = 205 V. find the power output and power factor of each transformer.	10M	5	3

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 18HUM102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

PRINCIPLES OF MANAGEMENT

(Common to ME, CSE, CSIT & CST)

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

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

			Marks	CO	BL
Q.1	i.	Define Management.	1M	1	1
	ii.	Write one Managerial Role.	1M	1	1
	iii.	Explain the meaning of Planning.	1M	2	1
	iv.	What is the main goal of a College?	1M	2	1
	v.	What is Departmentation?	1M	3	1
	vi.	Define Delegation.	1M	3	1
	vii.	List out two main barriers of Communication.	1M	4	1
	viii.	What is the most important Motivator?	1M	4	1
	ix.	What is Feed Forward?	1M	5	1
	x.	Explain about the Value Chain.	1M	5	1
Q.2(A)		What is Management? explain skills and roles of manager	10M	1	2
		OR			
Q.2(B)		What is Social Responsibility? Explain Managerial Ethics- Social responsibility in an organisation.	10M	1	3
Q.3(A)		What are the types of Planning? Write some contemporary issues in Planning.	10M	2	2
		OR			
Q.3(B)		Define Strategic Management. What are the different types of Strategies? Give examples.	10M	2	2
Q.4(A)		What are the different types of Organizational Structures? Draw some of them.	10M	3	2
		OR			
Q.4(B)		Explain the role of HR in the present era in MNCs. How do companies manage change and innovation?	10M	3	3
Q.5(A)		Explain any two important Theories of Motivation.	10M	4	3
		OR			
Q.5(B)		How is a Leader different from a Manager? Explain any two Leadership Theories.	10M	4	3
Q.6(A)		What is Value Chain Management? explain its goal requirements	10M	5	3
		OR			
Q.6(B)		What is Operations Management? Explain the functions of an Operational Manager.	10M	5	2

***** END*****

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

Question Paper Code: 18ME102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

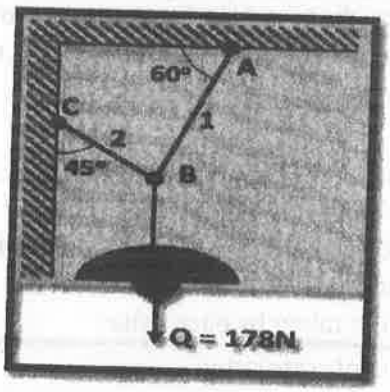
ENGINEERING MECHANICS

(Mechanical Engineering)

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

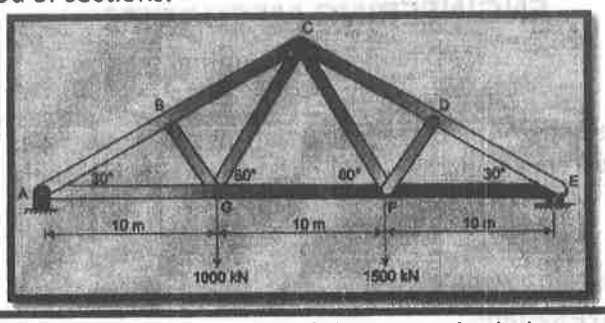
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either Part-A or B only

			Marks	CO	BL
Q.1	i.	State parallelogram law of forces	1M	1	1
	ii.	Classify the force system	1M	1	2
	iii.	What are trusses?	1M	2	1
	iv	What is meant by frictional force?	1M	2	1
	v.	Define centre of gravity.	1M	3	2
	vi	Discuss the significance of Moment of Inertia?	1M	3	2
	vii.	What is meant by Displacement?	1M	4	1
	viii.	Show the relation between rectangular components and tangential and normal components of acceleration.	1M	4	2
	ix.	State D`Alembert`s principle.	1M	5	1
	x.	State the work-energy equation for translation	1M	5	1
Q.2(A)		Forces P1,P2,P3 and P4 of magnitude 10kN,20kN,25kN and 40kN are concurrent in space and are oriented at 30^0, 135^0, 230^0, and 315^0respectively. Determine the resultant of the system of forces.	10M	1	3
		OR			
Q.2(B)		An electric light fixture of weight Q = 178 N is supported as shown in the figure. Find the tensile forces "S1"and "S2"in the wire BA and BC.	10M	1	3

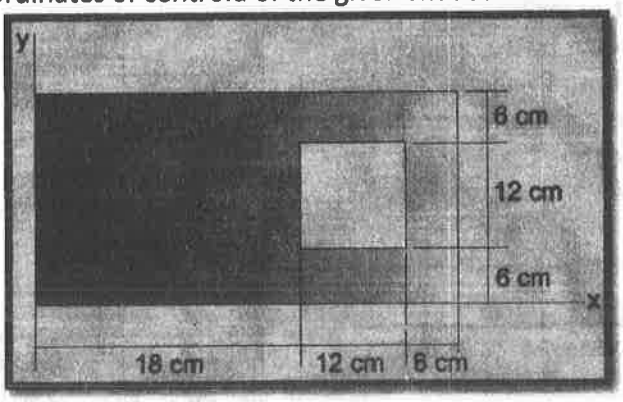


Q.3(A)		A uniform ladder of weight 800N and of length 7 m rests on a horizontal ground and leans against a smooth vertical wall. The angle made by the ladder with the horizontal is 60^0. When a man of weight 600N stands on the ladder at a distance 4m from the top of the ladder (along its length), the ladder is at the point of sliding. Determine the coefficient of friction between the ladder and the floor.	10M	2	3
		OR			

Q.3(B)	Find the forces in members CD, CF, and FG of the truss shown in Figure using method of sections.	10M	2	3



Q.4(A)	Determine coordinates of centroid of the given shaded area.	10M	3	3



OR

Q.4(B)	State Perpendicular axis theorem. & Derive the Centroid of a triangular from first principle.	10M	3	3
Q.5(A)	An elevator is moving upwards with a constant speed of 10m/s. If a man standing inside the elevator drops a coin from a height of 2.45m, find the time taken by the coin to reach the floor of the elevator. ($g=9.8m/s^2$).	10M	4	3

OR

Q.5(B)	Two trains R and S start from rest simultaneously from stations A and B facing each other with accelerations 0.5 m/s^2 and 2/3 m/s^2 reaching their maximum speeds of 90 kmph and 72 kmph respectively. If they cross each other midway between the stations, find the distance between the stations and the time taken by each other.	10M	4	3
Q.6(A)	Derive the work-energy equation of translation	10M	5	3

OR

Q.6(B)	A particular move along a straight line so that its displacement in meter from a fixed point is given by, $s = t^3 + 3t^2 + 4t + 5$. **Determine:** i)Velocity at start and after 6 seconds ii)Acceleration at Start and after 6 seconds	10M	5	3

*** END***

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

Course Code: 18ME103

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations -JULY 2022

BASIC THERMODYNAMICS

(ME)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
In Q.no 1 to 5 answer either Part A or Part B only. Q.no 6 which is a case study is compulsory.

