MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech I Year I & II Semester (R14) Supplementary End Semester Examinations –SEPTEMBER 2021
FUNCTIONAL ENGLISH
(Common to all branches)

Time: 3Hrs

Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	Change the following sentence into passive form . *My father loves seafood.*	1M	CO1	2
	ii.	Fill in the blank with an appropriate article. Miss Mona speaks _____ Spanish fluently (A/ An/ The/ None)	1M	CO1	1
	iii.	*I speak French well. (Knowledge)* Include the word knowledge in your answer so that it has the similar meaning to the above given statement	1M	CO2	3
	iv	Fill in the blank with suitable preposition *There is a bridge _____ the river.*	1M	CO2	3
	v.	Use the idiom *a drop in the ocean* in your own words.	1M	CO3	4
	vi	Rewrite the following sentences using 'must/might/can't' whichever is appropriate. *I am sure you were surprised .*	1M	CO3	4
	vii.	Rewrite the following sentences using 'otherwise'. They must be expecting guests, because the house was so tidy.	1M	CO4	4
	viii.	Use the verbs in the tenses suggested in brackets I_____(work) for an NGO in Gwalior (simple present)	1M	CO4	4
	ix.	Rewrite the following sentences starting with 'If' *I'm a very polite person. I didn't tell her what I really thought of her.*	1M	CO5	4
	x.	*Why do people use social media.* State one reason.	1M	CO5	5
Q.2(A)		Have you ever shown your palm to an astrologer? Do you believe in Fortune telling. Write your views in not more than 300 words	10M	CO1	6
		OR			
Q.2(B)		Fill in the blanks with appropriate verb forms	10M	CO1	4
	i.	He_____ (work) here for the last six years.			
	ii.	By the time the police _____ (arrive), the robbers _____ (run) away.			
	iii.	Listen, they _____(make) an announcement. Please pay attention			
	iv.	What _____ (be)the price of the pen?			
	v.	Leela _____(clean) the garage last week.			
	vi.	The doctor is busy now, but he _____(see) you after an hour.			
	vii.	She-------------(read) the novel since morning.			
	viii.	When I -------------(see) him, he -------------(read) a novel			

Q.3(A)	(i)Here are some instructions related to a game. Name out the game and fill the gaps with the given words	10M	CO2	5

. 1. bounce 2. out 3. net   4. serve   5.point

When you _____, the ball has to _____ twice, once on each side of the _____. If your shot misses the table, its _____, and you lose the _____.

(ii)Arrange the following jumbled sentences so as to make a meaningful paragraph.

i. Such a man goes on working hard and even if he fails he is never downcast.

ii. It is therefore, the man who labours hard with a strong resolution and an unshaken will, who achieves success and makes his fortune.

iii. In turn failures make him all the more determined and resolute and he persists in his tasktill he attains the desired success.

iv. A man who possesses a strong will and firm determination finds all difficulties solved

v. To him there are a thousand ways open to steer clear of all dangers and difficulties.

OR

Q.3(B)	Write the suitable dialogues for the following situations.	10M	CO2	6

a)Meena introduces Sneha, a new employee, to Aruna, another employee in the department.

b)Maria is a new student in the college. She asks Prakash for directions to the chemistry lab

Q.4(A)	With the advancement in technology, It is easier and cheap to communicate and connect with people across the world. Justify the statement in 300 words	10M	CO3	6

OR

Q.4(B)	Write a similar sentence by using the word given in the brackets	10M	CO3	4

i I speak Spanish well(Knowledge)

ii I have worked as a chef for three years (Experience).

iii I play guitar well(Good)

iv I have qualifications in Language teaching(Teacher)

v. Working under stress is nothing new to me(used to)

Fill in the blanks choosing between Will and Would

i. She promised me that she --------------phone as soon as she got home

ii. Don't worry. I'm sure she ---------ring soon.

iii. I wish your friends -----wipe their feet when they come in.

iv. I ------ carry that for you, if you like.

v. If you went by train, you-----get there much faste

Q.5(A)	Correct the following sentences	10M	CO4	4

    i.   My brother bought new furniture

    ii.   I did not find no one in the office on Sunday

    iii.   He is not superior than you.

    iv.   Every player must bring their bats.

    v.   The apple is tasting sweet.

    vi.   Where did you went yesterday?

    vii.   Are you agree with me?

    viii.   The teacher along with his students were going.

ix.   Suresh is my older brother

x.   More you read less you understand.

OR

Q.5(B) Modern children have more fun than the children in the olden days. Justify the statement in 300 words   10M   CO4   6

Q.6(A) **Read the following passage and answer the questions given below.**   10M   CO5   5

Most human beings are awake during the day and sleep all night. Owls live the opposite way. Owls are nocturnal. This means that they sleep all day and stay awake at night. Because owls are nocturnal, this means they must eat at night. But finding food in the dark is difficult. To help them, they have special eyes and ears.

