O.P.Code: 20CE0163	R20	H.T.No.									

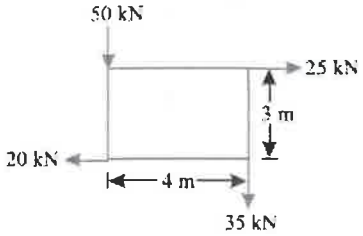
SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year II Semester Supplementary Examinations July-2024
BASICS OF ENGINEERING MECHANICS
(Common to AGE & ME)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	State and prove parallelogram law of forces.	CO1	L2	6M
	b	A system of forces are acting at the corners of a rectangular block as shown in Fig.. Determine the magnitude and direction of the resultant force.	CO1	L4	6M



OR

2	a	Explain free body diagram with example.	CO1	L2	4M
	b	State and prove Lami's theorem.	CO1	L4	8M

UNIT-II

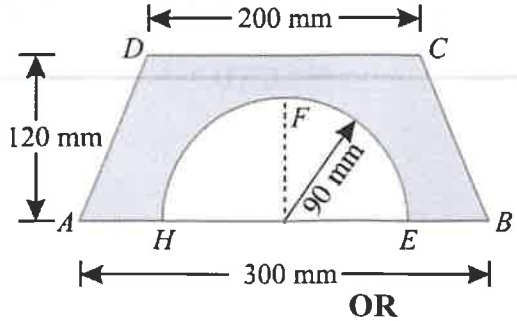
3		Define the following: (a) Limiting Force of Friction (b) Kinetic Friction (c) Co-efficient of Friction (d) Angle of Friction (e) Angle of Repose	CO2	L1	12M

OR

4		A ladder 5 meters long rests on a horizontal ground and leans against a smooth vertical wall at an angle 70° with the horizontal. The weight of the ladder is 900 N and acts at its middle. The ladder is at the point of sliding, when a man weighing 750N stands on a rung 1.5 metre from the bottom of the ladder. Calculate the coefficient of friction between the ladder and the floor	CO2	L4	12M

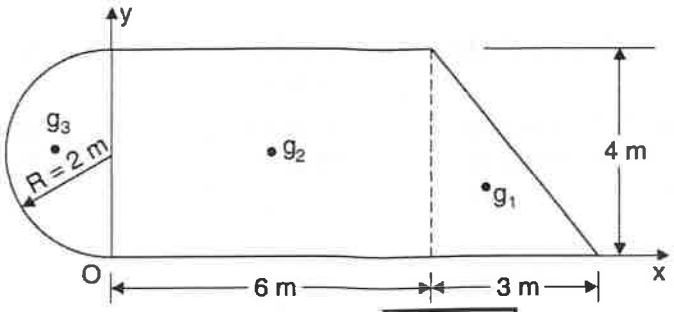
UNIT-III

5		A semicircle of 90 mm radius is cut out from a trapezium as shown in Fig. Find the position of the centre of gravity of the figure.	CO3	L4	12M



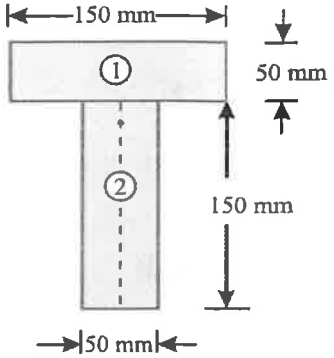
OR

6		Determine the centroid of the area shown in Fig. with respect to the axis shown	CO3	L4	12M



UNIT-IV

7	Find the moment of inertia of a T-section with flange as 150 mm × 50 mm and web as 150 mm × 50 mm about X-X and Y-Y axes through the centre of gravity of the section as shown in fig	**CO4**	**L4**	**12M**

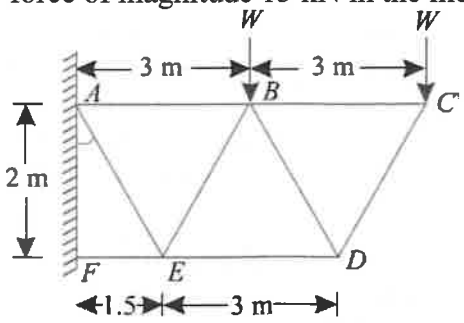


OR

8	Prove the parallel axis theorem in the determination of moment of inertia of areas with the help of a neat sketch	**CO4**	**L5**	**12M**