			Marks	CO	BL
Q.1	i.	Define thermodynamics.	1M	1	2
	ii.	During a heating process, the temperature of a system rises by 10°C. Express this rise in temperature in Kelvin scale.	1M	1	2
	iii.	What do you understand by triple point? Give the pressure and temperature of water at its triple point.	1M	2	1
	iv	What is a saturation state for a pure substance?	1M	2	1
	v.	What is perpetual motion machine 1 and 2?	1M	3	1
	vi	What is a Carnot cycle? Describe the four processes which constitute the cycle?	1M	3	1
	vii.	What is compressibility factor?	1M	4	2
	viii.	What is reduced parameter?	1M	4	2
	ix.	Draw the T-s diagram of Otto cycle.	1M	5	
	x.	Draw p-V diagram of Dual cycle.	1M	5	
Q.2(A)		State and explain (i)The first law of thermodynamics for a closed system undergoing a cycle, (ii)The first law of thermodynamics for a closed system undergoing a change in state, and (iii) The property introduced by the first law.	10M	1	3
		OR			
Q.2(B)		Air at 10°C and 80 kPa enters the diffuser of a jet engine steadily with a velocity of 200 m/s. The inlet area of the diffuser is 0.4 m^2. The air leaves the diffuser with a velocity that is very small compared with the inlet velocity. Determine (i) the mass flow rate of the air, and (ii) the temperature of the air leaving the diffuser.	10M	1	3
Q.3(A)		Explain the phase change processes of a water at one atmospheric pressure. Explain each zone with suitable p-V and T-s plots.	10M	2	3
		OR			
Q.3(B)		Steam initially at 1.5 MPa, 300°C expands reversibly and adiabatically in a steam turbine to 40°C. Determine the ideal work output of the turbine per kg of steam.	10M	2	3
Q.4(A)		A heat pump is used to meet the heating requirements of a house and maintain it at 20°C. On a day when the outdoor air temperature drops to -2°C, the house is estimated to lose heat at a rate of 80,000 kJ/h. If the heat pump under these conditions has a COP of 2.5, determine (i) the power consumed by the heat pump and (ii) the rate at which heat is absorbed from the cold outdoor air.	10M	3	3

OR

Q.4(B)	A Carnot engine absorbs 200 J of heat from a reservoir at the temperature of the normal boiling point of water and rejects heat to a reservoir at the temperature of the triple point of water. Find the heat rejected, the work done by the engine and the thermal efficiency.	10M	3	3
Q.5(A)	Derive Clasius-Clapeyrons equation. What assumptions are made in this equation?	10M	4	2

OR

Q.5(B)	A constant volume chamber of 0.3 m^3 capacity contains 2 kg of this gas at 5°C. Heat is transferred to the gas until the temperature is 100°C. Find the work done, the heat transferred, and the changes in internal energy, enthalpy and entropy.	10M	4	2
Q.6(A)	List down the assumptions made for the analysis of air standard cycles. Derive an expression for the air standard thermal efficiency of a Diesel cycle.	10M	5	3

OR

Q.6(B)	A simple Brayton cycle using air as the working fluid has a pressure ratio of 8. The minimum and maximum temperatures in the cycle are 310 and 1160 K. Determine (i) the air temperature at the turbine exit, (ii) the network output, and (iii) the thermal efficiency.	10M	5	3

*** END***

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

Course Code: 18ME104

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations -JULY 2022

MATERIAL SCIENCE AND ENGINEERING

(Mechanical Engineering)

Time: 3Hrs

Max Marks: 60

Attempt all the questions. All parts of the question must be answered in one place only.
Question 1 is compulsory. Q2. to Q6. have two choices (A or B). Answer any one.

			Marks	CO	Bl
Q.1	i.	What is a unit cell?	1M	1	2
	ii.	Define linear density in relation to a crystal structure.	1M	1	1
	iii.	List the types of imperfections.	1M	2	1
	iv	What is self-diffusion?	1M	2	1
	v.	What is slip?	1M	3	1
	vi	State Hook's law.	1M	3	1
	vii.	What is a hypoeutectoid alloy?	1M	4	2
	viii.	What do you understand by a peritectic reaction?	1M	4	2
	ix.	Write two applications of plastic.	1M	5	1
	x.	Name two alloys of copper.	1M	5	1
Q.2(A)		Classify materials with their applications.	10M	1	2
		OR			
Q.2(B)		Show that the atomic packing factor for HCP is 0.74.	10M	1	3
Q.3(A)		What is meant by an imperfection in a crystal? Explain the point defects in crystals.	10M	2	2
		OR,			
Q.3(B)		Write about different diffusion mechanism.	10M	2	1
Q.4(A)		What is fracture? Explain the modes of fracture with appropriate stress-strain curve. Define fracture toughness.	10M	3	2
		OR			
Q.4(B)		Cite advantages and disadvantages of hot working and cold working.	10M	3	1
Q.5(A)		Briefly cite the differences between pearlite, bainite, and spheroidite relative to microstructure and mechanical properties.	10M	4	2
		OR			
Q.5(B)		Distinguish between hypereutectoid and hypoeutectoid steels.	10M	4	2
Q.6(A)		List the 4 classification of steels. Briefly describe the properties and typical applications of each.	10M	5	1
		OR			
Q.6(B)		What is a hybrid composite? List two important advantages of hybrid composites over normal fiber composites.	10M	5	1

