MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations -JULY 2022
STRUCTURAL ANALYSIS - I
(Civil Engineering)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	Define fixed and continuous beams	1M	1	1
	ii.	How many point of contraflexures does a fixed beam has?	1M	1	1
	iii.	Write procedure for analyzing the continuous beam using slope deflection method	1M	2	1
	iv	Sum of distributional factors at a joint is ------	1M	2	1
	v.	Write expression for strain energy due to bending?	1M	3	1
	vi	Write one application of Influence Line Diagram.	1M	3	1
	vii.	Draw the influence line diagram for SF and BM at a section	1M	4	1
	viii.	Mention the practical applications of influence lines	1M	4	1
	ix.	Differentiate between the cable and arch.	1M	5	1
	x.	What is meant by theoretical arch?	1M	5	1

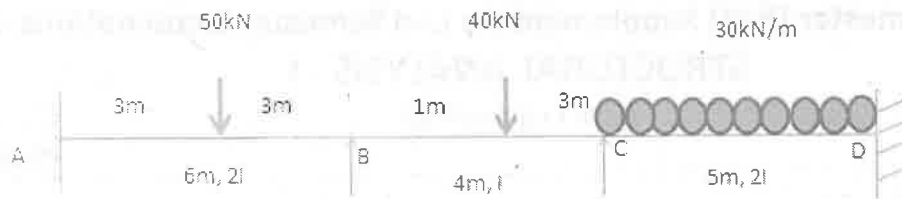| Q.2(A)	A fixed beam AB of span 7m is carrying a UDL of 7kN/m over the left half of the span. Find the fixed end moments, support reactions and draw SFD and BMD.	10M	2	5

OR

Q.2(B)	A continuous beam ABCD 15m long is simply supported at A, B, C and D. The beam consists of spans AB, BC and CD of lengths 5m, 5m, and 5m respectively. It carries a point load of 60kN on the span AB at a distance of 2m from A, a load of 40kN on the span BC at a distance of 3m from B and a UDL of 25kN/m on the span CD. Find the support moments, reactions and draw BMD.	10M	3	6

Q.3(A)	Analyse the continuous beam shown below using slope deflection method	10M	2	6
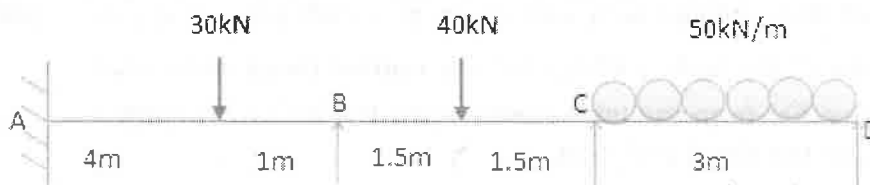
Q.3(B) Analyse the continuous beam shown below using moment distribution   10M   3   5
method

50kN   40kN   30kN/m

```
       3m        3m        1m       3m   oooooooooooo
   A |_____↓_____|_____↓_____|============| 
     |       6m, 2I    |B     4m, I      |C  5m, 2I  D|
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Q.4(A) Derive the expression for Castigliano's first theorem.   10M   2   3

OR

Q.4(B) Find the horizontal and vertical deflections of the joint C of a pin jointed   10M   5   1
truss shown below. Area of members are AB=350mm² and
AC=BC=500mm². Take E=3x10⁵N/mm².

25kN

```
        ↓
       /\        ↑
      /  \       6m
     /    \      ↓
    /_____\
      10m
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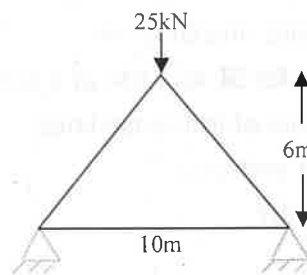
Q.5(A) Two wheel loads of 30kN and 40kN spaced at 4m apart cross a girder of   10M   5   2
12m span from left to right. Find maximum SF and BM at a section 6m
from left support.

OR

Q.5(B) A system of moving loads shown in the figure below crosses from left to   10M   5
right a girder of 36m span simply supported at its ends. (i) Determine the
maximum BM in the girder, (ii) Absolute maximum bending moment.

50kN   100kN   200kN   100kN   150kN

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 ↓      3m    ↓   4.5m   ↓    4m     ↓     3.5m      ↓
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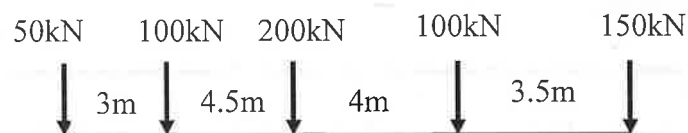
Q.6(A) The equation of three hinged arch with origin at its left support is $y =$ 10M   4   4
$x - \frac{x^2}{40}$. The span of the arch is 40m. Find the normal thrust and radial
shear at a section 5m from the left support when the arch is carrying a
UDL of 3 kN/m for the left of half span.

OR

Q.6(B) Determine the tension in each segment of the cable shown in the figure below. Also, find what is the dimension h?   10M   4   6
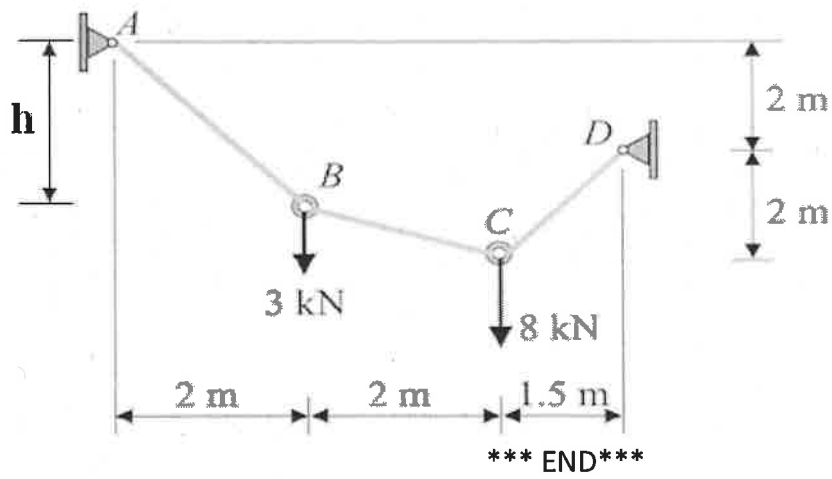
Question Paper Code: 18CE110

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022
WATER RESOURCES AND IRRIGATION
(Civil Engineering)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	Define Catchment Yield?	1M	3	1
	ii.	Define Gross Irrigation Requirement	1M	2	1
	iii.	Give an example of fixed module outlet of canal.	1M	2	1
	iv	What is Low Gravity Dam?	1M	4	1
	v.	What is Silt Ejector?	1M	3	1
	vi	What is Aqueduct?	1M	3	1
	vii.	What is Trap Efficiency?	1M	4	1
	viii.	What is Density current in reservoir sedimentation?	1M	4	1
	ix.	What is load factor of a hydropower plant?	1M	5	1
	x.	Write an example of Impulse Turbine?	1M	5	1

Q.2(A)	Discuss about various types of irrigation methods used in the field	10M	1	1
	OR			
Q.2(B)	(i) What are the ill effects of salinity and alkalinity in soil?	2M	1	1
	(ii) What are the various methods of soil reclamation?	8M	1	1

Q.3(A)	(i) How to fix location of a canal fall?	2M	2	2
	(ii) List different types of canal falls and explain any three with neat sketches.	8M	2	1
	OR			
Q.3(B)	Design a canal to carry a discharge of 60 cumecs using Kennedy's theory. Assume necessary values.	10M	2	5

Q.4(A)	Draw a neat sketch of a barrage, label the components and discuss each of them.	10M	3	1
Q.4(B)	(i) What are the various types of reservoirs available?	5M	3	1
	(ii) Draw a neat sketch of a reservoir and indicate different zones of storage. Write in brief about them.	5M	3	1

Q.5(A)	Discuss different types of Earthen Dams with help of neat sketches.	10M	4	1
	OR			
Q.5(B)	What are the different forces acting solid gravity dam? Explain in brief	10M	4	1

Q.6(A) Classify and write in brief about different types of hydropower plants based on scheme and head? 10M 5 2

OR

Q.6(B) The load on a hydel plant varies from a minimum of 10,000 kW to a maximum of 35,000 kW. Two turbo generators of capacities 22,000 kW each have been installed. Calculate: 10M 5 5
      (i)   Total installed capacity of the plant
      (ii)   Plant factor, maximum demand
      (iii)   Load factor
      (iv)   Utilization factor

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations -JULY 2022
GEOTECHNICAL ENGINEERING
(Civil Engineering)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
	i.				
Q.1	ii.	Write the major type of soils found in India?	1M	1	1
	iii.	Define shrinkage limit	1M	1	1
	iv.	Write the relationship between bulk unit weight, G_s, e, w and Υ_w	1M	2	1
	v.	Explain About metamorphism of rock	1M	2	1
	vi.	Write short note on organic soils	1M	3	1
	vii.	Which test is suitable for the field problem where there is a chance of sudden drawdown (that occurs in earth dam or canal embankment)	1M	3	1
	viii.	If you pour a sand on the ground, the angle made by the sand with respect to the horizontal is called as …….	1M	4	1
	ix.	What do you mean by factor of safety	1M	4	1
	x.	Write the number of methods are available to analyze the F.S in embankment dams	1M	5	1
	xi.	Write the relation between the factor of safely and Taylor's stability number Sn	1M	5	1
Q.2(A)	(i) Differentiate between 'residual' and 'transported' soils. (II)What do you mean by Liquid Limit ? Explain (III) List and explain the major type of soils found in India?	10M	1	2

OR

| Q.2(B) | A sample of saturated soil has a water content of 35%. The specific gravity of solids is 2.65. Determine its void ratio, porosity, saturated unit weight and dry unit weight. | 10M | 1 | 3 |

| Q.3(A) | Compute the total, effective and pore pressure at a depth of 15 m below the bottom of a lake 6 m deep. The bottom of the lake consists of soft clay with a thickness of more than 15 m. The average water content of the clay is 40% and the specific gravity of soils may be assumed to be 2.65. | 10M | 2 | 3 |

OR

| Q.3(B) | The discharge of water collected from a constant head permeameter in a period of 15 minutes is 500 ml. The internal diameter of the permeameter is 5 cm and the measured difference in head between two gauging points 15 cm vertically apart is 40 cm. Calculate the coefficient of permeability. If the dry weight of the 15 cm long sample is 4.86 N and the specific gravity of the solids is 2.65, calculate the seepage velocity. | 10M | 2 | 3 |

		10M	3	3

Q.4(A)   A simple of dry sand is subjected to a triaxial test. The angle of internal friction is 37 degrees. If the minor principal stress is 200 kPa, at what value of major principal stress will the soil fail?   **10M   3   3**

OR

Q.4(B)   (I) Explain the Mohr-Coulomb strength envelope   **10M   3   3**
(II) Explain the principle of the direct shear test. What are the advantages of this test ?

Q.5(A)   Explain about Mechanism of compaction.   **10M   4   2**

OR

Q.5(B)   (I)What are the assumptions made in Terzaghi's One dimensional consolidation?   **10M   4   2**
(II) In a consolidation test the following results have been obtained when the load was changed from 50kN/m2 to 100kN/m2, the void ratio changed from 0.70 to 0.65. Determine the coefficient of volume decrease mv and the compression index Cc.

