Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20CE104

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUG/SEP 2022
ENVIRONMENTAL 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

			Marks	CO	BL
Q.1	i.	Define the term Air Pollution.	1	1	1
	ii.	What is the expected BOD and COD range for domestic wastewater?	1	1	1
	iii.	What is a water quality index?	1	2	1
	iv.	What is Manning's equation?	1	2	1
	v.	Write the equation of Stoke's law.	1	3	1
	vi.	What is sewage?	1	3	1
	vii.	What is the unit used to express the noise?	1	4	1
	viii.	What do you know about Sludge drying?	1	4	1
	ix.	How is the segregation of solid waste conducted?	1	5	1
	x.	List the components of Air.	1	5	1
Q.2(A)		Define Sedimentation and Explain the process and components of a slow sand filtration unit.	10	1	3
		OR			
Q.2(B)		List the different types of appurtenances used in water supply systems. Explain the water distribution system	10	1	3
Q.3(A)		Differentiate between biological and chemical wastewater treatment? Explain the aerobic and anaerobic types of wastewater treatment methods.	10	2	3
		OR			
Q.3(B)		What is sewage pumping? What are the factors influencing the variation in sewage flow also list some of the design considerations for sewerage systems.	10	2	3
Q.4(A)		Name and explain any two different types of low-cost wastewater treatment methods used in villages.	10	3	2
		OR			
Q.4(B)		How do the sludge drying beds work? List the factors affecting sludge digestion.	10	3	4

Q.5(A)	What is the acceptable range of noise for human hearing? Write a note or methods of noise control.	10	4	3
	OR			
Q.5(B)	How to mitigate vehicular air pollution? Explain how air pollution can be controlled using air pollution control equipment.	10	4	4

Q.6(A)	Explain Different methods of solid waste disposal.	10	5	3
	OR			
Q.6(B)	What is biodegradable solid waste? Explain the methods of waste management using reduce, reuse, and recycle principles.	10	5	3

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐ Question Paper Code: 20CE105

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUG/SEP 2022
ENGINEERING HYDROLOGY
(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**

			CO	BL
Q.1	i. What are the first checks to be carried out after collecting rainfall data?	1M	1	1
	ii. Differentiate between hydrologic and hydraulic channel routing?	1M	1	1
	iii. What is orographic precipitation?	1M	2	1
	iv. What is Aquiclude?	1M	2	1
	v. What is Pigmy meter?	1M	3	1
	vi. What is channel routing?	1M	3	1
	vii. What is intrinsic permeability?	1M	4	1
	viii. What is Field Capacity?	1M	4	1
	ix. What is the significance of DAD curves?	1M	5	1
	x. What is the name of the equipment used for evapotranspiration measurement?	1M	5	1

Q.2(A)	i) Define the following: Mass curve of rainfall, Hyetograph and Rainfall Excess.	3M	1	2
	ii) Explain a Thiessen Polygon method of finding average rainfall over an area.	7M	1	3

OR

Q.2(B)	Discuss about different forms of precipitation. How do you estimate missing rainfall data? Explain in detail.	10M	1	4

Q.3(A)	(i) The infiltration capacity in a basin is represented by Horton's equation as $f_p = 2.7 + e^{-2t}$ Where f_p is in cm/h and t is in hours. Assuming the infiltration to take place at capacity rates in a storm of 60 minutes duration, estimate the depth of infiltration in first 30 min duration and the second 30min duration.	6M	2	4
	(ii) What is evapotranspiration? Differentiate between potential and actual evapotranspiration	4M	2	2

OR

Q.3(B)	(i) Explain briefly the evaporation process. Discuss the factors that	10M	2	4

affect the evaporation from water body.

(ii) What are the various methods of reducing evaporation loss from water body?

Q.4(A)	Using suitable example explain various methods of direct measurement of stream flow	10M	3	3
	OR			
Q.4(B)	(i) What is rating curve? Outline various problems associated with rating curve?	5M	3	2
	(ii) Explain the method of finding stage at zero discharge	5M	3	4

Q.5(A) A 160 ha watershed has the following characteristics: Maximum   10M   4   4
length of travel of water in the catchment=4000m, Difference in
elevation between the most remote point on the catchment and the
outlet=85m, Land use:

Land use/land cover	Area (ha)	Runoff coefficient
Forest	50	0.21
Pasture	20	0.16
Cultivated Land	90	0.43

The maximum intensity-duration-frequency relationship for the watershed is given by

$$i = \frac{2.97 T^{0.159}}{(D + 0.18)^{0.815}}$$

Where, i= intensity in cm/h, T=Return period in years and D=duration of rainfall in hours.

Estimate 30 year peak runoff from the watershed that can be expecte

OR

Q.5(B)	i)What is Flood Forecasting"? What are the various methods of forecasting flood?	5M	4	2
	ii) Using example discuss the Unit Hydrograph method of flood forecasting in brief.	5M	4	4

Q.6(A)	What is Darcy's law? Using suitable diagram derive the expression to estimate discharge from a confined aquifer of width B.	10M	5	2
	OR			
Q.6(B)	i) Draw and describe different zones of ground water.	5M	5	4
	ii) A 30cm diameter well completely penetrates a confined aquifer of permeability 50 m/day. The length of the stainer is 20m. Under steady state of pumping, the drawdown at the well was found to be 3m and the radius of influence was 350m. calculate the discharge.	5M	5	4

*** END***

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUG/SEP 2022

CONCRETE TECHNOLOGY
(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**

			Marks	CO	BL
Q.1	i.	Highlight the features of Segregation of Concrete.	1M	1	1
	ii.	Define shrinkage of concrete	1M	1	1
	iii.	Quote the different types of Slump in Concrete	1M	2	1
	iv.	Outline the purpose of Concrete Mix Design.	1M	2	1
	v.	Recall how the C-S-H particles pack and leave the gel pores between inter particle region at nanoscale	1M	3	1
	vi.	Identify the necessity of Statistical Quality Control for concrete.	1M	3	1
	vii.	Define High-Density Concrete.	1M	4	1
	viii.	Recognize the concern about durability of concrete structures?	1M	4	1
	ix.	Label the parameters observed in Shape of an Aggregate.	1M	5	1
	x.	Describe the necessity of Statistical Quality Control of concrete.	1M	5	1
Q.2(A)		Predict the impact of Air Entraining on strength of concrete?	10M	1	5
OR					
Q.2(B)		Summarize the impact of cementitious composites containing Calcium silicate slag.	10M	1	4
Q.3(A)		List the factors affecting the workability of concrete.	10M	2	4
OR					
Q.3(B)		Describe the scheme of portland cement hydration	10M	2	3
Q.4(A)		Interpret the Non-Destructive Testing Methods.	10M	3	5
OR					
Q.4(B)		Give a list of determination of the Original Water / Cement ratio.	10M	3	3
Q.5(A)		Present the concept of Mix Design.	10M	4	3
OR					
Q.5(B)		Comment on the significance of Durability of Concrete structures.	10M	4	3
Q.6(A)		Identify the significance of the orientation of fibres affecting the properties of Fibre reinforced concrete	10M	5	2
OR					
Q.6(B)		Explain the shielding ability of concrete.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUG/SEP 2022
STRENGTH OF MATERIALS
(Civil Engineering)
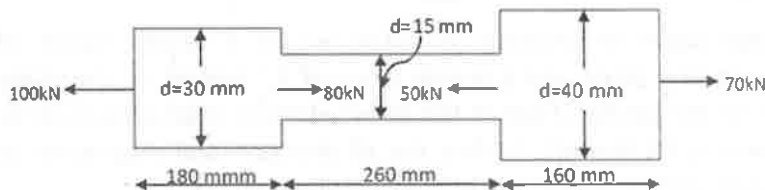
Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	Define Hook's law?	1M	1	1
	ii.	Write the various types of the stresses.	1M	1	1
	iii.	What is meant by point of contra flexure?	1M	2	1
	iv.	What are the assumptions have considered in the Euler's column buckling?	1M	2	1
	v.	Define Neutral axis of the beam.	1M	3	1
	vi.	State any four assumptions in the simple bending theory	1M	3	1
	vii.	Define principal stress and principal strain	1M	4	1
	viii.	What is the use of Mohr's circle?	1M	4	1
	ix.	Mention the situations where we need conjugate beam method	1M	5	1
	x.	Write the relation between bending moment, slope and deflection	1M	5	1

Q.2(A)	A bar of 30 mm diameter is subjected to a pull of 60 kN. The measured extension on gauge length of 200 mm is 0.1 mm and change in diameter is 0.004 mm. Calculate Young's modulus, Poisson's ratio and Bulk modulus.		10M	1	5

OR

Q.2(B)	Find the total extension of the bar as shown in Figure. Take E=200Gpa.		10M	1	5

Q.3(A)	Draw SFD and BMD for the beam as shown in Figure.		10M	2	5
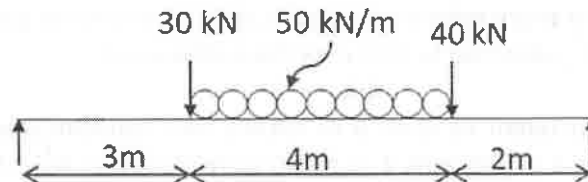
OR

|					
Q.3(B)	A cylindrical column 150 mm external diameter and 100 mm internal diameter, 7 m long is hinged at both ends. Calculate (i) Euler's crippling load, (ii) Crippling load as given by Rankine's formula. Given E = 80 GPa, α=1/1600 and σ_{yp} =550 N/mm².		10M	2	5

Q.4(A) The SSB of span 4 m has a cross section as shown in Figure. If the 10M 3 5
permissible stress of the material of beam is 140 N/mm². To determine
(i) the maximum UDL it can carry, (ii) the maximum point load it can carry
at the center of span, and (iii) the maximum point load if can carry at a
distance of 1 m from left support.
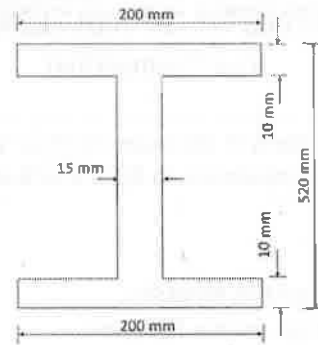
OR

Q.4(B) Draw the shear stress variation diagram for the I-section shown in Figure, 10M 3 5
if it is subjected to a shear force of 150 kN.
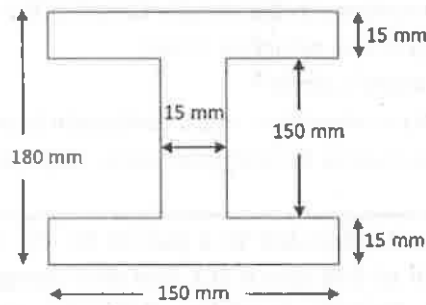
Q.5(A) A shaft has to transmit 105kW power at 160 r.p.m. If the shear stress 10M 4 5
exceed 65 N/mm² and the twist in a length of 3.5 m must not exceed 1⁰.
suitable diameter. Take C=8 X 10⁴ N/mm².

OR

Q.5(B) A rectangular block of material is subjected to a tensile stress of 10M 4 5
110 N/mm² on one plane and a tensile stress of 47 N/mm² on the plane
right angles to the former. Each of the above stresses is accompanied by
a shear stress of 63 N/mm². To find the (i) direction and magnitude of
Principal stress and (ii) magnitude of greatest shear stress.

Q.6(A) Using moment area method find maximum slope and deflection of 10M 5 5
(i) Simply supported beam subjected to point load at the centre and
(ii) Cantilever beam subjected to UDL over the entire span.

OR

Q.6(B) A simply supported beam of span 6 m carries two concentrated loads 10M 5 5
50 kN and 40 kN at a distance of 2 m and 5 m respectively from the left
support. Find (i) deflection under each load, (ii) maximum deflection and
its location, (iii) slopes at ends. Assume Take E=1 x 10⁴ N/mm² and
I=10 x 10⁶ mm⁴·

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUG/SEP 2022

PROBABILITY & STATISTICS FOR ENGINEERS

(Common to CE, 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**

			Marks	CO	BL
Q.1	i.	If two dice are thrown, what is the probability that the sum is greater than 8?	1M	1	2
	ii.	State conditions for a function to be a discrete density.	1M	1	1
	iii.	Evaluate $\int_0^\infty z^2 e^{-z} dz$	1M	2	2
	iv.	Write the moment generating function of Gamma distribution.	1M	2	1
	v.	Define covariance between two random variables	1M	3	1
	vi.	Define the conditional density of X given Y=y	1M	3	1
	vii.	Write an example of One-Tailed test.	1M	4	1
	viii.	If P=0.5 and the sample size is 250 then the standard error is	1M	4	1
	ix.	What is Two-Way ANOVA?	1M	5	1
	x.	What is Replication in design of experiments ?	1M	5	1

		Marks	CO	BL
Q.2(A)	i) State and prove Bayes' theorem.	5M	1	3
	ii) In a bolt factory machines A, B and C manufacture respectively 25%, 35% and 40% of the total. Of their output 5%, 4%, 2% are defective bolts. A bolt is drawn at random from the production and is found to be defective. What are the probabilities that it was manufactured by machines A, B and C?	5M	1	3

OR

		Marks	CO	BL
Q.2(B)	i) A continuous random variable X has a probability density function $f(x) = kx(1-x), \quad 0 \le x \le 1$. Compute (a) k (b) Mean (c) variance (d) $P(X < 0.4)$ (e) Distribution Function of X	10M	1	3

		Marks	CO	BL
Q.3(A)	The mean of the Binomial distribution is 3 and variance is $\frac{9}{4}$. Then find (a) the value of the n (b) $P(X \ge 7)$ (c) $P(1 \le X \le 6)$	10M	2	4

OR

		Marks	CO	BL
Q.3(B)	Derive the moment generating function of Normal distribution and find the mean and variance.	10M	2	4

		Marks	CO	BL
Q.4(A)	Given the following bivariate probability distribution, obtain (i) Marginal distributions of X and Y (ii) the conditional distribution of X given Y=2 (iii) Cov[XY]	10M	3	3

X\Y	0	1	2
-1	1/15	3/15	2/15
0	2/15	2/15	1/15
1	1/15	1/15	2/15

Q.4(B) The joint density for (X, Y) is given by $f(x, y) = xye^{-x}e^{-y}$ $x > 0, y > 0$ 10M   3   3

        (i)   Find the marginal densities for X and Y.