*** END***

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

Question Paper Code: 18MAT108

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022

PARTIAL DIFFERENTIAL EQUATIONS AND PROBABILITY & STATISTICS

(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 Part-A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	Define partial differential equation?	1M	1	1
	ii.	Form the PDE by eliminating arbitrary function f from $z = f(x^2 - y^2)$	1M	1	1
	iii.	Define axiomatic definition of probability.	1M	2	1
	iv	X is the binomial variate with parameters n= 15 and p= 0.2 find variance of X	1M	2	1
	v.	Define p.d.f. of uniform distribution?	1M	3	1
	vi	Evaluate $\int_0^\infty z^2 e^{-z} dz$	1M	3	1
	vii.	Write the condition for independence of random variables?	1M	4	1
	viii.	Define rank correlation coefficient?	1M	4	1
	ix.	Explain Type-I error?	1M	5	1
	x.	Define student's t – statistics	1M	5	1
Q.2(A)		(i) Form the PDE by eliminating the arbitrary constants from $(x-a)^2 + (y-b)^2 + z^2 = c^2$. (ii) Form the PDE by eliminating the arbitrary functions from $z = f(x+at) + g(x-at)$.	10M	1	3
		OR			
Q.2(B)		Using the method of separation of variable, solve $\frac{\partial u}{\partial x} = 4\frac{\partial u}{\partial y}$, where $u(0, y) = 8e^{-3y}$.	10M	1	4
Q.3(A)		A computer center has three printers A, B, and C, which print at different speeds. Programs are routed to the first available printer. The probability that a program is routed to printers A, B and C are 0.6, 0.3 and 0.1 respectively. Occasionally a printer will jam and destroy the printout. The probability that printers A, B and C will jam are 0.01, 0.05 and 0.04 respectively. Your program is destroyed when a printer jams. What is the probability that printer A is involved? Printer B involved?	10M	2	3

OR

Q.3(B) Let X denote, the number of holes that for can be drilled per bit. The density for X is given the following table: 10M 2 3

x	1	2	3	4	5	6	7	8
$f(x)$	0.02	0.03	0.05	0.2	0.4	0.2	0.07	$f(8)$

(a) Find $f(8)$?
(b) Find the table for F ?
(c) Use F to find the probability that a randomly selected bit can be used to drill between three and five holes inclusive.
(d) Find $p(X \leq 4)$ and $p(X < 4)$.

Q.4(A) Let X be a Gamma random variable with $\alpha = 3, \beta = 4$ 10M 3 3

(i) What is the expression for the density for X?
(ii) What is the Moment generating function for X?
(iii) Find μ, σ^2, σ

OR

Q.4(B) Find moment generating function for normal distribution and mean and variance? 10M 3 4

Q.5(A) Verify that $f(x,y) = xye^{-x}e^{-y}; \quad x > 0; y > 0$ satisfy the conditions necessary to be a density for a continuous random variable (X,Y). Find the marginal densities for X and Y. Are X and Y independent? 10M 4 3

OR

Q.5(B) Calculate the correlation coefficient for the following data: 10M 4 3

X :	68	64	75	50	64	80	75	40	55	64
Y :	62	58	68	45	81	60	68	48	50	70

Q.6(A) Explain the following: 10M 5 3
(i) Null and alternative hypotheses (ii) Types of errors
(iii) Level of significance (iv) Standard error

OR

Q.6(B) Ten individuals are chosen at random from a normal population and their heights are found to be 63, 63, 66, 67, 68, 69, 70, 70, 71, 71 inches. Test if the sample belongs to the population whose mean height is 66inches at 5% level of significance? ($t_{0.05,9} = 2.262$) 10M 5 3

*** END***

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

Question Paper Code: 18ECE101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester Supplementary End Semester Examinations – July 2022

(Regulations: R18)

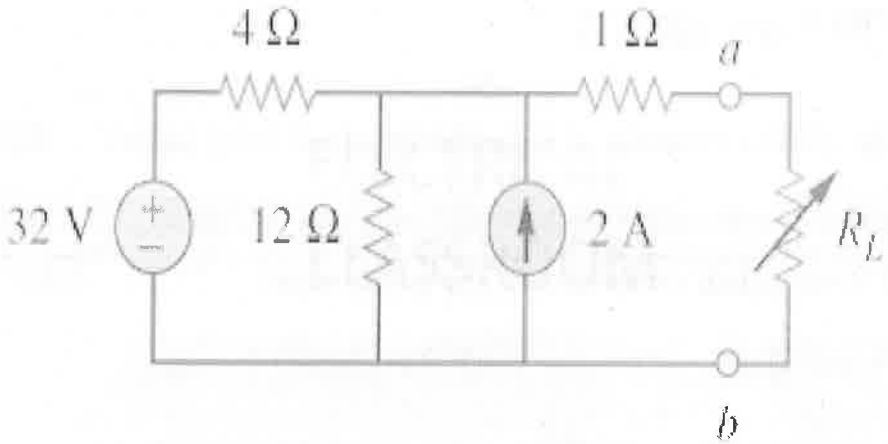
NETWORK THEORY

(ECE)

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

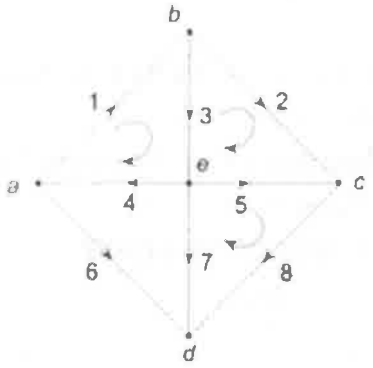
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either Part-A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	State superposition theorem.	1M	1	1
	ii.	Define tellegan's theorem.	1M	1	1
	iii.	Define Resonance	1M	2	1
	iv	Determine the resonance frequency of the parallel R,L,C circuit consisting of R=10Ω, L=0.1H and C=10μF.	1M	2	2
	v.	Write Laplace transform of sin (αt).	1M	3	1
	vi	Define initial and final condition theorem.	1M	3	1
	vii.	Write the parameter Y_{11} in terms of Z parameters.	1M	4	1
	viii	If the Laplace transform of f(t) is F(s), what is the Laplace transform of f(at)?	1M	3	2
	ix.	Write expressions for open circuit impedance parameters	1M	4	1
	x.	State an one difference between constant-k and m-derive filters.	1M	5	1
Q.2(A)		Find V_{th}, R_{th} and the current through the RL = 2 Ohm resistor by thevenin's theorem	10M	1	2

