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

Question Paper Code: 20PHY101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations – SEPTEMBER 2021

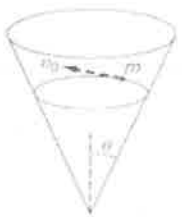
ENGINEERING PHYSICS

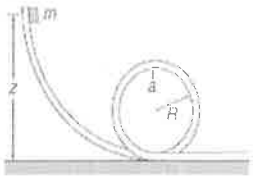
(ME)

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

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

			Marks	CO	BL
Q.1	i.	What is unit vector of $\vec{A} = \hat{\imath} - \hat{\jmath} + \hat{k}$.	1M	1	1
	ii.	If $\hat{r}$ and $\hat{\theta}$ are the base vectors in polar coordinate system, then calculate $\hat{r} \cdot \hat{\theta}$.	1M	1	2
	iii.	State conservation of momentum.	1M	2	1
	iv.	How much initial velocity required for a body of mass 50 kg to escape from the earth?	1M	2	1
	v.	What are the characteristics of simple harmonic motion?	1M	3	1
	vi.	Distinguish transverse wave and longitudinal wave.	1M	3	2
	vii.	Write the condition to get the constructive interference.	1M	4	1
	viii.	Define grating element.	1M	4	1
	ix.	Which pumping mechanism is used in He-Ne laser to achieve population inversion?	1M	5	1
	x.	Define Numerical Aperture.	1M	5	1

Q.2(A)	(*i*) Derive the expression for the velocity in polar coordinate if position of the particle is $\vec{r} = r\,\hat{r}$.	4M	1	3
	(*ii*) A bead moves along the spoke of a wheel at constant speed '*u*' meters per second. The wheel rotates with uniform angular velocity $\dot{\theta} = \omega$ radians per second about an axis fixed in space. At t = 0 the spoke is along the x axis, and the bead is at the origin. Find the bead's velocity at time t (*i*) in polar coordinates; (*ii*) in Cartesian coordinates.	6M	1	4
	OR			
Q.2(B)	(*i*) A particle is moving in the x-y plane and the position of the particle is $\vec{r} = r(\cos\omega t\,\hat{\imath} + \sin\omega t\,\hat{\jmath})$, where r and ω are constants. Find the velocity $(\vec{v})$ of the particle and prove that position $(\vec{r})$ and velocity $(\vec{v})$ is perpendicular to each other.	5M	1	3
	(*ii*) A particle of mass 'm' slides without friction on the inside of a cone. The axis of the cone is vertical, and gravity is directed downward. The apex half-angle of the cone is θ, as shown. The path of the particle happens to be a circle in a horizontal plane. The speed of the particle is v_0. Find the radius of the circular path in terms of v_0, g, and θ. 	5M	1	4

Q.3(A)	Derive the rocket equation. By using rocket equation, find the final velocity of rocket when the rocket moves in a free space?	10M	2	3
	OR			
Q.3(B)	(*i*) State and prove work-energy theorem.	5M	2	3
	(*ii*) A small block of mass '*m*' starts from rest and slides along a frictionless loop-the-loop as shown in the sketch. The radius of the loop is '*R*'. What should be the initial height '*z*', so that '*m*' pushes against the top of the track (at a) with a force equal to its weight? 	5M	2	4
Q.4(A)	*i*) What are Lissajous figures? On which factors the shape of Lissajous figures depends?	3M	3	2
	ii) Two vibrations at right angles to one another are described by the equations as given (*a*) $x = 10 \cos(5\pi t)$ and (*b*) $y = 10 \cos(5\pi t + \pi/4)$. Construct the Lissajous figure of the combined motion.	7M	3	3
	OR			
Q.4(B)	Discuss the various cases of damped harmonic oscillator by deriving the necessary expressions?	10M	3	5
Q.5(A)	What is interference? Explain how the radius of curvature of a given plano-convex lens is determined by forming Newton's rings.	10M	4	5
	OR			
Q.5(B)	Describe Fraunhoffer diffraction due to single slit with a suitable diagram and derive the expression for its resultant intensity.	7M	4	4
	ii) What is Brewster's law? Show that when a ray is incident at the polarizing angle, the reflected ray is perpendicular to the refracted ray.	3M	4	2
Q.6(A)	Describe the construction of Ruby laser and explain the working principle of Ruby laser by using energy level diagram.	10M	5	4
	OR			
Q.6(B)	With the help of a suitable diagram, explain the principle, construction and working of an optical fiber.	10M	5	3

***** END*****

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

Question Paper Code: 20CHE101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations – SEPTEMBER 2021

ENGINEERING CHEMISTRY

(Common to CE, ECE, CST, CSE-IOT & CSE-CS)

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.	50 mL of $CaCO_3$ solution (standard hard water) consumed 25 mL of EDTA. 50 mL of sample water consumed 15 mL EDTA. Calculate the total hardness of the water in ppm.	1M	1	1
	ii.	If P = ½ M, what are the ions responsible for the alkalinity of the water?	1M	1	1
	iii.	Explain the n+1 rule with an example.	1M	2	1
	iv.	What are the different factors that influence the S_N1 reaction?	1M	2	1
	v.	State the basic principle of UV-Visible spectroscopy.	1M	3	1
	vi.	How many signals does CH3-CH2-CH2-OH produce in ^1H NMR?	1M	3	1
	vii.	Define entropy. Write the formula to calculate the change in entropy.	1M	4	1
	viii.	Write the Nernst equation.	1M	4	1
	ix.	Define flashpoint.	1M	5	1
	x.	What is a photocatalyst? Give one example.	1M	5	1
Q.2(A)		Explain a suitable treatment method to produce de-ionized water from hard water.	10M	1	5
		OR			
Q.2(B)		Describe the various steps involved in the Municipal water treatment process. Explain the significance of breakpoint chlorination.	10M	1	5
Q.3(A)		Discuss the electronic configuration of an element influencing its oxidation state and explain with a suitable example.	10M	2	6
		OR			
Q.3(B)		Elaborate on condensation polymerization with an example.	10M	2	6
Q.4(A)		Discuss the working principle, instrumentation and applications of FT-IR spectroscopy.	10M	3	6
		OR			
Q.4(B)		Explain in detail Raman spectroscopy.	10M	3	5
Q.5(A)		i) Explain the construction and working principle of the H_2-O_2 fuel cell with a neat diagram.	5M	4	5
		ii) Discuss the intercalation mechanism of lithium-ion battery with proper anodic and cathodic reactions.	5M	4	6
		OR			

Q.5(B)	Derive the expression for a change in the entropy of an ideal gas during isothermal, isobaric and isochoric processes.	10M	4	5
Q.6(A)	Explain the synthesis of carbon nanotubes by the chemical vapour deposition method.	10M	5	5
	OR			
Q.6(B)	Discuss the process of manufacturing cement from raw materials.	10M	5	6

***** END*****

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

Question Paper Code: 20PHY102

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations – SEPTEMBER 2021

APPLIED PHYSICS

(Common to EEE, CSE, CSE-DS, CS-AI)

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

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

			Marks	CO	BL
Q.1	i.	The displacement in SHM is x=A sin (5πt). Find frequency of SHM.	1M	1	1
	ii.	Define transverse wave.	1M	1	1
	iii.	Write the relation between phase difference and path difference.	1M	2	1
	iv.	Mention the minima condition in a single slit diffraction.	1M	2	1
	v.	What is Heisenberg's uncertainty principle?	1M	3	1
	vi.	Calculate the minimum uncertainty in its momentum if the position of an electron is determined to within 1 Å?	1M	3	2
	vii.	Differentiate intrinsic and extrinsic semiconductor.	1M	4	2
	viii.	Give example of Direct band gap semiconductors.	1M	4	1
	ix.	What is the active medium in ruby laser?	1M	5	1
	x.	On which principle optical fiber work?	1M	5	1
Q.2(A)		What are Lissajous figures? Construct the Lissajous figures for the superimposed two perpendicular simple harmonic motions described by following equations' x= 10 Cos (5πt) and y = 10 Cos (5πt+π/2)	10M	1	3
		OR			
Q.2(B)		(i) Deduce the differential equation of propagation of one dimensional wave.	5M	1	3
		(ii) A transvers wave with displacement Y = 10 Sinπ(5x-2t) is propagating in air. Find amplitude (A), wavelength (λ) time period (T), and velocity (V).	5M	1	2
Q.3(A)		Define Interference? Explain how the wavelength of source is determined by Newton's rings experiment.	10M	2	5
		OR			
Q.3(B)		(i) Differentiate Quarter wave plate and Half wave plate.	4M	2	4
		(ii) What is Brewster's law? Show that when a ray is incident at the polarizing angle, the reflected ray is perpendicular to the refracted ray.	6M	2	2
Q.4(A)		(i) What is the significance of wave function? Derive Schrodinger's time independent wave equations.	8M	3	3
		(ii) Calculate the de-Broglie wavelength of an electron having energy 10 keV.	2M	3	2
		OR			