Owls have very large eyes. These eyes absorb more light than normal. Since there is little light during the night, it is helpful to be able to absorb more of it. This helps owls find food in the dark. Owls also have very good hearing. Even when owls are in the trees, they can hear small animals moving in the grass below. This helps owls catch their prey even when it is very dark. Like owls, mice are also nocturnal animals. Mice have an excellent sense of smell. This helps them find food in the dark. Being nocturnal helps mice to hide from the many different animals that want to eat them. Most of the birds, snakes, and lizards that like to eat mice sleep at night—except, of course, owls!

Questions

1) In paragraph 1, we learn that "Owls are nocturnal." The word diurnal is the opposite of the word nocturnal. Using information in the passage as a guide, we can understand that an animal that is diurnal

A. sleeps at night and is awake during the day B. hunts during the day and is awake at night

C. sleeps every other night and is awake during the day D. hunts during the day and night

2) Based on information in paragraph 2, it can be understood that an animal with small eyes

A. must be diurnal B. has trouble seeing in the dark

C. can see very well at night D. is likely to be eaten by an owl

3) According to the passage, owls can find food in the dark using their sense of

I. sight II. sound III. smell

A. I only B. I and II only C. II and III only D. I, II, and III

4) Based on information in the final paragraph, it can be understood that mice sleep during the day in order to

A. find food that other animals can not B. keep themselves safe

C. store energy for night time activities D. release stress

5) Based on information in the final paragraph, it can be understood that

A. owls hunt mice B. mice can hide from owls

C. mice and owls both hide from birds, snakes, and lizards D. birds and snakes often hunt lizards

OR

Q.6(B) Human values are degrading day by day. Justify the statement in 300 words   10M   CO5   6

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech I Year I & II Semester (R14) Supplementary End Semester Examinations –SEPTEMBER 2021
TECHNICAL REPORT WRITING

Time: 3Hrs

Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	In many cases the message fails to produce the desired response because of a semantic gap between the sender and the receiver. What is a semantic gap?	1M	CO1	1
	ii.	What factor would help you decide whether a communication has succeeded or failed?	1M	CO1	1
	iii.	Julia works at a pet store and owns four cats, a lizard, a dog, and a rabbit. What do you infer from the given statement?	1M	CO2	2
	iv	Explain Visual Perception in one or two sentences.	1M	CO2	2
	v.	Create a sentence on the role of education in the society.	1M	CO3	6
	vi	Explain the importance of staying fit in one or two sentences.	1M	CO3	4
	vii.	Distinguish between formal and informal report.	1M	CO4	4
	viii.	Explain the importance of recommendations in a report.	1M	CO4	2
	ix.	Create a questionnaire with a question and a few options for customer satisfaction survey.	1M	CO5	6
	x.	Frame options for the question "How many of your friends on social networking websites have you met in person?" (Don't use numbers in your options)	1M	CO5	6

Q.2(A)	Explain the different types of Formal and Informal Networks.		10M	CO1	2
	OR				
Q.2(B)	Explain the process of Communication including clearly the role of each constituent element.		10M	CO1	2

Q.3(A)	The table illustrates the proportion of monthly household income five European countries spend on food and drink, housing, clothing and entertainment. Summarize the information by selecting and reporting the main features and make comparisons where relevant. Write at least 150 words.		10M	CO2	4

	Food and drink	Housing	Clothing	Entertainment
France	25%	31%	7%	13%
Germany	22%	33%	15%	19%
UK	27%	37%	11%	11%
Turkey	36%	20%	12%	10%
Spain	31%	18%	8%	15%

OR

Q.3(B) Read the following passage and answer the questions below.   10M   CO2   3

When an old cave is discovered in the south of France, it is not usually news. Rather, it is an ordinary event. Such discoveries are so frequent these days that hardly anybody pays heed to them. However, when the Lascaux cave complex was discovered in 1940, the world was amazed. Painted directly on its walls were hundreds of scenes showing how people lived thousands of years ago. The scenes show people hunting animals, such as bison or wild cats. Other images depict birds and, most noticeably, horses, which appear in more than 300 wall images, by far outnumbering all other animals.

Early artists drawing these animals accomplished a monumental and difficult task. They did not limit themselves to the easily accessible walls but carried their painting materials to spaces that required climbing steep walls or crawling into narrow passages in the Lascaux complex.

Unfortunately, the paintings have been exposed to the destructive action of water and temperature changes, which easily wear the images away. Because the Lascaux caves have many entrances, air movement has also damaged the images inside.

Although they are not out in the open air, where natural light would have destroyed them long ago, many of the images have deteriorated and are barely recognizable. To prevent further damage, the site was closed to tourists in 1963, 23 years after it was discovered.

    i. Which title best summarizes the main idea of the passage?
    ii. The words **pays heed to** are closest in meaning to _____.
    iii. Based on the passage, what is probably true about the south of France?
    iv. According to the passage, which animals appear most often on the cave walls?
    v. The word **depict** is closest in meaning to _____.
    vi. Why was painting inside the Lascaux complex a difficult task?

vii. According to the passage, what are the agents that have caused damage to the paintings?
viii. What does the passage say happened at the Lascaux caves in 1963?
ix. The word **deteriorated** is closest in meaning to _____ .
x. Why was the world amazed?