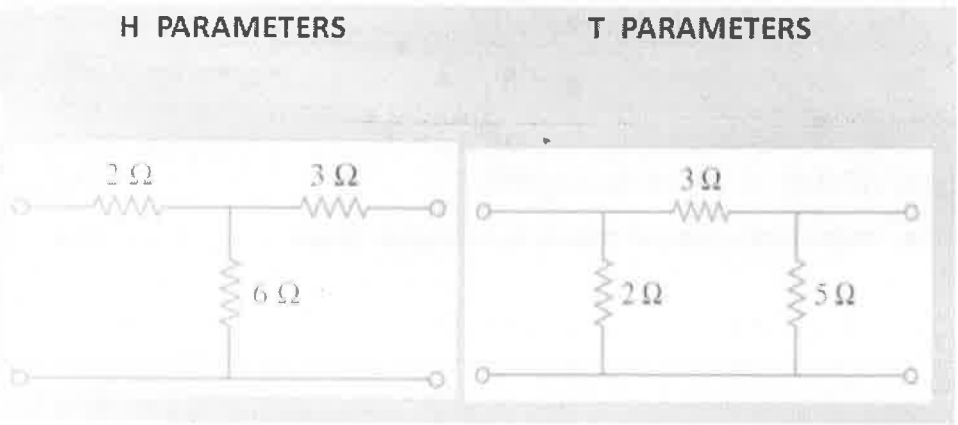


OR

Q.2(B)	(a) State the properties of the Incident matrix	4M	1	2
	(b) Obtain the fundamental cut-set matrix for the give graph	6M	1	2

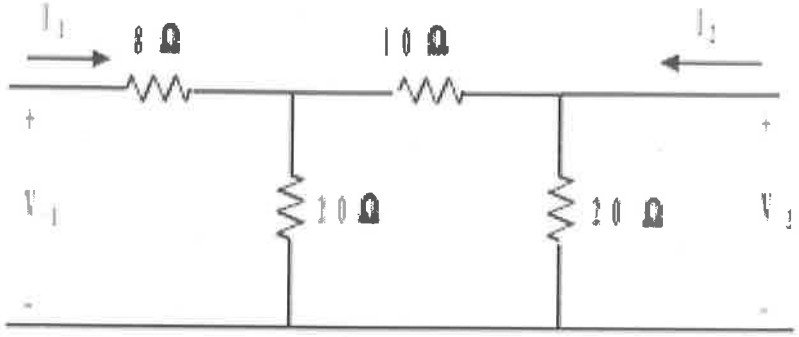


Q.3(A)	(i) A series RLC circuit has a quality factor of 5 at 50 rad/sec. The current flowing through the circuit at resonance is 10 A and the supply voltage is 100 V. Find the circuit constants. (ii) A 5 μF condenser is connected in series with a coil having inductance of 50 mH. Determine the frequency at resonance, the resistance of the coil if a 50V source operating at resonance frequency causes a circuit current of 10mA. What is the quality factor of the coil?	10M	2	3
	OR			
Q.3(B)	i) For a series RLC circuit with R = 2 Ω, L=1 mH, C=0.4 μF and a supply voltage v(t)=20 sin(ωt), find the resonance frequency and quality factor.	5M	2	3
	ii) A coil having an inductance of 50 mH and resistance 10 Ω is connected in series with a 25 μF capacitor across a 200 V ac supply. Calculate (a) resonance frequency of the circuit (b) current flowing at resonance and (c) value of Q_0 by using different data.	5M	2	3
Q.4(A)	a) Describe the Step response of a series RL circuit using Laplace transform.	5M	3	2
	b) Find the inverse Laplace transform of the function $F(s) = \frac{2s+9}{(s+3)(s+4)}$	5M	3	2
	OR			
Q.4(B)	a) Describe the impulse response of a parallel RC circuit using Laplace transform.	5M	3	2
	b) Find the Laplace transform of an exponential and ramp functions.	5M	3	2
Q.5(A)	Find h and T (Transmission) parameters for the given circuits.	10M	4	2



OR

Q.5(B)	Find the Z and Y parameters for the given circuit	5M	4	2



Q.6(A)	Design a m-derived low pass filter having cut-off frequency of 1 kHz, design impedance of 400 Ω, and the resonant frequency 1100 Hz. Finally draw the filter.	10M	5	4

OR

Q.6(B)	Discuss about the constant-k low pass and constant-k high pass filters.	10M	5	3

***** END*****

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

Question Paper Code: 18ECE102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester Supplementary End Semester Examinations – July 2022

(Regulations: R18)

DIGITAL SYSTEM 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 Part-A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	10's complement of decimal no. 5674.	1M	1	1
	ii.	Convert 1100 to Gray code.	1M	1	1
	iii.	Implement the circuit for 1-bit magnitude comparator.	1M	2	2
	iv	Give the comparison between combinational circuits and sequential circuits.	1M	2	1
	v.	State the difference between synchronous and asynchronous counter.	1M	3	2
	vi	What is the operation of D flip-flop?	1M	3	1
	vii.	Define race around condition.	1M	3	1
	viii.	Sketch the CMOS circuit acting as an inverter.	1M	4	2
	ix.	Explain RAM and ROM.	1M	4	1
	x.	What are the types of various modeling styles in VHDL?	1M	5	1
Q.2(A)		Reduce the Boolean function using k-map technique and implement using gates $f(w, x, y, z) = \sum m(0,1,4,8,9,10)$ which has the don't cares condition $d(w, x, y, z) = \sum m(2,11)$.	10M	1	3
		OR			
Q.2(B)		Find the minimum SOP expression using K-map for the function $f = \sum m(7, 9, 10, 11, 12, 13, 14, 15)$ and realize the minimized function using only NAND gates.	10M	1	3
Q.3(A)		Design and Explain i) Half Subtractor ii) Full Subtractor	10M	2	2
		OR			
Q.3(B)		Explain Decimal to BCD Encoder with suitable block diagram, truth table and circuit implementation with logic gates.	10M	2	2
Q.4(A)		Design and explain Binary adder with look ahead carry. Draw the diagram for 4 bit look ahead adder.	10M	3	2
		OR			
Q.4(B)		i) Write the characteristic table and excitation table of SR, JK, D T flip flops. ii)Design Master Slave JK Flip flop	5M 5M	3	2
Q.5(A)		What is programmable array logic (PAL)? Discuss the design of a combination circuit using PAL with suitable example.	10M	4	2
		OR			
Q.5(B)		Design a 4-bit ripple or asynchronous counter using JK flip-flop.	10M	4	4
Q.6(A)		Discuss dataflow and behavioral modelling styles in detail.	10M	5	1
		OR			
Q.6(B)		Write the VHDL code for 2x1 multiplexer and 2x4 decoder.	10M	5	2

