Hall Ticket Number :										

R-19

Code: 19A321T

I B.Tech. II Semester Supplementary Examinations February 2022

Engineering Graphics-II

(Common to CE & ME)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

		Marks	CO	Blooms Level
	UNIT–I			
1.	A square prism, base 40 mm side, axis 80 mm long, has its base on the HP and its faces equally inclined to the VP. It is cut by a plane perpendicular to the VP, inclined at 60° to the HP and passing through a point on the axis 55 mm above the HP. Draw its front view, sectional top view	14M	CO1	L4
	OR			
2.	A cylinder of 40mm diameter, 60mm height and having its axis vertical, is cut by a section plane, perpendicular to the V.P., inclined at 45^0 to the H.P., and intersecting the axis 32mm above the base. Draw its front view, sectional top view and true shape of the section.	14M	CO1	L4
	UNIT–II			
3. a)	A square prism of side of base 40mm and axis 80mm long, is resting on its base on HP. such that, a rectangular face of it is parallel to VP. Draw the development of the prism.	07M	CO2	L3
b)	Draw the development of the lateral surface of a square pyramid, side of base 25mm and height 50mm, resting with its base on HP and all the sides of the base are equally inclined to VP.	07M	CO2	L3
	OR			
4.	A cone of base diameter 50mm and axis 60mm long is resting on its base on HP. It is cut by a section plane perpendicular to VP and parallel to and extreme generator passing through a point on the axis at a distance of 20mm from the apex. Draw the development of the retained solid.	14M	CO2	L3
	UNIT–III			
5.	A vertical cylinder of base 90mm and 120mm axis is penetrated by a cone of base diameter 90mm and axis 140mm long. The axes of the two solids bisect each other at right angle. Draw the projections of the two solids showing the lines of intersection.	14M	CO3	L4
	OR			

6. A cylinder of 60mm diameter and axis 80mm long is standing vertically on its base on HP. It is penetrated by a square prism of 30mm side and 100mm length, the axis of which is parallel to both the reference planes and the faces equally inclined to HP. The axes of the solids intersect at right angles. The height of the axis of the prism above HP is 40mm. Draw the projections of the solids showing the curves of intersection in the front view and also draw its top view and side view. 14M CO3 L4

UNIT–IV

7. a) Draw the isometric view of a pentagon of 50mm diameter with its plane horizontal and vertical. 07M CO4 L4

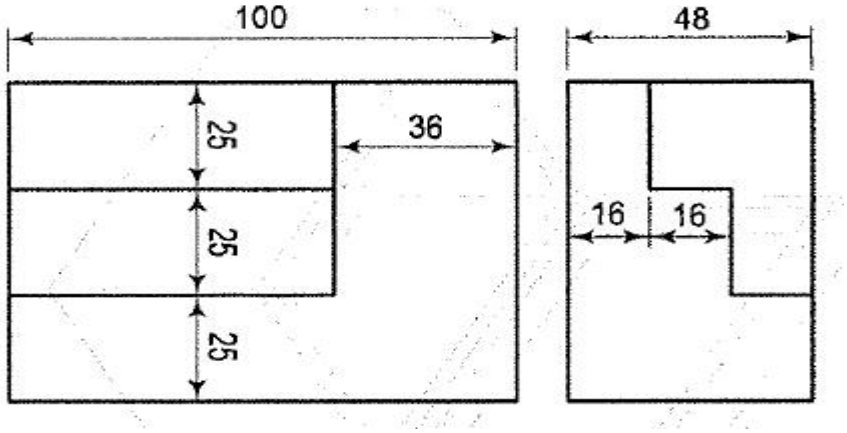
   b) Draw the isometric view of a hexagon of 50mm diameter with its plane horizontal and vertical. 07M CO4 L4