Q.4(A)	Write a letter to your Principal requesting him to exempt you from appearing at the university exam due to your illness.	10M	CO3	3
	OR			
Q.4(B)	Develop a paragraph by using the hints: Development of Ethics – morality – youth – development – quality education – character development – behaviour – training – skills development – improvement of health – quality of life - learning network – basic element of life.	10M	CO3	6

Q.5(A)	The District Collector is concerned about the rapid increase in the number of road accidents in the areas. Draft a report to the Chairman, Municipal Corporation on the causes for the accidents and suggest measures to improve the situation.	10M	CO4	6
	OR			
Q.5(B)	Draft a report to the General Manager by highlighting the necessity of establishing a Computer Training Institute in your area.	10M	CO4	6

Q.6(A)	You wish to study the attitude of students as regards the board and lodging arrangements in your college hostels. Prepare a mail questionnaire to be sent to them for collecting data for this report.	10M	CO5	6
	OR			
Q.6(B)	Prepare a mail questionnaire to be sent to the secretary of each student society, club or association, which will elicit the information on the activities of students in your college.	10M	CO5	6

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech I Year I & II Semester (R14) Supplementary End Semester Examinations –SEPTEMBER 2021
ENGINEERING CHEMISTRY
(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**

			Marks	CO	BL
Q.1	i.	Draw the chemical structure of EDTA.	1M	1	1
	ii.	Diagrammatically show reverse osmosis purification of sea water.	1M	1	1
	iii.	What are the limitations of the first law of thermodynamics?	1M	2	1
	iv.	Write the Arrhenius equation which relates 'k' and 'E_a'?	1M	2	1
	v.	Which monomer is the polymer backbone structure of PTFE?	1M	3	1
	vi	How many vibrational nodes are there for Water (H_2O) molecules?	1M	3	1
	vii.	What is a salt bridge and give its uses?	1M	4	1
	viii.	Define corrosion.	1M	4	1
	ix.	Give any two examples of solid lubricants.	1M	5	1
	x.	Which constituent of cement causes its initial setting?	1M	5	1
Q.2(A)	Explain the ion exchange process for softening of water.		10M	1	5
		OR			
Q.2(B)	Estimate the dissolved oxygen in water using Winkler's method.		10M	1	5
Q.3(A)	(i) Evaluate the rate order for the first order reaction.		7M	2	5
	(ii) The half-life of a substrate in a certain enzyme-catalysed first-order reaction is 138s. How long is required for the concentration of substrate to fall from 1.28 mmol dm^{-3} to 0.040 mmol dm^{-3}?		3M	2	2
		OR			
Q.3(B)	(i) A sample of gas changes in volume from 4.00 L to 6.00 L against an external pressure of 1.50 atm, and simultaneously absorbs 1000 J of heat. Calculate the change in the internal energy of the system?		5 M	2	5
	(ii) Determine the overall change in entropy for the following process using 1.00 mole of He: He (298.0 K, 1.50 atm) → He (100.0 K, 15.0 atm). The heat capacity of He is 20.78 $Jmol^{-1}K^{-1}$. Assume that helium acts ideally.		5 M	2	5
Q.4(A)	Elaborate in detail the gel permeation chromatography (GPC)?		10M	3	6
		OR			
Q.4(B)	Explain the preparation, properties and applications of Nyon 6,6.		10M	3	5
Q.5(A)	Discuss the functioning and applications of Li-Ion battery.		10M	4	6
		OR			
Q.5(B)	Explain in detail on the various factors influence the rate of corrosion		10M	4	5
Q.6(A)	Discuss the synthesis of Portland cement in with a neat schematic illustration.		10M	5	6
		OR			
Q.6(B)	Explain sol gel method for synthesizing nanomaterials.		10M	5	5

*** END ***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech I Year I&II Semester (R14) Supplementary End Semester Examinations – Sep' 2021
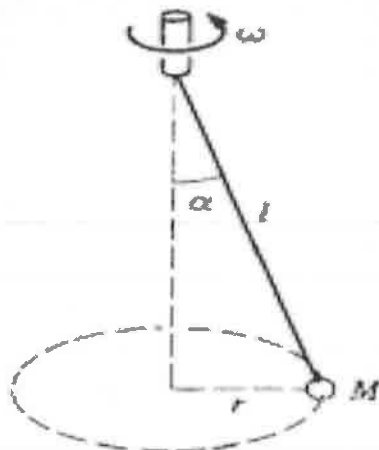## ENGINEERING PHYSICS
(Common to All)