        (ii)   Find Cov (X,Y)

        (iii)   Are X and Y independent?

        (iv)   Find $p(X \leq 1)$

Q.5(A) The average mark scored by 32 boys is 72 with a S.D of 8, while 36 girls is 70 with S.D   10M   4   3
OF 6. Test the significance difference between the means.

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

Q.5(B) The time taken by the workers in performing a job by method I and method II is given   10M   4   3
below:

Method-I	20	16	26	27	23	22	-
Method-II	27	33	42	35	32	34	38

Do the data show that the variances of time distribution from population from which these samples are drawn do not differ significantly?

Q.6(A) Data recorded on three variety of wheat treated with five fertilizers the yield per acre   10M   5   4
is given below.

	Variety of wheat		
fertilizer	v1	v2	v3
f1	55	70	62
f2	65	66	52
f3	60	65	49
f4	62	68	48
f5	58	63	52

Analyze the data by Two-Way ANOVA and give your conclusion.

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

Q.6(B) Analyse the variance in the following Latin square of yields (in kgs) of paddy; where A,   10M   5   4
B, C, D denote the different methods of cultivations.

	Fertilizers			
	D 8	A 12	C 19	B 10
	B 12	C 18	A 7	D 6
Plots	A 5	B 22	D 10	C 21
	C 27	D 12	B 17	A 7

<div align="center">*** END***</div>

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUG/SEP 2022
ELECTROMAGNETIC FIELDS
(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

			Marks	CO	BL
Q.1	i.	Represent point P(0,2,1)m given in Cartesian coordinates into spherical coordinates.	1M	1	1
	ii.	Define the term Gradient.	1M	1	2
	iii.	How do you represent coulomb's law?	1M	2	1
	iv.	What is the electric field intensity at a distance of 15 cm from a charge of 1.5 μC in a vacuum?	1M	2	1
	v.	Define: Magnetization	1M	3	1
	vi.	Distinguish between scalar and vector magnetic potential.	1M	3	1
	vii.	What is meant by displacement current?	1M	4	1
	viii.	State Stoke's theorem.	1M	4	1
	ix.	Mention any two properties of uniform plane wave	1M	5	1
	x.	What is the skin effect?	1M	5	1
Q.2(A)		Explain in detail the line, surface, and volume integrals of vector functions.	10M	1	2

OR

			Marks	CO	BL
Q.2(B)	i).	What is meant by a coordinate system? Explain in detail different types of coordinate systems.	5M	1	3
	ii).	Given the two points: A(x=3,y=2,z=-1) and B(r=4,θ=30^0,Φ=120^0). Find the spherical coordinates of A and Cartesian coordinates of B.	5M	1	3

			Marks	CO	BL
Q.3(A)	i).	Determine the electric field intensity at P(– 0.3, 0, – 2.1) due to a point charge of + 5nC at Q(0.2, 0.1, – 2.5) in air. All dimensions are in meters.	5M	2	3
	ii).	Derive the expression for energy density in electrostatic fields.	5M	2	2

OR

			Marks	CO	BL
Q.3(B)	i).	Deduce an expression for the capacitance of a parallel plate capacitor having two dielectric media.	5M	2	3
	ii).	A parallel plate capacitor has an area of 0.6 m^2 separation of 0.2 mm with a dielectric for which ε_r=1000 and a field of 10^6 V/m. Calculate C and V.	5M	2	3

Q.4(A)	Derive the expression for self-inductance, mutual inductance, and coefficient of coupling.	10M	3	3

OR

Q.4(B)	Derive the boundary condition to explain the behavior of the magnetic field at the interface of two media.	10M	3	4

Q.5(A)	Derive Maxwell's equations in Integral and point forms.	10M	4	3

OR

Q.5(B)	Write short notes on Transformer EMF and Motional EMF.	10M	4	4

Q.6(A)	Derive the Electromagnetic wave equations in phasor form.	10M	5	3

OR

Q.6(B)	State and prove Poynting's theorem and derive the expression for average power	10M	5	2

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐

Question Paper Code: 20EEE106

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUG/SEP 2022

DIGITAL ELECTRONICS
(EEE)

Time: 3Hrs

Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	What are special gates? Write down the truth table?	1M	1	1
	ii.	Convert $(ABCD)_{16}$ into binary?	1M	1	1
	iii.	Design 2x1 MUX?	1M	2	2
	iv.	Draw 4 variable K map?	1M	2	1
	v.	Mention the applications of counter?	1M	3	1
	vi.	Define flip-flop?	1M	3	1
	vii.	Define fanout?	1M	4	1
	viii.	Define propagation delay?	1M	4	1
	ix.	Differentiate RAM and ROM	1M	5	2
	x.	Expand FPGA?	1M	5	1

Q.2(A)	(i) Perform the following arithmetic operation using 2's Complement method? (a)101111-100110 (b)111001-011010 (ii) Solve the following (a)$(53.625)_{10}$ to $(?)_2$ (b)$(3FD)_{16}$ to $(?)_2$	6M 4M	1 1	3 3

OR

Q.2(B)	What are Universal gates? Realize all the logic gates using NAND and NOR gates?	10M	1	2

Q.3(A)	Simplify the following Boolean functions, using a four variable Karnaugh map method and implement the simplified function using NAND gates $F(A,B,C,D) = \Sigma(0,2,4,5,6,7,8,10,13,15)$	10M	2	3

OR

Q.3(B)	Design & Give expression for 2 bit Magnitude comparator?	10M	2	3

Q.4(A)	i) Convert JK Flip Flop to SR Flip Flop? ii) Write the differences between synchronous and asynchronous counters?	6M 4M	3 3	2 2

OR

Q.4(B)	i) Design a 4 bit Shift Register and explain its operation? ii) What is Race around condition? How to avoid it?	6M 4M	3 3	3 2

Q.5(A)	Compare the RTL,DTL,TTL,ECL and MOSL logic families?	10M	4	2

OR

Q.5(B)	Draw and Explain the operation of TTL NAND logic gate?	10M	4	2

Q.6(A)	Explain about different types of Memories?	10M	5	2

OR

Q.6(B)	i) Compare the Different features of PROM, PAL and PLA?	6M	5	2
	ii) Write short note on FPGA?	4M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUG/SEP 2022
INDUCTION & SYNCHRONOUS MACHINES
(EEE)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	Calculate the pitch factor of the winding: 36 stator slots, 4-poles, coil span 1-15	1M	1	2
	ii.	What is the significance of rotating magnetic field in rotating machine?	1M	1	1
	iii.	Compare salient pole and non-salient pole synchronous machine	1M	2	1
	iv.	What is the significance of synchronous condenser	1M	2	
	v.	Draw the V and inverted V curves of the synchronous motor?	1M	3	1
	vi.	Why the synchronous motor is not self-starting?	1M	3	1
	vii.	What is the principle of synchronous generator?	1M	4	1
	viii.	Why the slip ring induction motor have high starting torque?	1M	4	2
	ix.	Write the principle of switch reluctance motor.	1M	5	1
	x.	Write the advantages of brushless motor over brushed motor.	1M	5	1

		Marks	CO	BL
Q.2(A)	i). Describe the advantages of providing field winding on the rotor and armature winding on the stator in case of large synchronous machine.	6M	1	2
	ii).Distinguish between a) armature winding and field winding b) load current and exciting current	4M	1	2

OR

		Marks	CO	BL
Q.2(B)	i). Compare salient pole and non-salient pole synchronous machine.	5M	1	2
	ii).For a 3-phase alternator, derive the expressions a).Pitch-factor b).Distribution factor	5M	1	2

|		Marks	CO	BL
Q.3(A)	i).Two alternators are running in parallel, supplying a lighting load of 2,000 kW and a motor load of 4,000 kw at pf 0.8 lagging. One machine is loaded to 2,400 kW at pf 0.95 lagging. What is the output & pf of second machine?	6M	2	3
	ii). What are the advantages of parallel operation?	4M	2	2

OR

		Marks	CO	BL
Q.3(B)	Explain with phasor diagram, the effect of armature reaction on the terminal voltage of an alternator at (i) UPF load, (ii) lagging ZPF load and (iii) leading ZPF load.	10M	2	3

Q.4(A)	i).What is the power factor? Explain how a synchronous motor can be used for power factor improvement, with proper vector diagram.	6M	3	2
	ii).Explain what happens when a synchronous motor is loaded beyond its pull-out load.	4M	3	2

OR

Q.4(B)	i).Draw the phasor diagram of synchronous motor and derive expressions for torque?	5M	3	2
	ii).A 3-phase, 415V, 6-pole, 50Hz, star connected synchronous motor has line emf of 520V. the stator winding has a synchronous reactance of 2ohm per phase, and the motor develops a torque of 220 Nm. Calculate the load angle?	5M	3	3

Q.5(A)	i).Explain different speed control methods of 3-phase induction motor?	5M	4	2
	ii).A 3-phase,400V, 6 poles, 50 Hz Induction motor takes a power input of its full load speed of 970 rpm. The total stator losses are 1 KW and the windage losses are 1.5 KW. Then calculate (a) slip (b) rotor copper losses.	5M	4	3

OR

Q.5(B)	i).Explain the construction of circle diagram for 3-phase induction motor.	6M	4	2
	ii).A 3-phase induction motor has 4 poles and is connected to 400V,50Hz supply. Calculate the actual rotor speed and rotor frequency when the slip is 4%.	4M	4	3

Q.6(A)	i).Explain construction and working principle of stepper motors?	5M	5	3
	ii).Explain about capacitor-run single phase induction motors?	5M	5	3

OR

Q.6(B)	i).Explain double field revolving theory.	5M	5	3
	ii). A 230V,50Hz,4-pole, single phase induction motor has the following parameters. R_1=2.51ohm, R_2'=7.81 ohm, X_m=150.8 ohm, X_1=4.62 ohm, X_2'=4.62 ohm. Determine the main winding current and power factor when motor is running at a slip of 0.05.	5M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUG/SEP 2022
CONTROL 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**

			Marks	CO	BL
Q.1	i.	What are the applications of Closed Loop Systems?	1M	1	1
	ii.	Define Transfer function.	1M	1	1
	iii.	What are the different types of Static errors?	1M	2	1
	iv.	Write the generalized expression for steady state error (e_{ss}).	1M	2	1
	v.	Define BIBO Stability.	1M	3	1
	vi.	Write the expression for angle of Asymptotes in Root locus?	1M	3	1
	vii.	Define Phase Margin.	1M	4	1
	viii.	What is Lead Compensator?	1M	4	1
	ix.	Draw the block diagram of PID controller	1M	5	2
	x.	Define State Space Model.	1M	5	1

		Marks	CO	BL
Q.2(A)	a)Compare Open loop and Closed loop Systems?	6M	1	2
	b)What is the significance of Mason's gain formula	4M	1	2

OR

		Marks	CO	BL
Q.2(B)	Obtain the transfer function of the mechanical systems shown in Figure.	10M	1	3
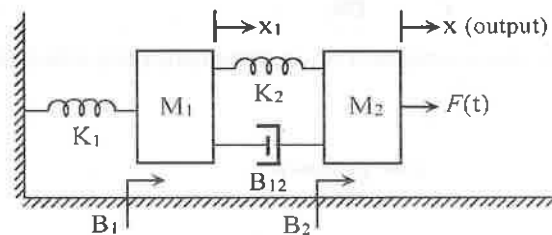
		Marks	CO	BL
Q.3(A)	Derive the expressions for rise time, peak time and peak overshoot for underdamped second order system.	10M	2	3

OR

		Marks	CO	BL
Q.3(B)	A unity feedback servo-driven instrument has an open loop transfer function $G(s) = \frac{10}{s(s+2)}$ find	10M	2	3

(a) The natural frequency of oscillation and damping ratio
(b) The time domain response for a unit step input
(c) Peak time and maximum overshoot
(d) Steady state error to an input (1+4t)

Q.4(A)	Apply RH criterion to determine the location of roots on the s-plane and hence the stability for the system whose characteristic equation is $s^5 + 2s^4 + 2s^3 + 4s^2 + s + 2 = 0$.	10M	3	3

OR

Q.4(B)	Given a unity feedback system with open loop transfer function $G(s) = \frac{K}{s(s+1)(s+2)}$. Draw the Root locus plot for the given function?	10M	3	3

Q.5(A)	Sketch the bode plot for the following Transfer function and determine phase margin and gain margin	10M	4	3

$$G(s) = \frac{75(1 + 0.2s)}{s(s^2 + 16s + 100)}$$

OR

Q.5(B)	Construct the typical sketches of polar plot for the following systems:	10M	4	2

    i.   Type: 0, Order: 1
    ii.   Type: 0, Order: 2
    iii. Type: 1, Order: 2
    iv. Type: 1, Order: 3
    v.   Type: 2, Order: 4

Q.6(A)	The transfer function of a system is given by	10M	5	3

$$\frac{Y(s)}{U(s)} = \frac{s^2 + 3s + 9}{8s^4 + 24s^3 + 34s^2 + 23s + 6}$$

Determine State model.