Q.4(B)	Write down Schrodinger equation for a quantum mechanical particle confined in a potential box defined as $V(x) = 0$ for $0 \leq x \leq a$ and $V(x) = \infty$ otherwise. Obtain the energy eigen values and Eigen functions for this particle in the ground, 1st and 2nd excited states.	10M	3	4
Q.5(A)	What is Hall effect? Derive expression for Hall voltage and Hall coefficient.	10M	4	3
	OR			
Q.5(B)	Define drift velocity. Obtain an expression for electrical conductivity on the basis of quantum free electron theory.	10M	4	4
Q.6(A)	Describe the principle and construction of a He-Ne Laser. By energy level diagram, explain the working of He-Ne laser.	10M	5	4
	OR			
Q.6(B)	(i) Define Acceptance angle and derive an expression for the acceptance angle of the fiber.	7M	5	3
	(ii) An optical fiber has a core of refractive index 1.563 and cladding of refractive index 1.498 The light is launched into it in air. Calculate its numerical aperture and acceptance angle.	3M	5	3

***** END*****

Hall Ticket No: | | | | | | | | | | | Question Paper Code: 20ENG101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations – SEPTEMBER 2021

PROFESSIONAL ENGLISH

(Common to CE, ECE, CST, CSE-IOT & CSE-CS)

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.	**Fill the blank with correct form of verb.** After he _____(read) the newspaper, he tidied the room.	1M	1	3
	ii.	**Write the verb in brackets in the present perfect tense** He (reach) Delhi just now.	1M	1	3
	iii.	**Fill the blank with appropriate modal verb:** When Tanveer was 16, he was a fast runner. He _____ run 200 metres in 22 seconds.	1M	1	3
	iv	Use correct conditional. If Ajay had had enough time, he _____ (travel) more.	1M	1	3
	v.	Add a prefix to the verb given to form a meaningful word. ***Try***	1M	1	3
	vi	Change the following sentence from ***direct speech*** to ***indirect speech.*** "Don't waste your money" she said.	1M	1	3
	vii.	State whether the given statement is True or False "Eye-contact is a part of verbal communication."	1M	1	2
	viii.	Frame question for the reply given: "Yes, I travel much in my job."	1M	1	3
	ix.	What is a Memo?	1M	1	2
	x.	What is the importance of Report writing?	1M	1	2
Q.2(A)		Read the following sentences carefully. Give the synonyms of the underlined word from each sentence.	10M	1	3

i. I am capable of achieving anything in life.
ii. It is time to begin our lesson.
iii. You are kind even when he is mean to you.
iv. After the adventurous trip, I felt very happy.
v. It is difficult to comprehend topics if we don't show any interest.
vi. I want a friend circle who is not judgemental about my style of living.
vii. Afternoon times bring lethargy to our mood.
viii. It was quite unusual of the nurse handling the patients.
ix. Such a spectacular view, I have never seen before in my life.
x. My friend wants to poke her nose in every matter. She is very inquisitive.

OR

Q.2(B)	Complete the sentences given below with suitable verb forms for the words given in brackets. i) When I opened my eyes, I _____ (see) a strange sight. ii) She _____ (teach) English for twelve years. iii) During my last summer holidays, my parents _____ (send) me on a language course to London. iv) She _____(drive) to work yesterday. v) After he _____(read) the newspaper, he tidied the room. vi) He _____ (go) to bed at 11 o'clock at night. vii) I _____(study) in the Delhi School of Economics next year. viii) Look! How the bird _____(fly)! ix) She _____(play) the piano when he visited her house. x) He _____ (not, receive) the letter yet.	10M	1	3

Q.3(A)	Write a paragraph on the following topics. i) Environmental Protection. ii) Handling Global Pandemics.	10M	2	6

OR

Q.3(B)	Read the following text carefully and answer the questions given below. An owl is a bird. There are two basic types of owls: typical owls and barn owls. Owls live in almost every country of the world. Owls are mostly nocturnal, meaning they are awake at night. Owls are predators- they hunt the food that they eat. Owls hunt for mice and other small mammals, insects, and even fish. Owls are well adapted for hunting. Their soft, fluffy feathers make their flight nearly silent. They have very good hearing, which helps them to hunt well in the darkness. The sharp hooked beaks and claws of the owl make it very easy to tear apart prey quickly, although owls also eat some prey whole. Owl eyes are unusual. Like most predators, both of the owl's eyes face front. The owl cannot move its eyes. Owls are far-sighted, which means they can see very well far away... but they can't see up close very well at all. Fortunately, their distant vision is what they use for hunting, and they can see far away even in low light. Owls have facial disks around their eyes, tufts of feathers in a circle around each eye. These facial disks are thought to help with the owl's hearing. Owls can turn their heads 180 degrees. This makes it look like they might be able to turn their heads all the way around, but 180 degrees is all the owl needs to see what's going on all around him. Perhaps because of the owl's mysterious appearance, especially its round eyes and flexible neck, there are a lot of myths and superstitions about owls. Many cultures believe that owls are unusually wise. Because owls are nocturnal, some cultures associate owls with bad omens. The screech of the barn owl is considered by many to sound eerily human, like a person screaming. However, owls probably do not interact with the fates of humans at all. In fact, some owl species may become extinct because of humans.	10M	2	3

Q. Choose the correct option of the following questions.

i. Which of the following is NOT true about owls?

a. Owls eat small animals.
b. Owls are able to fly silently.
c. Owls have the best hearing of all birds.
d. Owls have poor vision

ii. What is the eyesight of the owl used for?

a. flying b. hunting c. sleeping d. none of these

iii. What is the purpose of this story?

a. to entertain b. to inform c. to persuade d. none of these

iv. What would be a good title for this story?

a. Owls Hunt at Night b. Owls Can Fly Silently
c. Owls Are Interesting Animals d. Owls Have Flexible Necks

v. What is a predator?

a. a small feather b. an animal that hunts other animals
c. a small mouse d. none of these

vi. Which of the following is true?

a. The facial disks of the owl help them to see.
b. Owls have a strong, bent beak.
c. Most owls hunt for food during the day.
d. Owls are dangerous to humans.

vii. Why does it look like an owl can turn its head completely around?

a. They are able to turn their heads very quickly.
b. They have ears located on the sides of their head.
c. They can turn their heads 1/2 of the way around.
d. both a and c

viii. Nocturnal means

a. one who likes to roam
b. one who likes to roam in day time
c. active only at night
d. dies at night but is alive during daytime

ix. Deduce the meaning of the word "eerily".

a. freely b. commonly c. strangely d. rarely

x. Give a suitable title to the passage.

Q.4(A)	Write the importance of body language in the professional life.	10M	3	6
	OR			
Q.4(B)	Develop the following situation into meaningful conversation with minimum twelve exchanges: Ask your friend and share your routine actions.	10M	3	6
Q.5(A)	Develop the following situation into meaningful conversation with minimum twelve exchanges: Expressing apologies for not attending the meeting conducted by the Manager.	10M	4	3
	OR			
Q.5(B)	Develop the following situation into meaningful conversation with minimum twelve exchanges: A team of three members discuss on organizing a training course to the new employees.	10M	4	3

Q.6(A)	You work for a company which is interested in making contacts and opening a branch in the USA. Write an email to Ronald Leman including the following points: • introduce your company • explain why you are thinking of expanding to the USA • ask what help Washington Partners can provide for your business • ask for contact details of a partner located in your country	10M	5	6
	OR			
Q.6(B)	The Education minister of your state is planning to set up a state university in your region. So he has directed you to gather information on the on possibilities of setting up a state university in your area. Write a report using the following points: • Importance of opening a state university in your area. • Availability of land in your area and other facilities like water, healthcare. • Required infrastructure. • Requirement of teaching and non-teaching staff. • Any other relevant point.	10M	5	6

*** END***

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

Question Paper Code: 20EEE101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations – SEPTEMBER 2021

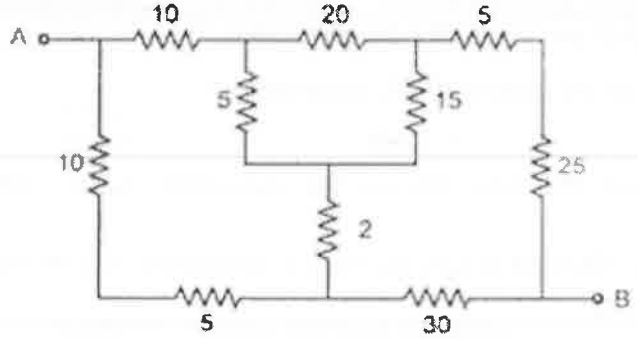
BASIC ELECTRICAL ENGINEERING

(Common to EEE, ME, CSE, CSE-DS, CSE-AI)