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.no		Question	Marks	CO	BL
Q.1	i.	Find the unit vector along the direction of $\vec{A} = 2\hat{\imath} - 2\hat{\jmath} + \hat{k}$.	1M	CO1	2
	ii.	Write Newton's 2nd law in angular form?	1M	CO1	1
	iii.	Calculate the momentum of a tennis ball of mass 100 gm served with velocity 50 m/s.	1M	CO2	2
	iv	State work energy theorem.	1M	CO2	1
	v.	A bob is suspended with a mass less string of length 245 cm. Find its time period.	1M	CO3	2
	vi	What is the phase difference between two vibrations $x_1 = \cos \omega t$ and $x_2 = 2 \sin \omega t$?	1M	CO3	1
	vii.	What are the characteristics of simple harmonic motion?	1M	CO4	1
	viii.	$Y = 0.8 \sin \pi(2t - 3x)$ cm, Calculate the time period of the wave.	1M	CO4	1
	ix.	Mention the conditions for interference.	1M	CO5	1
	x.	What is the grating element?	1M	CO5	1
Q.2(A)		i) State and explain Scalar Product of two vectors with an example.	4M	CO1	2
		ii) Three vectors are given as $\vec{A} = 2\hat{\imath} - \hat{\jmath} + \hat{k}$, $\vec{B} = 2\hat{\imath} + \hat{\jmath} - \hat{k}$ and $\vec{C} = -\hat{\imath} + \hat{\jmath} + 2\hat{k}$. Find a) $(\vec{A} \times \vec{C})$ and b) $\vec{A} \cdot (\vec{B} \times 2\vec{C})$.	6M	CO1	2

OR

| Q.2(B) | Mass M hangs from a string of length 'l', which is attached to a rod rotating at constant angular frequency 'ω', as shown in the diagram. The mass moves with steady speed in a circular path of constant radius. Find 'α', the angle the string makes with the vertical and discuss the result. | 10M | CO1 | 4 |

Q.3(A)	Derive the rocket equation and show that final velocity is independent of how the mass is released when it moves in a free space?	10M	CO2	4
	OR			
Q.3(B)	With the help of work-energy theorem, deduce the expression for escape velocity for an object of mass 'm' projected vertically upward.	10M	CO2	4
Q.4(A)	What is moment of inertia? On what factors it depends? State and prove parallel axis theorem of moment of inertia.	10M	CO3	3
	OR			
Q.4(B)	The displacement of a simple harmonic oscillator is given by $x=a \sin(\omega t+\varphi)$. If the oscillation started at $t = 0$ from a position x_0 with a velocity v_0. Show that, $tan\varphi = \frac{\omega x_0}{v_0}$, and $a = \sqrt{\left(x_0^2 + \frac{v_0^2}{\omega^2}\right)}$	10M	CO3	3
Q.5(A)	What are Lissajous Figures? Two SHMs at right angles to one another are described by the equations given below. $x = 2 \cos (5\pi t)$ and $y = 2 \cos (5\pi t + \pi/2)$. Construct the Lissajous figure of the combined motion.	10M	CO4	3
	OR			
Q.5(B)	i) Obtain the relation between the phase velocity and group velocity.	5M	CO4	3
	ii) Deduce the differential equation of propagation of one dimensional wave?	5M		
Q.6(A)	Derive the formula for refractive index of transparent liquid by using Newton's ring method?	10M	CO5	4
	OR			
Q.6(B)	Describe Fraunhofer diffraction due to single slit with a suitable diagram. And obtain the conditions for maxima, minima, and secondary maxima intensities in the diffracted spectrum.	10M	CO5	4

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B. Tech I Year I & II Semester (R14) Supplementary End Semester Examinations – September 2021
ADVANCED CALCULUS
(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

			Marks	CO	BL
Q.1	i.	Write the polar equation for equivalent Cartesian equation $x^2 + xy + y^2 = 1$	1M	1	1
	ii.	When the curve $r^2 = 4cos^2\theta$ is symmetric	1M	1	2
	iii.	Write the domain and range for the surface $w = \sqrt{x^2 + y^2 + z^2}$	1M	2	2
	iv	If $f(x,y) = x\cos y + ye^x$, then find $\dfrac{\partial^2 f}{\partial x^2}$	1M	2	1
	v.	Evaluate $\displaystyle\int_0^2\int_0^1 (x-y)dy\,dx$	1M	3	1
	vi	Express dv in spherical coordinates	1M	3	1
	vii.	Find the gradient field of $f(x,y,z) = x^2 y + y^2 z + z^2 x$	1M	4	1
	viii.	State Stokes Theorem.	1M	4	1
	ix.	Define Ratio test	1M	5	1
	x.	State Taylor series generated by $f(x)$ at $x = c$	1M	5	1

		Marks	CO	BL
Q.2(A)	Sketch the curve $r = a(1 + \sin\theta)$	10M	1	3

OR

		Marks	CO	BL
Q.2(B)	Find T, N and K for the plane curve $r(t) = (6\sin 2t)i + (6\cos 2t)j + 5tk$	10M	1	3

		Marks	CO	BL
Q.3(A)	Graph $f(x,y) = 100 - x^2 - y^2$ and plot the level curves $f(x,y)=0$, $f(x,y)=51$ and $f(x,y)=75$ in the domain of f in the plane	10M	2	3

OR

		Marks	CO	BL
Q.3(B)	i. Use the implicit derivative, find $\dfrac{\partial z}{\partial x}$ and $\dfrac{\partial z}{\partial y}$ at $(0,0,0)$, if $x^3 + z^2 + ye^{xz} + z\cos y = 0$.	5M	2	3
	ii. Find the maximum and minimum values of the function $f(x,y) = 3x + 4y$ on the circle $x^2 + y^2 = 1$	5M	2	3