UNIT-V

9	A cantilever truss is loaded as shown in Fig.30. Find the value W, which would produce the force of magnitude 15 kN in the member AB.	**CO5**	**L4**	**12M**



OR

10	Explain the procedure to find forces in members of truss by using method of joints	**CO5**	**L2**	**12M**

***** END *****

O.P.Code: 20EC0402	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year II Semester Supplementary Examinations July-2024
ELECTRONIC DEVICES AND CIRCUITS
(Electrical & Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Discuss the effect of temperature on V-I characteristics of a PN Junction Diode.	CO1	L2	6M
	b	Construct the positive and negative diode clippers and explain with neat waveforms.	CO1	L3	6M

OR

2	a	Analyze the current components of a PN Junction diode and derive the diode current equation.	CO1	L4	6M
	b	Show that the Zener diode can act as a voltage regulator with a neat circuit diagram.	CO1	L3	6M

UNIT-II

3	a	Draw the circuit diagram of a full wave rectifier and with the help of waveforms and describe its operation.	CO2	L4	6M
	b	Explain the Volt-Ampere (V-I) characteristics of a Tunnel diode with the help of energy band diagrams and List out its applications.	CO2	L3	6M

OR

4	a	A Half wave rectifier is supplied from a 230V, 50 Hz supply with a step-down ratio of 3:1 to a resistive load of 10kΩ. The diode forward resistance is 75Ω while transformer secondary is 10Ω. Calculate maximum, average, RMS values of current, DC output voltage, efficiency of rectification and ripple factor.	CO2	L3	6M
	b	With a neat circuit diagram and waveforms, illustrate the working of a Bridge rectifier.	CO2	L3	6M

UNIT-III

5	a	Explain the current components of a NPN transistor.	CO3	L2	6M
	b	Evaluate the relation between α and β of a Transistor.	CO3	L3	6M

OR

6	a	Explain the construction and working principle of N-Channel JFET.	CO3	L2	6M
	b	Explain the Input and output characteristics of a BJT in CE configuration.	CO3	L3	6M

UNIT-IV

7	a	List the different types of biasing a transistor and explain the fixed bias of a transistor.	CO4	L2	6M
	b	Design a collector to base bias circuit for the specified conditions: Vcc= 15V, V_{CE} = 5V, I_C = 5mA and β = 100.	CO4	L3	6M

OR

8	a	Draw the circuit diagram of self bias of a transistor and determine its Q-point.	CO4	L4	6M
	b	Explain diode compensation technique for the parameters of V_{BE} and I_{CO}.	CO4	L2	6M

UNIT-V

9	a	Draw the circuit diagram of JFET common source amplifier with voltage divider bias for bypassed R_s and determine the expression for input impedance, output impedance and voltage gain.	CO5	L4	6M
	b	Draw the simplified h-parameter model for a transistor in CE, CB and CC configuration.	CO5	L4	6M

OR

10	a	Analyze CE amplifier with emitter resistance using simplified h-parameter model.	CO5	L4	6M
	b	Draw and explain the small signal model of FET.	CO5	L4	6M

***** END *****

O.P.Code: 20CE0102	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations July-2024

ENGINEERING MECHANICS

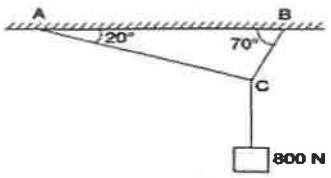
(Civil Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

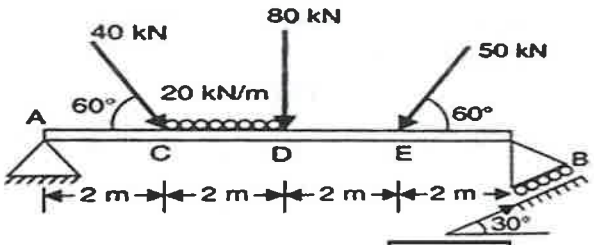
UNIT-I

1	a	State and prove parallelogram law of forces.	CO1	L2	7M
	b	A weight of 800N is supported by two chains as shown in Figure below. Determine the tension in each chain using Lami's theorem.	CO1	L3	5M