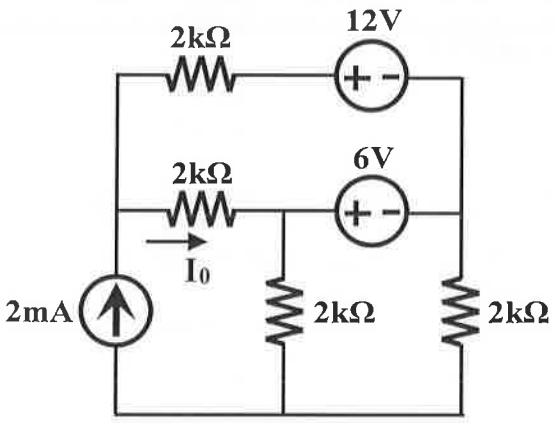
Time: 3Hrs **Max Marks: 60**

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

			Marks	CO	BL
Q.1	i.	State Kirchhoff's Current Law.	1M	1	1
	ii.	What are passive electrical elements?	1M	1	1
	iii.	Define form factor of AC signal.	1M	2	1
	iv.	What is apparent power?	1M	2	1
	v.	What is leakage flux?	1M	3	1
	vi.	Define voltage regulation of a transformer.	1M	3	1
	vii.	In a DC generator, what is the function of commutator?	1M	4	1
	viii.	What is slip in an induction motor?	1M	4	1
	ix.	What is SFU?	1M	5	1
	x.	Expand MCCB.	1M	5	1
Q.2(A)	i.	Determine the resistance between the terminals A-B of the circuit shown in Figure below.	5M	1	3



	ii.	Derive the equation for star-delta transformation.	5M	1	2
		OR			
Q.2(B)		Apply superposition to find I_0 in the circuit shown in below figure.	10M	1	3



Q.3(A)	i.	What do you mean by AC quantity? Define cycle, Frequency, phase and phase difference of an alternating quantity.	5M	2	2
	ii.	A circuit consisting of a resistor in series with a capacitor takes 100 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.	5M	2	3
		OR			
Q.3(B)	i.	Derive the relationship between phase and line voltages in a balanced three phase star connected system.	5M	2	2
	ii.	A three-phase, balanced star-connected load of (4+j8) Ω is connected across a 400V, three-phase balanced supply. Determine the phase currents and line currents. Assume the phase sequence to be RYB. Also calculate the power drawn by the load.	5M	2	3
Q.4(A)	i.	Draw and explain hysteresis loop of a ferro magnetic material.	5M	3	2
	ii.	A magnetizing force of 8000A/m is applied to a circular magnetic circuit of mean diameter 30cm by passing a current through a coil wound on the circuit. If the coil is uniformly wound around the circuit and has 750 turns, find the current in the coil.	5M	3	3
		OR			
Q.4(B)	i.	Explain the construction and working principle of a single phase transformer.	5M	3	2
	ii.	Draw the equivalent circuit of a transformer with respect to: (a). primary side (b) secondary side.	5M	3	2
Q.5(A)	i.	Derive the EMF equation of a DC generator.	5M	4	2
	ii.	Explain the speed control of DC shunt motor.	5M	4	2
		OR			
Q.5(B)	i.	Explain about the DOL starter for induction motor with neat diagram	5M	4	2
	ii.	Explain how rotating magnetic field is produced in a three-phase induction motor.	5M	4	2
Q.6(A)		Discuss in details the operation of a full wave bridge rectifier with a neat circuit diagram and relevant waveforms.	10M	5	2
		OR			
Q.6(B)		Discuss the working of a miniature circuit breaker (MCB) with the help of neat diagram.	10M	5	2

*** END***

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

Question Paper Code: 20MAT101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations – SEPTEMBER 2021

ENGINEERING CALCULUS

(Common to ME, CSE,CSE-DS, CSE-AI,CE,ECE,CST,CSE-IOT,CSE-CS)

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.	Determine the volume of the solid by revolving the curve $y=x^2$, $0\le x\le 9$ about the x-axis.	1M	1	2
	ii.	Find the value of integral $\int_0^1 x^4(1-x)^3\,dx$ by using beta and gamma functions	1M	1	2
	iii.	State the Cauchy's mean value theorem	1M	2	1
	iv	Evaluate $\underset{x\to 0}{Lt}\tan x.\log x$	1M	2	2
	v.	Determine the series $\sum_{n=1}^{\infty}\frac{2^n}{n^3}$ converges or diverges	1M	3	2
	vi	If $f(x)=x+\pi$ in $0<x<2$ then determine a_0.	1M	3	1
	vii.	If $f(x,y)=x\sin y+e^y$ then find $\frac{\partial^2 f}{\partial x^2}$.	1M	4	1
	viii.	Find ∇f at the point (1,1,1) for the function $f(x,y,z)=x^2+y^2-2z^2+z\ln x$	1M	4	2
	ix.	Write the equations relating to the Cartesian and spherical coordinate system.	1M	5	1
	x.	State Stoke's theorem.	1M	5	1
Q.2(A)		Find the surface area of the solid generated by the revolution of the lemniscate $r^2=a^2\cos 2\theta$ about the initial ray.	10M	1	3
		OR			
Q.2(B)		i. Evaluate $\int_0^{\infty} e^{-x^2}dx$	5M	1	3
		ii. Evaluate $\int_0^{\infty} e^{-kx}x^{p-1}dx\,(k>0)$	5M	1	3
Q.3(A)		Expand $\log(1+\sin x)$ upto the term containing x^4 by using Maclaurin's series	10M	2	3
		OR			
Q.3(B)		i. Find the values of a, b and c such that $\underset{x\to 0}{Lt}\frac{x(a+b\cos x)-c\sin x}{x^5}=1$	5M	2	3
		ii. Find the maximum and minimum values of $3x^4-2x^3-6x^2+6x+1$ in the interval $(0,2)$	5M	2	3

Q.4(A)	Determine whether the following series converges or diverges i. $\sum_{n=3}^{\infty} \frac{5n^3-3n}{n^2(n-2)(n^2+5)}$ ii. $\sum_{n=1}^{\infty}(-1)^{n+1}\frac{n}{n^3+1}$	10M	3	3
	OR			
Q.4(B)	Obtain the half range cosine and sine series for $f(x)=x^2$ in $0 \le x \le \pi$.	10M	3	4
Q.5(A)	(i) Find the derivative of the function $f(x,y,z)=xy+yz+zx$ at $(1,-1,2)$ in the direction of $v=3i+6j-2k$.	5M	4	3
	(ii) By applying Chain rule, find $\frac{\partial w}{\partial u}$ and $\frac{\partial w}{\partial v}$, if $w=xy+yz+zx$, $x=u+v,\ y=u-v,\ z=uv$	5M	4	3
	OR			
Q.5(B)	The plane $x + y + z = 1$ cuts the cylinder $x^2+y^2=1$ in an ellipse. Find the points on the ellipse that lie closest to and farthest from the origin.	10M	4	4
Q.6(A)	Sketch the region of integration for the integral $\int_0^2 \int_{x^2}^{2x} (4x+2)dy\,dx$ and evaluate by change of order of integration	10M	5	3
	OR			
Q.6(B)	Verify divergence theorem for the expanding vector field $F = xi + yj + zk$ over the sphere $x^2+y^2+z^2=a^2$.	10M	5	4

*** END***

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

Question Paper Code: 20MAT105

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations – SEPTEMBER 2021

CALCULUS AND DIFFERENTIAL EQUATIONS

(EEE)