*** END***

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

Question Paper Code: 18ECE103

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester Supplementary End Semester Examinations – July 2022

(Regulations: R18)

ELECTRONIC DEVICES AND CIRCUITS

(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.	In amplifiers, what is the name of the parameter which represents the ratio between the change in output current and the change in input voltage?	1M	4	1
	ii.	Avalanche breakdown occurs at higher reverse voltage compared to Zener breakdown. Why?	1M	1	2
	iii.	What is Early effect in bipolar junction transistor?	1M	2	1
	iv	Define the threshold voltage of an n-channel enhancement MOSFET.	1M	2	1
	v.	Define ripple factor of a rectifier	1M	3	1
	vi	Draw the circuit of a positive clipper.	1M	3	1
	vii.	Define current gain in CB, CE, CC configuration in BJT	1M	4	1
	viii	Draw the small signal equivalent circuit for MOSFET	1M	4	1
	ix.	What are the important internal capacitances in a MOSFET	1M	5	1
	x	Draw the small-signal equivalent circuit of a BJT	1M	4	1
Q.2(A)		(i) Derive the expressions for electron and hole concentrations in semiconductors under thermal equilibrium.	6M	1	2
		(ii) An n-type silicon sample 0.1cm long and 100μm^2 cross-sectional area has a majority carrier concentration of 1×10^{15} /cm^3. The electron mobility is 1300 cm^2/Vs at 300K. The charge of electron is 1.6×10^{-19} coulomb. Calculate the resistance of the sample.	4M	1	3
		OR			
Q.2(B)		(i) Explain the operation of the p-n junction diode under forward and reverse bias conditions with the help of energy band diagram.	6M	1	2
		(ii) Calculate the cut-in voltage of a silicon p-n junction diode. $N_a = 2 \times 10^{17}/cm^3$ and $N_d = 10^{15}/cm^3$. kT/q=0.0259V, $n_i=1.45x10^{10}/cm^3$.	4M	1	3
Q.3(A)		(i) Explain the operation of an n-p-n transistor in the forward active region. Draw the input and output characteristics of a transistor in common-emitter configuration.	6M	2	2
		(ii) What is Early effect in BJTs? On the sane figure, draw the output characteristic of common-emitter configuration without and with the Early effect.	4M	2	3
		OR			
Q.3(B)		With the help of neat diagrams, explain the structure and operation of an n-channel enhancement mode MOSFET. Also draw and explain its drain and transfer characteristics.	10M	2	2

Q.4(A)	Draw and explain different types of clipping and clamping circuits.	10M	3	2
	OR			
Q.4(B)	Why biasing is necessary in BJT amplifiers? Describe different biasing techniques in BJT amplifier circuit.	10M	3	3
Q.5(A)	Draw the small signal equivalent circuit diagram of CE amplifier. Derive the equation for voltage gain, input resistance and output resistanc	10M	4	2
	OR			
Q.5(B)	Draw the circuit of a common-source amplifier and its small signal equivalent. Derive the expression for voltage gain, input resistance and output resistance.	10M	4	2
Q.6(A)	Explain BJT internal capacitances and draw its high frequency model.	10M	5	2
	OR			
Q.6(B)	Draw and explain high frequency response of common-emitter amplifier with its high frequency model.	10M	5	2

*** END***

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

Question Paper Code: 18MAT111

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations –JULY 2022

PROBABILITY MODELS AND STATISTICS

(Common to CSE & CST)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Define Pair wise independent.	1M	1	1
	ii.	A family has two children. What is the conditional probability that both are boys given that at least one of them is a boy?	1M	1	1
	iii.	Define distribution function of a random variable?	1M	2	1
	iv	$Cov(X, Y+Z) =$	1M	2	1
	v.	Define irreducible Markov chain?	1M	3	1
	vi	Define ergodic state?	1M	3	1
	vii.	Average number of customers in a Single-Server Exponential Queueing System is	1M	4	1
	viii.	Define regression coefficient of *Y* on *X*?	1M	4	1
	ix.	Explain null hypothesis?	1M	5	1
	x.	Define student's t – statistics	1M	5	1
Q.2(A)		Urn 1 has five white and seven black balls. Urn 2 has three white and twelve blackballs. We flip a fair coin. If the outcome is heads, then a ball from urn 1 is selected, while if the outcome is tails, then a ball from urn 2 is selected. Suppose that a white ball is selected. What is the probability that the coin landed tails?	10M	1	2
		OR			
Q.2(B)		If *X* is uniformly distributed over $(0,10)$, calculate (a) $p(X<3)$, (b) $p(X>7)$, (c) $p(1<X<6)$.	10M	1	2
Q.3(A)		Derive moment generating function for geometric distribution and find mean and variance?	10M	2	3
		OR			
Q.3(B)		The joint probability mass function of *X* and *Y*, $p(x,y)$, is given by $p(1,1)=\frac{1}{9}$, $p(2,1)=\frac{1}{3}$, $p(1,1)=0.5$, $p(1,2)=0.1$, $p(2,1)=0.1$, $p(2,2)=0.3$. Calculate the $Cov(X,Y)$ and the conditional probability mass function of X given that Y = 1	10M	2	3