Q.6(A)   Explain in detail about different types of foundation and how to find the location and depth of foundation.   **10M   5   3**

OR

Q.6(B)   What do you mean by shallow and deep foundations and explain about IS formula to find the bearing capacity of soil.   **10M   5   2**

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech. III Year I Semester (R18) Supplementary End Semester Examinations: JULY 2022
AIR POLLUTION AND SOLID WASTE MANAGEMENT
(Civil Engineering)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	Define air pollution?	1M	1	1
	ii.	What are the characteristics of air pollutants?	1M	1	1
	iii.	How do you differentiate between cyclone separator and a ESP?	1M	2	1
	iv	What is adsorption? Give an example for adsorbent?	1M	2	1
	v.	What are the factors influences on MSW generation?	1M	3	1
	vi	How does solid waste management contribute to environmental protection?	1M	3	1
	vii.	What is segregation? Why it is important?	1M	3	1
	viii.	What is a hazardous waste?	1M	4	1
	ix.	What is the hazardous solid waste management rule?	1M	4	1
	x.	What are the sources of E-waste?	1M	5	1
Q.2(A)		Explain the properties and composition of atmospheric air?	10M	1	5
		OR			
Q.2(B)		How to estimate the air quality index of a city? Explain in detail	10M	1	4
Q.3(A)		Why the air pollution control acts are required? Explain the air pollution control policy of India?	10M	2	5
		OR			
Q.3(B)		What are the roles and functions of air pollution control authorities? Constituted by the APC act 1981?	10M	2	1
Q.4(A)		Name the factors affecting the quantity of MSW generation? Explain the characteristics of MSW?	10M	3	2
		OR			
Q.4(B)		How to handle the leachate? Explain the design and construction of a landfill?	10M	3	3
Q.5(A)		i. How does the hazardous pollution occur?	5M	4	1
		ii. Explain the process of hazardous waste management?	5M	4	1
		OR			
Q.5(B)		Explain the processing and disposal of hazardous wastes?	10M	4	2
Q.6(A)		Discuss about the various benefits of construction and demolition wastes in the developmental projects?	10M	5	6
		OR			
Q.6(B)		What is E – waste? Explain the reuse, recycle and recovery of plastic waste generated from various activities in the construction industry?	10M	5	1

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022
ENGLISH COMMUNICATION: READING AND WRITING
(Common to CE, EEE, ECE)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	How can you define a discourse?	1M	1	1
	ii.	"It is good to scan a story if you want to read it quickly.." True or False	1M	1	3
	iii.	When does a reader make a prediction of the text?	1M	2	4
	iv	When a reader makes conclusions based on what he/she knows outside of the text using the information given in the text, it is called .... (a)Analysis (b)Prediction (c)Inference (d)Evaluation	1M	1	2
	v.	Which of the following is NOT a part of skimming? a) Focus on highlighted parts b) Move rapidly through the pages. c) Look for specific information d) Read the headings, sub-headings, etc.	1M	2	2
	vi	Define the term brainstorming	1M	5	3
	vii.	How can we find out the intended audience? Write any two points	1M	3	5
	viii.	What are the figures that can be used in academic texts?	1M	4	3
	ix.	Mention any two advantages of using visuals in texts.	1M	3	3
	x.	,,,,,,,,,,,,,,,,,,,,,,,, is an important step to complete before outlining the major points needed to create a well-organized essay. a) Preview, b) Brainstorming, C) Predicting, d) R b)	1M	5	1
Q.2(A)		**Read the passage and answer the following questions:**	7M	1	5

An upsurge of new research suggests that animals have a much higher level of brainpower than previously thought. If animals do have intelligence, how do scientists measure it? Before defining animals' intelligence, scientists defined what is not intelligence. Instinct is not intelligence. It is a skill programmed into an animal's brain by its genetic heritage. Rote conditioning is also not intelligence. Tricks can be learned by repetition, but no real thinking is involved. Cuing, in which animals learn to do or not to do certain things by following outside signals, does not demonstrate intelligence. Scientists believe that insight, the ability to use tools, and communication using human language are all effective measures of the mental ability of animals.

When judging animal intelligence, scientists look for insight, which they define as a flash of sudden understanding. When a young gorilla could not reach fruit from a tree, she noticed crates scattered about the lawn near the tree. She piled the crates into a pyramid, then climbed on them to reach her reward. The gorilla's insight allowed her to solve a new problem without trial and error.

The ability to use tools is also an important sign of intelligence. Crows use sticks to pry peanuts out of cracks. The crow exhibits intelligence by showing it has learned what a stick can do. Likewise, otters use rocks to crack open crab shells in order to get at the meat. In a series of complex moves, chimpanzees have been known to use sticks and stalks in order to get at a favorite snack—termites. To make and use a termite tool, a chimp first selects just the right stalk or twig. He trims and shapes the stick, then finds the entrance to a termite mound. While inserting the stick carefully into the entrance, the chimpanzee turns it skillfully to fit the inner tunnels. The chimp attracts the insects by shaking the twig. Then it pulls the tool out without scraping off any termites. Finally, he uses his lips to skim the termites into his mouth

Many animals have learned to communicate using human language. Some primates have learned hundreds of words in sign language. One chimp can recognize and correctly use more than 250 abstract symbols on a keyboard. These symbols represent human words. An amazing parrot can distinguish five objects of two different types. He can understand the difference between the number, color, and kind of object. The ability to classify is a basic thinking skill. He seems to use language to express his needs and emotions. When ill and taken to the animal hospital for his first overnight stay, this par-rot turned to go. "Come here!" he cried to a scientist who works with him. "I love you. I'm sorry. Wanna go back?"

The research on animal intelligence raises important questions. If animals are smarter than once thought, would that change the way humans interact with them? Would humans stop hunting them for sport or survival? Would animals still be used for food, clothing, or medical experimentation? Finding the answer to these tough questions makes a difficult puzzle even for a large-brained, problem-solving species like our own.

(i) 'An upsurge of new research suggests that animals have a much higher level of brainpower than previously thought.' – The word 'upsurge most nearly means ....
   a) an increasingly large amount
   b) an amount which cannot be measured
   c) a very small amount
   d) none of these

(ii) In which paragraph does the following inference occur :

   Research showing higher animal intelligence may fuel debate on ethics and cruelty.

(iii) Say whether the following sentence is true or false
      Cuing demonstrates animal intelligence

(iv) What conclusion do you arrive at from the example of chimpanzee?

3M   1   6

(v) In what sense do the scientists understand the word 'insight'?

(vi) What are the ways of measuring the intelligence of the animals?

(vii) Do you think animals can communicate using human language? Give one example.

(viii) Do you think animals are as intelligent as human beings? Justify your answer in three or four sentences.

OR

Q.2(B)   What is reading and what are the techniques in which reading comprehension can be enhanced?   10M   1   5

Q.3(A)   **Choose the most appropriate collocations.**   10M   2   3

The book *The Eye of the Universe* (a)......... (draws/ explains) an analogy1 between the birth of the universe and a lottery. It also draws parallels between the formation of new stars and the birth and death of flowers. It (b).........(makes/ presents) the case for a complete rethinking of how we understand space. The author, Patrick Rivaux, puts (c)...........(forward/ on) the argument that the universe is as it is because we humans are here looking at it. The author takes (d) .... (on/up) the position that the universe cannot have any beginning or end, and states his opinion that we can never understand the universe using the human ideas of time and space. He argues (d)......... (deliberately/convincingly) that the universe has a (f) .... (unique/ particular) nature. He (g)..........(pays/ draws) attention to new research which suggests the (h) ....(possible/ possibility) of the existence of other universes. He (i) ,,,,,,,,,,,,·············,,,,,,(brief/briefly) summarises the views of leading physicists and mathematicians, (j) ....(agrees/disagrees) profoundly with some of them and draws the conclusion that science alone cannot solve the mystery of the universe

OR

Q.3(B)   Interpret the picture in your own way and write a paragraph about it. Give a title to the picture.   10M   2   6

Q.4(A)   The paragraphs that make up any essay fall into three categories: introduction, body, and conclusion. Explain   10M   3   4

OR

Q.4(B)   You might have visited many places of importance. Describe any place you have visited in the form of a travelogue. You may include : vivid description of the place , your thoughts and feelings, cultural background of the place, interaction with locals, etc.   10M   3   6

Q.5(A) The process of making cement is described here. Prepare a flow chart ba sed on this   10M   4   5
description.
The two raw materials used in the process are limestone and clay. Limestone is crushed, sized, dried and stored in storage silos. In the same way, Clay is washed, crushed, and dried in storage basins. The two materials are mixed in the correct proportion and ground in a tube mill (This mixture is known as slurry) and stirred in a correcting basin. It is then stored in a storage tank. From there, it is fed into the rotary kiln where it is burnt at a high temperature of 1000 to 1700°C. Here clinkers are formed which are sent to a cooler, to be cooled. At this stage, Gypsum is added to the clinker and this mixture is powdered. The powdered mixture is the finished product, cement, and it is sent to the storage silos ready for distribution.

OR

Q.5(B) Here are a few words related to Science and Technology academic vocabulary .Use   10M   4   5
them in sentences of your own,
1) Indicate, 2) strategy, 3) verify, 4) incorporate, 5) procedure, 6) current, 7) impact, 8) perspective, 9) potential, 10) implication

Q.6(A) While writing an essay, we consider the audience, tone, purpose and content. Write an   10M   5   6
essay about how these features contribute to essay writing.

OR

Q.6(B) The following figure shows the data of road traffic deaths in India- 1970 through 2018   10M   5   5
(Source: NCRB 2015 & Transport Research Wing, 2019).. Analyze the data and summarise the information by selecting and reporting the main features. Make comparisons where relevant.Make sure you make use of academic verbs..
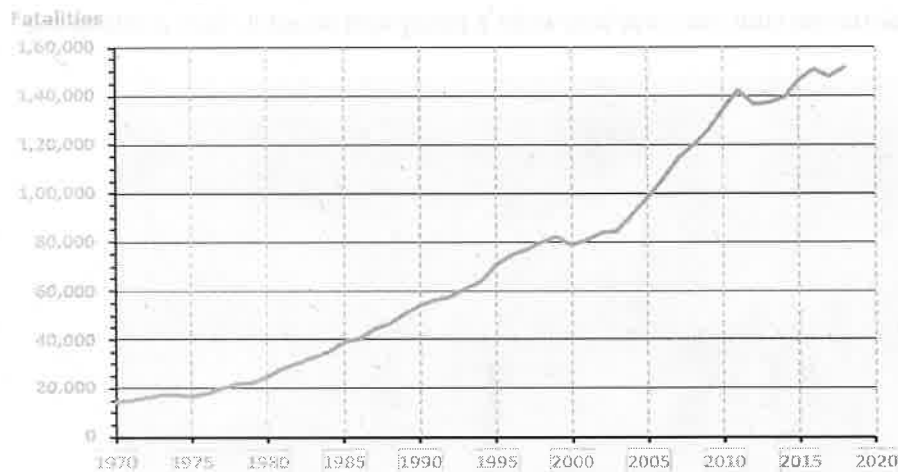
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MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech. III Year I Semester (R18) Supplementary End Semester Examinations – July 2022
POWER SYSTEMS – I
(EEE)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	Define load curve.	1M	1	1
	ii.	Draw the schematic diagram of electrical power system network.	1M	1	2
	iii.	Write the expression for inductance for 1-phase two wire system.	1M	2	1
	iv	What do you mean by transposition?	1M	2	1
	v.	Draw the phasor diagram of short transmission line.	1M	3	2
	vi	What do you understand by surge impedance of line? Also give its mathematical expression.	1M	3	1
	vii.	Give the mathematical expression of critical visual disruptive voltage (in kilo volt RMS)	1M	4	1
	viii.	Define sag in the transmission line? Where it is maximum between two supports at same level?	1M	4	1
	ix.	What do you mean by current source inverter?	1M	5	1
	x.	Draw the power curve of a wind turbine.	1M	5	2