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

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

			Marks	CO	BL
Q.1	i.	Verify the Lagrange's mean value theorem for $f(x)=x^3$ in $[-3,3]$	1M	1	1
	ii.	Find the length of the curve $y=4x$ from $x=0$ to $x=4$.	1M	1	2
	iii.	Find f_x, f_y, when $f(x,y)=x\sin y+e^{xy}$	1M	2	2
	iv	When the function $f(x,y)$ has saddle point at (a,b).	1M	2	3
	v.	Evaluate $\iint_R dA$, when $0\le x\le 4, -1\le y\le 2$	1M	3	2
	vi	Find the curl of $f(x,y,z)=xy\,i+yz\,j+zx\,k$	1M	3	1
	vii.	Solve the differential equation $y''+5y'+6y=0$	1M	4	1
	viii.	Determine the particular integral of $y'+2xy=e^x$	1M	4	2
	ix.	Test the convergence of the series $\sum_{n=1}^{\infty}\frac{1}{5n^{\frac{1}{2}}}$	1M	5	2
	x.	Give example for linear and nonlinear partial differential equations.	1M	5	2
Q.2(A)		Verify Rolle's theorem for the function $f(x)=\frac{Sinx}{e^x}$ in $(0,\pi)$	10M	1	3
		OR			
Q.2(B)		Find the area of the polar curves $r=a(1-\cos\theta)$	10M	1	3
Q.3(A)		Examine $\frac{\partial w}{\partial r}$ and $\frac{\partial w}{\partial s}$ in terms of r and s if $w=x^2+y^2$, $x=r-s$, $y=r+s$	10M	2	3
		OR			
Q.3(B)		Find the derivative of $f(x,y)=xe^y+\cos(xy)$ at the point (2,0) in the direction of v = 3i - 4j.	10M	2	3
Q.4(A)		Sketch the region of integration for the integral $\int_0^2\int_{x^2}^{2x}(4x+2)dy\,dx$ and evaluate by change of order of integration	10M	3	3
		OR			
Q.4(B)		Use stokes theorem to evaluate $\int_c F.dr$. If $F=xz\bar{i}+xy\bar{j}+3xz\bar{k}$ and C is boundary of the portion of the plane $2x+y+z=2$ in the first octant traversed counter clockwise direction.	10M	3	4

Q.5(A)	i) Solve $\frac{dy}{dx} - 2xy = 6xe^{x^2}$	5M	4	3
	ii) Solve $e^y dx + (xe^y + 2y)dy = 0$	5M	4	3
	OR			
Q.5(B)	Find the general solution of $y'' + 10y' + 25y = 14e^{-5x}$	10M	4	3
Q.6(A)	Solve $p\,Tanx + q\,Tany = Tanz$	10M	5	3
	OR			
Q.6(B)	Use any method to determine the series converges or diverges. a) $\sum_{n=1}^{\infty} \frac{(n+1)(n+2)}{n!}$ b) $\sum_{n=2}^{\infty} \frac{n+2}{n^2-n}$ c) $\sum_{n=2}^{\infty} \frac{3}{\sqrt{n}}$	10M	5	4

*** END***

Set - 1

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

Question Paper Code: 20ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations –SEPTEMBER 2021

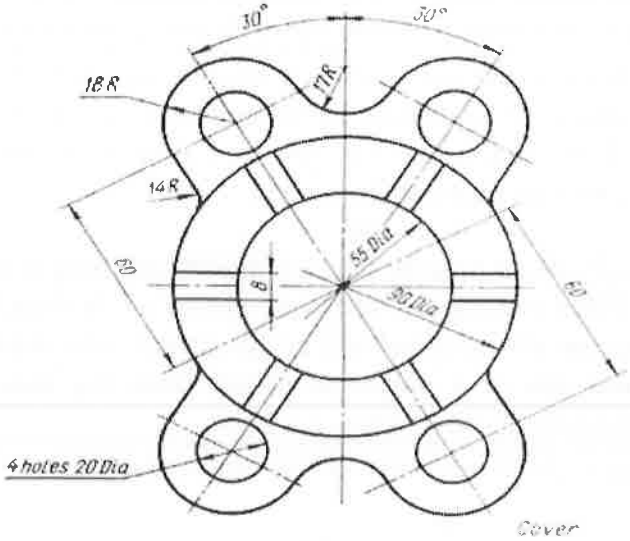
ENGINEERING GRAPHICS

(Common to ECE, CSE-CS)

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

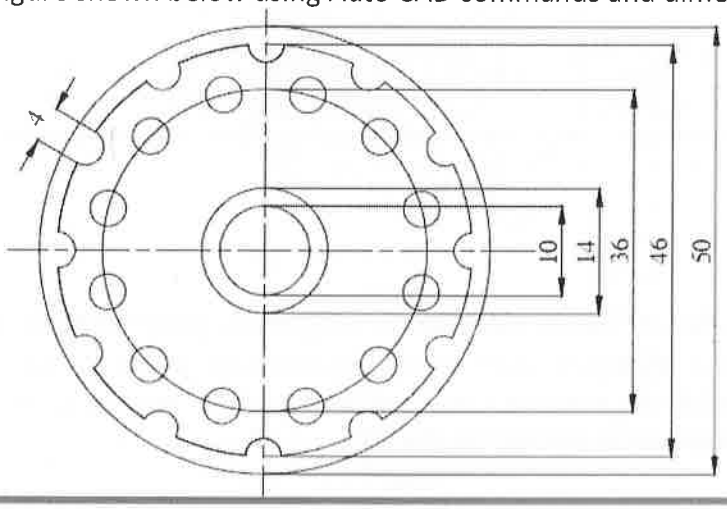
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 1 to 5 answer either Part-A or B only

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

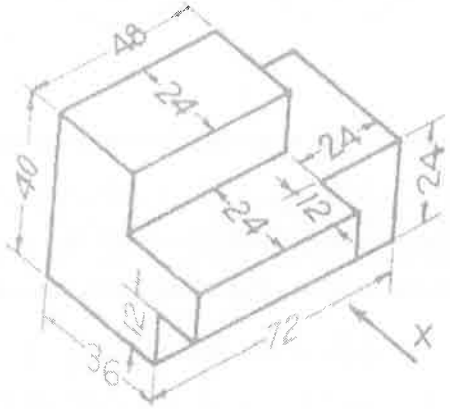


OR

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



Q.2(A)	Draw the projections of the following points on the same ground line XY; keeping the distance between the projectors are 40mm, Name the quadrants in which they lie. ➢ Point A, 20mm above the H.P. and 30mm in front of the V.P. ➢ Point B, 40mm below the H.P. and 30mm behind the V.P. ➢ Point C, 25mm above the H.P. and 35mm behind the V.P. ➢ Point D, 30mm below the H.P. and 20mm in front of the V.P.	12M	2
	OR		
Q.2(B)	A line AB 80mm long is inclined at an angle of 40^0 to H.P and 55^0 to V.P. The point A is 20mm above H.P and 30mm infront of V.P. Draw its Projections and find the apparent inclinations with HP and VP.	12M	2
Q.3(A)	A pentagonal pyramid of base side 30mm and axis 60mm has an edge of base parallel to H.P. Its axis is parallel to V.P and inclined at 45^0 to H.P. Draw its projections when the apex lies in the H.P.	12M	3
	OR		
Q.3(B)	Draw the projections of a circle of 50 mm diameter having its plane vertical and inclined at 30^0 to V.P. Its centre is 30 mm above HP and 20 mm infront of V.P.	12M	3
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, sectional top view and true shape of the section.	12M	4
	OR		
Q.4(B)	A hexagonal prism of side of base 30 mm and axis 70 mm long is resting on its base on H.P. such that a rectangular face is parallel to V.P. It is cut by a section plane perpendicular to V.P. and inclined at 30^0 to H.P. The section plane is passing through the axis at a height of 40mm from the base. Draw the development of the lateral surface of the cut prism.	12M	4
Q.5(A)	Draw the front, top and left side view for the figure given below	12M	5



	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	5

*** END***

Set - 2

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

Question Paper Code: 20ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations –SEPTEMBER 2021

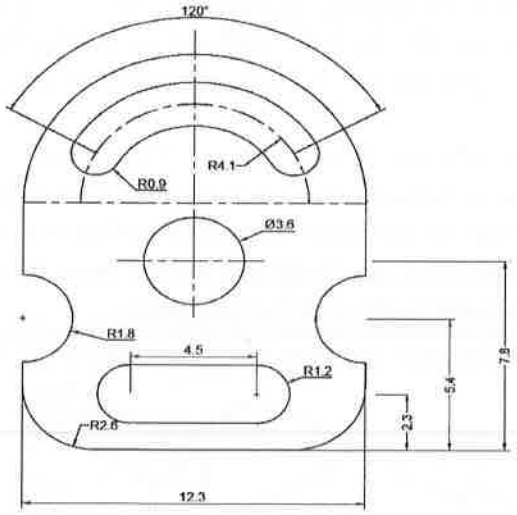
ENGINEERING GRAPHICS

(Common to ECE, CSE-CS)

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

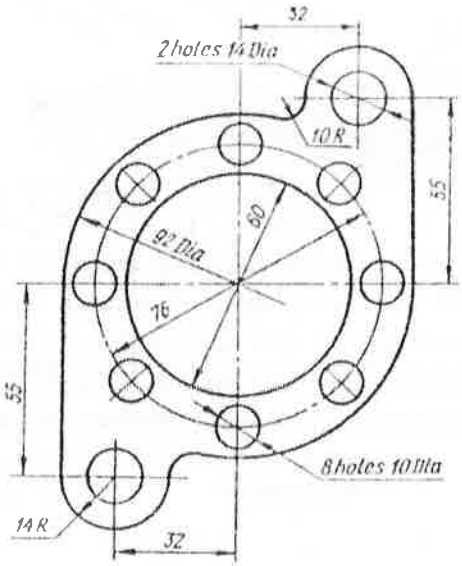
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 1 to 5 answer either Part-A or B only