OR

Q.6(B)	Obtain the state space representation of an armature-controlled DC motor	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUG/SEP 2022
ECONOMICS & FINANCIAL ACCOUNTING FOR ENGINEERS
(Common to ME, CSE, CSE(IOT), CSE(DS), CSE(CS), 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

			Marks	CO	BL
Q.1	i.	What is micro Economics?	1M	1	1
	ii.	Define scarcity.	1M	1	1
	iii.	Short note on Production function	1M	2	1
	iv.	Outline opportunity cost	1M	2	1
	v.	Write features of oligopoly.	1M	3	1
	vi.	How do you classify the markets?	1M	3	1
	vii.	Examine Accounting cycle	1M	4	1
	viii.	Outline the Ledger	1M	4	1
	ix.	What are the Quick Assets?	1M	5	1
	x.	Illustrate Earing Per share	1M	5	1
Q.2(A)		Define Managerial Economics. Explain Nature and scope of Economics	10M	1	2
		OR			
Q.2(B)		What is elasticity of demand? Describe Types of Price Elasticity in detail	10M	1	1
Q.3(A)		List out Breakeven point assumptions and importance.	10M	2	
		OR			
Q.3(B)		Examine Production Function in short run	10M	2	4
Q.4(A)		State the features of perfect competition market	10M	3	3
		OR			
Q.4(B)		How do you determine price- output under monopoly?	10M	3	4
Q.5(A)		Elucidate Accounting concepts and conventions	10M	4	5
		OR			
Q.5(B)		Can you journalize entries from the following transactions:	10M	4	2

Q.5(B) continued:
1.1.2020 Commence Business cash Rs. 20,000
2.1.2020 Amount Deposited into Bank Rs. 5,000
4.1.2020 Goods Purchased for cash Rs. 2,000
7.1.2020 Goods sold to Raju R s. 3000
9.1.2020 Salaries paid Rs. 10,000
11.1.2020 Machinery purchased paid by cheque Rs. 10,000
17.1.2020 Commission Received Rs. 5,000

Q.6(A) A business firm is thinking of choosing the right machine for their purpose   10M   5   3
after financial evaluation of the proposals the initial cost and the net cash
flow over five years .the business have cash flows details of machines,
Discount factor @10%, 1st Year 0.909, 2nd Year 0.826, 3rd Year 0.753, 4th Year
0.682, Fifth year 0.621.   :

Particulars	Machine X	Machine y
Initial cost of machine	20000	28000
Cash flows 1st year	8000	10000
2nd year	12000	12000
3rd year	9000	12000
4th year	7000	9000
5th year	6000	9000
Calculate 1) Payback period 2) NPV 3) Profitability index		

OR

Q.6(B) How do you classify different types of Ratios   10M .   5   4

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUGUST 2022
MECHANICS OF SOLIDS
(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

			Marks	CO	BL
Q.1	i.	Distinguish between limit of proportionality and elastic limit.	1M	1	1
	ii.	What are principal planes and principal stresses?	1M	1	1
	iii.	Define a beam and classify different types of beams.	1M	2	2
	iv.	Define shear force and bending moment.	1M	2	2
	v.	What is meant by pure bending?	1M	3	1
	vi.	Define deflection and slope of a beam when it is loaded.	1M	3	2
	vii.	What is meant by torsion?	1M	4	2
	viii.	Write the relation for strain energy stored in a body due to pure shear.	1M	4	2
	ix.	Give the ratios of equivalent length and actual length of column for different end conditions.	1M	5	2
	x.	Differentiate long column and short column.	1M	5	1

Q.2(A)	A compound tube consists of a steel tube 140 mm internal diameter and 160 mm external diameter and an outer brass tube 160 mm internal diameter and 180 mm external diameter. The two tubes are of the same length. The compound tube carries an axial load of 900 kN. Find the stresses and the load carried by each tube and the amount it shortens. Length of each tube is 140 mm. Take E for steel as 2×10^5 N/mm² and for brass as 1×10^5 N/mm².		10M	1	3

OR

Q.2(B)	The stresses on two mutually perpendicular planes are 40 MPa (tensile) and 20 MPa (tensile). The shear stress across these planes is 10 MPa. Determine the magnitude and direction of resultant stress on a plane making an angle of 30^0 with the plane of first stress.		10M	1	4

Q.3(A)	A cantilever of length 6 m carries two point loads of 2 kN and 3 kN at a distance of 1 m and 6 m from the fixed end respectively. In addition to this the beam also carries a uniformly distributed load of 1 kN/m over a length of 2 m at a distance of 3 m from the fixed end. Draw the S.F. and B.M. diagrams.		10M	2	4

OR

Q.3(B)	A beam of length 10 m is simply supported and carries point loads of 5 kN each at a distance of 3 m and 7 m from left support and also a uniformly distributed load of 1 kN/m between the point loads. Draw S.F. and B.M. diagrams for the beam.		10M	2	4

Q.4(A) A beam of I-section shown in Fig is simply supported over a span of 10 m. It carries a uniform load of 4 kN/m over the entire span. Evaluate the maximum bending stresses.   10M   3   4

    30 mm
    20 mm
N _____ A   660 mm
    ├── 300 mm ──┤
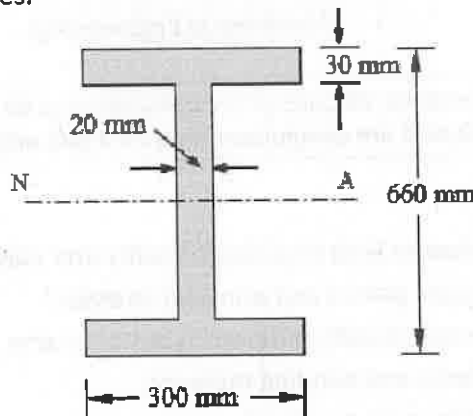
OR

Q.4(B) A beam of length 10 m is simply supported at its ends and carries two point loads of 100 kN and 60 kN at a distance of 2 m and 5 m respectively from the left support. Calculate the deflections under each load. Find also the maximum deflection. Take I = 18×10^8 mm^4 and E = 2×10^5 N/mm^2.   10M   3   4

Q.5(A) Derive the torsion equation and state clearly the assumptions involved.   10M   4   3

OR

Q.5(B) A solid circular shaft of 10 cm diameter of length 4 m is transmitting 112.5 kW power at 150 r.p.m. Determine the maximum shear stress induced in the shaft. Take modulus of rigidity value as 8×10^4 N/mm^2.   10M   4   3

Q.6(A) Derive the equation for the Euler's crippling load for a column with both of the ends hinged.   10M   5   3

OR

Q.6(B) A solid round bar 60 mm in diameter and 2.5 m long is used as a strut. One end of the strut is fixed, while its other end is hinged. Find the safe compressive load for this strut, using Euler's formula. Assume E = 200 GN/m^2 and factor of safety = 3.   10M   5   4

*** END ***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – AUGUST 2022
THEORY OF MACHINES
(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

			Marks	CO	BL
Q.1	i.	In crank and slotted lever mechanism why quick return ratio (QRR) is greater than 1. Justify your answer.	1M	1	2
	ii.	How Grashof's law is helpful in classifying the four bar mechanisms into different types?	1M	1	2
	iii.	Mention the 2 components of acceleration.	1M	2	2
	iv.	State the application of Kennedy's theorem.	1M	2	1
	v.	State law of gearing.	1M	3	1
	vi.	Define gyroscopic couple.	1M	3	1
	vii.	State the conditions for static and dynamic balancing.	1M	4	1
	viii.	State the application of cam mechanisims.	1M	4	2
	ix.	State the difference between longitudinal and transverse vibrations.	1M	5	1
	x.	What is the difference between free and forced vibrations?	1M	5	3
Q.2(A)		Determine the number of degrees of freedom for the following mechanisms.	10M	1	3

(a)

(b) (c)

OR

Q.'2(B)	State the Explain with a neat sketch any three inversions of single slider crank chain.	10M	1	2

Q.3(A)	In a four-bar chain ABCD, AD is fixed and is 150 mm long. The crank AB is 40 mm long and rotates at 120 r.p.m. clockwise, while the link CD = 80 mm oscillates about D. BC and AD are of equal length. Find the angular velocity of link CD when angle BAD = 60°.	10M	2	3

OR

Q.3(B)	PQRS is a four-bar chain with link PS fixed. The lengths of the links are PQ = 65 mm; QR = 180 mm; RS = 115 mm; and PS = 200 mm. The crank PQ rotates at 20 rad/s clockwise. Draw the velocity and acceleration diagram	10M	2	3

when angle QPS = 60° and Q and R lie on the same side of PS. Find the angular velocity and angular acceleration of links QR and RS.

Q.4(A)	An aeroplane makes a complete half circle of 50 metres radius, towards left, when flying at 200 km per hr. The rotary engine and the propeller of the plane has a mass of 400 kg and a radius of gyration of 0.3 m. The engine rotates at 2400 rpm in CW direction, when viewed from the rear. Find the gyroscopic couple on the aircraft and state its effect on it. Explain your answer with proper diagrams.	10M	3	3

OR

Q.4(B)	In an epicyclic gear train, an arm carries two gears A and B having 36 and 45 teeth respectively. If the arm rotates at 150 r.p.m. in the anticlockwise direction about the centre of the gear A which is fixed, determine the speed of gear B. If the gear A instead of being fixed, makes 300 r.p.m. in the clockwise direction, what will be the speed of gear B ?	10M	3	3

Q.5(A)	Construct the profile of a cam to suit the following specifications: Cam shaft diameter = 40 mm; Least radius of cam = 25 mm; Diameter of roller = 25 mm; Angle of lift = 120°; Angle of fall = 150°; Lift of the follower = 40 mm; Number of pauses are two of equal interval between motions. During the lift, the motion is S.H.M. During the fall the motion is uniform acceleration and deceleration. The speed of the cam shaft is uniform. The line of stroke of the follower is off-set 12.5 mm from the centre of the cam.	10M	4	4

OR

Q.5(B)	Four masses m1, m2, m3 and m4 are 200 kg, 300 kg, 240 kg and 260 kg respectively. The corresponding radii of rotation are 0.2 m, 0.15 m, 0.25 m and 0.3 m respectively and the angles between successive masses are 45°, 75° and 135°. Find the position and magnitude of the balance mass required, if its radius of rotation is 0.2 m.	10M	4	3

Q.6(A)	For the vibratory systems shown in the figure, take mass m = 10 kg, k_1 = 5 N/mm, and k_2 = 8 N/mm. Determine the natural frequency for both the cases.	10M	5	3

(a)

k_1

k_2

m

(b)

k_1

m

k_2
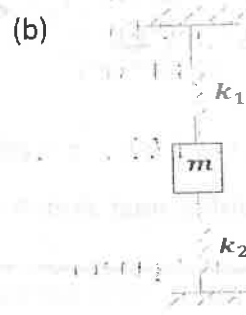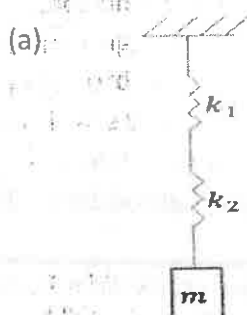
OR

Q.6(B)	The following data are given for a vibratory system with viscous damping: Mass = 2.5 kg; spring constant = 3 N/mm and the amplitude decreases to 0.25 of the initial value after five consecutive cycles. Determine the damping coefficient of the damper in the system.	10M	5	3

*** END ***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20ME108

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –AUGUST 2022
MANUFACTURING TECHNOLOGY - 1
(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 difference between true and semi centrifugal casting?	1M	1	1
	ii.	Why are patterns made slightly oversized than the required casting?	1M	1	1
	iii.	Give one advantage and one disadvantage of die casting.	1M	1	1
	iv.	What is the difference between brazing and soldering?	1M	2	2
	v.	Why are inert gases used as shielding gases in TIG and MIG welding? Name two shielding gases	1M	2	1
	vi.	What is the general arrangement for die set?	1M	3	1
	vii.	Mention the defects in drawing operation.	1M	4	1
	viii.	What are the different types of rolling operation?	1M	4	1
	ix.	Define angle of repose in powder metallurgy process.	1M	5	1
	x.	What is screen mesh in powder metallurgy process?	1M	5	1
Q.2(A)		What is the difference between cold chamber pressure die casting and hot chamber pressure die casting? Explain in details the working principle of gravity die casting and hot chamber pressure die casting with neat diagrams.	10M	1	2
		OR			
Q.2(B)		What are the probable reasons behind defective castings? Explain 5 casting defects in details.	10M	1	2
Q.3(A)		What is the basic difference between a TIG welding and MIG welding? Explain the working principle of both welding with neat diagrams.	10M	2	1
		OR			
Q.3(B)		Explain the working principle of submerged arc welding and Friction stir welding with neat diagrams.	10M	2	2
Q.4(A)		Mention the application of press working and explain the working of hydraulic press with suitable figure.	10M	3	1
		OR			
Q.4(B)		Describe the characteristics of sheet metal and differentiate between hydro forming and super plastic forming.	10M	3	1
Q.5(A)		What is extrusion? Explain hot and cold extrusion in details.	10M	4	1
		OR			
Q.5(B)		What is forging? What is the difference between open die forging and closed die forging? Explain upset forging with a neat diagram.	10M	4	1
Q.6(A)		Explain the process of atomization in powder metallurgy process.	10M	5	1
		OR			
Q.6(B)		How a powder metallurgy product is produced and explain it?	10M	5	1

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐ Question Paper Code: 20MAT108

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
PROBABILITY & STATISTICS
(Mechanical Engineering)

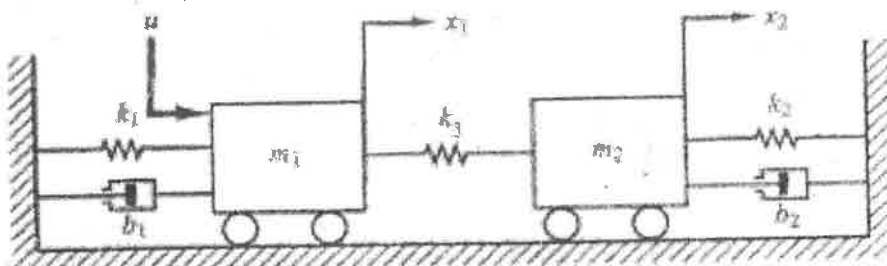Time: 3Hrs   Max Marks: 60

> 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 A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	Define axiomatic definition of probability?	1M	1	1
	ii.	The density for X is given by $f(x) = kx, 0 \le x \le 5$. Find the value of k.	1M	1	1
	iii.	X is the binomial variate with parameters n= 15 and p= 0.2 find variance of X	1M	2	1
	iv	Let X be a Gamma random variable with $\alpha = 3, \beta = 4$. Find variance of X?	1M	2	1
	v.	Define Hazard rate function.	1M	3	1
	vi	Write the condition for independence of random variables?	1M	3	1
	vii.	Define correlation coefficient?	1M	4	1
	viii.	Write the $t -$ statistic for one sample mean?	1M	4	1
	ix.	What are the assumptions of ANOVA?	1M	5	1
	x.	Write down the basic principles of Experimental design?	1M	5	1
Q.2(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? Printer C involved?	10M	1	3
		OR			
		A drug is used to maintain a steady heart rate in patients who have suffered a mild heart attack. Let X denotes the number of heart beats per minute obtained per patient	10M	1	3

x	40	60	68	70	72	80	100
$f(x)$	0.01	0.04	0.05	0.80	0.05	0.04	0.01

Q.2(B) Find the (i) $p(68 \le X \le 72)$ (ii) Distribution function (iii) average heart-beat of the patients (iv) variance of heart beats.