		Marks	CO	BL
Q.4(A)	Using polar integration, find the area of the region R in the xy – plane enclosed by the circle $x^2 + y^2 = 4$, above the line y = 1 and below the line $y = \sqrt{3}\,x$	10M	3	4

OR

		Marks	CO	BL
Q.4(B)	Find the volume of the tetrahedron cut from the first octant by the plane $6x + 3y + 2z = 6$	10M	3	3

Q.5(A)	Find the circulation of $F(x, y, z) = 2xi + 2zj + 2yk$ around the closed curve $r(t) = (\cos t)i + (\sin t)j + tk, \ 0 \le t \le \pi/2$	10M	4	3
	OR			
Q.5(B)	Use Green's theorem to find the counter clockwise circulation for the field $F = (x^2 + 4y)i + (x + y^2)j$ over the square bounded by x = 0, x = 1, y = 0, y = 1	10M	4	3
Q.6(A)	Investigate whether the series (a) $\sum_{n=1}^{\infty}(-1)^n \dfrac{1}{n}$ (b) $\sum_{n=1}^{\infty}(-1)^n \dfrac{1}{n+3}$ converges absolutely or conditionally	10M	5	3
	OR			
Q.6(B)	Determine the radius of convergence and interval of convergence of the power series (a) $\sum_{n=1}^{\infty}(-1)^n \dfrac{x^n}{n}$ (b) $\sum_{n=1}^{\infty}(-1)^{n-1} \dfrac{x^{2n-1}}{2n-1}$	10M	5	3

*** END***

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

B. Tech I Year I & II Semester (R14) Supplementary End Semester Examinations – SEPTEMBER 2021

LINEARALGEBRA AND COMPLEX ANALYSIS
(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

			Marks	CO	BL
Q.1	i.	Find the inverse of $A = \begin{bmatrix} 1 & 3 \\ 0 & 7 \end{bmatrix}$	1M	1	1
	ii.	Write any two properties of vector space.	1M	1	1
	iii.	Define Kernel of a linear transformation.	1M	2	1
	iv	Find the Eigen values of the matrix $A = \begin{bmatrix} 1 & 0 \\ 1 & 3 \end{bmatrix}$	1M	2	1
	v.	If $f(z) = CoshxCosy + iSinhxSiny$. Determine whether $f(z)$ is analytic or not.	1M	3	2
	vi	Express the function $f(z) = z^3 + z + 1$ in the form of $f(z) = u + iv$	1M	3	1
	vii.	Find all the values of $e^z = 2$	1M	4	2
	viii.	Evaluate $\int_{\theta=0}^{\pi} e^{2i\theta} d\theta$	1M	4	2
	ix.	Define Cauchy Residue Theorem.	1M	5	1
	x.	State fundamental theorem of algebra.	1M	5	1

Q.2(A)	Use Gauss Jordon method to find the minimal positive integer values for the variables that will balance the chemical equation $aC_6H_6 + bO_2 \rightarrow cCO_2 + dH_2O$	10M	1	3

OR

Q.2(B)	Find whether the following subset is linearly independent or not. $\left\{ \begin{bmatrix} 1 & 4 \\ 2 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 2 \\ 1 & 0 \end{bmatrix}, \begin{bmatrix} -3 & 1 \\ -1 & 0 \end{bmatrix}, \begin{bmatrix} 5 & -2 \\ 0 & -3 \end{bmatrix} \right\}$	10M	1	3

Q.3(A)	Let $L: R^3 \rightarrow R^4$ given by $L\begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix} = \begin{bmatrix} 4 & -2 & 8 \\ 7 & 1 & 5 \\ -2 & -1 & 0 \\ 3 & -2 & 7 \end{bmatrix} \begin{bmatrix} x_1 \\ x_2 \\ x_3 \end{bmatrix}$. Verify that $dim(\ker(L)) + dim(range(L)) = dim(R^3)$	10M	2	3

OR

Q.3(B)	Find the Eigen values and Eigen vectors of the matrix $A = \begin{bmatrix} 1 & 0 & 1 \\ 0 & 2 & -3 \\ 0 & 0 & -5 \end{bmatrix}$.	10M	2	3

Q.4(A) Show that the derivative of $f(z) = \begin{cases} \dfrac{\bar{z}^2}{z} & \text{when } z \neq 0 \\ 0 & \text{when } z = 0 \end{cases}$ does not exist at origin.   10M   3   4

OR

Q.4(B) Derive the Cauchy Riemann equations for polar coordinates.   10M   3   3

Q.5(A) To evaluate $\int_c f(z)dz$ where $f(z) = \pi e^{(\pi z)}$ and C is the boundary of the square with vertices at the points $0, 1, 1+i$ and i, the orientation of C being in the counter clockwise direction.   10M   4   3

OR

Q.5(B) Evaluate $\int_C \dfrac{e^{2z}}{(z-1)(z-2)} dz$ where C is the positively oriented circle $c: |z| = 1.5$ 10M   4   3