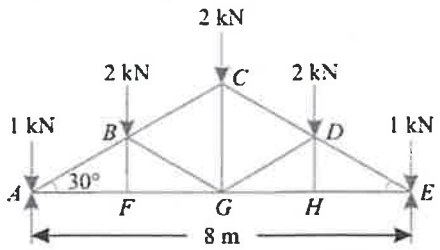
OR

2		A simply supported beam AB of length 8m, carries a system of loads as shown in the Figure below. Calculate the reactions at A and B.	CO1	L4	12M



UNIT-II

3		A king post truss of 8m span is loaded as shown in Figure below. Find the forces in each member of the truss.	CO2	L4	12M

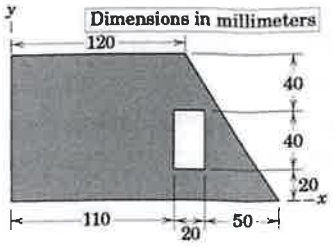


OR

4		Block-A weighing 1 kN rests on a rough inclined plane whose inclination to the horizontal is 45°. This block is connected to another block-B weighing 3 kN rests on a rough horizontal plane by a weightless rigid bar inclined at an angle of 30° to the horizontal as shown in Fig-2.8. Find horizontal force (P) required to be applied to the block (B) just to move the block (A) in upward direction. Assume angle of limiting friction as 15° at all surface where there is sliding.	CO3	L4	12M

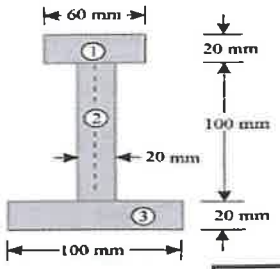
UNIT-III

5		Determine the co-ordinate of the C.G for the composite plane figure shown in Figure below.	CO4	L3	12M



OR

6	An I-section is made up of three rectangles as shown in Figure below. Find the MOI of the section about the horizontal axis passing through the C.G of the section.	**CO4**	**L3**	**12M**

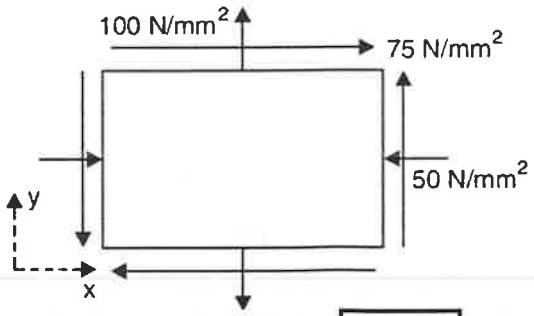


UNIT-IV

7	A bar of 25 mm diameter is tested in tension. It is observed that when a load of 60 kN is applied, the extension measured over a guage length of 200 mm is 0.12 mm and contraction in diameter is 0.0045 mm. Find Poisson's ratio and elastic constants E, G, K.	**CO5**	**L4**	**12M**

OR

8	State of stress at a point in a material is as shown in the Figure below. Determine (i) Principal stresses (ii) maximum shear stress (iii) Plane of maximum shear stress and (iv) The resultant stress on the plane of maximum shear stress.	**CO5**	**L4**	**12M**



UNIT-V

9	A 6mm thick metal cylinder is filled with an incompressible fluid at a pressure of 3 N/mm2. The cylinder has an internal diameter of 250mm and is 750mm long. Find the additional volume of fluid pumped into the cylinder.	**CO6**	**L3**	**12M**

OR

10	A pipe of 200mm internal diameter and 50mm thickness carries a fluid at a pressure of 10MN/m2. Calculate the maximum and minimum intensities of circumferential stresses across the section. Also sketch the radial stress (pressure) distribution and circumferential stress distribution across the section.	**CO6**	**L4**	**12M**

***** END ****

Q.P.Code: 20HS0810 | R20 | H.T.No.