Q.3(A)	Find moment generating function, mean and variance of the Poisson distribution?	10M	2	3
	OR			
Q.3(B)	Among diabetic, the fasting blood glucose level X may be assumed to be approximately normally distributed with mean 106 milligrams and S. D. 8 milligrams. a) Find the probability that randomly selected diabetic will have blood glucose level between 90 and 122 mg. b) Find $P[X \le 120\text{mg}]$ c) Find the point that has the property that 25% of all diabetic have a fasting glucose level of this value or lower.	10M	2	4

Q.4(A)	Let X be a Weibull random variable with parameters α and β. Show that the mean and variance of X are given by $\mu = \alpha^{-\frac{1}{\beta}}\Gamma\left(1+\frac{1}{\beta}\right)$ and $\sigma^2 = \alpha^{-\frac{2}{\beta}}\Gamma\left(1+\frac{2}{\beta}\right) - \mu^2$.	10M	3	4

OR

Q.4(B) Assume that the joint density for (X, Y) is given by   10M 3 3
$$f_{X,Y}(x,y) = c; 20 < x < y < 40$$
    (a) Find the value of 'c' that makes this a joint density for a two-dimensional random variable.
    (b) Find the marginal densities for X and Y.
    (c) Find $P(X \geq 25)$
    (d) Are X and Y independent?

Q.5(A) Find the correlation co-efficient between X and Y from the given data: 10M 4 3

x	78	89	97	69	59	79	68	57
y	125	137	156	112	107	138	123	108

OR

Q.5(B) A sample of height of 6400 soldiers have a mean of 67.85 inches and a standard   10M 4 3
deviation of 2.56 inches while a sample of heights of 1600 sailors has a mean of
68.55 inches and a standard deviation of 2.52 inches. Do the data indicate that
the sailors are on the average taller than soldiers?

Q.6(A) A study on the tensile strength of aluminum rods is conducted. Forty identical   10M 5 4
rods are randomly divided into four groups, each of size 6. Each group is
subjected to a different heat treatment, and tensile strength, in thousands of
pounds per square inch., of each of rod is determined. The following data
result:

Treatment

1	2	3	4
18.9	18.3	21.3	15.9
20.0	19.2	21.5	16.0
20.5	17.8	19.9	17.2
20.6	18.4	20.2	17.5
19.3	18.8	21.9	17.9
19.5	18.6	21.8	16.8

Test the null hypothesis of homogeneity of treatment means.

OR

Q.6(B) The design given in the following table is called a knight's move Latin square   10M 5 4
because one can get from each treatment type to another of the same type by
making a knight's move as in the game of chess. The observed responses are
given in parentheses in the table. Analyse the design at the $\alpha = 0.05$ level.

	I	II	III	IV
I	A(3)	B(4.2)	C(0.9)	D(5.3)
II	C(1.0)	D(5.6)	A(3.8)	B(4.3)
III	B(4.5)	A(3.5)	D(5.7)	C(1.2)
IV	D(5.5)	C(0.8)	B(3.9)	A(3.7)

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – August 2022
## CONTROL SYSTEMS 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.	Why negative feedback is invariably preferred in closed loop system?	1M	1	1
	ii.	Distinguish between open loop system and closed loop system	1M	1	2
	iii.	What is the effect of positive feedback on stability of a system?	1M	2	1
	iv	Define time constant of a first order system with suitable transfer function.	1M	2	1
	v.	Define controller and list types of controller.	1M	3	1
	vi	What is lead lag compensator?	1M	3	1
	vii.	List frequency domain specifications.	1M	4	1
	viii.	Define Phase Margin and Gain Margin	1M	4	1
	ix.	What is the significance of state transition matrix?	1M	5	1
	x.	State advantage of static space analysis.	1M	5	1
Q.2		Convert the block diagram to signal flow graph and determined the transfer function using Mason's gain formula.	10M	1	3
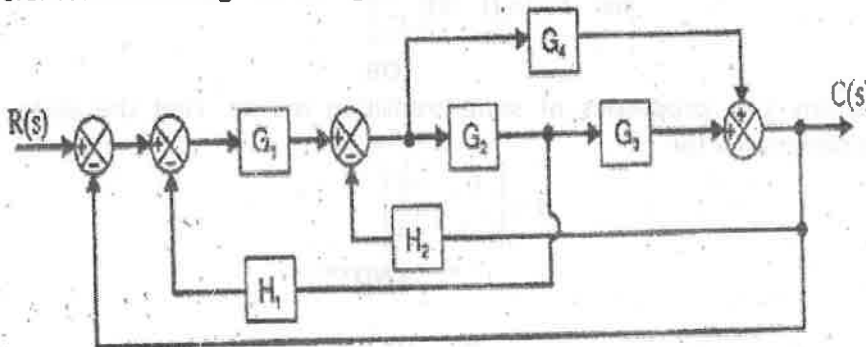
OR

| Q.2(B) | Sketch the free body diagram and draw the current analogous electrical circuits of the system shown in below figure | 10M | 1 | 3 |

| Q.3(A) | Explain briefly the effects of PI controller and PID controller on system performance with suitable block diagram. | 10M | 2 | 4 |

Q.3(B)	Derive the expressions for unit step response for the second order system.	10M	2	6
Q.4(A)	A unity negative feedback control system has an open loop transfer function as $G(s) = \dfrac{K}{S(S+2)(S+4)}$. Sketch the root locus and find the value of K corresponding to crossing point on imaginary axis	10M	3	3

Q.4(B)	Determine the range of K for stability of unity feedback system whose open loop transfer function is $G(s) = \dfrac{K}{S(S+1)(S+2)}$.	10M	3	3
Q.5(A)	$G(s) = \dfrac{10}{s(1+0.1s)(1+0.4s)}$. A unity feedback control system has Draw Bode plot and comments on Stability.	10M	4	3

Q.5(B)	The open loop transfer function of a unity feedback system is $G(s) = \dfrac{1}{s(1+s)(1+2s)}$. Sketch the polar plot and determine the gain margin and phase margin.	10M	4	3
Q.6(A)	Discuss concept of observability. Evaluate the observability of the system.	10M	5	5

$$\begin{bmatrix} \dot{X_1} \\ \dot{X_2} \end{bmatrix} = \begin{bmatrix} 1 & 1 \\ -2 & -1 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix} + \begin{bmatrix} 0 \\ 1 \end{bmatrix} U(t)$$

$$and \quad Y(t) = \begin{bmatrix} 1 & 0 \end{bmatrix} \begin{bmatrix} X_1 \\ X_2 \end{bmatrix}$$

Q.6(B)	Write any two properties of state transition matrix. Find the state transition matrix for	10M	5	3

$$A = \begin{bmatrix} 0 & -1 \\ +2 & -3 \end{bmatrix}$$

*** END ***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – August 2022
PRINCIPLES OF SIGNALS AND SYSTEMS
(ECE)

Time: 3Hrs　　　　　　　　　　　　　　　　　　　　　　　　　Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What are the classification of system?	1M	1	1
	ii.	Sketch the Continuous time signal given by $x(t) = 4u(t+4) - u(t) - 5u(t-2) + 2u(t-5)$	1M	1	1
	iii.	Identify whether the system $y(t) = x(\frac{t}{2})$ is causal or not.	1M	2	4
	iv	Define sampling theorem.	1M	2	2
	v.	Explain the time shifting property of Fourier transform.	1M	3	2
	vi	Find the Fourier transform of $e^{-at}u(t)$.	1M	3	2
	vii.	Define ROC in Laplace transform.	1M	4	1
	viii.	What is the Laplace transform of $te^{-at}u(t)$?	1M	4	1
	ix.	Explain region of convergence for Z-transform	1M	5	2
	x.	List the two types of Z transform?	1M	5	4
Q.2(A)	(i) Sketch the following signals (a) $u(t) - u(t-2)$　　(b)$r(-0.5t+2)$	5M	1	3
	ii) Find the even and odd part of the signal given by $x(t) = e^{jwt}$	5M	1	3
	OR				
Q.2(B)	Define and sketch the following elementary continuous time signals. (i) Unit impulse signal (b)Unit step signal (ii) Unit ramp signal (d) Rectangular pulse signal (iii) Sampling signal	10M	1	1
Q.3(A)	(i) Find the impulse response h[n] for the causal LTI discrete-time system described by the difference equation $$y[n] = \frac{1}{2}y[n-2] + 2x[n] - x[n-2]$$	8M	2	3
	(ii) State and prove any two properties of LTI systems.	2M	2	3
	OR				
Q.3(B)	Use graphical method to find out the convolution of two sequences $x_1(n) = \{1,-4, 2,3\}$ and $x_2(n)=\{1,-2,3,-1\}$.	10M	2	3
Q.4(A)	Identify the Fourier transform of the gate function shown in figure. Also, plot the magnitude response.	10M	3	3
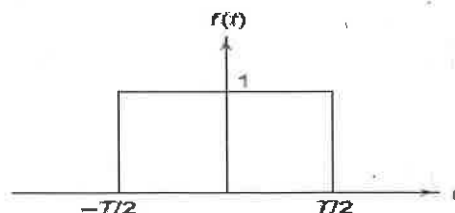
OR

Q.4(B)	Find the trigonometric Fourier series for half wave rectified sine wave.	10M	3	1
Q.5(A)	(i) Discuss about Initial value theorem and Final value Theorem of Laplace transform.	6M	4	6
	(ii) Find out the Laplace transformation of the signal given by $x(t)=3e^{-2t}u(t)-2e^{-t}u(t)$.	4M	4	1

OR

Q.5(B)	(i) Discuss the properties ofLaplace- transform.	6M	4	3
	(ii)Find the inverse Laplace-transform of $X(s) = \frac{1}{s(s+1)^2(s+2)}$.	4M	4	3
Q.6(A)	(i)Explain the Convolution, Time reversal and Differentiation properties of Z-Transform.	6M	5	2
	(ii) Find the Z-Transform if x(n)=2^n for n≤0 and = 0 for n>0	4M	5	3

OR

Q.6(B)	Find the inverse Z-transform of $X(z) = \frac{z(z+3)}{(z-1)(z-2)(z-3)}$	10M	5	3

$$(a)|z|>3, \quad (b)2<|z|<3.$$

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20ECE106

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – August 2022
ANALOG 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 A or B only**

Q.No		Question	Marks	CO	BL
Q.1	i.	Should CMRR of a differential amplifier be a large or a small number? Why?	1M	1	3
	ii.	What is cross-over distortion in class-B push-pull amplifier?	1M	1	1
	iii.	In an amplifier, feedback causes a decrease in the input resistance and an increase in the output resistance. Identify the amplifier	1M	2	3
	iv	Illustrate Barkhausen criteria for sustained oscillation.	1M	2	1
	v.	An op-amp has a differential voltage gain of 100,000 and a common-mode gain of 0.2. Determine and CMRR and express it in dB.	1M	3	3
	vi	Construct the circuit of a difference amplifier	1M	3	1
	vii.	What is the primary advantage of a Schmitt trigger circuit compared to a comparator?	1M	4	1
	viii.	All-pass filter passes all the frequency components. Why is it then used?	1M	4	1
	ix.	What is meant by astable and monostable multivibrators?	1M	5	1
	x.	What is the O/P voltage for IC-7912?	1M	5	1
Q.2(A)		Construct the circuit diagrams of modified MOSFET current mirror circuits and compare its output resistance with that of basic current mirror	10M	1	2
		OR			
Q.2(B)		Explain the working of class-A power amplifier and obtain the power efficiency	10M	1	5
Q.3(A)		(i) Estimate the overall gain of negative feedback amplifier. Also write the advantage and drawback of negative feedback amplifier.	6M		2
		(ii) With a negative voltage feedback, an amplifier gives an output of 10 V with an input of 0.5 V. When feedback is removed, it requires 0.25 V input for the same output. Evaluate feedback factor.	4M	2	4
		OR			
Q.3(B)		Sketch the circuit of an RC phase shift oscillator. Explain its working and derive the expression for oscillation frequency.	10M	2	3
Q.4(A)		Analyze the inverting and non-inverting configuration of op-amp with neat circuit diagram.	10M	3	3
		OR			
Q.4(B)		Build the circuit of an integrator and differentiator using an op-amp and derive an expression for output voltage in each case.	10M	3	3

Q.5(A)	(i) Construct the circuit of an active band-pass filter. Explain its operation and frequency response curve.	10M	4	2
	(ii) Explain the operation of a comparator. What is its drawback and how it can be eliminated?			2

OR

Q.5(B)	Build the circuit of a logarithmic and antilogarithmic amplifier using an op-amp and derive an expression for output voltage.	10M	4	3

Q.6(A)	Elaborate the working of an astable multivibrator using 555 timer with a neat functional block diagram and waveforms. Derive the expression for output frequency.	10M	5	3