		Marks	CO	BL
Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3

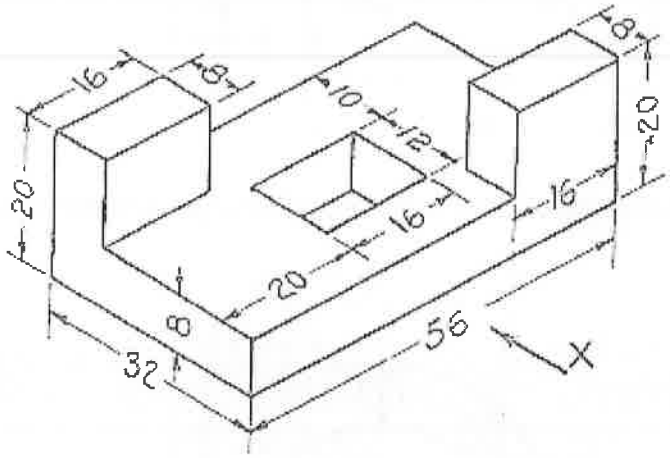


OR

Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3



Q.2(A)	A point A is 10 mm above H.P and 15mm in front of V.P. Another point B is 15 mm behind V.P and 20 mm below H.P. draw the projections of A and B keeping the distance between the projections equal to 30mm. Draw straight lines, joining (i) the top views and (ii) the front views.	12M	2	3
	OR			
Q.2(B)	A line AB 90 mm long is inclined at 45° to HP and its Top view makes an angle of 60° to V.P. The end A is in H.P and 12 mm infront of V.P. Draw its Front view and find its True inclination with V.P.	12M	2	3
Q.3(A)	A Cylinder of base diameter 50 mm and axis 70 mm has a generator in V.P and inclined at 30° to H.P. Draw its projections.	12M	3	3
	OR			
Q.3(B)	A pentagonal plate of 45 mm side has a circular hole of 40 mm diameter in its center. The plane stands on one of its sides on the H.P. with its plane perpendicular to V.P. and 45° inclined to H.P. Draw its projections.	12M	3	3
Q.4(A)	A Square prism base 40 mm side and axis 65 mm has its base on the H.P, and all the edges of the base equally inclined to the V.P. It is cut by a section plane, perpendicular to the V.P., inclined at 45° to the H.P. and bisecting the axis. Draw its front view and the sectional top view.	12M	4	4
	OR			
Q.4(B)	A hexagonal prism of side of base 30 mm and axis 70 mm long is resting on its base on H.P. such that a rectangular face is parallel to V.P. It is cut by a section plane perpendicular to V.P. and inclined at 30° to H.P. The section plane is passing through the axis at a height of 40mm from the base. Draw the development of the lateral surface of the cut prism.	12M	4	4
Q.5(A)	Draw the front, top and left side view for the figure given below	12M	5	3



OR

Q.5(B)	A vertical square prism, base 50mm side and height 90 mm has a face inclined at 30° to the VP. It is completely penetrated by another square prism, base 40 mm side and 100 mm long, faces of which are equally inclined to the VP. The axes of the two prisms are parallel to the VP and bisect each other at right angles. Draw the projections showing lines of the intersection.	12M	5	4

*** END***

Set - 3

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

Question Paper Code: 20ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations –SEPTEMBER 2021

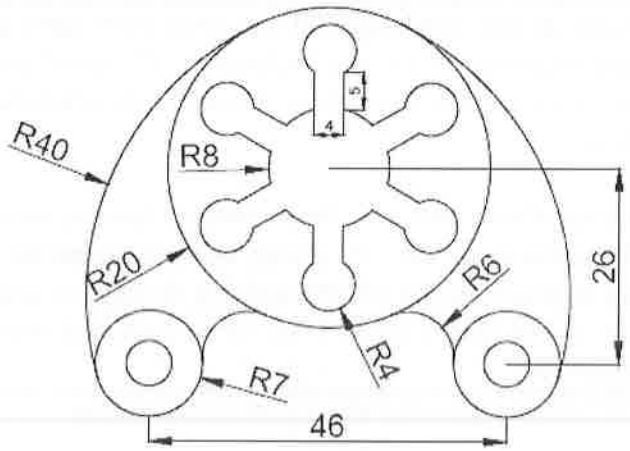
ENGINEERING GRAPHICS

(Common to ECE, CSE-IOT)

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

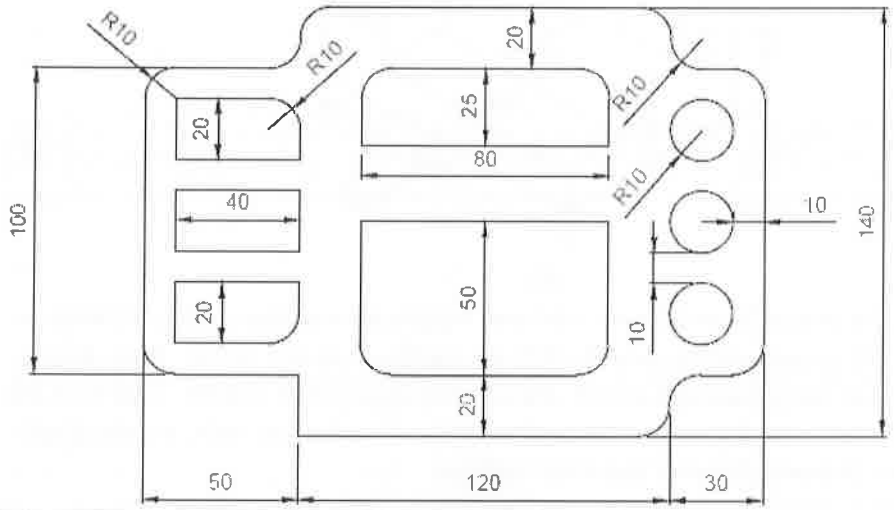
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 1 to 5 answer either Part-A or B only

		Marks	CO	Bl
Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3

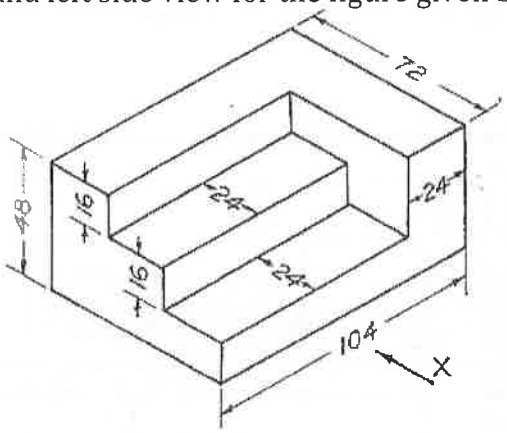


OR

Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3



Q.2(A)	A line CD 80mm long is inclined at an angle of 30^0 to H.P and 45^0 to V.P. The point C is 20 mm above H.P. and 30mm in front of V.P. Find the apparent inclinations and also draw the traces.	12M	2	3
	OR			
Q.2(B)	A point A is 10 mm above H.P and 15 mm in front of V.P. Another point B is 15 mm behind V.P and 20 mm below H.P. draw the projections of A and B keeping the distance between the projections equal to 30mm. Draw straight lines, joining (i) the top views and (ii) the front views.	12M	2	3
Q.3(A)	A Pentagonal pyramid of base side 30 mm and axis 65 mm has an edge of its base on the ground. The axis is inclined at 45^0 to the ground and parallel to V.P. Draw its projections.	12M	3	3
	OR			
Q.3(B)	A rectangular plate of negligible thickness having 150 mm length and 100 mm width is resting on one of its smaller side on HP. The surface makes an inclination of 30^0 to HP and smaller side makes an inclination of 60^0 to VP. Draw the projection of the plate.	12M	3	3
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 development of the lateral surface of the solid.	12M	4	4
	OR			
Q.4(B)	A square prism side of base 40mm and axis 70mm long Its base is resting on HP and its face is equally inclined to VP. It is cut by section plane, which is perpendicular to VP and inclined 45o to HP and passing through a point 25 mm from the top of the axis of the prism. Draw front view, sectional top view and true shape of the square prism.	12M	4	4
Q.5(A)	Draw the front, top and left side view for the figure given below	12M	5	3