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations July-2024
COMMUNICATIVE ENGLISH
(Common to CE, AGE, CAD, CSIT, CAI, CIC, CSE, CCC & CSM)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

				CO	L	M
1	a	Prepare a short note on Positive Attitude.		CO1	L2	6M
	b	Write a letter to the principal of your college to issue transfer & study certificates for further studies.		CO1	L3	6M

OR

2	a	What is the moral of the story "Half a Rupee Worth"?	CO1	L1	6M
	b	What are the strategies of reading?	CO1	L1	6M

UNIT-II

3	a	Prepare a short note on Positive Attitude.	CO2	L2	6M
	b	Fill in the blanks with suitable articles.	CO2	L1	6M

i. He has ____ one rupee note in his pocket.
ii. Varanasi is _____ holy city.
iii. John is _____ European.
iv. She is_____ honest woman.
v. Honesty is _____ best policy.
vi. Valmiki was_____ great poet in Sanskrit.

OR

4	a	Construct a dialogue between you and your friend on the importance of sports and games.	CO2	L3	6M
	b	State any six rules on punctuation marks with examples.	CO2	L1	6M

UNIT-III

5	a	Depict several ways of exploitation of women in "I am not that Woman"?	CO3	L2	6M
	b	Describe the types of listening.	CO3	L2	6M

OR

6	a	What changes take place to convert direct speech into indirect?	CO3	L1	6M
	b	How does work efficiency help an individual?	CO4	L2	6M

UNIT-IV

7	a	What made Mrs. Murthy restore her name in the story "What is My Name?"	CO5	L1	6M
	b	Describe the story "What is My Name"?	CO5	L2	6M

OR

8	a	What is Time Management? How do you prioritize the tasks?	CO5	L1	6M
	b	Compose a dialogue between a teacher and a student on the importance of Non-verbal Communication.	CO5	L3	6M

UNIT-V

9	a	What kind of life did Kalam's father lead as in the essay "The Power of Prayer"?	CO6	L1	6M
	b	**Fill in the blanks with correct tense forms.**	CO6	L2	6M

i) She_____ to school in the morning. (go)

ii) It _____ since this morning. (rain)

iii) India _____ Independence in 1947. (win)

iv) She usually _____ of my advice. (not care)

v) If you get up early, you _____ the bus. (catch)

vi) When we reached the field, the match _____ already. (start)

OR

10	a	Frame your own sentences using the prepositions given below. (according to, in addition to , instead of, within, during, since)	CO6	L2	6M
	b	What are the strategies of writing an essay?	CO6	L1	6M

***** END *****

Q.P.Code: 20ME0301	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations July-2024
ENGINEERING GRAPHICS
(Common to CE, AGE, CAD, CSIT, CAI, CIC, CSE, CCC & CSM)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	The vertex of a hyperbola is 60 mm from its focus. Draw the curve, if the eccentricity is 3/2. Draw a normal and a tangent at a point on the curve, 75 mm from the directrix.	**CO1**	**L3**	**12M**

OR

2	Construct a hypo cycloid of a circle of 50 mm diameter, which rolls inside another circle of 180 mm diameter for one revolution counter clockwise.	**CO1**	**L3**	**12M**

UNIT-II

3	A point A is 20mm above the HP and 50mm in front of the VP. Another point B is 40mm below the HP and 15mm behind the VP. The distance between the projectors of the points, measured parallel to xy, is 75mm. Draw the projections of the points. Draw lines joining their FVs and TVs.	**CO2**	**L3**	**12M**

OR

4	A line AB 50mm long, has its end A away from the HP and VP than end B. The line is inclined to the HP at 300 and to the VP at 45 0. Draw the projections if end A is 35mm above the HP and 50mm in front of the VP.	**CO2**	**L3**	**12M**

UNIT-III

5	A square plane ABCD of side 30mm is parallel to HP and 20mm away from it. Draw the projections of the plane, when (i) two of its sides are parallel to VP and (ii) and one of its side is inclined at 300 to VP.	**CO3**	**L3**	**12M**

OR

6	A cylinder of base diameter 5omm and axis 70 mm has a generator in the VP and inclined at 45o to thc IIP. Draw its projections.	**CO3**	**L3**	**12M**