Q.6(A) By using Cauchy – Residue theorem evaluate the integral, $\oint_c \dfrac{5z-2}{z(z-1)} dz$ where $c: |z| = 2$ 10M   5   3

OR

Q.6(B) Show that when $0 < |z-1| < 2, \dfrac{z}{(z-1)(z-3)} = -3 \sum_{n=0}^{\infty} \dfrac{(z-1)^n}{2^{n+2}} - \dfrac{1}{2(z-1)}$.   10M   5   3

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech I Year I & II Semester (R14) Supplementary End Semester Examinations –SEPTEMBER 2021
BASIC ELECTRICAL AND ELECTRONICS ENGINEERING
(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**

			Marks	CO	BL
Q.1	i.	The hot resistance of a 240V filament lamp is 960 Ω. Find the current taken by the lamp.	1M	CO1	2
	ii.	State Kirchhoff's Voltage Law?	1M	CO1	1
	iii.	If an R-C load is drawing 5 kVA at a power factor of 0.6 (leading) from a single-phase A.C. supply, find the active power drawn by the load.	1M	CO2	2
	iv	If a three-phase delta-connected balanced load is connected to a balanced three-phase supply, what is the relation between line current and phase current of the load?	1M	CO2	2
	v.	State faraday's law of electromagnetic induction.	1M	CO3	1
	vi	What is an Ideal transformer?	1M	CO3	1
	vii.	In a D.C. generator, which element is used to convert the A.C. voltage into D.C. voltage?	1M	CO4	2
	viii.	For a given frequency, if the number of poles is increased, how the synchronous speed of an AC machine will vary?	1M	CO4	1
	ix.	What is knee voltage of a diode?	1M	CO5	1
	x.	Sketch the symbol of PNP transistor.	1M	CO5	1

Q.2(A)	In the network shown in Figure, determine the loop currents by mesh current method.		10M	CO1	3
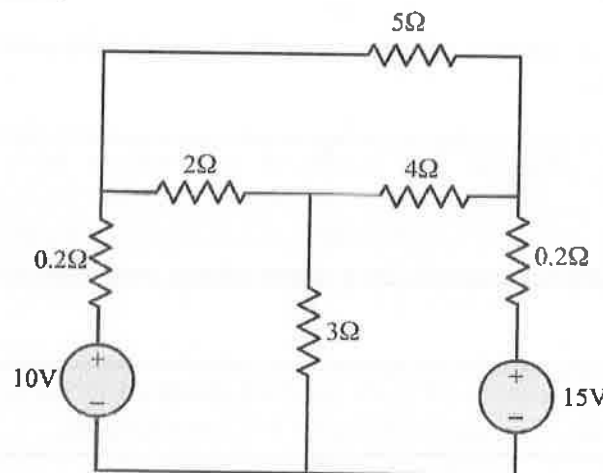
OR

Q.2(B) Apply superposition theorem, find the value of current flowing through   10M   CO1   3
the 8Ω resistor.
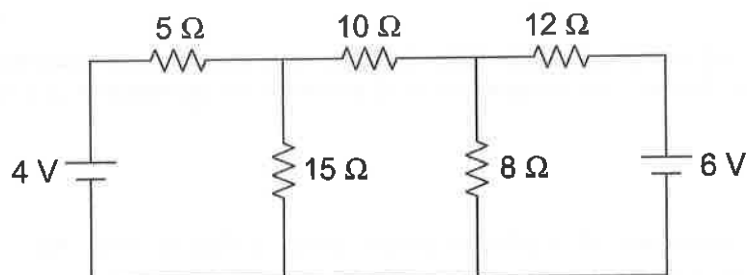
Q.3(A) (i) An alternating voltage given by v=100sin240t volts is applied across a   5M   CO2   2
coil of resistance 32Ω and inductance 100mH. Determine (a) the circuit
impedance, (b) the current flowing, (c) the p.d. across the resistance, and
(d) the p.d. across the inductance.

(ii) A circuit consisting of a resistor in series with a capacitor takes 100   5M   CO2   2
watts at a power factor of 0.5 from a 100 V, 60 Hz supply. Find (a) the
current flowing, (b) the phase angle, (c) the resistance, (d) the
impedance, and (e) the capacitance.

OR

Q.3(B) (i) Write the advantages of 3-phase systems   3M   CO2   1

(ii) Derive the relationship between phase and line voltages in a balanced   7M   CO2   2
three phase star connected system. Also write the expressions for active,
reactive and apparent powers.

Q.4(A) With a neat sketch explain the B-H curve for a ferromagnetic material   10M   CO3   2

OR

Q.4(B) Draw the equivalent circuit of a transformer with respect to (a) primary   10M   CO3   2
side (b) secondary side.

Q.5(A) Explain the working principle and action of commutator of a DC   10M   CO4   2
generator

OR

Q.5(B) Discuss the constructional features of a three phase induction motor   10M   CO4   2
with neat diagrams.

Q.6(A) Explain in detail the operation of a PN junction diode in forward and   10M   CO5   2
reverse bias conditions and draw the relevant V-I characteristics.

OR

Q.6(B) Discuss in details the operation of a full wave rectifier with a neat circuit   10M   CO5   2
diagram and relevant waveforms.