OR

Q.5(B)	A vertical square prism, base 50 mm side and height 90 mm has a face inclined at 30^0 to the VP. It is completely penetrated by another square prism, base 40mm side and 100 mm long, faces of which are equally inclined to the VP. The axes of the two prisms are parallel to the VP and bisect each other at right angles. Draw the projections showing lines of the inter section.	12M	5	4

*** END***

Set - 4

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

Question Paper Code: 20ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations –SEPTEMBER 2021

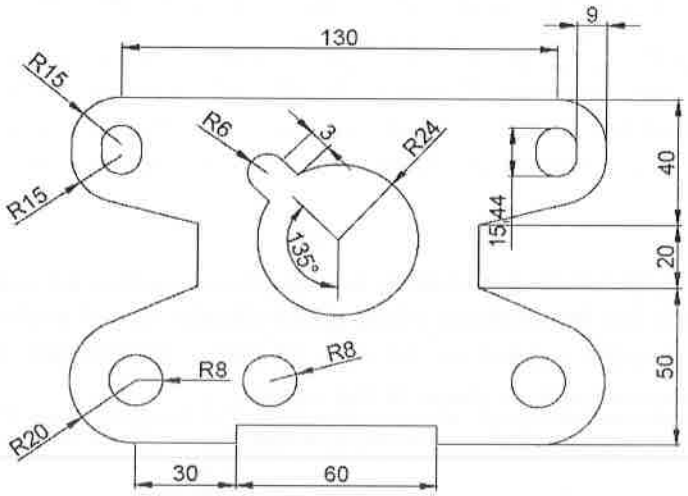
ENGINEERING GRAPHICS

(Common to ECE, CSE-IOT)

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

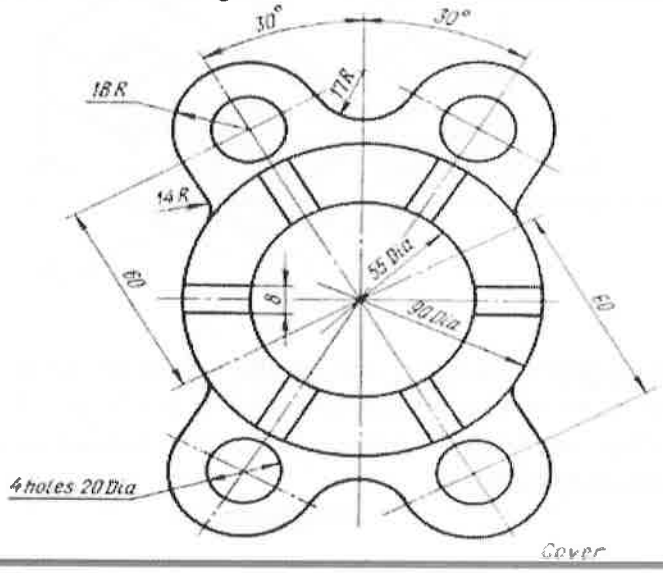
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 1 to 5 answer either Part-A or B only

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

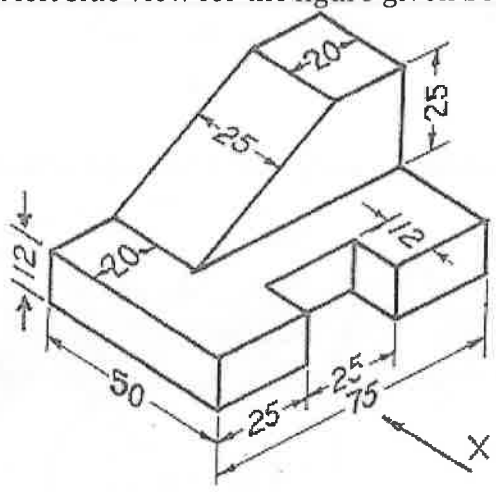


OR

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, keeping the projectors 40 mm apart. a) Point C, in the V.P. and 40 mm above the H.P. b) Point D, 25 mm below the H.P. and 25 mm behind the V.P. c). Point E, 15 mm above the H.P. and 50 mm behind the V.P. d) Point F, 40 mm below the H.P. and 25 mm in front of the V.P.	12M
	OR	
Q.2(B)	The line EF 70 mm long has its end E, at 10mm above the HP and 15mm in front of VP. Its Elevation and Plan measures 50mm and 60mm respectively. Draw the projections of the line and determine its inclinations with HP and VP.	12M
Q.3(A)	Draw the projections of a regular hexagon of 25 mm side having one of its sides in the H.P and inclined at 60^0 to V.P and its surface making an angle of 45^0 with H.P.	12M
	OR	
Q.3(B)	A Pentagonal Prism of base edge 30 mm and axis 60mm has a corner on the H.P with its axis inclined at 45^0 to the H.P. Draw the projections when the plane containing the resting corner and the axis is parallel to V.P.	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 development of the lateral surface of the solid.	12M
	OR	
Q.4(B)	A cube of side 50mm long is resting on the ground with a vertical surface inclined at 300 to V.P. It is cut by a section plane perpendicular to V.P and inclined at 30^0 to H.P and passing through a point on the axis, 38 above the ground. Draw the front view, sectional top view and true shape of the section.	12M
Q.5(A)	Draw the front, top and left side view for the figure given below	12M



OR

Q.5(B)	A cylinder having 70 mm diameter and 90 mm axis length is completely penetrated by a square prism of 40 mm base edge and 90 mm axis length. Both axes Intersect and bisect each other. All faces of prism are equally inclined to HP. Draw projections showing curves of intersections.	12M

*** END***

Set - 5

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

Question Paper Code: 20ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations –SEPTEMBER 2021

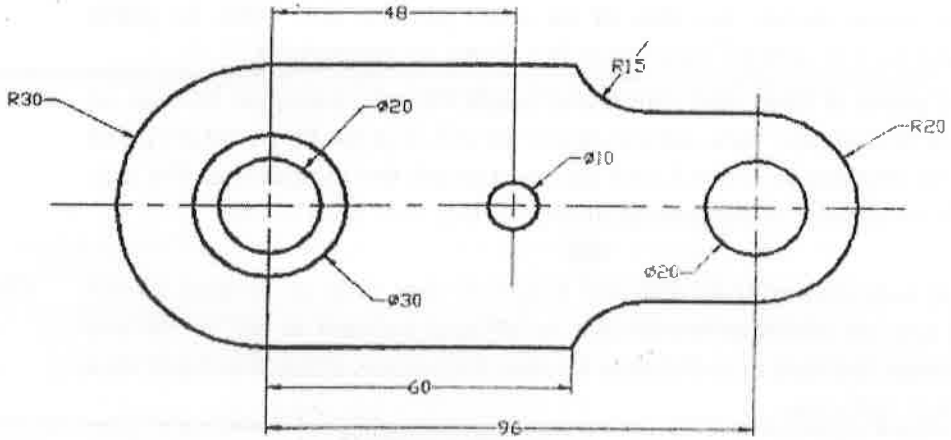
ENGINEERING GRAPHICS

(Common to ECE, CST)

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

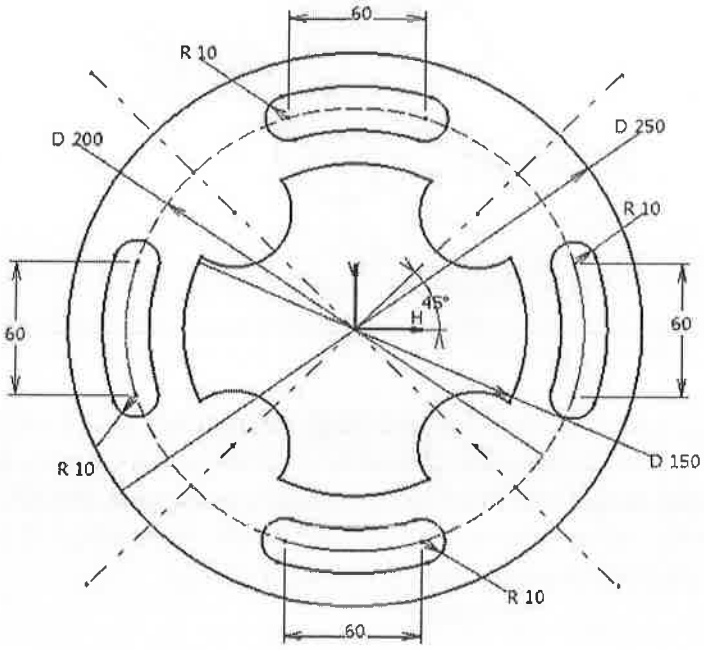
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 1 to 5 answer either Part-A or B only