Q.4(A) Let the transition probability matrix of a two-state Markov chain be given by $P=\begin{bmatrix} p & 1-p \\ 1-p & p \end{bmatrix}$ Show by mathematical induction that

$$P^{(n)}=\begin{bmatrix} \frac{1}{2}+\frac{1}{2}(2p-1)^n & \frac{1}{2}-\frac{1}{2}(2p-1)^n \\ \frac{1}{2}-\frac{1}{2}(2p-1)^n & \frac{1}{2}+\frac{1}{2}(2p-1)^n \end{bmatrix}$$

10M 3 4

OR

Q.4(B) (i) Show that if $\{N_i(t), t\geq 0\}$ are independent Poisson processes with rate $\lambda_i, i=1,2$ then $\{N(t), t\geq 0\}$ is a Poisson process with rate $\lambda_1+\lambda_2$ where $N(t)=N_1(t)+N_2(t)$.

5M 3 3

(ii) Cars pass a certain street location according to a Poisson process with rate λ. A woman who wants to cross the street at that location waits until she can see that no cars will come by in the next T time units.

5M

(a) Find the probability that her waiting time is 0.

(b) Find her expected waiting time

Q.5(A) Explain the Birth and Death Queueing models?

10M 4 3

OR

Q.5(B) Obtain the line of regression Y on X and estimate Y when $X=45$ for the following data:

10M 4 4

X:	56	42	72	36	63	47	55	49	38	68
Y:	147	125	160	118	149	128	150	145	115	152

Q.6(A) Explain the test of significance for difference of means. A sample of heights of 6400 English men has a mean of 67.85 inches and standard deviation 2.56 inches, while a sample of heights of 1600 Australians has a mean of 68.55 inches and S.D. of 2.52 inches. Do the data indicate that Australians are, on the average taller than Englishmen?

10M 5 3

OR

Q.6(B) A random sample of 10 boys had the following I.Q.: 70, 120, 110, 101, 88, 83, 95, 98, 107, and 100. Do these data support the assumption of a population mean I.Q. of 100 (Test at 5% significance level)? $t_{0.05,9}=2.262$

10M 5 3

*** END***

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

Question Paper Code: 18CSE103

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – July 2022

DATA STRUCTURES

(Computer Science & Engineering)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Define time and space complexity	1M	1	1
	ii.	What are the limitations of arrays?	1M	1	1
	iii.	What the condition for Queue underflow?	1M	2	1
	iv	What is Max heap?	1M	2	1
	v.	What Is the time complexity for selection sort?	1M	3	1
	vi	What is hashing?	1M	3	1
	vii.	What is sibling in tree terminology?	1M	4	1
	viii.	Define a Complete Binary Tree.	1M	4	1
	ix.	What are the properties of AVL tree?	1M	5	1
	x.	Compare tree and graph	1M	5	2
Q.2(A)		Discuss in detail about asymptotic notations	10M	1	6
		OR			
Q.2(B)		Evaluate the given infix notation to postfix notation: A +B * C / D – F + G	10M	1	5
Q.3(A)		Explain the condition for Queue overflow. How the drawback of wastage of memory is re-used In Circular Queue?	10M	2	5
		OR			
Q.3(B)		Apply to Sort the following using heap sort algorithm. 45, 78, 21, 42, 12, 65, 15, 23, 54, 67. 34. 90, 78, 32	10M	2	3
Q.4(A)		Explain about Merge sort algorithm with example?	10M	3	5
		OR			
Q.4(B)		Discuss collision in hashing. How it can be solved.	10M	3	6
Q.5(A)		What is a Tree data structure? Explain about tree traversal techniques	10M	4	5
		OR			
Q.5(B)		What is a BST? Construct a BST for the following values. 34, 67, 12, 89, 45, 43, 9, 34, 89, 32, 63, 83, 64, 49, 51	10M	4	6
Q.6(A)		Construct a Red-Black tree with the following values. 46, 81, 50, 23, 73, 93, 58, 62, 79, 48, 28, 89, 70	10M	5	6
		OR			
Q.6(B)		Define Graph. Explain how to traverse it by taking one suitable example.	10M	5	5

***** END*****

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

Question Paper Code: 18CSE104

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – July 2022

OBJECT ORIENTED PROGRAMMING USING JAVA

(Common to 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.	Compare method and constructor?	1M	1	2
	ii.	Why Java is a strongly typed language?	1M	1	1
	iii.	How to declare strings in Java?	1M	2	1
	iv	Define package?	1M	2	1
	v.	What is the syntax to create a user defined exception?	1M	3	1
	vi	Why synchronization is required in thread programs?	1M	3	1
	vii.	What is the usage of Queue and Priority Queue?	1M	4	1
	viii.	Define I/O streams?	1M	4	1
	ix.	List the limitations of AWT.	1M	5	1
	x.	What is the difference between Label and JLabel?	1M	5	1
Q.2(A)		Explain the categories of data types in Java?	10M	1	5
		OR			
Q.2(B)		Examine the various types of constructors using suitable examples?	10M	1	4
Q.3(A)		Discuss abstract class and interface with suitable example?	10M	2	5
		OR			
Q.3(B)		What are the contexts in which you can use the "final" keyword? Explain briefly?	10M	2	5
Q.4(A)		What is an exception? Explain exception handling in java with examples?	10M	3	5
		OR			
Q.4(B)		Explain the process of creating a thread?	10M	3	5
Q.5(A)		Analyze the advantage of collection classes and give example for HashSet, ArrayList, TreeSet?	10M	4	4
		OR			
Q.5(B)		Explain the usage of Byte Stream Classes with example?	10M	4	5
Q.6(A)		What is an event? Explain any two event handling classes with example?	10M	5	5
		OR			
Q.6(B)		Explain any five swing components with suitable examples?	10M	5	5

***** END*****

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

Question Paper Code: 18CSE105

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – July 2022

DATABASE MANAGEMENT SYSTEMS

(Computer Science & Engineering)