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech I Year I & II Semester (R14) Supplementary End Semester Examinations –SEP' 2021
COMPUTER PROGRAMMING
(Common to ALL Branches)

Time: 3Hrs   Max Marks: 60

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

			Marks	CO	BL
Q.1	i.	What are C tokens?	1M	CO1	1
	ii.	List any two keywords in C.	1M	CO1	1
	iii.	Compare user defined function and inbuilt function.	1M	CO2	2
	iv	Show syntax of one-dimensional array.	1M	CO2	1
	v.	List the string inbuilt functions.	1M	CO3	1
	vi	Define structure.	1M	CO3	1
	vii.	What is an object?	1M	CO4	1
	viii.	Justify dynamic memory allocation necessary.	1M	CO4	5
	ix.	What are types of Data Structure?	1M	CO5	1
	x.	Why queue is called FIFO data structures?	1M	CO5	1

Q.2(A)	Draw structure of C program. Explain its different section with example.	10M	CO1	5
	OR			
Q.2(B)	Explain about Jump Statements with suitable example.	10M	CO1	5

Q.3(A)	Demonstrate C program to sort a list of elements using bubble sort.	10M	CO2	2
	OR			
Q.3(B)	Explain storage classes in C with suitable examples.	10M	CO2	5

Q.4(A)	Explain any five string handling functions with suitable example.	10M	CO3	5
	OR			
Q.4(B)	What is a structure? Write syntax for defining a structure and declaring a structure variable and compare arrays & structures.	10M	CO3	1

Q.5(A)	Analyze the use of public, private and protected access controls in C++.	10M	CO4	4
	OR			
Q.5(B)	Explain type of inheritance in C++ with suitable example.	10M	CO4	5

Q.6(A)	Justify LIFO and FIFO data structures.	10M	CO5	2
	OR			
Q.6(B)	Demonstrate single linked list implementation using arrays.	10M	CO5	2

*** END***

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech. I Year I & II Semester (R14) Supplementary End Semester Examinations – SEPTEMBER 2021
ENVIRONMENTAL SCIENCE
(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.	Name the important components of environment.	1M	CO1	1
	ii.	Give the working principle of windmill.	1M	CO1	1
	iii.	Define food chain.	1M	CO2	1
	iv	What are producers?	1M	CO2	1
	v.	Name the two hot spots of Biodiversity in India.	1M	CO3	1
	vi.	What do you mean by genetic diversity?	1M	CO3	1
	vii.	Give any two sources for soil pollution.	1M	CO4	1
	viii.	Define earth quake?	1M	CO4	1
	ix.	What is population explosion?	1M	CO5	1
	x.	Give the names of any three greenhouse gases.	1M	CO5	1
Q.2(A)		Discuss the scope and importance of Environment?	10M	CO1	6
		OR			
Q.2(B)		Elaborate in detail the renewable energy sources with suitable examples.	10M	CO1	6
Q.3(A)		Explain the characteristic features, structure, and functions of grassland ecosystem.	10M	CO2	5
		OR			
Q.3(B)		Discuss the different types of nutrient cycle present in an ecosystem?	10M	CO2	6
Q.4(A)		Appraise the major hotspots of biodiversity in India and give the necessity of preserving these areas?	10M	CO3	5
		OR			
Q.4(B)		Explain why India is a Mega diversity nation.	5M	CO3	5
Q.5(A)		i. Describe source, effects and control of noise pollution.	5M	CO4	4
		ii. Discuss the various methods of solid waste management.	5M		6
		OR			
Q.5(B)		Discuss about Floods and Earth quakes.	10M	CO4	6
Q.6(A)		i. Write a short note on (a) acid rain, (b) Ozone layer depletion	5M	CO5	3
		ii. Discuss about the different methods of Water conservation.	5M		6
		OR			
Q.6(B)		Examine global warming impacts on the environment?	10M	CO5	4

*** END***

Hall Ticket No: ⬚⬚⬚⬚⬚⬚⬚⬚⬚⬚ Question Paper Code: 14ME11T01

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE
(UGC-AUTONOMOUS)
B.Tech I Year I & II Semester (R14) Regular End Semester Examinations –SEPTEMBER 2021
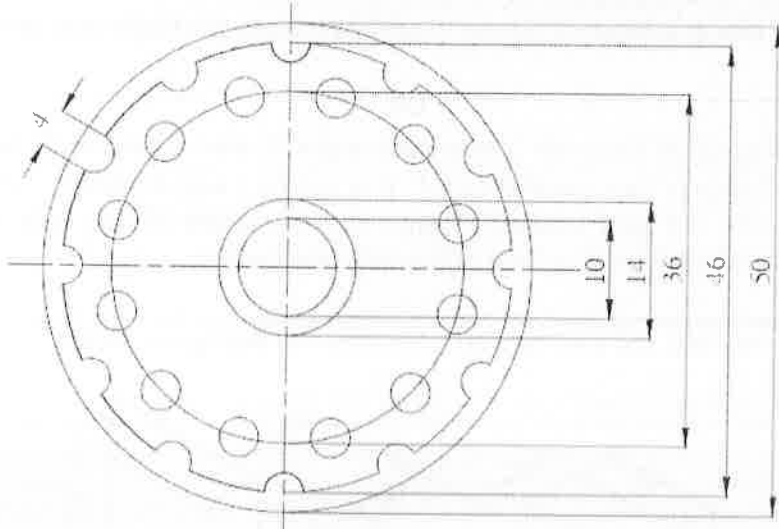## ENGINEERING GRAPHICS
(Common to All)