		Marks	CO	BL
Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3

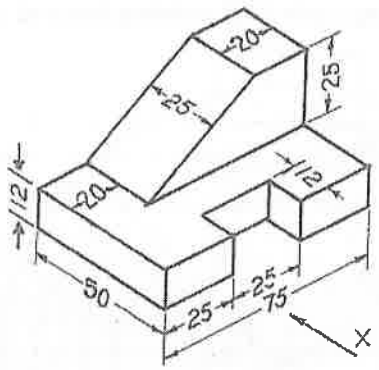


OR

Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3



Q.2(A)	A point A is 10mm above H.P and 15mm in front of V.P. Another point B is 15mm behind V.P and 20mm below H.P. draw the projections of A and B keeping the distance between the projections equal to 30mm. Draw straight lines, joining (i) the top views and (ii) the front views.	12M	2	3
	OR			
Q.2(B)	i. A point A is 30mm above H.P, 50mm in front of V.P and 25mm in front of P.P. Draw front view, top view and left side view of the point.	6M	2	3
	ii. A point B is 40mm below H.P, 50mm behind V.P and 30mm in front of P.P. Draw front view, top view and right side view of the point.	6M	2	3
Q.3(A)	Draw the projections of a regular hexagon of 25mm side having one of its sides in the H.P and inclined at 60^0 to V.P and its surface making an angle of 45^0 with H.P.	12M	3	3
	OR			
Q.3(B)	A pentagonal plate of 45mm side has a circular hole of 40mm diameter in its center. The plane stands on one of its sides on the H.P. with its plane perpendicular to V.P. and 45^0 inclined to H.P. Draw its projections.	12M	3	3
Q.4(A)	A hexagonal prism of base side 30mm and height 80 mm resting on its base on H.P with one rectangular face perpendicular to V.P. It is cut by a section plane inclined at 45 degrees to the H.P and passing though the midpoint of the axis. Draw the development of the lateral surface of the truncated prism.	12M	4	4
	OR			
Q.4(B)	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	4	4
Q.5(A)	Draw Front view ,Topview and sideviewfor the isometric view given below	12M	5	3



OR

Q.5(B)	A vertical square prism, base 50mm side and height 90mm has a face inclined at 30^0 to the VP. It is completely penetrated by another square prism, base 40mm side and 100mm long, faces of which are equally inclined to the VP. The axes of the two prisms are parallel to the VP and bisect each other at right angles. Draw the projections showing lines of the inter section.	12M	5	4

*** END***

Set - 6

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

Question Paper Code: 20ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations –SEPTEMBER 2021

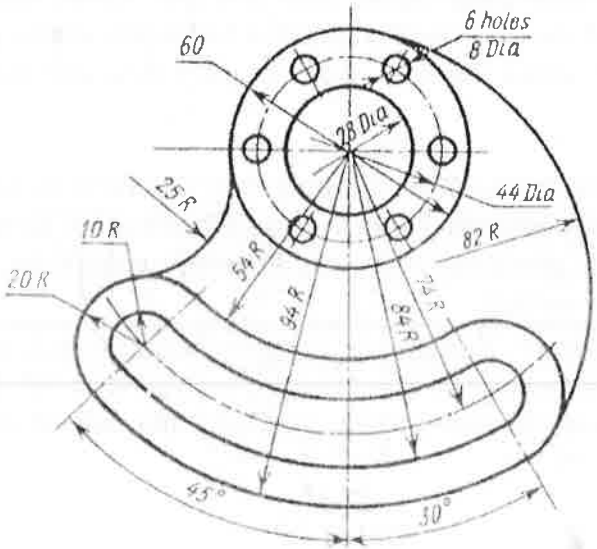
ENGINEERING GRAPHICS

(Common to ECE, CST)

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

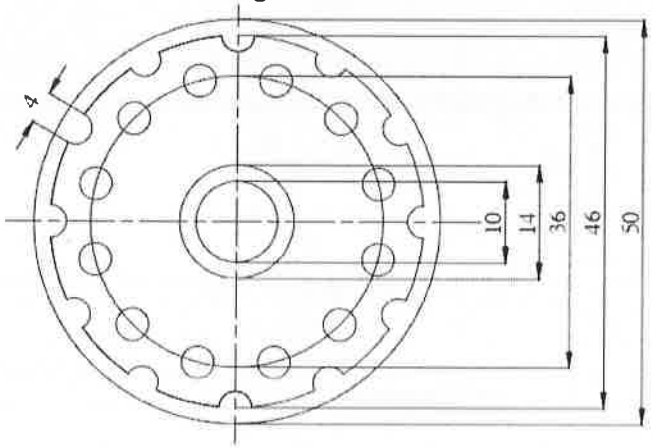
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 1 to 5 answer either Part-A or B only

		Marks	CO	Bl
Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3

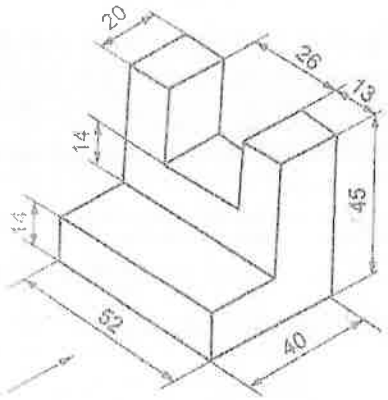


OR

		Marks	CO	Bl
Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3



Q.2(A)	Draw the projections of a 75mm long line in the following positions. i. Perpendicular to H.P, 20mm infront of V.P, and its one end 15mm above H.P ii. Perpendicular to V.P, 25mm above H.P, and its one end is in V.P iii. Perpendicular to H.P in V.P, and its one end is in H.P	12M	2	3
	OR			
Q.2(B)	A line AB is 80mm length. Point A is 20mm above HP and 20mm in front of VP. Another end point B is 40mm above HP and 50mm in front of VP. Draw the projections and determine the inclination angles with HP and VP.	12M	2	3
Q.3(A)	A Pentagonal Prism of base edge 30 mm and axis 60mm has a corner on the H.P with its axis inclined at 45^0 to the H.P. Draw the projections when the plane containing the resting corner and the axis is parallel to V.P.	12M	3	3
	OR			
Q.3(B)	A square plane is 40 mm side is equally inclined to VP its surface is 45^0 to the HP. And its diagonal corner is in the HP and its diagonal makes 60^0 the VP. Draw its projections.	12M	3	3
Q.4(A)	A Pentagonal prism of base edge 30mm side and axis 65mm has its base horizontal and an edge of the base parallel to V.P. A horizontal section plane cuts it at a distance of 25mm above the base. Draw its front view and sectional top view.	12M	4	4
	OR			
Q.4(B)	A cylinder of base 50mm and axis 60mm is resting on ground with its axis vertical. It is cut by a section plane perpendicular to V.P and inclined at 45^0 to H.P passing through the top of the generator and cuts all other generators. Draw its development of its lateral surface.	12M	4	4
Q.5(A)	A Vertical cylinder of 100mm diameter is completely penetrated by another cylinder of 70mm diameter with their axes bisecting each other at 90^0. Draw their projections showing curves of penetration, assuming the axis of penetrating cylinder to be parallel to the V.P.	12M	5	4
	OR			
Q.5(B)	Draw Front view ,Topview and sideview for the given isometric view.	12M	5	3



*** END***

Set - 7

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

Question Paper Code: 20ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations –SEPTEMBER 2021

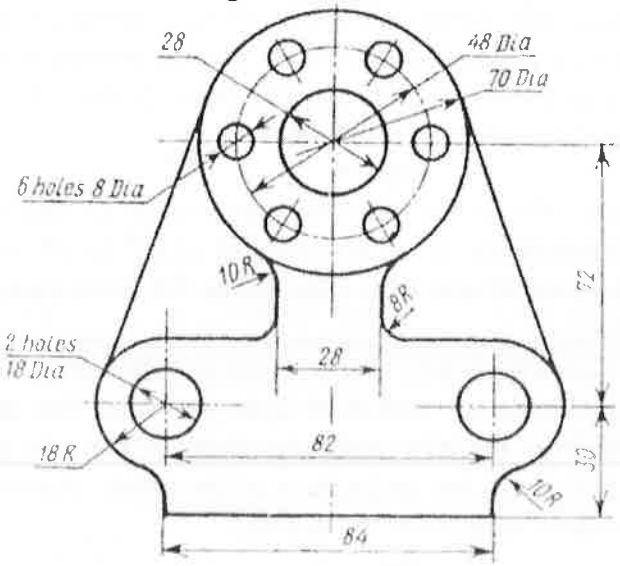
ENGINEERING GRAPHICS

(Common to CE, CST)