OR

Q.6(B)	(i) Briefly explain the operation of voltage controlled oscillator.	5M	5	3
	(ii) Design a PLL and analyze the function of each component	5M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – August 2022
MICROPROCESSORS AND MICROCONTROLLERS
(ECE)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What is the function of EU in 8086?	1M	1	1
	ii.	List the special purpose registers in 8086.	1M	1	1
	iii.	Write the modes of operation of 8255 PPI	1M	2	1
	iv	What is the use of HOLD and HLDA in DMA?	1M	2	1
	v.	List the features of 8051 microcontroller.	1M	3	1
	vi	Write differences between microprocessors and microcontrollers.	1M	3	1
	vii.	What is the difference between ARM7 and ARM9 in terms of architecture?	1M	4	1
	viii.	What are the processor modes of ARM microcontrollers?	1M	4	1
	ix.	Write the stepping sequence of stepper motor under full-drive mode	1M	5	1
	x.	Write HAL instructions to toggle port C pin 5 of the STM32 microcontroller, for every 2 seconds.	1M	5	2
Q.2(A)		Explain the different types of addressing modes in 8086 in detail.	10M	1	2
		OR			
Q.2(B)		Define Assembler directives and explain with suitable examples.	10M	1	2
Q.3(A)		In an 8086-microprocessor based system it is required to interface 32KB of RAM and the starting address is 2000:0000H. By analyzing the specification, design an appropriate memory interface diagram.	10M	2	4
		OR			
Q.3(B)		Explain the various modes of operation of 8254-PIT with suitable diagram.	10M	2	2
Q.4(A)		Draw the architecture of 8051 microcontroller and explain.	10M	3	2
		OR			
Q.4(B)		Explain following registers 1)B register 2)DPTR 3)Accumulator 4)SBUF	10M	3	2
Q.5(A)		Write ARM assembly code for the following C assignment. x = (a + b) - c;	10M	4	3
		OR			
Q.5(B)		Explain the various RISC pipeline mechanism of ARM microcontrollers	10M	4	2
Q.6(A)		Develop an 8051-assembly language program to control the traffic sequence on a 4-way road crossing. Each side should have signals for green, amber, red and pedestrian crossing.	10M	5	3
		OR			
Q.6(B)		Construct the 8-bit DAC interface with 8051 microcontroller and develop an assembly language program to generate a square wave.	10M	5	3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
PROBABILITY THEORY AND STOCHASTIC PROCESSES
(Electronics &Communication 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 axiomatic definition of probability?	1M	1	1
	ii.	Let A and B be events such that $p(A)=0.6$, $p(B)=0.4$ and $p(A \cup B)=0.8$. Are A and B to be independent?	1M	1	1
	iii.	A continuous random variable X having density function $f(x) = k(1-x^2)$; $0 \le x \le 1$. Find the value of the constant k ?	1M	2	1
	iv	Express the density function for Rayleigh distribution?	1M	2	1
	v.	If joint $p.d.f$ of X and Y is $f_{X,Y}(x,y) = kxy$; $0<x<1$ and $0<y<2$ then find the value of k	1M	3	1
	vi	Define Covariance between two random variables (X,Y)	1M	3	1
	vii.	Variances $\sigma_X^2 = 6$ and $\sigma_Y^2 = 9$; correlation coefficient $\rho_{XY} = -2/3$ Find the covariance C_{XY}	1M	4	1
	viii.	Write a condition for WLLNs?	1M	4	1
	ix.	Define the autocorrelation function?	1M	5	1
	x.	Define the power spectral density?	1M	5	1
Q.2(A)		A pharmaceutical product consists of 100 pills in a bottle. Two production lines used to produce the product are selected with probabilities 0.45 (line one) and 0.55 (line two). Each line can overfill or under fill bottles by at most 2 pills. Given that line one is observed, the probabilities are 0.02, 0.06, 0.88, 0.03 and 0.01 that the numbers of pills in a bottle will be 102, 101, 100, 99 and 98 respectively. For line two the similar probabilities are 0.03, 0.08, 0.83, 0.04 and 0.02. a). Find the probability that a bottle of the product will contain 102 pills. Repeat for 101, 100, 99 and 98 pills. b). Given that a bottle contains the correct number of pills, what is the Probability it came from line one?	10M	1	4
		OR			
Q.2(B)		(i) In a communication system the signal sent from point a to point b arrives by two paths in parallel. Over each path the signal passes through two repeaters (in series). Each repeater in one path has a probability of failing (becoming an open circuit) of 0.005. The probability is 0.008 for each repeater on the other path. All repeaters fail independently of each other. Find the probability that the signal will not arrive at point b?	5M	1	3
		(ii) A rifleman can achieve a "marksman" award if he passes a test. He is allowed to fire six shots at a target's bull's eye. If he hits the bull's eye with at least five of his six shots he wins a set. He becomes a marksman only if he can repeat the feat three times straight. i.e. if he can win three straight sets. If his probability is 0.8 of hitting a bull's eye on any one shot, find the probabilities of his (a) winning a set and (b) becoming a marksman.	5M		
Q.3(A)		(i) A random variable X is Gaussian with $a_X = 0$ and $\sigma_X = 1$.	5M	2	4

Find (a) $P(|X| > 2)$ and (b) $P(X > 2)$.

(ii) In a certain Junior Olympics, a contestant throw distances are well approximated by a Gaussian distribution for which $a_x = 30m$. In a qualifying round, contestants must throw farther than $26m$ to qualify. In the main event the record throw is $42m$.

(a) What is the probability of being disqualified in the qualifying round?

(b) In the main event what is the probability the record will be broken?

5M

OR

Q.3(B)   Show that the mean value and variance of the random variable having the uniform density function are: $\overline{X} = E(X) = \dfrac{b+a}{2}$ and $\sigma_X^2 = \dfrac{(b-a)^2}{12}$

10M   2   4

Q.4(A)   Given the function $f_{X,Y}(x,y) = b(x^2 + 4y^2)$; $0 \le |x| < 1 \ and \ 0 \le y < 2$.

(a) Find the constant b such that this is a valid joint density function.

(b) Determine the marginal density functions $f_X(x)$ and $f_Y(y)$.

10M   3   3

OR

Q.4(B)   Two random variables X and Y are related by the expression $Y = aX + b$; where a and b are any real numbers.

(a) Show that $\rho = \begin{cases} 1 & if \ a > 0 \ for \ any \ b \\ -1 & f \ a < 0 \ for \ any \ b \end{cases}$

(b) Show that their covariance is $C_{X,Y} = a\sigma_X^2$

10M   3   4

Q.5(A)   State and Prove Chebychev's inequality?

10M   4   3

OR

Q.5(B)   Gaussian random variables X_1 and X_2 for which $\overline{X_1} = 2, \sigma_{X_1}^2 = 9, \overline{X_2} = -1$, $\sigma_{X_2}^2 = 4$ and $C_{X_1 X_2} = -3$ are transformed to new random variables Y_1 and Y_2 according to $Y_1 = -X_1 + X_2, Y_2 = -2X_1 - 3X_2$. Find (a) $\overline{X_1^2}$ (b) $\overline{X_2^2}$ (c) $\rho_{X_1 X_2}$ (d) $\sigma_{Y_1}^2$ (e) $\sigma_{Y_2}^2$ and (f) $C_{Y_1 Y_2}$

10M   4   4

Q.6(A)   A random process is defined by $Y(t) = X(t)\cos(w_0 t + \theta)$ where $X(t)$ is a wide sense stationary random process that amplitude-modulates a carrier of constant angular frequency w_0 with a random phase θ independent of $X(t)$ and uniformly distributed on $(-\pi, \pi)$ (a) Find $E(Y(t))$ (b) Find the auto correlation function of $Y(t)$ (c) Is $Y(t)$ wide sense stationary?

10M   5   3

OR

Q.6(B)   Find the autocorrelation function and spectral density function of a random process $X(t) = A\cos(\omega_0 t + \Theta)$ where Θ a random variable is over the ensemble and is uniformly distributed over the interval $(0, 2\pi)$. Also find the average power?

10M   5   3

*** END ***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20CST104

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech II Year II Semester (R20) Regular End Semester Examinations – August 2022
COMPUTER ARCHITECTURE
(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

Q.No		Question	Marks	CO	BL
Q.1	i.	Sketch the Memory hierarchy pyramid.	1M	1	1
	ii.	State Moore's law.	1M	1	1
	iii.	List the various MIPS Instruction Formats.	1M	3	2
	iv	Which two algorithms are used for signed multiplication?	1M	3	1
	v.	Distinguish between exception and Interrupt.	1M	2	2
	vi	What are the hazards? Write its types.	1M	4	1
	vii.	Define the term Instruction level parallelism.	1M	4	1
	viii.	What is meant by hardware multithreading?	1M	4	1
	ix.	What do you mean by principle of locality in memory hierarchy?	1M	5	1
	x.	List the different cache mapping techniques.	1M	5	1
Q.2(A)		What are the various Instruction formats available in MIPS architecture, give atleast one instruction examples for each type.	10M	1	1
		OR			
Q.2(B)		What is an addressing mode? Explain the various MIPS addressing modes with figures.	10M	2	2
Q.3(A)		i) Explain the Booth's Multiplication Algorithm with the help of a flowchart.	5M	3	4
		ii) Multiply 13 x -13 using Booth's Multiplier.	5M		
		OR			
Q.3(B)		i) Illustrate the process of restoring division, with the help of a flowchart.	5M	3	4
		ii) Divide 11 by 2 using Restoring division algorithm.	5M		
Q.4(A)		What is data path and control logic? Discuss about building a data path for MIPS with neat diagrams.	10M	2	2
		OR			
Q.4(B)		Discuss the data hazards and forwarding in pipelining.	10M	4	2
Q.5(A)		Explain in detail with necessary diagrams the Flynn's classification of parallel hardware.	10M	4	2
		OR			
Q.5(B)		Discuss the principle of hardware multithreading and elaborate its types.	10M	4	2
Q.6(A)		i) Discuss briefly about the various Memory Mapping Techniques.	4M	5	3
		ii) Consider a direct mapped cache with a block size of 4 KB. The main memory size is 16 GB, with 10 bits in the tag. Find a) Size of cache memory b) Tag directory size	6M		
		OR			
Q.6(B)		What is virtual memory? Explain virtual memory with a neat diagram.	10M	5	2

*** END***

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
NETWORK AND COMMUNICATION
(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 Data Representation in computer network?	1M	1	1
	ii.	Differentiate the simple duplex and Full duplex.	1M	1	1
	iii.	Define IEEE 802.3.	1M	2	1
	iv	What is meant by Bluetooth Low Energy?	1M	2	1
	v.	Define Multicast routing.	1M	3	1
	vi	State the purpose of IPv6 with respect to IPv4.	1M	3	2
	vii.	Mention the use of TCP protocol in transport layer.	1M	4	2
	viii.	How congestion control is applied on transport layer.	1M	4	2
	ix.	Define Peer to Peer Networks.	1M	5	1
	x.	What is use of firewalls?	1M	5	2
Q.2(A)		Describe the various layers of OSI model with neat sketch.	10M	1	3
		OR			
Q.2(B)		Explain the core concept of check sum error detection and Hamming code error correction method with example.	10M	1	3
Q.3(A)		Explain the network layer protocols with adequate block diagram.	10M	2	2
		OR			
Q.3(B)		Discussthe factors to be considered to build the Bluetooth.	10M	2	2
Q.4(A)		Differentiate the purpose of unicast and multicast routing protocols with example.	10M	3	3
		OR			
Q.4(B)		Differentiate the Intradomain and Intradomain protocols with appropriate example.	10M	3	3
Q.5(A)		Explain in detail about congestion avoidance methods of DECbit and RED.	10M	4	2
		OR			
Q.5(B)		Discuss about Token Leaky bucket algorithm with a neat diagram.	10M	4	2
Q.6(A)		Explain about DNS, working of WWW and HTTP.	10M	5	3
		OR			
Q.6(B)		Determine the need for cryptography and network security in application layer.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
OBJECT ORIENTED PROGRAMMING USING JAVA
(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.	How many primitive data types are available in java? List them.	1M	1	1
	ii.	Differentiate == and equals() method on Strings.	1M	1	4
	iii.	Write the differences between method overloading and method overriding.	1M	2	1
	iv	What is an interface? What are the possible contents of the interface?	1M	2	1
	v.	How checked exceptions are different from unchecked exceptions?	1M	3	1
	vi	What are the different ways to achieve synchronization in java?	1M	3	4
	vii.	What is Event Listener?	1M	4	1
	viii.	Differentiate Byte and Character stream.	1M	4	4
	ix.	Write a Syntax for creating a button.	1M	5	1
	x.	What is the use of f.setTitle().	1M	5	1
Q.2(A)		(i)Compare and contrast Procedure oriented programming and object oriented programming.	10M	1	4
		(ii)What are Object Oriented Principles? Explain in detail about each principle?			1
		OR			
Q.2(B)		(i) Develop a Java program that demonstrates the usage of various bitwise operators.	10M	1	3
		(ii) Define Constructor and explain in detail about Constructer types.			2
Q.3(A)		(i) How does java support Runtime Polymorphism? Give an example.	10M	2	3
		(ii) Develop a java program that demonstrates the usage of "super" Keyword in java.			
		OR			
Q.3(B)		(i) What is package? How to create a user defined package in java. Give a suitable example?	10M	2	1
		(ii) When a class hierarchy is created? In what order the constructors are called? Give an example?			
Q.4(A)		(i) Draw a neat sketch for life cycle of thread. Explain each state of thread.	10M	3	6
		(ii) Write a program to demonstrate creation of multiple threads in JAVA.			
		OR			
Q.4(B)		(i) How to catch Multiple exceptions in java? Give an example?	10M	3	1
		(ii) Illustrate the usage of "finally" keyword in exception handling. Give anexample?			2

| Q.5(A) | (i) Explain in detail about adaptor class with an example? | 10M | 4 | 2 |
| | (ii) Discus about Event Delegation Model (EDM). | | | 6 |

OR

| Q.5(B) | What is the use of Event Listener? List out Event Listeners and their methods. Explain the role of Event Listeners in Event Handling mechanism with an example. | 10M | 4 | 2 |

| Q.6(A) | Draw the Java AWT Hierarchy and explain in detail. | 10M | 5 | 6 |

OR

| Q.6(B) | Write a JAVA program for AWT Example by Inheritance. | 10M | 5 | 6 |

*** END ***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20CST107

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
OPERATING 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 A or B only