UNIT-IV

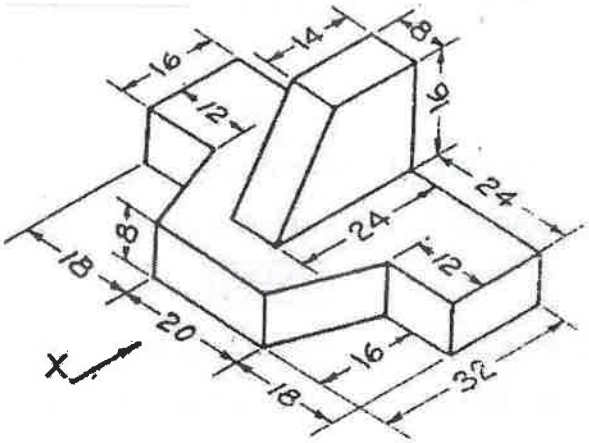
7	A hexagonal prism of side of base 30 mm and length of axis 75 mm is resting on its base on HP. It is cut by a section plane inclined at 450 to HP and passing through top corner. Draw the front and sectional top views of the solid and true shape of the section.	**CO4**	**L3**	**12M**

OR

8	A square pyramid, with side of base 30 mm and axis 50 mm long, is resting on its base on HP with an edge of the base parallel to VP. It is cut by a section plane, perpendicular to VP and inclined at 450 to HP. The section plane is passing through the mid-point of the axis. Draw the development of the surface of the cut pyramid.	**CO4**	**L3**	**12M**

UNIT-V

9	Draw three views of the blocks shown pictorially in figure according to first angle projection	**CO6**	**L4**	**12M**



OR

10	Draw the isometric view of a cone of base diameter 50mm and axis 60 mm. The cone has its base on (a) HP (b) VP	**CO5**	**L4**	**12M**

***** END *****

O.P.Code: 20EE0201	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations July-2024
FUNDAMENTALS OF ELECTRICAL CIRCUITS
(Electrical & Electronics Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

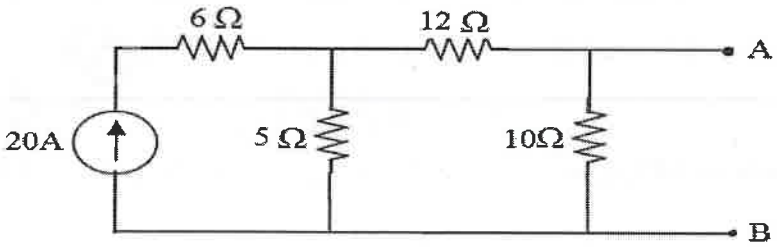
1	a	Explain in detail about passive elements.	CO1	L3	6M
	b	State and prove Kirchhoff's laws with suitable examples.	CO1	L3	6M

OR

2	a	An alternating current is expressed as I = 14.14 sin 314t. Determine. (i)Maximum current (ii)RMS current (iii)Frequency (iv)Instantaneous current when t = 0.02msec.	CO1	L3	6M
	b	Derive an expression for average values of sine wave form.	CO1	L2	6M

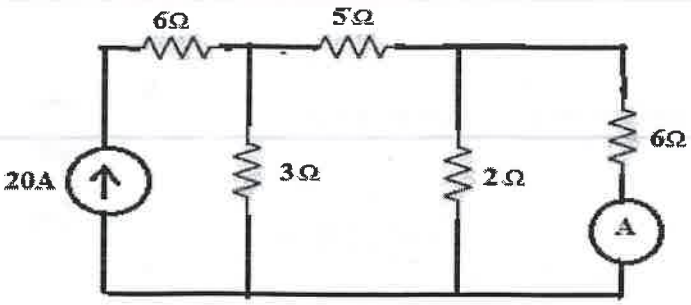
UNIT-II

3	a	State and explain Norton's theorem.	CO2	L2	6M
	b	Find the Norton's equivalent for the circuit shown below.	CO2	L3	6M



OR

4		Determine the ammeter reading where it is connected to 6Ω resistor as shown in below figure. The internal resistance of the ammeter is 2Ω, by using compensation theorem.	CO2	L4	12M

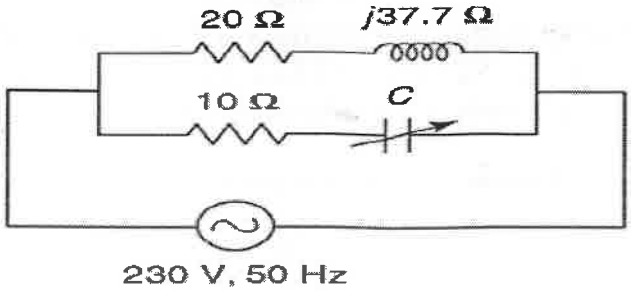


UNIT-III

5	a	Explain about Parallel resonance with phasor diagrams.	CO3	L3	6M
	b	Explain about Band-width of parallel resonance.	CO3	L2	6M