Q.2(A)	From a load duration curve, the following data are obtained: Maximum demand on the system is 20 MW. The load supplied by the two units is 14 MW and 10 MW. Unit No. 1 (base unit) works for 100% of the time, and Unit No. 2 (peak load unit) only for 45% of the time. The energy generated by Unit 1 is 1×10^8 units, and that by Unit 2 is 7.5×10^6 units. Find the load factor, plant capacity factor and plant use factor of each unit, and the load factor of the total plant.	10M	1	3

OR

Q.2(B)	Draw a neat schematic diagram of a hydro-electric plant and explain the functions of various components.	10M	1	2

Q.3(A)	Find the inductive reactance in ohms per kilometer at 50 Hz of a three-phase bundled conductor line with two conductors per phase as shown in figure. All the conductors are ACSR with radii of 1.725 cm.	10M	2	3
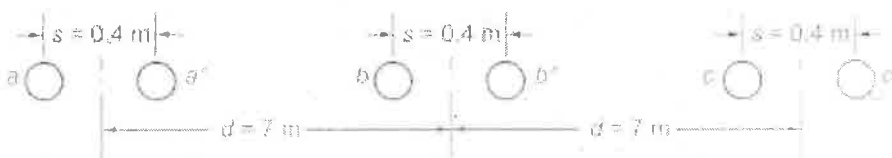
| Q.3(B) | Deduce an expression for line to neutral capacitance for a 3-phase overhead transmission line when the conductors are (i) symmetrically placed (ii) unsymmetrically placed but transposed | 10M | 2 | 2 |

| Q.4(A) | Draw the nominal-T circuit and corresponding phasor diagram of a medium length transmission line. Also, determine the ABCD constants and prove that AD-BC = 1. | 10M | 3 | 3 |

OR

| Q.4(B) | Determine the voltage, current and power factor at the sending end of a 3 phase, 50 Hz, overhead transmission line 160 km lone delivering and load of 100 MVA at 0.8 pf lagging and 132 kV to a balanced load. Resistance per km is 0.16 Ω, inductance per km is 1.2 mH and capacitance per km is 0.0082 μF. Use nominal Π method. | 10M | 3 | 3 |

| Q.5(A) | Explain in detail the different methods of improving the string efficiency. | 10M | 4 | 2 |

OR

| Q.5(B) | Deduce an approximate expression for sag in overhead lines when
(i) supports are at equal levels
(ii) supports are at unequal levels. | 10M | 4 | 2 |

| Q.6(A) | List and explain various types of HVDC systems | 10M | 5 | 2 |

OR

| Q.6(B) | Discuss the I-V and P-V characteristics of a solar panel. | 10M | 5 | 2 |

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

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

POWER ELECTRONICS

(EEE)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	List out the important types of diodes.	1M	1	1
	ii.	Why IGBT is very popular nowadays?	1M	1	1
	iii.	In a single phase full wave controlled bridge rectifier, at what firing angle maximum output voltage is obtained?	1M	2	2
	iv	Write the relationship between firing angles of converter 1 and converter 2 of a dual converter.	1M	2	1
	v.	List out the classification of choppers depending upon the direction of the output current and voltage.	1M	3	1
	vi	Define duty ratio of a DC-DC converter.	1M	3	1
	vii.	List out the industrial applications of an inverter.	1M	4	1
	viii.	Define modulation index?	1M	4	1
	ix.	What does ac voltage controller mean?	1M	5	1
	x.	List some industrial applications of cycloconverter.	1M	5	1

Q.2(A)	Describe all the turning ON possibilities of a SCR. Also, highlight the best method of turning ON with proper reason.	10M	1	2
	OR			
Q.2(B)	Explain the constructional details and working of a power MOSFET. Also, enlighten the steady-state characteristics of it.	10M	1	2

Q.3(A)	With necessary circuit and waveforms, explain the working of single phase full controlled bridge rectifier feeding R-L load in continuous and discontinuous current mode of operation. Also, derive the expression for the average output dc voltage.	10M	2	2
	OR			
Q.3(B)	Explain the working of a 3-phase full bridge converter feeding highly inductive load with its output voltage waveforms for a firing angle of (a) 30^0 (b) 60^0 (c) 90^0. Also derive the expression for the average output DC voltage.	10M	2	2

Q.4(A)	Describe the working principle of Boost converter with relevant waveforms in CCM and DCM. Also, derive an expression for the output voltage in terms of input voltage and duty cycle.	10M	3	2

Q.4(B)	Describe the working principle of flyback converter with relevant waveforms. Also, derive an expression for the output voltage in terms of input voltage and duty cycle.	10M	3	2

Q.5(A)	List out various voltage control methods of an inverter. Explain SPWM technique used in singe-phase inverter.	10M	4	2

OR

Q.5(B)	With the help of neat circuit diagram and waveforms, explain briefly the operation of a three-phase bridge inverter with resistive load in 180^0 conduction mode.	10M	4	2

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

OR

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

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022
MICROCONTROLLERS AND INTERFACING
(EEE)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	What is CISC and RISC processors?	1M	1	1
	ii.	Define interrupt.	1M	1	1
	iii.	What is program counter.	1M	2	2
	iv	What is the function of T0 pin in 8051?	1M	2	1
	v.	What is linker?	1M	3	1
	vi	Explain following instruction. SWAP A	1M	3	1
	vii.	Define linear decoding.	1M	4	1
	viii.	What is the function of Chip select pin?	1M	4	1
	ix.	What is watchdog timer?	1M	5	1
	x.	Write down one application of USART.	1M	5	1
Q.2(A)		Explain the Architecture of 8085 microprocessor with neat, labeled diagram.	10M	1	2
		OR			
Q.2(B)		Discuss the register organization of 8085 microprocessor.	10M	1	2
Q.3(A)		Explain the Architecture of 8051 microcontroller with neat labeled diagram.	10M	2	2
		OR			
Q.3(B)		List the SFRs and the operations associated with following functions in 8051 microcontroller. a. Timer/counter and b. Interrupts	10M	2	3
Q.4(A)		Explain different Addressing Modes of 8051 Microcontroller with proper examples.	10M	3	2
		OR			
Q.4(B)		Explain different types of Logical Instructions used in 8051 microcontroller with proper example.	10M	3	2
Q.5(A)		Draw and explain interfacing diagram of DAC with 8051 microcontroller.	10M	4	2
		OR			
Q.5(B)		Design a Microcontroller system using 8051. Interface the external RAM of size 16k x 8.	10M	4	6
Q.6(A)		Draw and explain interfacing diagram of stepper motor with 8051 microcontroller and write a program to run the motor in clock wise direction.	10M	5	3
		OR			
Q.6(B)		Discuss the peripherals features of PIC microcontroller.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech. III Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022
SPECIAL ELECTRICAL MACHINES
(EEE)

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

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

			Marks	CO	BL
Q.1	i.	Define detent torque.	1M	1	1
	ii.	What do you mean by resolution of a stepper motor?	1M	1	1
	iii.	What is synchronism in stepper motor?	1M	2	1
	iv	Why rotor teeth are made salient in VR Step motor?	1M	2	1
	v.	Name two rotor position sensing scheme used in switched reluctance motor.	1M	3	1
	vi	In which speed operation of switched reluctance motor, di/dθ is high?	1M	3	2
	vii.	Fill in the blank: Flux linkage (ψ) ÷ Current (i) = ...	1M	4	2
	viii.	Define recoil line.	1M	4	1
	ix.	Write some applications of permanent magnet synchronous motor.	1M	5	1
	x.	Name different rotor structure in permanent magnet synchronous motor.	1M	5	1
Q.2(A)		With a suitable schematics and truth tables for switching the phase sequences, explain full step and half step mode operation for a stepper motor. Also, discuss about micro stepping mode of operation.	10M	1	2
		OR			
Q.2(B)		i) Find the resolution of a stepper motor that is to be operated at an input pulse frequency of 6000 pulses/sec and travel a distance of 1800 on 0.025 second.	5M	1	3
		ii) A stepper motor has 40 stator teeth and 50 rotor teeth. Find (a) Step angle, (b) Resolution, (c) Number of steps required for 100 revolutions, (d) Shaft speed if the stepping frequency is 5000 pulses per second.	5M	1	3
Q.3(A)		Briefly, explain the dynamic characteristics of a variable reluctance stepper motor.	10M	2	2
		OR			
Q.3(B)		Derive the per phase torque equation of a variable reluctance stepper motor.	10M	2	2
Q.4(A)		Describe sensorless control of switched reluctance motor using appropriate block diagram.	10M	3	2
		OR			
Q.4(B)		With suitable schematic diagrams, explain the operation of any three converter circuit used in switched reluctance motor drive.	10M	3	2

Q.5(A)	Considering a suitable BLDC square wave motor with 1800 magnet arc, Discuss its operation with neat waveforms of corresponding flux density, flux linkage, current & voltages.	10M	4	3
	OR			
Q.5(B)	How do you classify BLDC motors? Explain.	10M	4	2

Q.6(A)	Derive the torque equation of permanent magnet synchronous motor. Draw its phasor diagram.	10M	5	2
	OR			
Q.6(B)	Explain in detail the vector control of permanent magnet synchronous motor.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech. III Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022
INDUSTRIAL ELECTRICAL 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 Part-A or B only**

			Marks	CO	BL
Q.1	i.	Draw the symbol for Fan, Relay, Push button and Lamp.	1M	1	1
	ii.	Draw the symbolic representation of any four circuit elements.	1M	1	1
	iii.	What are the different test conducted for testing of electrical wiring installation?	1M	2	1
	iv	Define Diversity factor.	1M	2	1
	v.	Define space to height ratio.	1M	3	1
	vi	Define specific consumption.	1M	3	1
	vii.	State different types on industrial substations.	1M	4	1
	viii.	What are the advantages of Power Factor correction	1M	4	1
	ix.	What does battery bank means?	1M	5	1
	x.	Sketch the diagram of basic PLC.	1M	5	1

		Marks	CO	BL
Q.2(A)	State the general requirement of Earthing and explain in detail the rod type Earthing with the help of neat diagram.	10M	1	2
	OR			
Q.2(B)	Draw the schematic and wiring diagram for a circuit in which a bell is to be operated from a 240 V a c supply by means of two push buttons situated at different places. The push buttons are required to be operated at 6 V dc. Use relays with NC contacts.	10M	1	3
Q.3(A)	State the reason why fuses are provided on the line wire and never on the neutral wire. Explain the concept of Diversity with the help of neat diagram.	10M	2	2
	OR			
Q.3(B)	State under what situations the following types of wiring are used. (a) cleat wiring, (b) Wood casing and Capping, (c) Batten wiring, (d) Surface Conduit Wiring and (e) Concealed Conduit wiring.	10M	2	2
Q.4(A)	With the help of neat sketch, explain the construction and operation of Incandescent lamp.	10M	3	2
	OR			
Q.4(B)	With the help of neat sketch, explain the construction and operation of LED.	10M	3	2

Q.5(A)	What is HT Connection and Explain in detail the material used for distribution line?	10M	4	2
	OR			
Q.5(B)	What is an industrial substation and Types of Industrial Substations? With the help of neat sketch, explain outdoor substation.	10M	4	2

Q.6(A)	Explain in detail about Power Factor Correction.	10M	5	2
	OR			
Q.6(B)	Explain about the electrical systems for elevators.	10M	5	2

*** END***

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

B. Tech III Year I Semester (R-18) Supplementary End Semester Examinations – JULY 2022

DESIGN OF MACHINE ELEMENTS
(Mechanical Engineering)