Q.No		Question	Marks	CO	BL
Q.1	i.	List the four major components of computer system.	1M	1	1
	ii.	Summarize the functions of DMA.	1M	1	1
	iii.	Define Process.	1M	1	1
	iv	Define critical section?	1M	2	1
	v.	Define non- preempt able resource.	1M	2	1
	vi	Define Thrashing.	1M	4	1
	vii.	Differentiate base and limit.	1M	4	1
	viii.	What is swapper?	1M	4	1
	ix.	List out file attributes.	1M	5	1
	x.	Differentiate HDD and SSD.	1M	5	2
Q.2(A)		Explain about the computer system organization in detail.	10M	1	2
		OR			
Q.2(B)		Discuss in detail about Interrupt handling with neat diagram.	10M	1	2
Q.3(A)		Explain about semaphores in detail.	10M	2	2
		OR			
Q.3(B)		Explain in detail about Inter-process communication.	10M	2	2
Q.4(A)		Elaborate about the deadlock prevention mechanism in detail.	10M	2	2
		OR			
Q.4(B)		Solve the CPU scheduling with respect to FCFS, RR and SJF	10M	2	4

Process	Arrival time	Burst Time
P1	0 ms	5 ms
P2	1 ms	3 ms
P3	2 ms	3 ms
P4	4 ms	1 ms

Q.5(A)		Discuss the following allocation algorithms.	10M	3	2
		(i) First Fit (ii) Best Fit (iii) Worst Fit			
		OR			

Q.5(B)	Given memory partitions of 100 KB, 500 KB, 200 KB, 300 KB, and 600 KB. How would each of the First fit Best-Fit and Worst-Fit algorithms place processes of 212 KB, 417 KB, 112 KB, and 426 KB? Rank the algorithms in terms of how efficiently they use memory.	10M	4	5
Q.6(A)	Discuss in detail about File system Protection.	10M	5	2
	OR			
Q.6(B)	Explain about the different access methods of a file?	10M	5	1

*** END ***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
OPERATING SYSTEMS FUNDAMENTALS
(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 Batch system.	1M	1	1
	ii.	State the advantages of multiprogramming.	1M	1	2
	iii.	What are the types of schedulers?	1M	2	1
	iv	List out the types of Multithreading Models.	1M	2	1
	v.	What is semaphore?	1M	3	1
	vi	Define entry and exit sections of a critical section.	1M	3	1
	vii.	Define swapping.	1M	4	1
	viii.	Define MVT.	1M	4	1
	ix.	Outline the drawbacks of Contiguous Allocation of Disk Space.	1M	5	2
	x.	Categorize the various File Attribute.	1M	5	4
Q.2(A)		Define system calls, write about various system calls.	10M	1	2
		OR			
Q.2(B)		Illustrate the system components of an operating system and explain them briefly?	10M	1	2

Q.3(A)		Explain the Scheduling Criteria
		  i) CPU Utilization
		  ii) Turnaround Time
		  iii) Waiting Time
		  iv) Response Time
			10M	2	2

		OR			

Q.3(B)		Discuss the following
		  i) CPU-I/O burst cycle
		  ii) CPU schedule
		  iii) Pre-emptive and non-preemptive scheduling
		  iv) Dispatcher
			4M
			2M
			2M
			2M
				2	2

Q.4(A)		Discuss on process Synchronization. Illustrate any two classical Problems of Synchronization	10M	3	6
		OR			
Q.4(B)		Define deadlock and explain Banker's algorithm for deadlock avoidance.	10M	3	2
Q.5(A)		State and explain about virtual memory with neat diagram.	10M	4	2
		OR			
Q.5(B)		Extend your views on Demand paging.	10M	4	2
Q.6(A)		Explain with a neat sketch about the various directory structures.	10M	5	2
		OR			

Q.6(B)   Consider that a disk drive has 5000 cylinders, numbered 0 to 4999 the   10M   5   3
         drive is currently serving request at cylinder 143,and the previous
         request was at cylinder 125 the queue of pending requests in FIFO order
         is :86,1470,913,1174,948,1022,1750,130
         Starting from head position, what is the total distance (in cylinders that
         the disk arm moves to satisfy all pending request for each of the
         following disk scheduling algorithms?
              i) FCFS
             ii) SSTF
            iii) SCAN
            iv) C-SCAN

                                    *** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   **Question Paper Code: 20CSE108**

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
JAVA PROGRAMMING
(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 feature of Java.	1M	1	1
	ii.	Define the Inheritance.	1M	1	1
	iii.	What is the usage of 'super' keyword?	1M	2	1
	iv	What is the importance of Package?	1M	2	1
	v.	List out the Java built-in Exceptions.	1M	3	1
	vi	What are the states the Thread undergoes during execution time?	1M	3	1
	vii.	What is Collections framework in Java?	1M	4	1
	viii.	What is mean by I/O streams. State its types.	1M	4	1
	ix.	What is Tree component in Java Swing?	1M	5	1
	x.	What are the steps for using tables in JApplet?	1M	5	1
Q.2(A)		Explain in detail about constructors and its types with suitable examples?	10M	1	2
		OR			
Q.2(B)		Develop a Java program to calculate the 3*3 matrix multiplication using arrays.	10M	1	6
Q.3(A)		Explain different types of Inheritances in detail with suitable examples?	10M	2	2
		OR			
Q.3(B)		Develop a Java program to create an interface 'prime' and has a method 'display'. It should take an integer input and returns the total number of prime number between 2 and integer 'n'.	10M	2	6
Q.4(A)		What is Exception? Explain Exception handling in detail with an example?	10M	3	2
		OR			
Q.4(B)		Develop a Java program to implement the Producer – Consumer problem using Inter-thread Communications?	10M	3	6
Q.5(A)		Explain in detail about the implementation of Stack using Collections Framework?	10M	4	3
		OR			
Q.5(B)		Develop a Java program to read a file and count the number of lines and words in it using I/O Streams.	10M	4	6
Q.6(A)		Discuss about any two of the Components of JSwing.	10M	5	2
		OR			
Q.6(B)		Develop a Java program to design and develop a Simple Calculator using AWT controls.	10M	5	6

*** END***

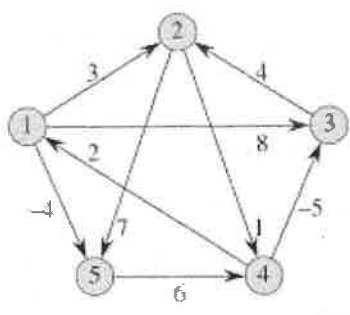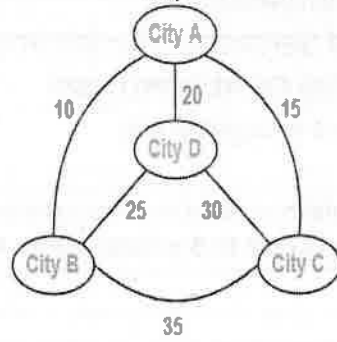# MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
DESIGN AND ANALYSIS OF ALGORITHMS
(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.	List any two differences between Quick sort and merge sort.	1M	1	1
	iii.	Define objective function.	1M	2	1
	iv	Can we solve 0/1 knapsack problem with greedy method? Give a one line reason.	1M	2	1
	v.	Define spanning Tree.	1M	3	1
	vi	What is the key idea of all pairs shortest path algorithm?	1M	3	1
	vii.	Give the formula to evaluate the number of nodes in 8-queens state space tree?	1M	4	1
	viii.	What is the E-node selection rule for LC search?	1M	4	1
	ix.	State Cooks theorem?	1M	5	1
	x.	Define an approximate solution.	1M	5	1
Q.2(A)		Solve the recurrence relation using substitution method (analyze the time complexity). $$T(n) = \begin{cases} 1 & n = 1 \\ T(n-1) + n & n > 1 \end{cases}$$	10M	1	6
		OR			
Q.2(B)		Explain the strassen's matrix multiplication?	10M	1	2
Q.3(A)		Find an optimal solution to the knapsack instance n=7,m=15,(p1,p2,...p7)=(10,5,15,7,6,18,3) and (w1,w2,...w7)=(2,3,5,7,1,4,1)	10M	2	5
		OR			
Q.3(B)		Explain about matrix chain multiplication with an example.	10M	2	2
Q.4(A)		Explain Depth first search algorithm with an example?	10M	3	5
		OR			
Q.4(B)		Discuss Floyd-Warshall's All Pairs Shortest Path Algorithm and find the shortest path between every pair of vertices of the given graph.	10M	3	5

| Q.5(A) | Create the solution to 4 Queen's problem using backtracking algorithm. | 10M | 4 | 6 |

OR

| Q.5(B) | Determine the cost of an optimal tour for a given network using Branch and Bound method , start from city A. | 10M | 4 | 5 |

| Q.6(A) | Distinguish P, NP, NP hard and NP- complete. Give example problems for each. | 10M | 5 | 4 |

OR

| Q.6(B) | Analyze the approximation algorithm for knapsack problem. | 10M | 5 | 4 |

*** END***

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
DISCRETE MATHEMATICAL STRUCTURES
(Common to CSE, CSE(AI), CSE(DS), CSE(IOT), CSE(CS) & 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

Q.No		Questions	Marks	CO	BL
Q.1	i.	Construct the truth table for $P \wedge \neg Q$.	1M	1	1
	ii.	What is Quantifiers?	1M	1	1
	iii.	$\sum_{k=0}^{n} \binom{n}{k} = \underline{\quad}$.	1M	2	1
	iv	How many people must be selected to guarantee that at least two with the same birthday?	1M	2	1
	v.	Define grammar.	1M	3	1
	vi	Define co-set of a groups.	1M	3	1
	vii.	Draw Hasse diagram of (P (A), ⊆) for A={a, b, c}.	1M	4	1
	viii.	What is cyclic graph?	1M	4	1
	ix.	Define adjacency matrix of the graph.	1M	5	1
	x.	What is minimum spanning tree?	1M	5	1
Q.2(A)		(i) Show the following implication $((P \vee \neg P) \to Q) \to ((P \vee \neg P) \to R) \Rightarrow (Q \to R)$.	5M	1	3
		(ii) Show the following equivalence $\neg(P \rightleftarrows Q) \Leftrightarrow (P \wedge \neg Q) \vee (\neg P \wedge Q)$.	5M		3
		OR			
Q.2(B)		(i) Show that SVR is a tautologically implied by $(P \vee Q) \wedge (P \to R) \wedge (Q \to S)$.	5M	1	3
		(II)Show that $(\exists x)M(x)$ follows logically form the premises $(x)(H(x) \to M(x))$, and $(\exists x)H(x)$	5M		3
Q.3(A)		(i) Each user on a computer system has a password, which is six to eight characters long, where each character is an uppercase letter or a digit. Each password must contain at least one digit. How many possible passwords are there?	5M	2	2
		(ii) How many positive integers between 10 and 1000 inclusive are divisible by 5 but not by 6?	5M		3
		OR			
Q.3(B)		(i) How many different strings can be made by reordering the letters of the word "SUCCESS"?	5M	2	2
		(ii) How many solutions does the equation $x_1 + x_2 + x_3 = 10$ have, where $x_1, x_2,$ and x_3 are positive integers?	5M		3
Q.4(A)		Derive the language $L(G) = a^2 b^2 c^2$ is generated by the following grammar. G = <{S, B, C}, {a, b, c}, S, φ> Where φ consists of the productions S→ aSBC, S→ aBC, CB→ BC, aB→ ab, bB→ bb, bC→ bc, cC→ cc.	10M	3	4

Q.4(B) Discuss grammar and their type with suitable example. Differentiate between context sensitive grammar (CSG) and context free grammar(CFG).   10M   3   4

Q.5(A) (i) If n = 30, S30 = {1, 2, 3, 5, 6, 10, 15, 30}. Let R denote the relation divi: show by drawing the Hasse diagram that (S30, R) is a Lattice.   5M   4   3
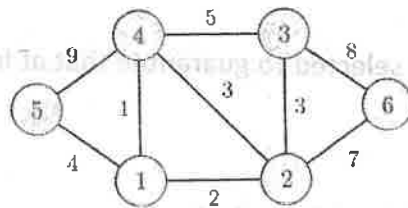
(ii) In any Boolean algebra, show that $a = b \Leftrightarrow ab' + a'b = b$ 5M   3

OR

Q.5(B) (i) Obtain the product-of-sum canonical forms of the Boolean expression   5M   4   3

$$[x_1 + x_2(x_3 x_4)]$$

(ii) Use the Karnaugh map representation to find a minimal sum-of- product expression of $f(a, b, c, d) = \sum(0, 1, 2, 3, 13, 15)$ 5M   3

Q.6(A) Construct the minimum spanning tree (MST) for the given graph using Kruskal's Algorithm   10M   5   4

OR

Q.6(B) Use Dijkstra's algorithm to find shortest paths from source '0' to all vertices in the given graph.   10M   5   4
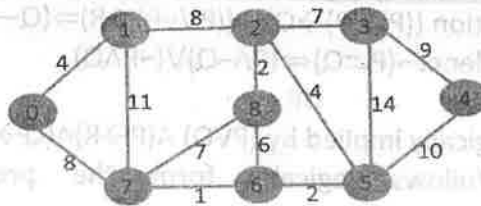
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# MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)

B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022

DESIGN AND ANALYSIS OF ALGORITHMS

(Computer Science & Engineering (Data Science))

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Differentiate between Big-oh and Omega notation.	1M	1	1
	ii.	What are Polynomial time and Non-deterministic Polynomial time algorithms?	1M	1	1
	iii.	Define time complexity.	1M	2	1
	iv	Define Divide & Conquer Strategy.	1M	2	1
	v.	Name two optimization problems where branch and bound algorithm is used.	1M	3	1
	vi	State 4-Queens problem.	1M	3	1
	vii.	When do you apply dynamic programming to solve a problem?	1M	4	1
	viii.	Define the terms feasible solution, optimal solution, and objective function.	1M	4	1
	ix.	Differentiate between Big-oh and omega notation.	1M	5	1
	x.	What do you understand by worst-case time complexity? What is it for merge sort algorithm?	1M	5	1
Q.2(A)		i) Write the pseudo code for Quick sort. What is its time complexity?	5M	1	3
		ii) Analyze the time complexity of the following recursive algorithm using Master's method. $$T(n)=2T(n/2) + n$$	5M		
		OR			
Q.2(B)		Explain recursive binary search algorithm and mention the algorithm's time complexity.	10M	1	4
Q.3(A)		Write step by step process for finding optimal sequence for the below job sequencing with deadlines instance, n=6, (p1,p2,p3,p4,p5,p6) = (3, 5, 20, 18, 1, 6), and (d1,d2,d3,d4,d5,d6) = (1, 3, 4, 3, 2, 1).	10M	2	5
		OR			
Q.3(B)		Identify the bit-strings for every character to encode "THE ESSENTIAL FEATURES" using Huffman code.	10M	2	4
Q.4(A)		Traverse the graph below in Breadth First Order.	10M	3	4
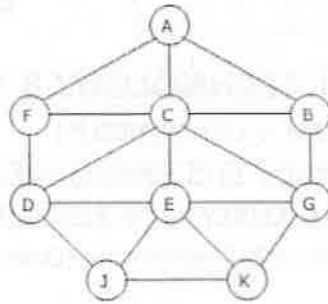
OR