OR

6	Find the value of C in the circuit shown to get resonance.	CO3	L3	12M



UNIT-IV

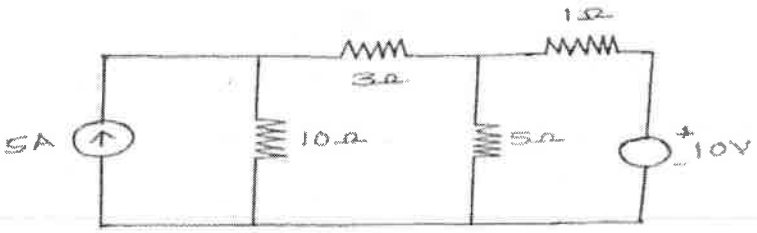
7	a	Explain coefficient of coupling.	CO4	L2	6M
	b	Write the expression for equivalent inductance of two coupled coils connected in series and parallel.	CO4	L3	6M

OR

8	a	What is dot convention? Why it is required?	CO4	L2	6M
	b	Two coils connected in series have a self-inductance of 20mH and 60mH respectively. The total inductance of the combination was found to be 100mH. Determine the amount of mutual inductance that exists between the two coils (i) aiding each other,(ii) opposing each other.	CO4	L3	6M

UNIT-V

9	Determine current in 10Ω resistor for the following network by using nodal analysis.	CO5	L4	12M



OR

10	Write the procedure for constructing tie-set matrix.	CO5	L3	12M

***** END *****

O.P.Code: 20HS0831	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations July-2024

DIFFERENTIAL EQUATIONS AND COMPLEX ANALYSIS

(Common to CE, AGE, ME, EEE & ECE)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Solve the differential equation $(2x-y+1)dx+(2y-x-1)dy=0$	CO1	L1	6M
	b	Solve the differential equation $\frac{dy}{dx}+2xy=e^{-x^2}$	CO1	L2	6M

OR

2	a	Solve the following Second order differential equation: $y''-5y'+6y=0,\ y(1)=e^2\ and\ y'(1)=3e^2$	CO1	L2	6M
	b	$(D^2-3D+2)y=xe^{3x}+\sin 2x$	CO1	L3	6M

UNIT-II

3	a	Solve $\frac{d^2y}{dx^2}+4y=\tan 2x$ by the method of variation of parameters	CO2	L4	6M
	b	Solve $(x^2D^2-4xD+6)y=x^2$	CO2	L3	6M

OR

4		An uncharged condenser of capacity is charged applying an *e.m.f.* $E\sin\frac{t}{\sqrt{LC}}$ through leads of self-inductance L and negligible resistance. Prove that at time 't' the charge on one of the plates is $\frac{EC}{2}[\sin\frac{t}{\sqrt{LC}}-\frac{t}{\sqrt{LC}}\cos\frac{t}{\sqrt{LC}}]$	CO2	L5	12M

UNIT-III

5	a	Form the PDE by eliminating the arbitrary constants from $(x-a)^2+(y-b)^2+z^2=c^2$	CO3	L2	6M
	b	Form the PDE by eliminating the arbitrary functions from $z=f(x+at)+g(x-at)$	CO3	L2	6M

OR

6		A tightly stretched flexible string has its ends fixed at $x=0$ and $x=l$ is initially at rest in its equilibrium position. If it is set to vibrate by giving each of its points a velocity $kx(l-x)$, find the displacement of the string at any distance from one end at any time t.	CO3	L4	12M

UNIT-IV

7	a	Verify Cauchy Riemann equations at $z=(0,0)$ for the function defined by $$f(z)=\begin{cases}(\bar{z})^2/z, & when\ z\neq 0\\ 0, & when\ z=0\end{cases}$$ and show that $f'(z)$[first order derivative] does not exist at $z=(0,0)$	CO4	L4	6M
	b	Show that $u=\frac{1}{2}\log(x^2+y^2)$ is harmonic.	CO	L2	6M