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

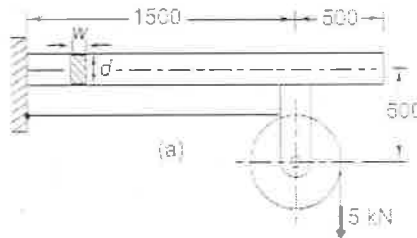> Attempt all the questions. All parts of the question must be answered in one place only.
> **All parts of Q.no 1 are compulsory. In Q.no 2 to 6 answer either Part-A or B only**

			Marks	CO	BL
Q.1	i.	What are different between static and dynamic loading.	1M	1	2
	ii.	What is a brittle material? Give its examples.	1M	1	2
	iii.	What is fatigue failure?	1M	2	2
	iv	What is stress concentration?	1M	2	2
	v.	What are different between bolt and screw?	1M	3	2
	vi	What is bolt of uniform strength?	1M	3	2
	vii.	What are permanent joints? Give their examples.	1M	4	2
	viii.	What are the difference between electric arc and gas welding process?	1M	4	2
	ix.	What is surge in springs?	1M	5	2
	x.	What is stiffness of spring?	1M	5	2

| Q.2(A) | Explain the sequential procedure of design of machine element with flow chart or diagram. | 10M | 1 | 3 |

OR

| Q.2(B) | A cantilever beam of rectangular cross-section is used to support a pulley as shown in Fig. 4.38 (a). The tension in the wire rope is 5 kN. The beam is made of cast iron FG 200 and the factor of safety is 2.5. The ratio of depth to width of the cross-section is 2. Determine the dimensions of the cross-section of the beam. | 10M | 1 | 3 |

| Q.3(A) | Write and explain theory of failures for static loading conditions | 10M | 2 | 3 |

OR

| Q.3(B) | A flat plate subjected to a tensile force of 5 kN is shown in Fig. The plate material is grey cast iron FG 200 and the factor of safety is 2.5. Determine the thickness of the plate. | 10M | 2 | 4 |
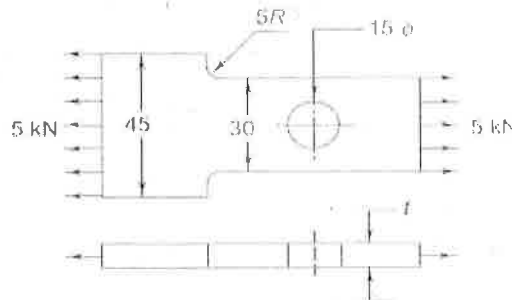
Q.4(A) A gearbox weighing 7.5 kN is provided with a steel eye bolt for lifting   10M   3   4
and transporting on the shop floor. The eyebolt is made of plain carbon
steel 30C8 (S_{yt} = 400 N/mm^2) and the factor of safety is 5. Determine the
nominal diameter of the eye bolt having coarse threads if, d_c = 0.8d
where d_c and d, are core and major diameters respectively.

OR

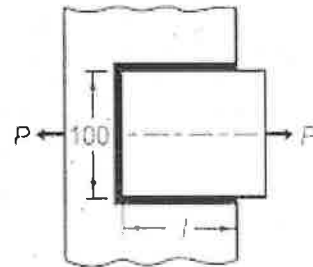Q.4(B) A steel plate subjected to a force of 5 kN and fixed to a channel by   10M   3   4
means of three identical bolts is shown in Fig. The bolts are made from
plain carbon steel 45C8 (Syt = 380 N/mm2) and the factor of safety is 3.
Specify the size of bolts.
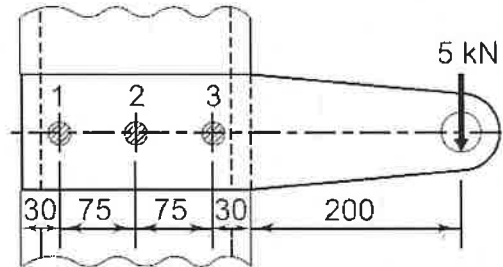
Q.5(A) 1. What is welding? Write advantages.   (4+6)M   4   3
2. A steel plate, 100 mm wide and 10 mm
thick, is joined with another steel plate by
means of single transverse and double
parallel fillet welds, as shown in Fig. The
strength of the welded joint should be
equal to the strength of the plates to be
joined. The permissible tensile and shear
stresses for the weld material and the
plates are 70 and 50 N/mm^2 respectively.
Find the length of each parallel fillet weld. Assume the tensile force
acting on the plates as static.

OR

Q.5(B) How much length of a 10 mm fillet weld is required to weld the long   10M   4   4
side of an ISA angle 150×75×10 to a steel plate with side welds only? A
static load of 125 kN acts through the centre of gravity of the angle
section which is 53.2 mm from the short side. The allowable load per
mm of the weld length is 665 N.
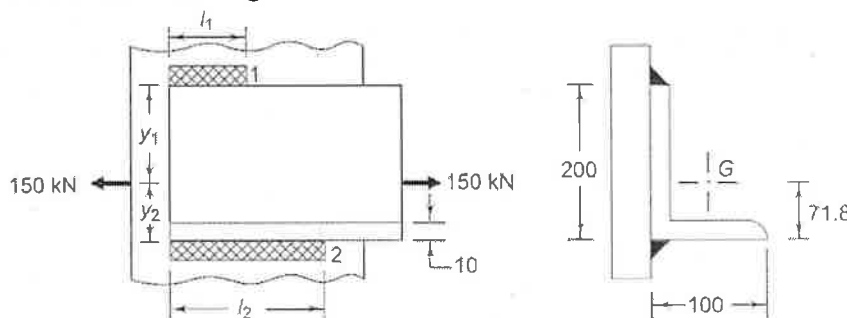
Q.6(A) A helical compression spring, made of circular wire, is subjected to an axial force, which varies from 2.5 kN to 3.5 kN. Over this range of force, the deflection of the spring should be approximately 5 mm. The spring index can be taken as 5. The spring has square and ground ends. The spring is made of patented and cold-drawn steel wire with ultimate tensile strength of 1050 N/mm^2 and modulus of rigidity of 81370 N/mm^2. The permissible shear stress for the spring wire should be taken as 50% of the ultimate tensile strength. Design the spring and calculate
(i) Wire diameter;
(ii) Mean coil diameter;
(iii) Number of active coils;
(iv) Total number of coils;
(v) Solid length of the spring;
(vi) Free length of the spring;
(vii) Required spring rate; and
(viii) Actual spring rate

10M   5   4

OR

Q.6(B) A semi-elliptic leaf spring used for automobile suspension consists of three extra full-length leaves and 15 graduated-length leaves, including the master leaf. The centre-to-centre distance between two eyes of the spring is 1m. The maximum force that can act on the spring is 75kN. For each leaf, the ratio of width to thickness is 9:1. The modulus of elasticity of the leaf material is 207000N/mm^2. The leaves are pre-stressed in such a way that when the force is maximum, the stresses induced in all leaves are same and equal to 450N/mm^2. Determine
(i) the width and thickness of the leaves;
(ii) the initial nip; and
(iii) the initial pre-load required to close the gap C between extra full-length leaves and graduated-length leaves.

10M   5   4

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations -JULY 2022
MANUFACTURING TECHNOLOGY
(Mechanical Engineering)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	What are the various types of chip breakers?	1M	1	1
	ii.	How do you define tool wear?	1M	1	1
	iii.	How is a shaping machine specified?	1M	2	1
	iv	List out the types of boring machine.	1M	2	1
	v.	Distinguish between dressing and truing.	1M	3	1
	vi	Define lapping.	1M	3	1
	vii.	What is the principle of Ultrasonic machining?	1M	4	1
	viii.	What are the applications of ECM?	1M	4	1
	ix.	Write down the formula for calculating the machining time per unit.	1M	5	1
	x.	List the main components of a NC machine tool.	1M	5	1
Q.2(A)		How is tool life affected by variations in the feed rate and depth of cut? Explain.	10M	1	3
		OR			
Q.2(B)		Show schematically the Merchant's force circle. Derive the expression for shear force in terms of the metal properties and cutting process parameters.	10M	1	2
Q.3(A)		List and explain various drilling operations with sketch.	10M	2	2
		OR			
Q.3(B)		List the various methods of indexing. Explain any two methods in detail.	10M	2	2
Q.4(A)		i) Explain the principle of grinding process. ii) Discuss various variables of grinding process.	10M	3	3
		OR			
Q.4(B)		Explain the following terms i) Dressing, ii) Truing, iii) Loading and iv) Glazing of a grinding wheel.	10M	3	3
Q.5(A)		With the help of neat sketch explain the process of electron beam machining. What are the merits and demerits of EBM?	10M	4	3
		OR			
Q.5(B)		With the help of neat sketch explain the process of electric discharge machining. What are the merits and demerits of EDM?	10M	4	3
Q.6(A)		List the main components of a CNC machine tool and explain their functions.	10M	5	2
		OR			
Q.6(B)		Derive the expression for determining the optimum cutting speed for minimum cost in turning operation.	10M	5	3

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Course Code: 18ME112

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

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

HEAT TRANSFER
(Mechanical Engineering)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	Define thermal conductivity.	1M	1	1
	ii.	What is overall heat transfer coefficient?	1M	1	2
	iii.	Define natural convection.	1M	2	2
	iv	Define Reynold's number.	1M	2	2
	v.	Define boundary layer.	1M	3	1
	vi	What is laminar flow?	1M	3	2
	vii.	Define nucleate boiling.	1M	4	2
	viii.	Write the LMTD formula to find mean temperature.	1M	4	2
	ix.	Define Planck's distribution law	1M	5	1
	x.	Define reflectivity in radiation.	1M	5	2

Q.2(A)	A hollow sphere, $r_1 = 4$ cm, $r_2 = 6$ cm, k = 20 W/mK, is electrically heated at the inner surface at a rate of 10^5 W/m^2. Heat is dissipated at the outer surface by convection to a fluid at 100 °C with h = 450 W/m^{2}K. Find the inner and outer surface temperatures of the sphere.	10M	1	3
	OR			
Q.2(B)	Derive the expression for heat conduction in cylindrical rod with internal heat generation.	10M	1	2

Q.3(A)	A 50 mm x 50 mm iron bar 0.4 m long is connected to the walls of two heated reservoirs each at 120 °C. The ambient air temperature is 35 °C and the convective heat transfer coefficient is 17.4 W/m^{2}K. Calculate the rate of heat loss from the bar and the temperature of the bar midway between the reservoirs. The thermal conductivity of iron is 52 W/mK.	10M	2	3
	OR			
Q.3(B)	Derive the expression to find performance and efficiency of fins.	10M	2	2

Q.4(A)	Water at 10 °C flows over a flat plate (at 90 °C) measuring 1 m x 1 m, with a velocity of 2 m/s. Properties of water at 50 °C are Density = 988.1 kg/m^3, viscosity = 0.556 x 10^{-6} m^2/s, Pr = 3.54 and k = 0.648 W/mK. Find (i) The length of plate over which the flow is laminar, (ii) the rate of heat transfer from the entire plate.	10M	3	3
	OR			
Q.4(B)	Derive the conservation equations of mass, momentum, and energy for laminar flow over a flat plate.	10M	3	2

Q.5(A)	In a solar-assisted air-conditioning system, 0.5 kg/s of ambient air at 270 K is to be preheated by the same amount of air leaving the system at 295 K. If a counterflow heat exchanger has an area of 30 m², and the overall heat transfer coefficient is estimated to be 25 W/m²K, determine the outlet temperature of the preheated air. Take cp for air as 1000 J/kgK.	10M	4	3

OR

Q.5(B)	With neat sketch explain the film wise condensation process.	10M	4	2

Q.6(A)	A black body emits radiation at 2000 K. Calculate (i) the monochromatic emissive power at 1 micrometer wavelength, (ii) wavelength at which the emission is maximum, (iii) the maximum emissive power.	10M	5	3