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

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Define database management system.	1M	1	1
	ii.	List out any two differences between file system and database management system.	1M	1	1
	iii.	What do you mean by views?	1M	2	1
	iv	What is functional dependency?	1M	2	1
	v.	What is multivalued attribute? How it translated it into relational model?	1M	3	1
	vi	Define trigger?	1M	3	1
	vii.	What is check point?	1M	4	1
	viii.	What is serializability?	1M	4	1
	ix.	Define MAC?	1M	5	1
	x.	What is SQL injection?	1M	5	1
Q.2(A)		Explain about database system structure in detail?	10M	1	5
		OR			
Q.2(B)		Construct an ER diagram that captures the following information: A company database needs to store information about employees (identified by ssn, with salary and phone as attributes), departments (identified by dno, with dname and budget as attributes), and children of employees (with name and age as attributes). Employees work in departments; each department is managed by an employee; a child must be identified uniquely by name when the parent (who is an employee; assume that only one parent works for the company) is known. We are not interested in information about a child once the parent leaves the company.	10M	1	6
Q.3(A)		Design the following relation schema, Give an expression in SQL for each of the following queries: employee(employee-name, street, city) works(employee-name, company-name, salary) company(company-name, city) manages(employee-name, manager-name) i) Find the names, street address, and cities of residence for all employees who work for 'First Bank Corporation' and earn more than $1000. ii) Find the names of all employees in the database who live in the same cities as the companies for which they work. iii) Find the names of all employees who earn more than the average salary of all employees of their company. Assume that all people work for at most	10M	2	6

	one company and find the name of the company that has the smallest payroll.			
	OR			
Q.3(B)	Explain about Triggers and Stored procedures with an example?	10M	2	5
Q.4(A)	What is normalization? Explain different normal forms with examples?	10M	3	5
	OR			
Q.4(B)	Explain briefly the following: i). Functional dependency ii). Partial dependency iii). Full dependency iv). Transitive dependency v). Trivial dependency	10M	3	5
Q.5(A)	Discuss in detail about lock-based protocols?	10M	4	6
	OR			
Q.5(B)	i). What is transaction? Explain the ACID Properties of transactions? ii). Explain the Time Stamp - Based Concurrency Control protocol?	10M	4	5
Q.6(A)	Explain in details about DAC and RBAC with suitable example?	10M	5	5
	OR			
Q.6(B)	Explain the following: i) Authorization and access control ii) SQL injection	10M	5	5

***** END*****

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 18CST101/18CSIT102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – July 2022

DATA STRUCTURES

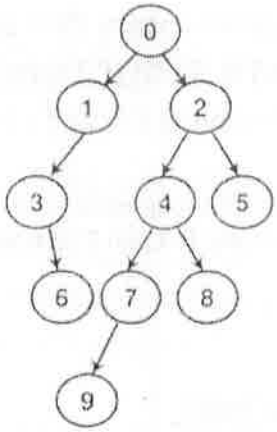
(Common to CST and CSIT)

Time: 3Hrs Max Marks: 60

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

Q.No.		Question	Marks	CO	Bl
Q.1	i.	Define an Algorithm?	1M	1	1
	ii.	What are the types of linked lists?	1M	1	1
	iii.	What is the difference between queue and stack?	1M	2	1
	Iv	Write the Applications of queue.	1M	2	1
	v.	What is the time complexity of merge sort?	1M	3	1
	Vi	Define hashing?	1M	3	2
	vii.	Define Binary Tree Traversal?	1M	4	1
	viii.	Define binary search tree?	1M	4	2
	ix.	List applications of AVL Tree?	1M	5	2
	x.	Define Graph Traversal?	1M	5	2
Q.2(A)		Explain the Asymptotic Notations (Big O, Ω, θ) used while analyzing an algorithm.	10M	1	1
		OR			
Q.2(B)		What is Doubly Linked List? Write an algorithm to insert and delete a node.	10M	1	1
Q.3(A)		Explain QUEUE and its operations with an example?	10M	2	2
		OR			
Q.3(B)		Define heap? Explain about Min Heap with an example?	10M	2	2
Q.4(A)		Arrange the following list of elements in ascending order using Merge Sort: **27, 4, 7, 18, 30, 13, 20, 39, and 21.** Clearly show the sorting process at each step?	10M	3	3
		OR			
Q.4(B)		Insert the keys **70, 69, 8, 72, 24** into the Hash Table of size 13. Resolve all collisions using Double Hashing where first hash-function is h1(k) = k mod 13 and second hash function is h2(k) = 1 + (k mod 11).	10M	3	3
Q.5(A)		What is Binary Search Tree (BST)? What is the maximum number of nodes possible in a binary tree of dept **D?** Make a BST for the following sequence of numbers and Traverse the tree in all types of traversals: **45,78,65,87,32,90,96,41,74,92**	10M	4	2
		OR			

Q.5(B)	Construct Inorder, Preorder and Postorder traversals of the binary tree shown below?	10M	4	2



Q.6(A)	What are the advantages of AVL trees? Write an algorithm to Rotate AVL tree right and illustrate with the help of an example?	10M	5	2

OR

Q.6(B)	Briefly explain Graph Traversal techniques with example?	10M	5	2

*** END***

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 18CST102/18CSIT103

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – July 2022

OBJECT ORIENTED PROGRAMMING USING JAVA

(Common to CSIT, & IT)