OR

8. Draw the isometric view of a cylinder and a cone with base diameter 50mm and axis 65mm long. 14M CO4 L4

UNIT–V

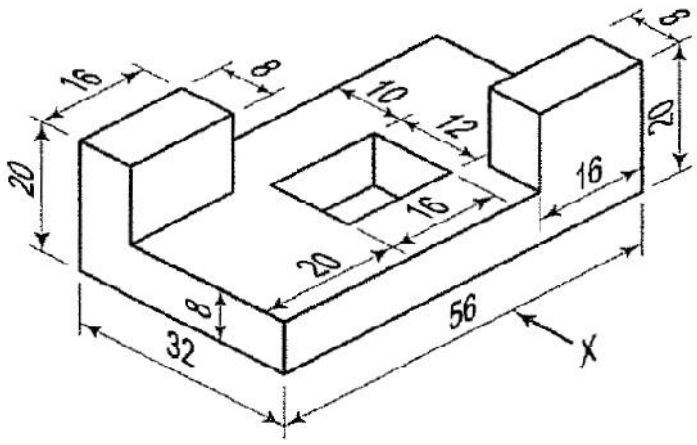
9. Draw the isometric view of the following figure



14M CO5 L4

OR

10. Draw the front view, top view and side view of the solid object given below:



14M CO5 L4

***

Hall Ticket Number :										

R-19

Code: 19A322T

I B.Tech. II Semester Supplementary Examinations February 2022

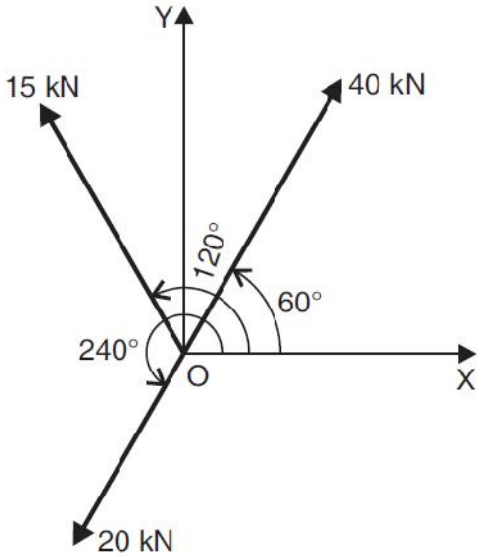
Engineering Mechanics

(Common to CE & ME)

Max. Marks: 70 Time: 3 Hours

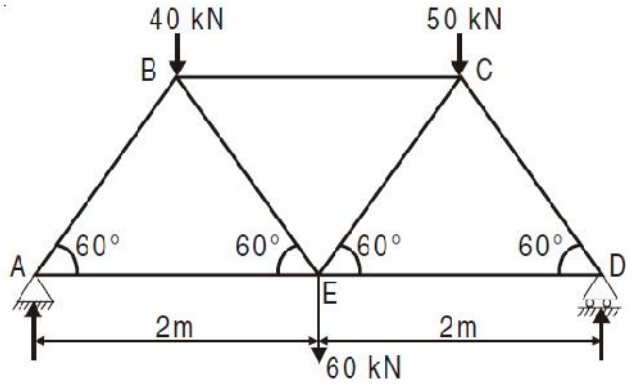
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

		Marks	CO	Blooms Level
	UNIT–I			
1.	A sphere of weight 100 N is tied to a smooth wall by a string as shown in Fig. Find the tension T in the string and reaction R of the wall. 	14M	1	3
	OR			
2.	Three forces of magnitude 40 kN, 15 kN and 20 kN are acting at a point O as shown in Fig. The angles made by 40 kN, 15kN and 20 kN forces with X-axis are 60°, 120° and 240° respectively. Determine the magnitude and direction of the resultant force. 	14M	1	3

UNIT–II

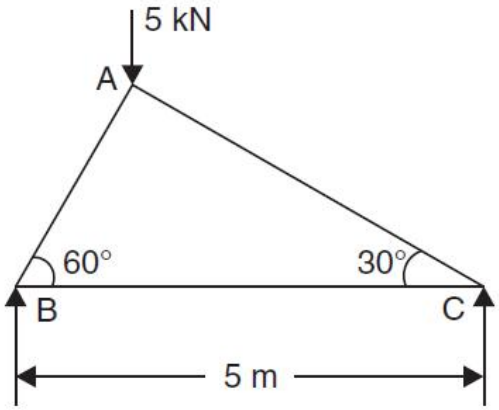
3. Determine the forces in all the members of the truss shown in Fig. and indicate the magnitude and nature of forces on the diagram of the truss. All inclined members are at 60° to horizontal and length of each member is 2 m.