OR

Q.6(B)	Explain the following with equations: i. Planck's Law ii. Rayleigh-Jean's Law iii. Wien's Law iv. Wien's Displacement Law v. Stefan-Boltzmann Law	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech. III Year I Semester (R18) Supplementary End Semester Examinations: JULY 2022
PRODUCTION PLANNING & CONTROL
(Mechanical Engineering)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	List two main benefits of production planning and control.	1M	1	1
	ii.	Write about economics of new design.	1M	1	1
	iii.	What is meant by critical analysis of method study?	1M	2	1
	iv	State the techniques for work measurement.	1M	2	1
	v.	What is value analysis?	1M	3	1
	vi	What is product planning?	1M	3	1
	vii.	Define forecast errors.	1M	4	1
	viii.	What is master scheduling?	1M	4	1
	ix.	Define inventory.	1M	5	1
	x.	Briefly explain VED Analysis.	1M	5	1

Q.2(A)	What are the functions of production planning and control? Explain in detail.	10M	1	1
	OR			
Q.2(B)	What are the benefits of production planning and control? Explain the organization of production planning and control.	10M	1	1

Q.3(A)	Define method study? Explain different types of process chart symbols with examples.	10M	2	2
	OR			
Q.3(B)	Explain stop watch procedure for collecting time study data. Also explain various rating techniques with their mathematical expressions.	10M	2	2

Q.4(A)	State and elaborate the steps involved in process planning.	10M	2	1
	OR			
Q.4(B)	i) Explain about economic batch quantity with figure. ii) Find the economic batch quantity using the data given below: Set-up cost = Rs. 20 per set-up; Annual requirements or yearly consumption of parts = 1000; Inventory carrying cost = 10 % of value per year; Cost per part = Rs. 2.	10M	2	3

Q.5(A) Explain briefly dispatch rules involved in PPC.   10M   3   2

OR

Q.5(B) The following information gives the sales of the company for ten months. If   10M   4   3
the smoothing factor is 0.50 used, forecast the demand for November.

Month	Sales x 1000
January	920
February	1280
March	825
April	920
May	1025
June	840
July	1276
August	1440
September	1502
October	1250
November	????

Q.6(A) With flow chart explain applications of computers in PPC. What are the   5   3
advantages and disadvantages of computers in PPC?

OR

Q.6(B) XYZ Computer Company uses 1,000 transistors each month for its   10M   5   3
computers assembly. The unit cost of each transistor is INR 10, and the cost
of carrying one transistor in inventory for a year is INR 3. Ordering cost is
INR 30 per order. Compute:
a) The optimal order quantity.
b) The expected number of orders placed each year.
c) The expected time between orders. (Assume 200 working day per year)
*** END ***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – JULY 2022
FINITE ELEMENT METHODS
(Mechanical Engineering)

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

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

			Marks	CO	BL
Q.1	i.	Define the term finite element.	1M	1	1
	ii.	List two advantages of FEM.	1M	1	2
	iii.	What is a beam?	1M	2	1
	iv	Write the stiffness matrix of a truss element	1M	2	2
	v.	Define CST element?	1M	3	1
	vi	Difference between constant strain triable and linear strain triangle.	1M	3	2
	vii.	Define heat transfer.	1M	4	1
	viii.	Write down the basic differential equation for heat transfer equation?	1M	4	2
	ix.	Define Vibration?	1M	5	1
	x.	What are the different types of vibration	1M	5	2
Q.2(A)	i) With neat sketches, explain "element shapes". ii) Explain what are the steps involved in Galerkin's method.		10M	1	2
		OR			
Q.2(B)	Using Gauss elimination method, solve: $2x - y + 3z = 9$ $x + y + z = 6$ $x - y + z = 2$		10M	1	3
Q.3(A)	Derive the Shape function of 1D Quadratic Element in terms of Natural co-ordinates.		10M	2	3
		OR			
Q.3(B)	Consider the two-bar truss shown in the figure below.		10M	2	4

Q.3(B) (continued)

    I.   Determine the element stiffness matrix for each of the element
    II.   Assemble the structural stiffness matrix K for the entire truss
    III.   Stress in each element

Take $E=2\times10^5 N/mm^2$, $A_1=1200mm^2$, $A_2=1000mm^2$ & P=12KN
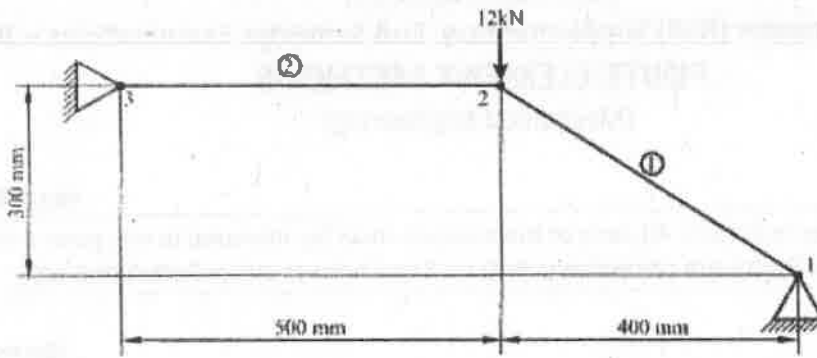
Q.4(A) Derive the Shape functions for constant strain triangular element.   10M   3   3

OR

Q.4(B) For a Triangular plate shown in figure compute the strain displacement   10M   3   4
relation matrix B using a two element CST mode
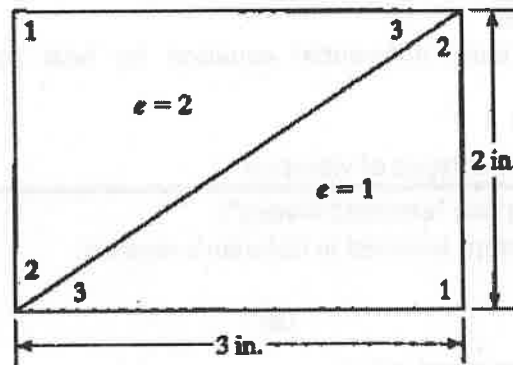
Q.5(A) Determine the temperature distribution through the composite wall   10M   4   4
subjected to connection heat loss on the right-side surface with
convective heat transfer coefficient shown in figure below. The ambient
temperature is -5^0 C.
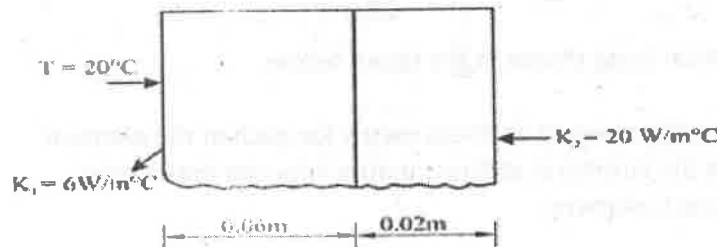
OR

Q.5(B) Define the Following terms   10M   5   2
    i)   Heat Flux
    ii)   Temperature gradient
    iii)   Thermal conductivity
    iv)   Convection heat transfer co-efficient

Q.6(A) Determine the eigen values and frequencies for the stepped bar shown in figure. 10M 5 4

$$E = 30 \times 10^{10} \, N/m^2$$
$$Sp. \, weight = 8500 \, kg/m^3$$

OR
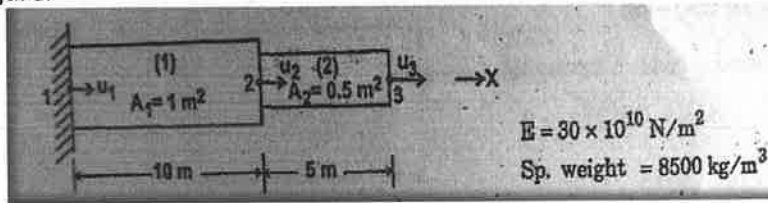
Q.6(B) Derive the expression for element mass matrix for one dimensional bar element. 10M 5 4

*** END ***

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

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

FLUID POWER SYSTEMS
(Mechanical Engineering)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	What is Specific gravity (SG)?	1M	1	1
	ii.	What is Tandem cylinder?	1M	1	1
	iii.	Give an example of a rotary type hydraulic actuator.	1M	2	1
	iv	What is the function of an after-cooler?	1M	2	1
	v.	Why Cylinder Cushions are important?	1M	3	1
	vi	What is the function of Directional control valve?	1M	3	1
	vii.	Define dew point.	1M	4	1
	viii.	Why air lubricator is used in a pneumatic circuit?	1M	4	1
	ix.	What are the desirable properties of the hydraulic oils?	1M	5	1
	x.	Explain the problems caused by gases in hydraulic fluids.	1M	5	2
Q.2(A)	(i)	Write the Advantages and disadvantages of non-positive displacement pumps	4M	1	2
	(ii)	A gear pump has an outside diameter of 90 mm, inside diameter of 60 mm and a width of 30 mm. If the actual pump rotates at 2000 RPM, what is the discharge of the pump?	6M	1	3

OR

Q.2(B)	A hydraulic motor has a volumetric displacement of 125 CC and a pressure rating of 150 bars. It receives a theoretical flow of oil of 0.0015 m^3/s from a pump. Find the motor: a) Speed b) theoretical torque c) theoretical power.	10M	1	3

Q.3(A)	(i) What are the functions of Directional control valve, pressure control valve and Flow control valves.	5M	2	1
	(ii) Describe the working principle of a 2-Way DCV (Normally Opened) with a neat sketch.	5M		

OR

Q.3(B)	How to control the single and double acting hydraulic cylinders. Explain the differences in between them. Also discuss about the retraction method, advantages and disadvantages for both of them.	10M	2	2

Q.4(A)	Explain the working procedure of a Double vane limited rotation actuator with a proper sketch.	10M	3	1

OR

Q.4(B)	Explain with a proper sketch how to control a double acting cylinder by a 4/2 direction control valve.	10M	3	1

Q.5(A)	Explain the cascading method. Consider 3 cylinders with control valves and assign cascading values for cylinder 1 as A+, B+. Cylinder 2 as B-,A-,C+ and Cylinder 3 as C-. Consider limit valves to indicate the end of strokes. Draw the motion and control diagram.	10M	4	1

OR

Q.5(B)	Explain the working procedure of air lubricator with a neat diagram.	10M	4	1

Q.6(A)	(i) What are various properties required for an ideal hydraulic fluid?	5M	5	2
	(ii) Discuss the importance of viscosity and lubricity of a hydraulic fluid.	5M	5	3

OR

Q.6(B)	(i) Explain the types of contamination and common sources of contamination in hydraulic systems.	5M	5	3
	(ii) Explain about the thermal control in hydraulic systems. Also Explain the effects of increase in working temperature of the hydraulic systems.	5M	5	3

*** END ***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – July 2022
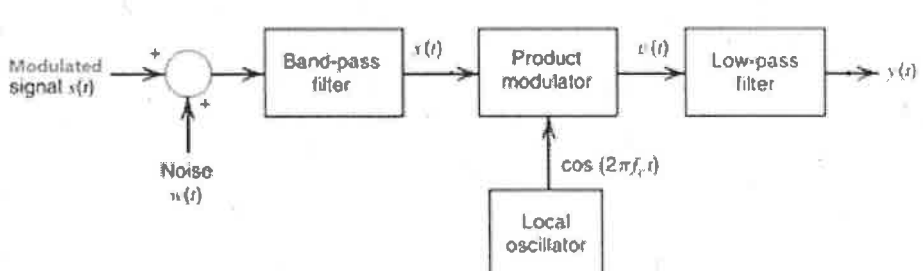# ANALOG AND DIGITAL COMMUNICATIONS
(ECE)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Why is AWGN noise model used in communication system design?	1M	1	1
	ii.	Define Figure of Merit in noise analysis of communication system.	1M	1	1
	iii.	List the elements of communication system.	1M	2	1
	iv	What is the maximum power efficiency of DSB-FC AM modulation system?	1M	2	1
	v.	Calculate the Nyquist rate for a 5 KHz telephone voice signal.	1M	3	3
	vi	What is quantization noise in PCM technique?	1M	3	1
	vii.	Write the expression of impulse response of matched filter.	1M	4	1
	viii.	Give the advantages of M-ary signaling scheme.	1M	4	1
	ix.	Define equalizer and its purpose.	1M	5	1
	x.	What are linear block codes?	1M	5	1
Q.2(A)		Describe the noise effects in FM system with relevant sketches and expressions.	10M	1	2

OR

Q.2(B)	The following model shown in Figure Q1 is used in an AM receiver. By **analyzing** the model:	10M	1	3

1. Identify the receiver type (coherent or non-coherent)
2. Assuming DSB-SC AM wave is received, sketch the power spectral density of the bandpass filter
3. Estimate the output, v(t), at the output of product modulator
4. Discuss the bandwidth requirement of the low pass filter

Determine the Figure of Merit and comment on it.