Q.4(B)	Using Floyd-Warshall's All Pairs Shortest Path Algorithm compute the shortest path between every pair of vertices of the given graph.	10M	3	5
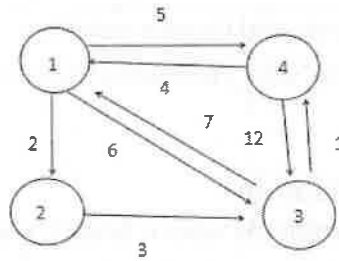
Q.5(A)	i) Distinguish Backtracking and Branch and bound methods.	5M	4	4
	ii) State sum of subsets problem. Explain how to solve sum of subsets problem using backtracking method with an example.	5M		

OR

Q.5(B)	Present the algorithm to solve sum of subset problem using backtracking algorithm. Explain step by step with the example when the set A = {4, 9, 20, 14, 10, 17} and the target sum T = 30.	10M	4	3

Q.6(A)	i) Explain P, NP class of problems with examples.	3M	5	3
	ii) Define Satisfiability Problem?	3M		
	iii) What are NP hard class of problems?	4M		

OR

Q.6(B)	i) What is Cook's theorem? Why is it useful?	5M	5	3
	ii) Let S be an NP-complete problem and Q and R be two other problems not known to be in NP. Q is polynomial time reducible to S and S is polynomial-time reducible to R. Then, what class problem is R?	5M		

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20CSD107

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
OPERATING SYSTEMS FUNDAMENTALS
(Computer Science & Engineering (Data Science))

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Differentiate between kernel mode and user mode.	1M	1	1
	ii.	What is Argument Validation?	1M	1	1
	iii.	How many types of of threads?	1M	2	1
	iv	What is CPU utilization?	1M	2	1
	v.	What is a critical section? Give examples.	1M	3	1
	vi	Differentiate Semaphore and Counting Semaphore.	1M	3	1
	vii.	Distinguish between Logical and Physical address space.	1M	4	3
	viii.	Explain various ways to handle a page fault.	1M	4	4
	ix.	Write short notes on File Attributes.	1M	5	1
	x.	List the steps needed for page replacement.	1M	5	2
Q.2(A)		Mention the objectives and functions of Real-Time Embedded systems.	10M	1	1
		OR			
Q.2(B)		Distinguish between client-server and peer-to-peer models of distributed systems.	10M	1	2
Q.3(A)		Define a Thread? Give the benefits of multithreading. What resources are used when a thread is created? How do they differ from those used when a process is created?	10M	2	1
		OR			
Q.3(B)		Assume the following workload in a system:	10M	2	4

Process Arrival Time Burst Time

P1	5	5
P2	4	6
P3	3	7
P4	1	9
P5	2	2

Q.No	Question	Marks	CO	BL
Q.4(A)	What is Dining Philosophers problem? Discuss the solution to Dining philosopher's problem using monitors?	10M	3	4
	OR			
Q.4(B)	Explain about the strategies to recover from deadlock?	10M	3	2
Q.5(A)	Describe the Logical and Physical address mapping.	10M	4	5
	OR			

Q.5(B)	Write a short note on the following i) Stable storage implementation ii) Free space management.	10M	4	1

Q.6(A)	How to organize the mass storage? Explain?	10M	5	2
	OR			
Q.6(B)	Describe any two disk scheduling algorithms with suitable illustrations.	10M	5	5

*** END***

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022

PYTHON FOR DATA SCIENCE

(Computer Science & Engineering (Data Science))

Time: 3Hrs

Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Define Data cleaning?	1M	1	1
	ii.	What is Big data?	1M	1	1
	iii.	How to create a ND array? Give one suitable example.	1M	2	1
	iv	What is transposing? Give a suitable example for transposing.	1M	2	1
	v.	Write the syntax for filter method in data frame.	1M	3	1
	vi	Define Drop Index?	1M	3	1
	vii.	What do you mean by missing values in pandas?	1M	4	1
	viii.	What is Histogram?	1M	4	1
	ix.	What is K-Means Algorithm?	1M	5	1
	x.	List out some of the applications of machine learning.	1M	5	1
Q.2(A)		What is the difference between data cleaning and data transformation? Explain the steps in involving in Data cleaning process?	10M	1	2
		OR			
Q.2(B)		Discuss any 5 data science real-time application scenarios.	10M	1	2
Q.3(A)		What is slicing and indexing in NumPy? Explain various methods used for implementing slicing and indexing in python?	10M	2	2
		OR			
Q.3(B)		Explain transposing and swapping in NumPy using suitable syntax and examples?	10M	2	2
Q.4(A)		Illustrate how to Sort Data in a Pandas Data Frame.	10M	3	3
		OR			
Q.4(B)		Write various methods involving in Indexing and Selecting Data with Pandas.	10M	3	3
Q.5(A)		Write various methods used for handling Missing Data in Pandas.	10M	4	3
		OR			
Q.5(B)		Illustrate the data frame in python pandas using Min, Max, Dense and Rank by Group.	10M	4	3
Q.6(A)		What is reinforcement machine learning algorithm? Illustrate the categories of supervised machine learning algorithm with its advantages, disadvantages and applications?	10M	5	3
		OR			
Q.6(B)		Demonstrate in detail about Naive Bayes Classifier with its types and applications.	10M	5	3

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20CSO107

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations - August 2022
INTERNET OF THINGS
(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.	Elaborate the term "**Ubiquitous computing**".	1M	1	1
	ii.	Write the role of communication Unit in IOT.	1M	1	1
	iii.	What is SoC?	1M	2	1
	iv	What are the internal blocks of raspberry pi?	1M	2	1
	v.	How many GPIO pins are present in Raspberry Pi 3?	1M	3	1
	vi	Specify the role of Linux commands, "mkdir" and "ls".	1M	3	2
	vii.	What is an IP address?	1M	4	2
	viii.	What is length of IPv6 Address?	1M	4	1
	ix.	What is full form of REST?	1M	5	1
	x.	What is the use of htpp?	1M	5	1
Q.2(A)	i.	What are the basic differences between SoC (System-on-chip) and MCU (Microcontroller unit)?	5M	1	1
	ii.	Give a comparative analysis between WoT and IoT.	5M	1	1
		OR			
Q.2(B)		What are the basic differences between SoC (System-on-chip) and MCU (Microcontroller unit)?	10M	1	1
Q.3(A)		Explain the pin description of Arduino UNO and mention its specification and individual components.	10M	2	1
		OR			
Q.3(B)		Write a program to glow a LED at an interval of 20ms connected to pin number 6 of an Arduino UNO at an interval of 20ms, if input voltage across A0 pin is above 4.2V.	10M	2	3
Q.4(A)		Explain different generation of Raspberry Pi and what is role of SPI interface, TWI interface, UART and DMA controller available in Raspberry Pi board.	10M	3	2
		OR			
Q.4(B)		Write a program for raspberry pi to read digital input from any sensor at interval of 100ms.	10M	3	3
Q.5(A)	i.	What is the difference between IPv4 and IPv6? Provide a detail comparison with suitable explanation.	4M	4	2
	ii.	Write short Notes on the following a) Static IP address assignment b) Domain name system	4M	4	2
		OR			
Q.5(B)		For given IP address 157.48.93.43/17 find following parameters i) Subnet Mask ii) Class iii) Type iv) Network ID v) No of possible Hosts	10M	4	2

Q.6(A)	What is curl? Give names of any five protocols that are associated with curl	10M	5	1

        i) What is MQTT protocol? Explain how MQTT is different from XAPP?

        ii) What is Constrained Application Protocol (CoAP)?

OR

Q.6(B)	What is real time reaction? Explain with the help of Polling and Comet. How scaling works with Comet?	10M	5	2

*** END***

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
DATABASE MANAGEMENT SYSTEM
(Computer Science & Engineering (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.	List the properties of the database system.	1M	1	1
	ii.	What do you mean by Derived attribute?	1M	1	2
	iii.	Define Cartesian product operator in relation algebra?	1M	2	1
	iv	Distinguish between select and project operations.	1M	2	1
	v.	What is the difference between 1NF and 2NF?	1M	3	2
	vi	Compare immediate and deferred update.	1M	3	1
	vii.	Define check point.	1M	4	1
	viii.	Define loss less join decomposition with example?	1M	4	1
	ix.	List out the ACID properties?	1M	5	1
	x.	What is the Condition for 2PL?	1M	5	1
Q.2(A)		Illustrate and create an ER diagram for the Library Management System?	10M	1	2
		OR			
Q.2(B)		Discuss various types of databases?	10M	1	2
Q.3(A)		Explain the fundamental operations in relational algebra with examples?	10M	2	3
		OR			
Q.3(B)		Explain the Tuple relational calculus (TRC) and Domain relational calculus (DRC) with examples?	10M	2	2
Q.4(A)		(i) A Relation R (A, B, C, D) has FD C ->B. is in 3NF? Justify your answer. (ii) A Relation R (A, B, C,) has FD's A -> AC, is R is in 3NF? Does AC -> C? Justify your?	10M	3	2
		OR			
Q.4(B)		Explain briefly the following: (i) Functional dependency, (ii) Partial dependency, (iii) Full dependency, (iv) Transitive dependency and (v) Trivial dependency	10M	3	5
Q.5(A)		Explain the construction of B trees with example?	10M	4	6
		OR			
Q.5(B)		Explain three types of conflicts occur with the Concurrent Execution of the operations?	10M	4	5
Q.6(A)		Explain the CAP theorem in NOSQL with example?	10M	5	5
		OR			
Q.6(B)		Explain the shadow paging recovery technique?	10M	5	

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20CSO109

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
COMMUNICATION NETWORKS
(Computer Science & Engineering (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 multiplexing and demultiplexing?	1M	1	
	ii.	Classify the various devices used in different layers of TCP/IP layers?	1M	1	
	iii.	List the functions of LLC?	1M	2	
	iv	Define ALOHA and its importance?	1M	2	
	v.	What is broadcast routing?	1M	3	
	vi	Define choke packet?	1M	3	
	vii.	How congestion control is different from flow control?	1M	4	
	viii.	What are the functions of a transport layer.	1M	4	
	ix.	What is the use of SNMP?	1M	5	
	x.	What is Client and Server?	1M	5	
Q.2(A)		Explain in detail about layers of ISO-OSI model with a neat diagram?	10M	1	
		OR			
Q.2(B)		How TCP/IP is different from Layered architecture. Explain in detail.	10M	1	
Q.3(A)		a) Outline the transfer modes provided by HDLC? Explain. b) Illustrate the frame format of HDLC protocol with every field in detail	10M	2	
		OR			
Q.3(B)		Given the generator polynomial x^3+1 and data polynomial x^7+1. Test the error if any using CRC method..	10M	2	
Q.4(A)		Explain link state routing algorithm with an example?	10M	3	
		OR			
Q.4(B)		Discuss Distance vector routing algorithm in detail?	10M	3	
Q.5(A)		What is the format of TCP segment. With a diagram explain the c establishment and release phases of TCP. Discuss the issues associated wit	10M	4	
		OR			
Q.5(B)		Discuss the various congestion prevention policies?	10M	4	
Q.6(A)		Explain the Server side and client-side web page generation	10M	5	
		OR			
Q.6(B)		How computer networks are used in health care applications? Explain.	10M	5	

*** END***

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
OPERATING SYSTEMS FUNDAMENTALS
(Computer Science & Engineering (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 functions of Operating Systems.	1M	1	1
	ii.	Define system call.	1M	1	1
	iii.	What are the various scheduling criteria for CPU scheduling?	1M	2	1
	iv	Differentiate between Thread and Process.	1M	2	1
	v.	Define semaphore.	1M	3	1
	vi	What are the methods for handling deadlocks?	1M	3	1
	vii.	Difference between internal and external fragmentation.	1M	4	1
	viii.	What is virtual memory? Mention its advantages.	1M	4	1
	ix.	Write the objectives of File Management System.	1M	5	1
	x.	Define seek time and latency time.	1M	5	1
Q.2(A)		What are the various components of operating – system structure explains the simple and layered approach of operating system in details.	10M	1	2
		OR			
Q.2(B)		Explain Microkernel and multithreading operating system designs with advantages and disadvantages.	10M	1	2
Q.3(A)		What is a process? With a neat sketch, illustrate various fields of Process Control Block.	10M	2	2
		OR			
Q.3(B)		Does preemptive scheduling give same performance as non-preemptive scheduling algorithm? Compare their performance by assuming at least 5 processes arrived at different time intervals.	10M	2	4
Q.4(A)		What is Dining Philosophers problem? Discuss the solution to Dining philosopher's problem using monitors.	10M	3	3
		OR			
Q.4(B)		Illustrate Bankers algorithm for deadlock avoidance with an example.	10M	3	3
Q.5(A)		Illustrate the page-replacement algorithms i) FIFO ii) Optimal Page Replacement use the reference string 7, 0,1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2,1, 2, 0, 1, 7, 0, 1 for a memory with three frames.	10M	4	4
		OR			
Q.5(B)		Explain in detail about demand paging.	10M	4	2
Q.6(A)		Discuss about various file allocation methods.	10M	5	2
		OR			
Q.6(B)		Discuss various types of disk storage management.	10M	5	2