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 1 to 5 answer either Part-A or B only

Q.1(A)   Draw the figure shown below using Auto CAD commands and dimension it   12M

OR

Q.1(B)   Draw the figure shown below using Auto CAD commands and dimension it   12M
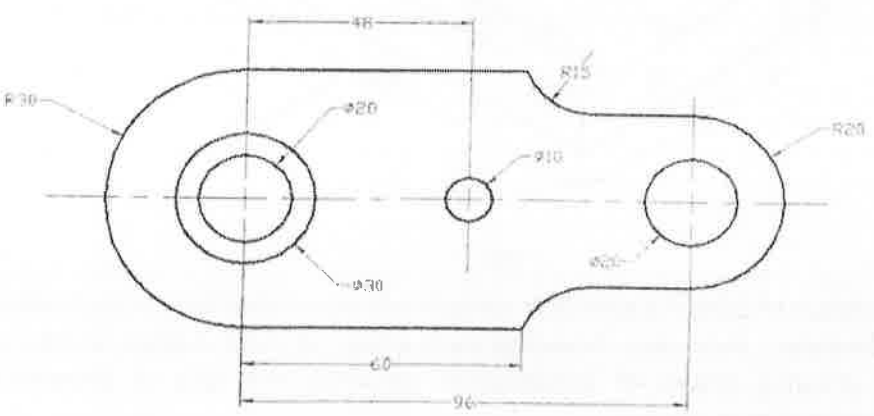
Q.2(A)   Draw the projections of the following points on the same ground line XY; keeping   12M
the distance between the projectors are 35mm, Name the quadrants in which they
lie.
1) Point A, 20mm above the H.P. and 30mm in front of the V.P.
2) Point B, 40mm below the H.P. and 30mm behind the V.P.
3) Point C, 25mm above the H.P. and 35mm behind the V.P.
4) Point D, 30mm below the H.P. and 20mm in front of the V.P.

OR

Q.2(B)	A line AB of 75mm long is inclined at 30^0 to HP and 45^0 to the VP. One end of the line is 20mm above HP and 40mm in front of VP. Draw the projections and find its apparent inclinations with HP and VP.	12M

| Q.3(A)	Draw the projections of a circle of 50mm diameter resting in the H.P and a point A on the circumference. Its plane is inclined at 45^0 to the HP and the top view of the diameter AB making an angle of 30^0 with the VP.	12M

OR

Q.3(B)	A pentagonal pyramid side of base 25 mm and axis 60 mm is resting with one of its slant edge on the HP. The axis of the pyramid is parallel to VP. Draw its projections.	12M

Q.4(A)	A cylinder of base diameter 40 mm and height 80 mm rests on its base on HP. It is cut by section plane perpendicular to VP and inclined at 45° to HP and passing through the axis at a distance 40 mm from base. Draw the front view and sectional top view.	12M

OR

Q.4(B)	A Hexagonal prism of base side 30mm and height 70 mm resting on its base on H.P with the rectangular face parallel to V.P. It is cut by a section plane inclined at 45 degrees to the H.P and passing though the mid-point of the axis. Draw the development of the lateral surface of the truncated prism.	12M

Q.5(A)	Draw the front view, top view and left side view for the figure shown.	12M
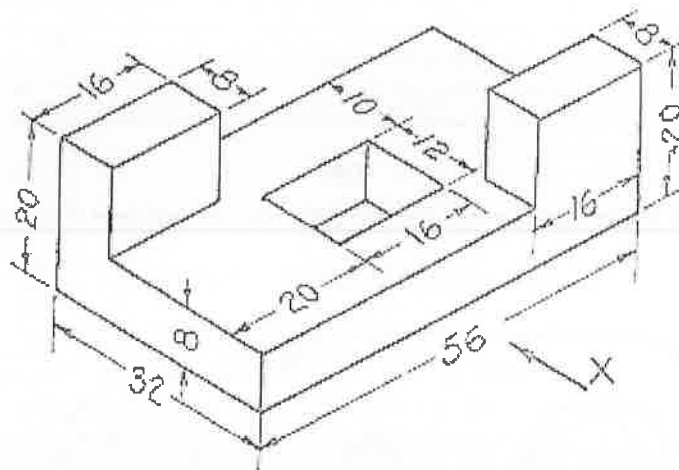
OR

Q.5(B)	A Vertical cylinder of 80mm diameter is completely penetrated by another cylinder of 60mm diameter, their axes bisecting each other at right angles. Draw their projections showing curves of penetration, assuming the axis of penetrating cylinder to be parallel to the V.P.	12M

*** END***