Q.3(A)	Explain the detection of AM signals using envelope detector.	10M	2	4

OR

Q.3(B)	Carrier wave of frequency of 1MHz with peak voltage of 20V is modulated by a signal of frequency 1kHz with peak voltage of 10V. Calculate out the following (i) Modulation index, μ. (ii) Frequencies of modulated wave. (iii) Bandwidth of modulated wave.	10M	2	3

| Q.4(A) | Illustrate the operation of TDM system with an example. | 10M | 3 | 4 |

OR

| Q.4(B) | Describe in detail the PCM technique with focus on the sampling rate, and signal to quantization noise ratio. | 10M | 3 | 2 |

| Q.5(A) | Demonstrate the effect of inter symbol interference on digital communication with suitable diagram and its explanations. | 10M | 4 | 6 |

OR

| Q.5(B) | Compare the polar and unipolar NRZ and RZ coding schemes with advantages and disadvantages. | 10M | 4 | 4 |

| Q.6(A) | Explain the convolutional coding and decoding process with the help of code tree. | 10M | 5 | 4 |

OR

| Q.6(B) | Consider a (6,3) linear block coder that accepts 3-bit binary message u=(u0,u1,u2) at the input and deliver a corresponding 6-bit code v=(v0,v1,v2,v3,v4,v5) at the output. If the generator matrix, G, of the coder is | 10M | 5 | 3 |

$$G = \begin{bmatrix} 1 & 0 & 0 & 1 & 1 & 0 \\ 0 & 1 & 0 & 0 & 1 & 1 \\ 0 & 0 & 1 & 1 & 0 & 1 \end{bmatrix}$$

i) Determine the parity-check matrix, H.
ii) Determine output code vector, v, for all possible message vector, u.
iii) Show the syndrome table showing all possible error pattern and the corresponding syndrome vector

If suppose [111000] is the code transmitted, and due noise in the channel the received code is corrupted as [111001], **show** how the code can detect and correct this error.

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 18ECE110

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – July 2022
DIGITAL SIGNAL PROCESSING
(ECE)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What are even and odd signals?	1M	1	1
	ii.	Enumerate the difference between time-variant and time-invariant system.	1M	1	2
	iii.	What is zero padding?	1M	2	1
	iv	What is DIT algorithm?	1M	2	1
	v.	State the structure of IIR filter.	1M	3	1
	vi	What are the advantages of FIR filters?	1M	3	1
	vii.	Mention the procedures for digitizing the transfer function of an analog filter.	1M	4	2
	viii.	List the design techniques of FIR filters?	1M	4	1
	ix.	What are the advantages of floating pint representation?	1M	5	1
	x.	Enumerate the advantage of Harvard architecture over Von Neumann architecture.	1M	5	2
Q.2(A)		Check the Stability of the following systems i) $y(n) = x(n) + \frac{1}{2} x(n-1) + \frac{1}{4} x(n-2)$ ii) $h(n) = 2^n u(n)$	10M	1	2
		OR			
Q.2(B)		Find the discrete convolution of the following sequences i) $x(n) = \{1, 2, -1, 1\}$ and $h(n) = \{1, 0, 1, 1\}$ ↑ ii) $\cos(\pi n/2)\ u(n)\ *\ (n-1)$	10M	1	2
Q.3(A)		Compute the DFTs of the sequence $x(n) = 2^{-n}$ where N = 8 using DIT algorithm.	10M	2	2
		OR			
Q.3(B)		Find the system function and the impulse response of the system described by the difference equation $y(n) = x(n) + 2x(n-1) - 4x(n-2) + x(n-3)$.	10M	2	2
Q.4(A)		Describe the sampling theorem in detail.	10M	3	3
		OR			
Q.4(B)		Realize the system described by the following difference equation in cascade and parallel form. $y(n) = -(13/12)\ y(n-1) - (9/24)\ y(n-2) - (1/24)\ y(n-3) + x(n) + 4x(n-1) + 3x(n-2)$	10M	3	2

Q.5(A) The desired frequency response of a lowpass filter is given below   4   3

$$H_d(\omega) = \begin{cases} e^{-j3\omega} & \text{for } -\pi/4 \leq \omega \leq \pi/4 \\ 0 & \text{for } \pi/4 \leq |\omega| \leq \pi \end{cases}$$

Obtain the filter coefficients h (ṅ) by using rectangular window.

OR

Q.5(B) Design a digital Butterworth filter for the following specifications using   10M   4   3
impulse invariant method.

$$0.8 \leq |H(\omega)| \leq 1 \qquad 0 \leq \omega \leq 0.2\,\pi$$
$$|H(\omega)| \leq 0.2 \qquad 0.32\,\pi \leq \omega \leq \pi$$

Q.6(A) Elaborate the architecture of TMS320C6713 floating point processor.   10M   5   3

OR

Q.6(B) What are the limitations of pipelining in Digital Signal Processor?   10M   5   2

*** END***

Hall Ticket No: [ ][ ][ ][ ][ ][ ][ ][ ][ ][ ]   Question Paper Code: 18ECE108

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

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

ARTIFICIAL INTELLIGENCE TOOLS, TECHNIQUES AND APPLICATIONS
(ECE)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Define Logic.	1M	1	1
	ii.	Distinguish between BFS and DFS	1M	1	4
	iii.	Define lemmatization.	1M	2	1
	iv	List out the two components of NLP?	1M	2	1
	v.	What is NLP in the cloud?	1M	3	1
	vi	Define thresholding.	1M	3	1
	vii.	Name the first step in Image Processing?	1M	4	1
	viii.	How to reduce the error in cost function?	1M	4	1
	ix.	List the applications of smart home.	1M	5	1
	x.	Define forward propagation?	1M	5	1
Q.2(A)		Discuss about an algorithm for detecting anomalies in given dataset.	10M	1	6
		OR			
Q.2(B)		Summarize about Supervised Learning Algorithm Linear Regression with an example.	10M	1	2
Q.3(A)		Explain about the Natural Language Understanding (phases/modules) with neat sketches.	10M	2	2
		OR			
Q.3(B)		Examine the elements and best practices needed to design a chatbot?	10M	2	4
Q.4(A)		Illustrate about spatial domain enhancement.	10M	3	2
		OR			
Q.4(B)		Define image segmentation? Explain.	10M	3	2
Q.5(A)		Explain the role of activation functions in a neural network with diagram.	10M	4	2
		OR			
Q.5(B)		Explain about the usage of back propagation algorithm in detail.	10M	4	2
Q.6(A)		Examine the artificial neural network for smart agriculture.	10M	5	4
		OR			
Q.6(B)		Outline about the smart agriculture using deep learning.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – July 2022
NETWORKS AND TRANSMISSION LINES
(ECE)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What are the different types of network elements?	1M	1	1
	ii.	Give some examples of linear and nonlinear network elements.	1M	1	1
	iii.	Write the cutoff frequency of constant k high pass filter.	1M	2	1
	iv	Draw T-section circuit for constant k -high pass filter.	1M	2	1
	v.	Define attenuator.	1M	3	1
	vi	Write the decibels measure equation of attenuation.	1M	3	1
	vii.	Transmission line theory is valid when circuit size in ranges of wavelengths. (True or False)	1M	4	1
	viii.	Circuit theory is valid when size of the circuit is much less than wavelength. (True or False)	1M	4	1
	ix.	What are the different types of line distortions?	1M	5	1
	x.	A transmission line with VSWR of 5 and characteristic impedance 50 Ω is terminated with a load impedance Z_L. Find the reflection coefficient and Z_L?	1M	5	2
Q.2(A)		Explain driving point functions, transfer functions and Properties of Driving Point Functions.	10M	1	3
		OR			
Q.2(B)		Derive the expression of Iterative Impedance of π- Network.	10M	1	3
Q.3(A)		Derive the characteristic impedance of symmetric π- network in the pass and stop bands.	10M	2	3
		OR			
Q.3(B)		Design a m-derived low pass filter having cut-off frequency of 1 kHz, design impedance of 400 Ω, and the resonant frequency 1100 Hz	10M	2	3
Q.4(A)		Derived design equations for bridged-T attenuator with suitable network.	10M	3	3
		OR			
Q.4(B)		Design a T-pad attenuator to give an attenuation of 80dB and to work in a line of 300Ω impedance.	10M	3	3
Q.5(A)		A distortion less line has Zo = 60 Ω, α = 20 mNp/m, u = 0.6c, where c is the light in a vacuum. Find R, L, G, C, and λ at 100 MHz.	10M	4	2
		OR			

Q.5(B)	A certain transmission line operating at $\omega = 10^6$ rad/s has $\alpha = 8$ dB/m, $\beta =$ 1 rad/m, and $Zo = 60 + j40\ \Omega$, and is 2 m long. If the line is connected to a source of 10 V, $Zg = 40\ \Omega$ and terminated by a load of $20 + j50\ \Omega$, determine (a) The input impedance (b) The sending-end current (c) The current at the middle of the line	10M	4	3
Q.6(A)	Explain in detail a) Standing wave b) Reflection loss c) Power transmission.	10M	5	3

OR

Q.6(B)	Antenna with impedance $40 + j30\Omega$ is to be matched to a 100-Ω lossless line with a shorted stub. Determine (a) The required stub admittance (b) The distance between the stub and the antenna (c) The stub length (d) The standing wave ratio on each ratio of the system	10M	5	3

*** END***

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

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

PATTERN RECOGNITION AND ITS APPLICATIONS
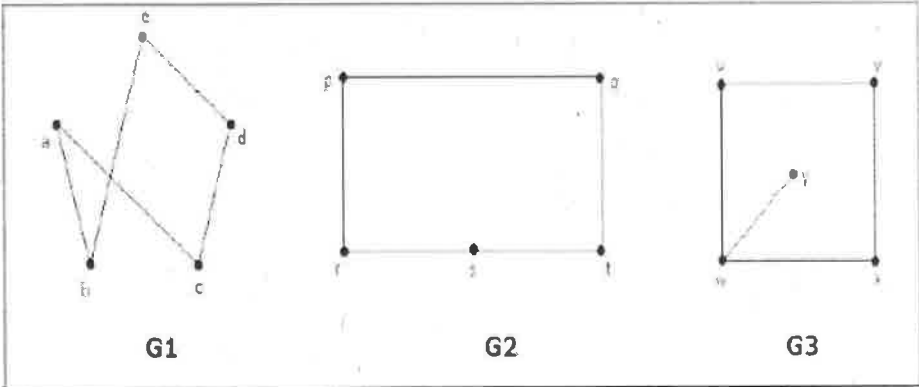(ECE)