OR

8	a	Find the bilinear transformation which maps the points $(\infty, i, 0)$ into the points $(-1,-i,1)$ in w-plane.	CO4	L2	6M
	b	Find the image of infinite strip bounded by $x=0$ and $x=\frac{\pi}{4}$ under the transformation $w=\cos z$.	CO4	L4	6M

UNIT-V

9	a	Evaluate using Cauchy's integral formula $\int_C \frac{\sin^6 z}{(z-\frac{\pi}{2})^3}dz$ around the circle $C:\lvert z\rvert=1$	CO5	L3	6M
	b	Find the Laurent's series expansion of the function $f(z)=\frac{z^2-6z-1}{(z-1)(z-3)(z+2)}$ in the region $3<\lvert z+2\rvert<5$	CO5	L3	6M

OR

10		Evaluate $\int_0^{2\pi}\frac{1}{a+b\cos\theta}d\theta=\frac{\pi}{\sqrt{a^2-b^2}};a>b>0$	CO5	L5	12M

***** END *****

O.P.Code: 20HS0835	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations July-2024

PROBABILITY & STATISTICS

(Common to CAD, CSIT, CAI, CIC, CSE, CCC & CSM)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	If three coins are tossed. Find the probability of getting (i) Three heads (ii) Two heads (iii) no heads.	CO1	L1	6M
	b	Evaluate $(i)\ P\left(\frac{B}{A}\right)\ (ii)P\left(\frac{A}{B^c}\right)$, if A and B are events with $P(A)=\frac{1}{3}, P(B)=\frac{1}{4}, P(A\cup B)=\frac{1}{2}$.	CO1	L5	6M

OR

2		A random variable X has the following probability function	CO1	L5	12M

X	0	1	2	3	4	5	6	7
$P(X)$	0	K	$2K$	$2K$	$3K$	K^2	$2K^2$	$7K^2+K^2$

Determine (i) K (ii) Evaluate $P(X\geq 6)$ and $P(0<X<5)$

(iii) If so $P(X\leq K)>\frac{1}{2}$, find the minimum value of K (iv) variance.

UNIT-II

3	a	The mean and variance of a binomial distribution are 4 and $\frac{4}{3}$. Find $P(X\geq 1)$.	CO2	L1	6M
	b	If the mean of a Poisson distribution is **1.8** then find $P(X>1)$.	CO2	L1	6M

OR

4		Find the mean and variance of a Normal distribution in which **7%** of items are under **35** and **89%** are under **63**.	CO2	L1	12M

UNIT-III

5	a	Find the arithmetic mean to the following data using the step deviation method.	CO3	L1	6M

Marks	10-20	20-30	30-40	40-50	50-60
Frequency	5	8	25	22	10

	b	Find the median to the following data	CO3	L1	6M

Marks	40-50	50-60	60-70	70-80	80-90
Frequency	5	12	23	8	2

OR

6		Find two regression equations from the following data	CO3	L1	12M

X	10	25	34	42	37	35	36	45
Y	56	64	63	58	73	75	82	77

UNIT-IV

7	a	Fit a second-degree polynomial to the following data by the method of least square.	CO4	L1	6M

X	0	1	2	3	4
Y	1	1.8	1.3	2.5	6.3

	b	Obtain a relation of the form $y = ab^x$ for the following data by the method of least squares	CO4	L3	6M

X	2	3	4	5	6
Y	8.3	15.4	33.1	65.2	127.4

OR

8	a	In a random sample of **125** cool drinkers **68** said they prefer Thums up to Pepsi. The test thus null hypothesis $P = 0.5$ against the alternative hypothesis is $P > 0.5$	CO4	L4	6M
	b	A sample of **64** students has a mean weight of **70** kg. Can this be regarded as a sample from a population with a mean weight of **56** kgs and a standard deviation of **25** kgs?	CO4	L2	6M

UNIT-V

9	a	A sample of **26** bulbs gives a mean life of **990** hours with a S. D of **20** hours. The manufacturer claims that the mean life of bulbs is **1000** hours. Is the sample not up to the standard?	CO5	L4	6M
	b	In one sample of **8** observations the sum of the squares of deviations of the sample values from the sample was **84.4** and in the other samples of **10** observations, it was **102.6**. Test whether this difference is significant at a **5%** level.	CO5	L4	6M