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

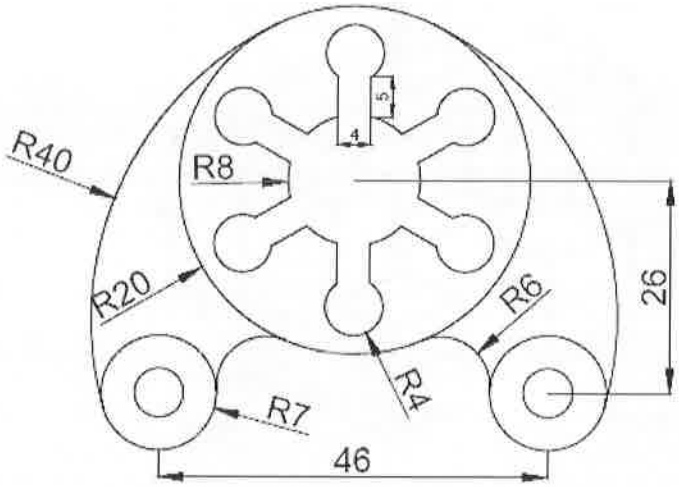
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 1 to 5 answer either Part-A or B only

		Marks	CO	B
Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3

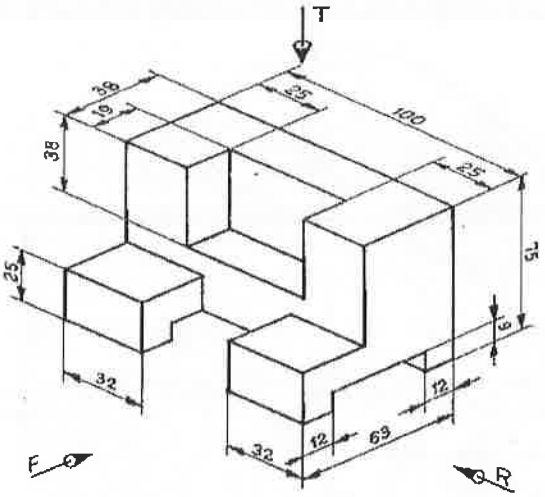


OR

Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it	12M	1	3



Q.2(A)	Two points C and D are in the H.P. The point C is 15mm in front of V.P and D is behind the V.P. the distance between their projectors is 40mm and line joining their top views makes an angle of 40^0 with XY. Find the distance of the point C from the V.P.	12M	2	3
	OR			
Q.2(B)	A line CD 80mm long is inclined at an angle of 30^0 to H.P and 45^0 to V.P. The point C is 20mm above H.P. and 30mm in front of V.P. Find the apparent inclinations and also draw the traces.	12M	2	3
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	3	3
	OR			
Q.3(B)	A Cylinder of base diameter 50mm and axis 70mm has a generator in V.P and inclined at 45^0 to H.P. Draw its projections.	12M	3	3
Q.4(A)	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	4	4
	OR			
Q.4(B)	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, sectional top view and true shape.	12M	4	4
Q.5(A)	A Vertical square prism base 50mm side, is completely penetrated by a horizontal square prism, base 35mm side, so that their axes intersect. The axis of the horizontal prism is parallel to the V.P., while the faces of the two prisms are equally inclined to the V.P. Draw the projections of the solids, showing lines of intersection. (Assume suitable lengths for the prisms).	12M	5	4
	OR			
Q.5(B)	Draw front view, top view and side view of the above figure	12M	5	3



*** END***

Set - 8

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

Question Paper Code: 20ME101

MADANAPALLE INSTITUTE OF TECHNOLOGY & SCIENCE, MADANAPALLE

(UGC-AUTONOMOUS)

B.Tech I Year I Semester (R20) Regular End Semester Examinations –SEPTEMBER 2021

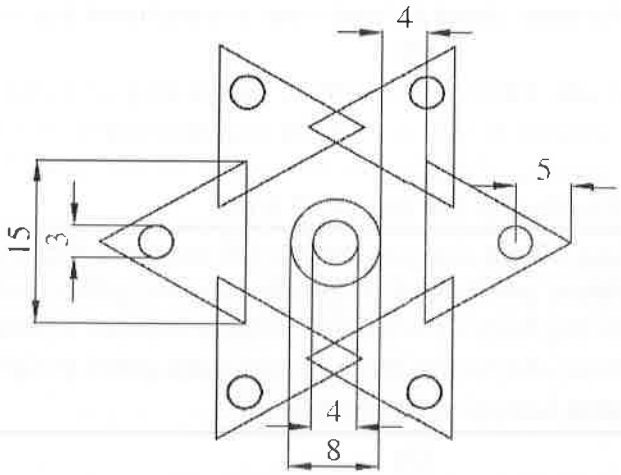
ENGINEERING GRAPHICS

(Common to CE, CST)

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

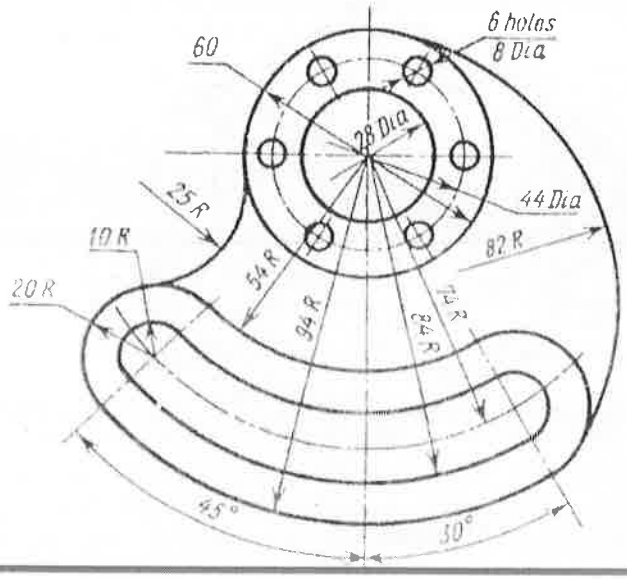
Attempt all the questions. All parts of the question must be answered in one place only.
All parts of Q.no 1 are compulsory. In Q.no 1 to 5 answer either Part-A or B only

		Marks	CO	Bl
Q.1(A)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3

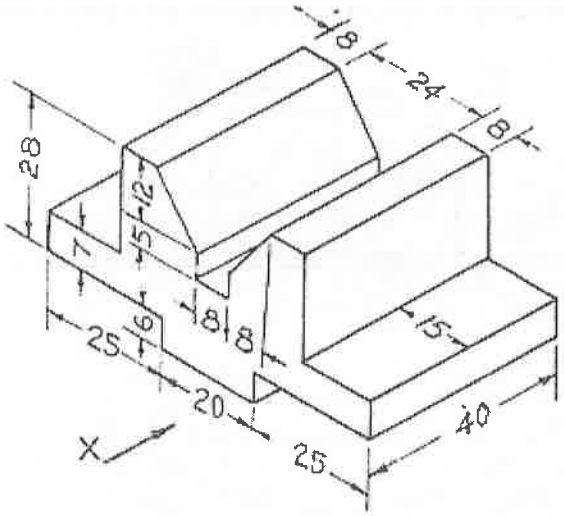


OR

Q.1(B)	Draw the figure shown below using Auto CAD commands and dimension it.	12M	1	3



Q.2(A)	The line EF 70 mm long has its end E, at 10mm above the HP and 15mm in front of VP. Its Elevation and Plan measures 50mm and 60mm respectively. Draw the projections of the line and determine its inclinations with HP and VP.	12M	2	3
	OR			
Q.2(B)	The Top view of a 75mm long line measures 65mm. While the length of its Front view is 50mm. Its one end A is in H.P and 12mm in front of V.P. Draw the projections of AB and determine its inclinations with H.P and V.P	12M	2	3
Q.3(A)	A Hexagonal Pyramid of Base side 30mm and axis 60mm is lying on a slant edge on the H.P with the axis parallel to V.P. Draw its projections.	12M	3	3
	OR			
Q.3(B)	A Pentagonal Prism of base edge 30 mm and axis 60mm rests on an edge of its base in the H.P. Its axis is parallel to V.P and inclined at 45^0 to H.P. Draw its projections.	12M	3	3
Q.4(A)	A Pentagonal prism of base edge 30mm side and axis 65mm has its base horizontal and an edge of the base parallel to V.P. A horizontal section plane cuts it at a distance of 25mm above the base. Draw its front view and sectional top view.	12M	4	4
	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	4	4
Q.5(A)	A vertical square prism, base 50mm side and height 100mm has a face inclined at 45^0 to the VP. It is completely penetrated by another square prism, base 40mm side and 90mm long, both the faces of which are equally inclined to the VP. The axes of the two prisms are parallel to the VP and bisect each other at right angles. Draw the projections showing lines of the inter section.	12M	5	4
	OR			
Q.5(B)	Draw the front view, top view and side view for the figure shown	12M	5	3



*** END***