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.	How predicted output is different from actual output?	1M	1	1
	ii.	What is activation function in neural network?	1M	1	1
	iii.	Explain cohesion and separation.	1M	2	1
	iv	What is the selection procedure of centroid for C-mean method?	1M	2	2
	v.	What is string?	1M	3	1
	vi	What is the application of string-based classification?	1M	3	2
	vii.	What is the use data normalization?	1M	4	1
	viii.	What is the meaning of outlier in data?	1M	4	2
	ix.	What is fuzzy classes?	1M	5	1
	x.	Write name of classifiers suitable for digit data recognition system?	1M	5	1
Q.2(A)		Describe each block or stage of pattern recognition system.	10M	1	2,4
		OR			
Q.2(B)		Explain in detail about design of pattern recognition system.	10M	1	2
Q.3(A)		Write steps for K-means clustering and discuss the convergence criteria in K-mean algorithm? Make the two cluster of given data(data=[2,2,2,6,7,10,22,22,34,3,4,4,7] using K-mean.	10M	2	1, 2
		OR			
Q.3(B)		How many schemes are available in Hierarchical clustering algorithm? Give brief (any one) descriptions.	10M	2	2,3
Q.4(A)		Explain the term 'isomorphism' in graph theory and explain which two graph in the given figure are equal?	10M	3	2

G1   G2   G3

OR

Q.4(B)		What is syntactic pattern recognition approach, describe how it is different from statistical pattern recognition?	10M	3	1,4

Q.5(A)	How feature selection is achieved through KL transform?	10M	4	1,3
	OR			
Q.5(B)	What is binary image? Explain at least five binary features with its mathematical equations that can be obtained from binary image.	10M	4	1
Q.6(A)	What is genetic algorithm? Explain the use of genetic algorithm in pattern recognition system with suitable example.	10M	5	1, 2
	OR			
Q.6(B)	What do you mean by fuzzy decision making? Discuss the fuzzy c-mean clustering algorithm.	10M	5	1

*** END ***

Hall Ticket No: ⬜⬜⬜⬜⬜⬜⬜⬜⬜⬜   Question Paper Code: 18ECE403

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – July 2022
BIO-MEDICAL ELECTRONICS
(ECE)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What are the components of a biomedical system?	1M	1	
	ii.	Compare Sensor and actuator	1M	1	
	iii.	List the types of bioelectric potentials.	1M	2	
	iv	Draw the graph of Depolarization and Repolarization.	1M	2	
	v.	Covid19 belongs to _____ disease	1M	3	
	vi	List the types of Blood Pressure Measurements.	1M	3	
	vii.	CT stands for _____	1M	4	
	viii.	How are X-rays produced?	1M	4	
	ix.	What is the generally used power source for implantable pacemakers?	1M	5	
	x.	What is the need of a cardiac defibrillator?	1M	5	
Q.2(A)		Explain the function of human respiratory system in detail with a neat sketch.	10M	1	
		OR			
Q.2(B)		What is difference between VIVO and VITRO Measurements in medical field? Explain intelligent medical instrumentation system with suitable examples.	10M	1	
Q.3(A)		Discuss in detail about bio-potential amplifiers for EMG.	10M	2	
		OR			
Q.3(B)		Explain 12 lead electrode system for ECG measurement.	10M	2	
Q.4(A)		What type of transducer is used for measuring direct blood pressure? Draw a simple circuit for calculating systolic and diastolic blood pressure.	10M	3	
		OR			
Q.4(B)		What are the direct methods of measuring blood pressure? Draw a typical set up of a pressure measuring system by direct method.	10M	3	
Q.5(A)		Explain the principle of constructing 3-D ultrasound images.	10M	4	
		OR			
Q.5(B)		Describe with the help of a block diagram the construction of a CT Scanner	10M	4	
Q.6(A)		Discuss in detail about Defibrillators.	10M	5	
		OR			
Q.6(B)		Explain in detail about the Heart lung machine with neat block diagram.	10M	5	

*** END***

Hall Ticket No: ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚   Question Paper Code: 18CSE109

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – July 2022
FORMAL LANGUAGES AND AUTOMATA THEORY
(CSE)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What is a string? Write about concatenation of two strings.	1M	1	1
	ii.	Define Regular Expression.	1M	1	1
	iii.	Differentiate ambiguous and unambiguous grammar with example.	1M	2	2
	iv	Mention the production rules of Context Sensitive Grammar.	1M	2	1
	v.	Explain Church Turing Thesis.	1M	3	2
	vi	What are the components of Turing Machine?	1M	3	1
	vii.	Give the formal definition of Linear Bounded Automata.	1M	4	1
	viii.	Differentiate between RLG and LLG.	1M	4	2
	ix.	Define Turing Reducibility.	1M	5	1
	x.	Give an example of undecidable problem.	1M	5	1
Q.2(A)		i)Design a DFA which accepts all the strings with even number of 0's and odd number of 1's over alphabet {0,1}	5M	1	6
		ii)Explain the operations on Strings and Languages	5M	1	5
		OR			
Q.2(B)		Construct a DFA for the Regular Expression (0+1)*(00+11)(0+1)*.	10M	1	3
Q.3(A)		Convert the following CFG into GNF $S \to AB1/0$ $A \to 00A/B$ $B \to 1A1$	10M	2	3
		OR			
Q.3(B)		i)Prove that the following grammar is ambiguous for the string 000111 $S \to 0Y/01$ $X \to 0XY/0$ $Y \to XY1/1$	5M	2	5
		ii)Show that $L=\{a^n b^n c^n \mid n>=1\}$ is not a context free language	5M	2	2
Q.4(A)		i) Explain about Variations of Turing Machines	5M	3	5
		ii)Construct a Turing Machine for the Regular Expression (a+b)*(aa+bb)(a+b)*	5M	3	6
		OR			
Q.4(B)		Design a Turing Machine to accept the Language $L=\{a^n b^n c^n /n>=1\}$	10M	3	6

Q.5(A)	Construct RLG and LLG for the regular expression RE=(a+b)*abb(a+b)*	10M	4	6
	OR			
Q.5(B)	i) Explain about the equivalence of Linear Bounded Automata and Context Sensitive Grammar	5M	4	5
	ii)Convert the following Regular Grammar to Finite Automata: S->aA/B A->aaB B->bB/a	5M	4	2
Q.6(A)	Explain about NP complete and NP hard problems.	10M	5	2
	OR			
Q.6(B)	Describe about decidable and undecidable problems with examples.	10M	5	4

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech III Year I Semester (R18) Supplementary End Semester Examinations –July 2022
COMPUTER ORGANIZATION AND ARCHITECTURE
(Computer Science & Engineering)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	How performance is correlated with execution time?	1M	1	1
	ii.	Find the clock rate for a processor having a clock cycle time of 0.5 ns.	1M	1	1
	iii.	Relate $(0.75)10$ in IEEE 754 Single Precision Floating Point Format.	1M	2	1
	iv.	How is overflow detected in binary addition of signed numbers?	1M	2	1
	v.	State the purpose of PC register.	1M	3	2
	vi.	List the five steps in MIPS instruction execution.	1M	3	1
	vii.	Define Cluster.	1M	4	1
	viii.	State Amdahl's Law.	1M	4	1
	ix.	List the advantages of Direct Mapped Cache.	1M	5	1
	x.	What is meant by address mapping?	1M	5	1
Q.2(A)		Explain the various Instruction Formats and addressing modes in MIPS with suitable examples?	10M	1	2
		OR			
Q.2(B)		Consider two different implementation of the same instruction set architecture, the instruction can be divided into four classes according to their CPI (class A, B, C and D). P1 with clock rate 2.5 GHz and CPI s of 1,2,3, and 3 respectively and P2 with clock rate 3 GHz and CPI s of 2,2,2and 2 respectively. Given a program with a dynamic instruction count of 1.0*106 instruction divided into classes as follows: 10% class A, 20% class B, 50% class C, and 20% class D, which implementation is faster? What is the global CPI for each implementation? Find the clock cycles required in both cases.	10M	1	3
Q.3(A)		Illustrate Booth Multiplication Algorithm for Signed Multiplication with a suitable example?	10M	2	2
		OR			
Q.3(B)		Construct the block diagram of a floating point adder and illustrate the steps involved in single precision floating point addition with a suitable example?	10M	2	5
Q.4(A)		i) Construct the MIPS Pipelined data path for Load Instruction.	5M	3	5
		ii) How Exceptions are handled in MIPS architecture?	5M		
		OR			

Q.4(B)	What are Data Hazards? Elaborate the various techniques employed to resolve Data Hazards in a MIPS Pipeline?	10M	3	2
Q.5(A)	i) Elaborate the challenges faced by parallel processing programs.	6 M	4	5
	ii) Compare the features of UMA and NUMA Processors.	4 M	4	2

OR

Q.5(B)	i) Compare and Contrast fine grain and coarse grain multithreading with suitable examples?	6 M	4	2
	ii) Explain the concept of Message Passing Multiprocessors with a neat block diagram?	4 M	4	5
Q.6(A)	Explain the various classifications of Memory Technologies?	10M	5	5

OR

Q.6(B)	What is virtual memory? Explain steps involved in mapping of a virtual address into physical address with a neat diagram?	10M	5	5

*** END ***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – July 2022
COMPUTER NETWORKS
(Computer Science & Engineering)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Define protocol?	1M	1	1
	ii.	What are the various protocols used in physical layer?	1M	1	1
	iii.	Outline are the responsibilities of the datalink layer	1M	2	2
	iv	What are types of addresses used in different layers?	1M	2	1
	v.	What are the parameters using which quality of service is measured?	1M	3	1
	vi	Define Tunneling?	1M	3	1
	vii.	Define Congestion control?	1M	4	1
	viii.	What are the fields that are present in the UDP header?	1M	4	1
	ix.	What are various protocols of application layer?	1M	5	1
	x.	What is POP in an email system?	1M	5	1
Q.2(A)		Explain in detail about layers of ISO-OSI model with a neat diagram?	10M	1	2
		OR			
Q.2(B)		(i) Examine various causes of Transmission Impairment?	5M	1	4
		(ii) Distinguish between Circuit switching and Packet switching?	5M	1	4
Q.3(A)		What is Exponential Backoff algorithm? Explain working of CSMA/CD?	10M	2	5
		OR			
Q.3(B)		Explain in detail Go Back N and Selective repeat sliding window protocols?	10M	2	5
Q.4(A)		Explain link state routing algorithm with an example?	10M	3	5
		OR			
Q.4(B)		Summarize OSPF and BGP protocols with an example?	10M	3	2
Q.5(A)		Classify open loop and closed loop congestion control techniques?	10M	4	4
		OR			
Q.5(B)		With the help of diagrams, explain what is three-way handshake methods of TCP connection establishment and release?	10M	4	2
Q.6(A)		a) Explain the functions of user agent, message transfer agent and message access agent in e-mail system?	5M	5	2
		b) Explain TELNET works?	5M	5	2
		OR			
Q.6(B)		What is DNS? Explain various name spaces of it with its architecture?	10M	5	2

*** END***

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

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

SOFTWARE ENGINEERING
(Computer Science & Engineering)