14M 2 3

OR

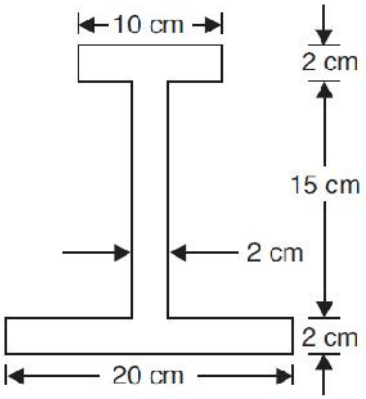
4. Find the forces in the members *AB, AC* and *BC* of the truss shown in Fig



. 14M 2 3

UNIT–III

5. Find the centre of gravity of the I-section shown in Fig.



14M 3 3

OR

6. State the theorem of perpendicular axis. How will you prove this theorem? 14M 3 1

UNIT–IV

7.	The angle of rotation of a body is given as a function of time by the equation, $\theta=\theta_o + at + bt^2$ where θ_o initial angular displacement, a and b are constants. Obtain general expressions for : (a) the angular velocity and (b) the angular acceleration of the body. If the initial angular velocity be 3® radian per second and after two seconds the angular velocity is 8® radian per second, determine the constants a and b.	14M	4	4

OR

8.	A wheel rotating about a fixed axis at 20 r.p.m. is uniformly accelerated for 70 second during which time it makes 50 revolutions. Find (i) angular velocity at the end of this interval, and (ii) time required for speed to reach 100 revolutions per minute.	14M	4	3

UNIT–V

9.	A train of weight 2000 kN is pulled by an engine on a level track at a constant speed of 36 kilometre per hour. The resistance due to friction is 10 N per kN of the train's weight. Find the power of the engine.	14M	5	3

OR

10.	The driver of a car 2 ton mass moving at 60 kmph apples sudden brakes to bring the car to a stop in 2 seconds. Determine the average braking force.	14M	5	3

***

Hall Ticket Number :										

R-19

Code: 19AC23T

I B.Tech. II Semester Supplementary Examinations February 2022

Engineering Physics

(Common to CE & ME)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Describe Focault's pendulum in detail	7M	CO1	L2
	b)	Define centre of mass and explain it for a system	7M	CO1	L1
		OR			
2.		Explain Newton's laws in inertial and linear acceleration non inertial frame of references	14M	CO1	L2
		UNIT–II			
3.	a)	List the factors affecting acoustics of building and their remedies	10M	CO2	L2
	b)	Define reverberation and reverberation time	4M	CO2	L1
		OR			
4.	a)	Derive the expression for absorption coefficient	8M	CO2	L3
	b)	State and explain Sabine's formula	6M	CO2	L2
		UNIT–III			
5.	a)	Define magnetic susceptibility and moment	4M	CO3	L1
	b)	Classify three types of magnetic materials and write properties	10M	CO3	L2
		OR			
6.	a)	Derive magnetic moment of material through origin of magnetic moment	10M	CO3	L3
	b)	List the applications of magnetic materials	4M	CO3	L2
		UNIT–IV			
7.	a)	Describe construction of optical fiber	6M	CO4	L2
	b)	Write the application of optical fiber in communication system	8M	CO4	L1
		OR			
8.	a)	Differentiate Step-Index and Graded-Index optical fibers in propagation	8M	CO4	L2
	b)	Brief the working principle of optical fiber in propagation of signal	6M	CO4	L2
		UNIT–V			
9.	a)	What is sensor and list various sensors	6M	CO5	L1
	b)	Write a note on Strain and pressure sensors	8M	CO5	L1
		OR			
10.	a)	Narrate magnetostriction sensor working	8M	CO5	L2
	b)	Mention the applications of sensors in various fields	6M	CO5	L2

***

Hall Ticket Number :										