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 key characteristics of objects?	1M	1	2
	ii.	Mentions the purpose of finalize method.	1M	1	1
	iii.	In java what is the use of Interfaces?	1M	2	1
	iv	What is the use of 'Super' Keyword? Give an example.	1M	2	1
	v.	How is custom exception created?	1M	3	1
	vi	How will interrupt threads in multiple windows?	1M	3	1
	vii.	What are Byte Stream in Java?	1M	4	1
	viii.	Discuss the methods of Stack class.	1M	4	1
	ix.	Mention any four event names of a button component.	1M	5	1
	x.	What is adapter class?	1M	5	1
Q.2(A)		Describe the term static variables and methods and explain its types with examples?	10M	1	5
		OR			
Q.2(B)		What is meant by package? How it is created and implemented in JAVA.	10M	1	4
Q.3(A)		Define multiple inheritances. With diagrammatic illustration and how to perform multiple inheritances in Java?	10M	2	5
		OR			
Q.3(B)		List the benefits of using packages? Write down the steps in creating a package and using it in a java program with an example?	10M	2	5
Q.4(A)		(i) . Explain the concept of throwing and catching exception in java. (ii) . Explain about Nested try statements with an example?	10M	3	5
		OR			
Q.4(B)		Explain briefly about thread synchronization in multithreading concepts?	10M	3	5
Q.5(A)		What is a vector? How does it differ from array, list with Example?	10M	4	4
		OR			
Q.5(B)		Write a program which stores a list of strings in an ArrayList and then displays the contents of the list?	10M	4	5
Q.6(A)		List out the steps for creating simple user Registration form using java swing with an example?	10M	5	5
		OR			
Q.6(B)		Write a short note on the following Java Swing Events: (i)Event Source (ii)Event Object	10M	5	5

*** END***

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

Question Paper Code: 18CSIT101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – 2022

DIGITAL LOGIC DESIGN

(Computer Science & Information 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 Part-A or B only

Q.No.		Question	Marks	CO	BL
Q.1	i.	Explain De Morgan's Theorem?	1M	1	2
	ii.	The octal number $(651)_8$ is equivalent to decimal?	1M	1	2
	iii.	Define SPOS and SSOP with suitable example?	1M	1	2
	iv	What is a karnaugh map? State the limitations of karnaugh map?	1M	2	2
	v.	Design 2:1 MUX. Using basic gates.	1M	3	2
	vi	State the difference between Combinational and Sequential Circuits.	1M	4	1
	vii.	Define Flip-flop. Mention the types?	1M	3	1
	viii.	Write the minimum number of flip-flops required to design MOD-9 up/down counter?	1M	4	2
	ix.	Write full form of PAL, PLA, and PLD?	1M	5	1
	x.	Write the difference among PROM, and EPROM?	1M	5	1
Q.2(A)		Express the following numbers in decimal form: (i) $(10110.0101)_2$ (ii) $(15.5)_{16}$ (iii) $(62.24)_8$ (iv) $(BADC.E)_{16}$	10M	1	3
		OR			
Q.2(B)		What are the universal logic Gates? Design All other Gates using NAND Gate Only?	10M	1	3
Q.3(A)		Find a minimal sum of products representation for $F(A,B,C,D,E) = \sum m = (1,4,6,10,20,22,24,26)+d(0,11,16,27)$ using K-map method. Implement the circuit?	10M	2	3
		OR			
Q.3(B)		Using tabulation method simplifies the following Boolean function: $F(A,B,C,D,E) = \sum m(0,1,8,11,12,15,20,21,22,24,29,31)$ which has the don't care condition $d(9,18,30)$	10M	2	3
Q.4(A)		Explain the Half adder and Full adder with neat logic diagram?	10M	3	2
		OR			
Q.4(B)		Design (8x1) Multiplexer and also implement (8x1) multiplexer by using (2x1) Multiplexer?	10M	3	4
Q.5(A)		Designs SR flip flop, D-flip-flop and JK flip-flop using logic gates?	10M	4	4
		OR			

Q.5(B)	Design Asynchronous Decade counter using JK flip-flop?	10M	4	4
Q.6(A)	Discuss programmable logic device in detail and describe the construction of ROM using suitable example?	10M	5	3
	OR			
Q.6(B)	What is programmable logic array (PLA)? Discuss the design of a combinational circuit using PLA with suitable example?	10M	5	2

*** END***

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

Question Paper Code: 18CSIT103

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year I Semester (R18) Supplementary End Semester Examinations – July 2022

DATABASE MANAGEMENT SYSTEMS

(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 Part-A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	What is a Database? Give an example?	1M	1	1
	ii.	What is a view, how can you create it?	1M	1	2
	iii.	What is DRC, give an example?	1M	2	2
	iv	Define inner join?	1M	2	1
	v.	Define functional dependencies?	1M	3	1
	vi	Give an example for Lossy decomposition?	1M	3	1
	vii.	What is transaction?	1M	4	1
	viii.	Different types of 2 phase locking protocols?	1M	4	1
	ix.	List 3 primary authentication methods.	1M	5	1
	x.	State the problems of Database Recovery.	1M	5	1
Q.2(A)		A university database contains information about professors (identified by social security number, or SSN) and courses (identified by course id). Professors teach courses; each of the following situations concerns the Teaches relationship set. For each situation, design and draw an ER diagram that describes the following relations. •Professors can teach the same course in several semesters, and each offering must be recorded. •Professors can teach the same course in several semesters, and only the most recent such offering needs to be recorded. •Every professor must teach some course	10M	1	5
		OR			
Q.2(B)		Explain the steps involved in designing the database?	10M	1	3
Q.3(A)		Construct the SQL queries for the following: i) Display all employee whose name start with 'A' and third character is ' 'a'. ii) Display name, number and salary of those employees whose name is 5 characters long and first three characters are 'Ani'. iii) Display the non-null values of employees and also employee name second character should be 'n' and string should be 5 character long. iv) Display the null values of employee and also employee name's third character should be 'a'.	10M	2	4
		OR			
Q.3(B)		Describe about different SQL operators and aggregate functions?	10M	2	2
Q.4(A)		What is Redundancy? Explain the anomalies in relational database?	10M	3	2

OR

Q.4(B)	Given a set of FDs for the relation schema R(A,B,C,D) with Primary key AB, and D → C or C → D or AC → D or AD → C or BC → D or BD → C. In which normal form is R?	10M	3	4
Q.5(A)	Define conflict equivalent schedule. Check whether the following the schedules are conflict equivalent or not. $S1: R1(A)\ R2(B)\ W1(A)\ W2(B)$ $S2: R2(B)\ R1(A)\ W2(B)\ W1(A)$	10M	4	4

OR

Q.5(B)	Discuss how multi-level indexes are constructed using B trees and B+ trees?	10M	4	3
Q.6(A)	Discuss about different types of types of Access control models?	10M	5	3

OR

Q.6(B)	Explain about SQL injection techniques in detail?	10M	5	2

*** END***