Time: 3 Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	Define application software	1M	1	1
	ii.	Who is called as the Stakeholder?	1M	1	1
	iii.	What is inception?	1M	2	1
	iv	Define event driven modeling.	1M	2	1
	v.	What is the need for modularity?	1M	3	1
	vi	List the various design quality attributes.	1M	3	1
	vii.	What is use case diagram?	1M	4	1
	viii.	Compare between black and white box testing.	1M	4	2
	ix.	Define Quality of conformance.	1M	5	1
	x.	What do you mean by Informal reviews?	1M	5	1
Q.2(A)		Explain the different Principles of Agile Software Engineering?	10M	1	5
		OR			
Q.2(B)		Explain the different levels of CMMI?	10M	1	5
Q.3(A)		Explain in detail about		2	5
		(i) Requirement Elicitation	5M		
		(ii) Requirement Validation	5M		
		OR			
Q.3(B)		Explain Structural Models with an example?	10M	2	2
Q.4(A)		Design and implement the following diagram with an example:		3	6
		(i) Class diagram	5M		
		(ii) Object diagram	5M		
		OR			
Q.4(B)		Explain in detail about User Interface Design Process model?	10M	3	2
Q.5(A)		Explain in detail about Metrics for source code?	10M	4	2
		OR			
Q.5(B)		Explain in detail about the types system testing?	10M	4	2
Q.6(A)		Explain the objectives of a Formal Technical Review?	10M	5	2
		OR			
Q.6(B)		Explain McCall's factors that affect Software quality?	10M	5	2

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 18CSE404

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

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

WEB TECHNOLOGIES
(Computer Science & Engineering)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	What is internet protocol?	1M	1	1
	ii.	Differentiate HTML and XHTML.	1M	1	1
	iii.	List out the various text properties.	1M	2	1
	iv	Define debuggers?	1M	2	1
	v.	What is Intrinsic Event Handling?	1M	3	1
	vi	Define Servlet?	1M	3	1
	vii.	What is meant by a XML namespace?	1M	4	1
	viii.	Define MVC?	1M	4	1
	ix.	State the significant use of web services.	1M	5	1
	x.	What is Database?	1M	5	1
Q.2(A)		Demonstrate in detail HTTP Request and Response messages?	10M	1	2
		OR			
Q.2(B)		Briefly discuss the different HTML Tables with examples?	10M	1	6
Q.3(A)		Explain in detail cascading style sheets with example programs?	10M	2	5
		OR			
Q.3(B)		Distinguish in detail text properties with example?	10M	2	4
Q.4(A)		Discuss in detail document object model with example?	10M	3	6
		OR			
Q.4(B)		Develop the various servlet servlet life cycles with examples?	10M	3	3
Q.5(A)		Demonstrate in detail XSLT Architecture?	10M	4	2
		OR			
Q.5(B)		Discuss in detail AJAX architecture with example?	10M	4	6
Q.6(A)		Explain in detail JAX-RPC-Concepts with suitable example?	10M	5	5
		OR			
Q.6(B)		Explain the elements of SOAP with examples?	10M	5	5

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations –July 2022
Computer Organization and Architecture
(Computer Science & Technology)

Time: 3Hrs   Max Marks: 60

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

Q.No.		Question	Marks	CO	BL
Q.1	i.	Which type registers store the results of arithmetic Calculations and Over flow instructions?	1M	1	2
	ii.	State Moore's law.	1M	1	1
	iii.	Convert 25.52 to binary.	1M	2	1
	iv	Represent - $(15.125)_{10}$ in single precision format	1M	2	1
	v.	Mention the purpose of Program Counter (PC).	1M	3	1
	vi	What is mean by Pipeline and Non pipe line approach?	1M	3	1
	vii.	Define Instruction Level Parallelism (ILP)?	1M	4	1
	viii	Why do we implement bubble operation after the execution of load instruction?	1M	4	1
	ix.	Define hit rate, miss rate and hit time?	1M	5	1
	x.	What is virtual memory?	1M	5	1
Q.2(A)		Explain brief about the Eight ideas to improve Computer hardware and its performance?	10M	1	2
		OR			
Q.2(B)		Discuss about Various data transfer instructions in 8085 microprocessor with suitable examples.	10 M	1	2
Q.3(A)		i) What is the purpose of using data Compression techniques? Discuss about Run length encoding data Compression techniques in detail?	5M	2	3
		ii) Represent the given floating number 297.927 in Single and double precision format? (IEEE 754 FORMAT).	5M	2	3
		OR			
Q.3(B)		Discuss the Addition and subtraction algorithm for the floating point number?	10M	2	3
Q.4(A)		Draw the Data path diagram for the load instruction lw $r1, $r2, 5. And also Explain the Operation of data path for above instruction?	10M	3	2
		OR			
Q.4(B)		Discuss about processor stages in short and Explain briefly about the internal Components of Decoding block with neat diagram?	10M	3	3

Q.5(A)	Explain briefly about Fine grained and Course grained multi thread concepts with neat process diagrams?	10M	4	4
	OR			
Q.5(B)	Discuss about the Various challenges of parallel processing.	10M	4	2
Q.6(A)	Explain about fully Associative cache mapping technique with neat block diagram?	10M	5	3
	OR			
Q.6(B)	Explain the following			
	i) TLB	3M	5	2
	ii) I/O Interrupts and I/O Mapping with Other peripherals	4M	5	2
	iii) Differentiate between SRAM and DRAM	3M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – July 2022
COMPUTER NETWORKS
(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.	Identify the five components of a data communications system.	1M	1	1
	ii.	Name three types of transmission impairment.	1M	1	1
	iii.	What are the two main functions of data link layer?	1M	2	2
	iv	Discuss the concept of redundancy in error detection and correction.	1M	2	2
	v.	What are the network layer design issues?	1M	3	1
	vi	How the packet cost referred in distance vector and link state routing?	1M	3	2
	vii.	Define Congestion and give the types of congestion control mechanisms.	1M	4	2
	viii.	Define peer-to-peer process.	1M	4	1
	ix.	Differentiate application programs and application protocols.	1M	5	2
	x.	What is the purpose of Domain Name System?	1M	5	2
Q.2(A)		Describe the concept of TCP/IP model with neat diagram.	10M	1	2
		OR			
Q.2(B)		Explain the two approaches of packet switching techniques in detail.	10M	1	2
Q.3(A)		Explain any two methods, in which, how the error control is achieved in data link layer with example.	10M	2	2
		OR			
Q.3(B)		Why collision is an issue in a random access protocol but not in controlled access or channelizing protocols?	10M	2	2
Q.4(A)		Explain about IPv4 classless addressing in detail.	10M	3	2
		OR			
Q.4(B)		Explain the operation of IGMP in detail.	10M	3	2
Q.5(A)		Explain TCP Congestion control techniques in detail.	10M	4	2
		OR			
Q.5(B)		Explain the techniques used in TCP to control the error in networks.	10M	4	2
Q.6(A)		Discuss about the fundamentals of Electronic Mail and the architecture of Email System.	10M	5	2
		OR			
Q.6(B)		Explain the Server side and Client-side Web page generation in detail.	10M	5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary End Semester Examinations – July 2022
MOBILE COMPUTING
(CSE, CSIT, CST)

Time: 3Hrs   Max Marks: 60

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

Q.No		Question	Marks	CO	BL
Q.1	i.	List mobile computing Applications.	1M	1	1
	ii.	What are the limitations for Mobile Computing?	1M	1	1
	iii.	Differentiate CDMA and TDMA.	1M	2	1
	iv	Summarize Exposed Terminal problem.	1M	2	1
	v.	Write full form of DHCP.	1M	3	1
	vi	Define Tunneling.	1M	3	1
	vii.	Give any two advantages of selective retransmission.	1M	4	1
	viii.	What is fast recovery of Mobile TCP?	1M	4	1
	ix.	When is one environment said to be application environment?	1M	5	1
	x.	Mention the usage of WTA server.	1M	5	1
Q.2(A)		Define Mobile Computing. Illustrate the architecture of Mobile Computing with neat sketch.	10M	1	2
		OR			
Q.2(B)		With a Neat Sketch, Analyze the Architecture and various Sub systems in GSM	10M	1	4
Q.3(A)		What are MAC protocols for GSM? Mention their Application Areas?	10M	2	3
		OR			
Q.3(B)		Explain the role of RTS and CTS & write about implementation of MAC in hidden and exposed terminals near for terminals.	10M	2	2
Q.4(A)		Briefly discuss about the Architecture and agent discovery Mechanism in Mobile IP.	10M	3	2
		OR			
Q.4(B)		Explain the goals, assumptions and requirements of Mobile IP.	10M	3	2
Q.5(A)		Discuss in detail Mobile TCP, and Mentions its advantages and disadvantages along with applications.	10M	4	3
		OR			
Q.5(B)		Differentiate Traditional, Indirect and Snooping by considering in all aspects.	10M	4	4
Q.6(A)		With neat sketches and illustrations, Analyze the Wireless Application Protocol architecture in detail.	10M	5	4
		OR			
Q.6(B)		What are user scenarios of Bluetooth? Explain about L2CAP & Security.	10M	5	2

*** END***

Hall Ticket No: ☐☐☐☐☐☐☐☐☐☐   Question Paper Code: 18ENG3M03

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech III Year I Semester (R18) Supplementary (MOOCS) End Semester Examinations – JULY 2022
SOFT SKILL DEVELOPMENT
(Common to ALL)

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.1(A)	Differentiate between soft skill and Hard skill. Explain different methods to enhance soft skills.	12M
	OR	
Q.1(B)	Discuss listening and responding. What are the four stages of listening process?	12M
Q.2(A)	What are the features of non-verbal communication?	12M
	OR	
Q.2(B)	What do you understand by the term personality?	12M
Q.3(A)	Explain the importance of time management during an interview.	12M
	OR	
Q.3(B)	What are the methods to improve self image	12M
Q.4(A)	How important is personality development in context of today's professional world.	12M
	OR	
Q.4(B)	Describe adaptability to change.	12M
Q.5(A)	Describe situational leadership.	12M
	OR	
Q.5(B)	What is the role of paralanguage and body language in effective communication?	12M

*** END***

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

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

Developing Soft Skills and Personality
(Common to all)

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

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

Q.1(A)	What are the general misconceptions about learning?	12M
	OR	
Q.1(B)	What are the ways to develop soft skills?	12M
Q.2(A)	State and explain the importance of Goal-setting?	12M
	OR	
Q.2(B)	What is the importance of improving personality?	12M
Q.3(A)	Explain different ways to understand human perception?	12M
	OR	
Q.3(B)	Explain the importance of time management in developing personality?	12M
Q.4(A)	What is the importance of motivation in achieving things?	12M
	OR	
Q.4(B)	Explain the importance of inter-personal communication?	12M
Q.5(A)	Discuss the importance of Reading skills and effective Reading.	12M
	OR	
Q.5(B)	Explain about Abraham Maslow's hierarchy of needs?	12M

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

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

ETHICS IN ENGINEERING PRACTICE

(Common to All)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	Professional ethics.	1M	1	1
	ii.	Effectiveness vs Efficiency.	1M	1	1
	iii.	Nature of engineering ethics.	1M	2	1
	iv	Advertisement ethics.	1M	2	1
	v.	Hacking.	1M	3	1
	vi	Profession.	1M	3	1
	vii.	Ethical hacking.	1M	4	1
	viii.	Deontological theory.	1M	4	1
	ix.	Utilitarian theory.	1M	5	1
	x.	Virtue theory.	1M	5	1
Q.2(A)		Define ethics and discuss ethical code of various professions?	10M	1	2
		OR			
Q.2(B)		Discuss applied ethics?	10M	1	2
Q.3(A)		Discuss gender equality? And explain work life balance and ethics?	10M	2	2
		OR			
Q.3(B)		Have you faced any ethical problems in your life? Explain with examples?	10M	2	3
Q.4(A)		Discuss Glass Ceiling?	10M	3.	4
		OR			
Q.4(B)		Elucidate the need of ethics in the field of education.	10M	3	5
Q.5(A)		Discuss the role of ethics in marketing	10M	4	5
		OR			
Q.5(B)		Explain corporate social responsibility with examples in Indian context	10M	4	6
Q.6(A)		Explain the issues related to computer ethics an interest with your personal experience.	10M	5	5
		OR			
Q.6(B)		Elucidate IEEE Code for professional ethics	10M	5	6

*** END***