*** END***

Hall Ticket No: ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚   Question Paper Code: 20CAI108

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
AI Tools, Techniques & Applications
(Computer Science & Engineering (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.	How are AI algorithms different from non-AI algorithms?	1M	1	1
	ii.	Differences between supervised learning and unsupervised learning	1M	1	1
	iii.	Draw the pdf $\mathcal{N}(10,2)$, showing one standard-deviation, and two standard-deviation lines on both sides of the mean	1M	2	2
	iv	Define an Outlier data?	1M	2	1
	v.	Is the input layer counted in multi-layer perceptron? If not, why not?	1M	3	1
	vi	Is Decision Tree a classifier or clustering algorithm?	1M	3	1
	vii.	What is the purpose of stemming and lemmatization?	1M	4	1
	viii.	What is a utility matrix?	1M	4	
	ix.	List the two labels of data for object detection?	1M	5	1
	x.	What is the purpose of image segmentation?	1M	5	
Q.2(A)		Explain using a univariate regression example the terms: Sum squared error (or Sum squared total), Sum squared residual, and Sum squared explained?	10M	1	3
		OR			
Q.2(B)		i) Explain univariate Linear Regression with a concrete example?	3M	1	2
		ii) Give an example of multivariate regression problem	3M		
		iii) Write the objective function to optimize for linear regression.	4M		
Q.3(A)		i) Draw the competitive learning (CL) network and explain its working Principle?	3M 3M	2	3
		ii) Write the pseudocode for training the CL network.	4M		
		iii) When will CL fail to cluster properly? Explain with diagram?			
		OR			
Q.3(B)		Explain Elbow method in details, with diagram? How does it determine proper value of the number of clusters?	10M	2	3
Q.4(A)		Could the classification result change if the size of the Parzen window is changed? Explain with diagram. Explain how Parzen window classifier could be made robust by using radial basis function kernel.	10M	3	2
		OR			
Q.4(B)		What is a confusion matrix? Explain with an example? What are False positive, False negative and F-score?	10M	3	1
Q.5(A)		What is a document matrix, explain with an example? What is meant by doc classification? Explain ?	10M	4	4

Q.5(B) Explain document classification using latent semantic analysis. What is the   10M   4   3
difference between a topic and a term?

Q.6(A) Explain Boltzmann learning with respect to convolution neural network.   10M   5   4
Draw the full configuration of Le-Net5 and Alex Net.

OR

Q.6(B) Explain the idea behind "Edge based segmentation". Please elaborate how   10M   5   3
a sobel filter perform edge based segmentation, using an example?

*** END ***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations – September 2022
DESIGN AND ANALYSIS OF ALGORITHM
(Computer Science & Engineering (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.	Differentiate between Big-oh and omega notation.	1M	1	1
	ii.	What do you understand by worst-case time complexity? What is it for merge sort algorithm?	1M	1	1
	iii.	When do you apply dynamic programming to solve a problem?	1M	2	1
	iv	Define the terms feasible solution, optimal solution, and objective function.	1M	2	1
	v.	What are the two graph traversal algorithms?	1M	3	1
	vi	How to ensure that a graph is bi-connected?	1M	3	1
	vii.	Name one application of graph colouring algorithm?	1M	4	1
	viii.	State 4-Queens problem.	1M	4	1
	ix.	What is a P class problem?	1M	5	1
	x.	Define reducibility.	1M	5	1
Q.2(A)		i) Analyze the time complexity of the following recursive algorithm using Master's method. $$T(n)=2T(n/2) + 1$$ ii) Analyze the time complexity of the following recursive algorithm using Master's method. $$T(n)=2T(n/2) + n$$	5M 5M	1	3
		OR			
Q.2(B)		Write an algorithm for Recursive sum and find the time complexity of the algorithm.	10M	1	4
Q.3(A)		Solve the following fractional knapsack problem using greedy algorithm: Weights are W :{1,3,5,6,7}; profits P: {3,9,7,11,18}. The knapsack capacity is 15.	10M	2	5
		OR			
Q.3(B)		Explain job sequencing with deadlines when n=6, (p1,p2,p3,p4,p5,p6) = (3, 5, 20, 18, 1, 6), and (d1,d2,d3,d4,d5,d6) = (1, 3, 4, 3, 2, 1). Write the algorithm steps. Explain your solution steps with the above example.	10M	2	4
Q.4(A)		Traverse the graph in Depth First Order.	10M	3	4
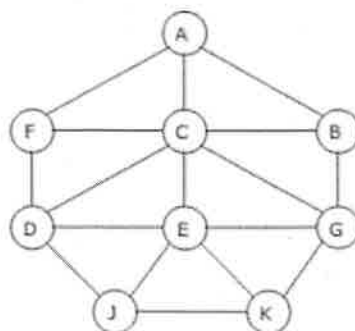
OR

Q.4(B)	Using Floyd-Warshall's All Pairs Shortest Path Algorithm compute the shortest path between every pair of vertices of the given graph.	10M	3	5
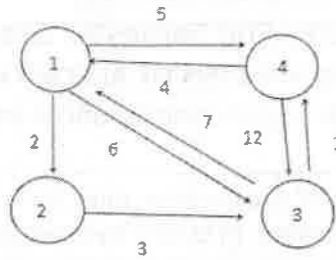
Q.5(A)	A thief enters a house for robbing it. He can carry a maximal weight of 5 kg into his bag. There are 4 items in the house with the following weights and corresponding values. What is the maximum value the thief could take, and what are the items to select. The thief can either take or leave an item completely? Provide the solution using branch and bound approach.	10M	4	4

Item	Weight (kg)	Value (Rs.)
Mirror	2	3
Chair	3	4
TV	4	5
Vase	5	6

OR

Q.5(B)	Present the algorithm to solve sum of subset problem using backtracking algorithm. Explain step by step with the example when the set A = {4, 9, 20, 14, 10, 17} and the target sum T = 30.	10M	4	3

Q.6(A)	i) Define P, NP class of problems with examples. Represent the two sets using a Venn diagram.	3M	5	3
	ii) Define Satisfiability Problem.	3M		
	iii) What are NP hard class of problems?	4M		

OR

Q.6(B)	i) What is Cook's theorem? Why is it useful?	5M	5	3
	ii) Let S be an NP-complete problem and Q and R be two other problems not known to be in NP. Q is polynomial time reducible to S and S is polynomial-time reducible to R. Then, what class problem is R?	5M		

*** END ***

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
OPERATING SYSTEMS FUNDAMENTALS FOR SECURTY
(Computer Science & Engineering (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 System Programs.	1M	1	1
	ii.	Mention the list of services provided by an Operating System?	1M	1	1
	iii.	What are the requirements that a solution to the critical section problem must satisfy?	1M	2	2
	iv	What are the conditions under which a deadlock situation may arise?	1M	2	1
	v.	What are the common strategies to select a free hole from a set of available holes?	1M	3	1
	vi	How the problem of external fragmentation can be solved.	1M	3	1
	vii.	What do you meant by DAC systems?	1M	4	1
	viii.	Mention some of the key characteristics of Trusted systems.	1M	4	1
	ix.	What are cons and pros of windows OS?	1M	5	1
	x.	Define Kerberos Network Authentication.	1M	5	1
Q.2(A)		Explain about the components of operating system in detail.	10M	1	2
		OR			
Q.2(B)		Elaborate on System Calls with neat diagram.	10M	1	2
Q.3(A)		Discuss any two classic problems of synchronization	10M	2	3
		OR			
Q.3(B)		Explain the various deadlock handling mechanism in detail.	10M	2	3
Q.4(A)		Differentiate between Paging and Segmentation.	10M	3	2
		OR			
Q.4(B)		Explain in detail about different disk scheduling algorithms?	10M	3	2
Q.5(A)		Define threat. Explain the significance of creating threat model in system (	10M	4	2
		OR			
Q.5(B)		Write short note on (i)Bell la padula Model (ii) Biba Integrity Model	10M	4	2
Q.6(A)		Discuss in detail about Windows security architecture.	10M	5	2
		OR			
Q.6(B)		Define Fault tolerance. Explain different fault tolerant issues in detail.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
JAVA PROGRAMMING
(Computer Science & Engineering (Cyber Security))

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What are constructors? What are the points to remember? While working with constructors?	1M	1	1
	ii.	What is inheritance?	1M	1	1
	iii.	Differentiate abstract class and an Interface	1M	2	1
	iv	What is meant by packages?	1M	2	1
	v.	List some methods supported by threads.	1M	3	1
	vi	What are the differences between Multithreading and Multitasking?	1M	3	1
	vii.	List the type of streams supported in Java.	1M	4	1
	viii.	What is Iterator?	1M	4	2
	ix.	Explain briefly JComboBox with syntax	1M	5	2
	x.	List two limitations of AWT.	1M	5	1
Q.2(A)		Write a java program for matrix multiplication using 2-D arrays.	10M	1	5
		OR			
Q.2(B)		Elaborate on the various object oriented concepts, with necessary illustrations.	10M	1	2
Q.3(A)		What is package? State how to create and access user defined package in Java	10M	2	3
		OR			
Q.3(B)		Write a java program for method overriding.	10M	2	5
Q.4(A)		With proper syntax and example explain following thread methods : (i) wait () (ii) sleep () (iii) resume () (iv) notify ()	10M	3	2
		OR			
Q.4(B)		Write a program to demonstrate synchronization of multiple threads.	10M	3	3
Q.5(A)		Write a Java program to create Linked List?	10M	4	5
		OR			
Q.5(B)		Explain in detail about HashSet Class with its Constructors and Methods?	10M	4	2
Q.6(A)		Explain the following: i) Limitations of AWT and ii) Containers in Swing	10M	5	2
		OR			
Q.6(B)		Write a Java program using JLabel, JTextField and Jbutton.	10M	5	5

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 20CSC109

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
DESIGN AND ANALYSIS OF ALGORITHMS
(Computer Science & Engineering (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.	State Master's theorem.	1M	1	1
	ii.	Write a short note on properties of Algorithm .	1M	1	1
	iii.	State the general principle of greedy method.	1M	2	1
	iv	Applications of the Optimal merge pattern.	1M	2	1
	v.	Distinguish prim's and kruskal's algorithm	1M	3	2
	vi	What does Floyd's Algorithm do?	1M	3	1
	vii.	Define Branch and Bound.	1M	4	1
	viii.	What are the features of Backtracking.	1M	4	1
	ix.	When is a problem said to be NP Hard?	1M	5	1
	x.	Define reducibility.	1M	5	1
Q.2(A)		In what way amortized analysis is used for performance analysis of algorithms? Explain?	10M	1	1
		OR			
Q.2(B)		$T(n)=aT(n/b)+f(n)$. Simplify this recurrence relation in terms $h(n)$ and $u(n)$ functions to find out the time complexities?	10M	1	3
Q.3(A)		Consider A1=5X4, A2=4X6, A3=6X2, A4=2X7.P1=5, P2=4, P3=6, P4=2, P5=7 and Apply matrix chain multiplication.	10M	2	3
		OR			
Q.3(B)		Write an algorithm to Longest Common Subsequence using Dynamic Programming with example?	10M	2	2
Q.4(A)		Write in detail about Topological sort. Give example to it?	10M	3	1
		OR			
Q.4(B)		Find the optimal Huffman code for the following set of frequencies. A:45, B:13, C:12, D:16, E:9, F:5	10M	3	3
Q.5(A)		Discuss the 4 – queen's problem. Draw the portion of the state space tree for n using backtracking algorithm?	10M	4	2
		OR			
Q.5(B)		Generate FIFO branch and bound solution for the given knapsack problem. m = 15, n = 3. (P1 P2 P3) = (10, 6, 8) (w1 w2 w3) = (10, 12, 3)	10M	4	3
Q.6(A)		What does NP and NP-hard mean? Demonstrate approximation algorithm for NP and NP hard problem?	10M	5	1
		OR			
Q.6(B)		Describe the Polynomial time Approximation.	10M	5	1

*** END***

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

B.Tech II Year II Semester (R20) Regular End Semester Examinations –September 2022
DESIGN AND ANALYSIS OF ALGORITHMS
(Computer Science & Engineering (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.	State Master's theorem.	1M	1	1
	ii.	Write a short note on properties of Algorithm .	1M	1	1
	iii.	State the general principle of greedy method.	1M	2	1
	iv	Applications of the Optimal merge pattern.	1M	2	1
	v.	Distinguish prim's and kruskal's algorithm	1M	3	2
	vi	What does Floyd's Algorithm do?	1M	3	1
	vii.	Define Branch and Bound.	1M	4	1
	viii.	What are the features of Backtracking.	1M	4	1
	ix.	When is a problem said to be NP Hard?	1M	5	1
	x.	Define reducibility.	1M	5	1
Q.2(A)		In what way amortized analysis is used for performance analysis of algorithms? Explain?	10M	1	1
		OR			
Q.2(B)		T(n)=aT(n/b)+f(n). Simplify this recurrence relation in terms h(n) and u(n) functions to find out the time complexities?	10M	1	3
Q.3(A)		Consider A1=5X4, A2=4X6, A3=6X2, A4=2X7.P1=5, P2=4, P3=6, P4=2, P5=7 and Apply matrix chain multiplication.	10M	2	3
		OR			
Q.3(B)		Write an algorithm to Longest Common Subsequence using Dynamic Programming with example?	10M	2	2
Q.4(A)		Write in detail about Topological sort. Give example to it?	10M	3	1
		OR			
Q.4(B)		Find the optimal Huffman code for the following set of frequencies. A:45, B:13, C:12, D:16, E:9, F:5	10M	3	3
Q.5(A)		Discuss the 4 – queen's problem. Draw the portion of the state space tree for n using backtracking algorithm?	10M	4	2
		OR			
Q.5(B)		Generate FIFO branch and bound solution for the given knapsack problem. m = 15, n = 3. (P1 P2 P3) = (10, 6, 8) (w1 w2 w3) = (10, 12, 3)	10M	4	3
Q.6(A)		What does NP and NP-hard mean? Demonstrate approximation algorithm for NP and NP hard problem?	10M	5	1
		OR			
O.6(B)		Describe the Polynomial time Approximation.	10M	5	1

*** END***