R-19

Code: 19A521T

I B.Tech. II Semester Supplementary Examinations February 2022

Python Programming

(Common to CE, ME & CSE)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	What is computer science? Explain about the Essence of Computational Problem Solving.	7M	CO1	L1
	b)	Write about the process of computational problem solving	7M	CO1	L2
		OR			
2.	a)	Write a python program to find weather a given number is odd or even.	7M	CO1	L3
	b)	Illustrate infinite loop with an example	7M	CO1	L2
		UNIT–II			
3.	a)	Summarize in detail about function routine.	14M	CO2	L2
	b)				
		OR			
4.	a)	Compare lists and tuples in Python	7M	CO2	L3
	b)	Describe the typical operations performed on lists	7M	CO2	L3
		UNIT–III			
5.	a)	Explain the use of modular design in software development	7M	CO3	L2
	b)	Explain the process of top-down design	7M	CO3	L2
		OR			
6.	a)	Distinguish different ways of using import statement	7M	CO3	L3
	b)	Differentiate between a text file and a binary file	7M	CO3	L3
		UNIT–IV			
7.	a)	Explain the concept of an object	7M	CO4	L2
	b)	Describe the use of object references	7M	CO4	L2
		OR			
8.	a)	Justify the need of automatic garbage collection in python	7M	CO4	L5
	b)	Summarize the concept of memory allocation and deallocation.	7M	CO4	L5
		UNIT–V			
9.	a)	Define data structures and list out various types of data structures	7M	CO5	L2
	b)	Discuss about the common operations performed on data structures	7M	CO5	L2
		OR			
10.		Examine abstract data type with its types along with the syntax used	14M	CO5	L3

***

Hall Ticket Number :										

R-19

Code: 19AC21T

I B.Tech. II Semester Supplementary Examinations February 2022

Differential Equations and Vector Calculus

(Common to All Branches)

Max. Marks: 70 Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

****

			Marks	CO	Blooms Level
		UNIT–I			
1.	a)	Solve $(D^2+6D+9)y=e^{-3x}$	7M	CO1	L3
	b)	Solve $(D^2-1)y=3x$	7M	CO1	L3
		OR			
2.		Solve $\frac{d^2y}{dx^2}-3\frac{dy}{dx}+2y=xe^{3x}+\sin 2x$	14M	CO1	L3
		UNIT–II			
3.		Solve $x^2\frac{d^2y}{dx^2}-x\frac{dy}{dx}+y=\log x.$	14M	CO2	L3
		OR			
4.		Solve the simultaneous equations $\frac{dx}{dt}+2y+\sin t=0, \frac{dy}{dt}-2x-\cos t=0$ given that $x=0$ and $y=0$ when $t=0$.	14M	CO2	L3
		UNIT–III			
5.	a)	Form the partial differential equation by eliminating arbitrary constants a and b from $(x-a)^2+(y-b)^2=z^2\cot^2\sim$	7M	CO3	L3
	b)	Form the partial differential equation by eliminating arbitrary function from $z=f(x^2+y^2)$	7M	CO3	L3
		OR			
6.	a)	Solve $x(y-z)p+y(z-x)q=z(x-y)$	7 M	CO3	L3
	b)	Solve $p\tan x+q\tan y=\tan z$	7 M	CO3	L3
		UNIT–IV			
7.	a)	Find $div\ \bar{f}$ *where* $\bar{f}=grad(x^3+y^3+z^3-3xyz)$	7M	CO4	L2
	b)	If $\bar{f}=(x+3y)\bar{i}+(y-2z)\bar{j}+(x+pz)\bar{k}$ is solenoidal, then find p .	7M	CO4	L2
		OR			
8.		Prove that $r^n\bar{r}$ *is solenoidal if* $n=-3.$	14M	CO4	L2
		UNIT–V			
9.		Verify Green's theorem in the plane for $\oint(3x^2-8y^2)dx+(4y-6xy)dy$ where C is the region bounded by $y=\sqrt{x}$ *and* $y=x^2$	14M	CO5	L3
		OR			
10.		Verify stokes theorem for the function $\bar{F}=x^2\bar{i}+xy\,\bar{j}$ integrated around the square in the plane z=0 whose sides are along the lines x=0,y=0,x=a,y=a.	14M	CO5	L3

***