OR

10	a	A die is thrown **264** times with the following results. Show that the die is biased. ($\psi^2 = 11.07$ at **5** d.f & **5%** L.S).	CO5	L2	6M
	b	Find the maximum difference that we can expect with a probability of **0.95** between the mean of samples of sizes **10** and **12** from a normal population if their standard deviations are found to be **2** and **3** respectively.	CO5	L1	6M

***** END *****

O.P.Code: 20EC0401	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations July-2024
FUNDAMENTALS OF DIGITAL COMPUTING SYSTEMS
(Electronics and Communication Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Distinguish between primary storage and secondary storage.	CO1	L2	6M
	b	List the uses of primary storage and secondary storage.	CO1	L1	6M

OR

2	a	Analyze why Protocols and standards are important features of networks.	CO3	L4	6M
	b	Describe the brief architectural history of a computer.	CO1	L1	6M

UNIT-II

3	a	Explain the relationship among the following words: system, environment, boundary and interface with a neat sketch.	CO3	L2	6M
	b	With an example, discuss the relationship between a system and its environment.	CO3	L2	6M

OR

4	a	Explain the architecture of Google data center search application.	CO2	L2	6M
	b	Illustrate Facebook's application architecture and explain how it processes the user application requests.	CO3	L2	6M

UNIT-III

5	a	Discuss various number systems of a computer.	CO4	L2	8M
	b	Tabulate the numbers up to 15 which can be represented in base-2, base-8, base-10 and base -16.	CO4	L2	4M

OR

6	a	Convert the following hexadecimal numbers to binary: (i) (4F6A)16 (ii) (9902)16 (iii) (A3AB)16	CO4	L2	6M
	b	Convert the following binary numbers into hexadecimal: (i) (101101110111010)2 (ii) (1111111111110001)2 (iii) 110001100011001)2	CO4	L2	6M

UNIT-IV

7	a	Summarize various types of common data that is represented in a computer	CO5	L2	6M
	b	Briefly explain the three standards that are used in common for alphanumeric characters.	CO5	L2	6M

OR

8	a	List the advantages of data compression.	CO5	L1	4M
	b	Distinguish lossless and lossy data compressions algorithms.	CO5	L4	8M

UNIT-V

9	a	Define 9's complement and 10's complement of a given number and explain the relation between them.	CO4	L1	6M
	b	Describe the unsigned binary and binary coded decimal representations with an example.	CO6	L2	6M

OR

10	a	Compute the floating-point representation for 0.0000019557.	CO4	L3	6M
	b	Compute division of the following two numbers, normalize the result obtained and round it to 3-bit. i) 04220000 / 02712500 ii) 625.2035 / 25.7585 iii) 7024.775E2 / 512.225E0	CO5	L3	6M

***** END *****

O.P.Code: 20ME0303	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations July-2024
BASIC THERMODYNAMICS
(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	List the difference between a closed system and an open system.	CO1	L1	6M
	b	Compare the cyclic process and non-cyclic process.	CO1	L5	6M
		OR			
2	a	Define the following i) Enthalpy ii) Internal Energy	CO1	L1	6M
	b	What is quasi static process? Explain in detail.	CO1	L1& L4	6M

UNIT-II

3	a	Explain the First law of Thermodynamics'. Formulate the equation for heat in a non-flow reversible constant pressure process.	CO2	L2& L6	6M
	b	Define Statements of second law of thermodynamics i) Clausius statement ii) Kelvin-plank statement.	CO2	L1	6M
		OR			
4		What is Steady Flow Process? Derive Steady Flow Energy Equation(SFEE) for an open system	CO2	L1& L3	12M

UNIT-III

5		Define Avogadro law. Develop equation of state of an Ideal gas.	CO3	L1& L3	12M
		OR			
6		Prove that for an ideal gas Cp- Cv=R.	CO3	L3	12M

UNIT-IV

7		Develop the expression for air standard efficiency, work done of an Otto cycle.	CO4	L6	12M
		OR			
8	a	Develop the expression for air standard efficiency for diesel engine.	CO4	L6	6M
	b	The stroke and cylinder diameter of a compression ignition engine are 250mm and 150mm respectively. If the clearance volume is 0.0004m3 and fuel injection take place at constant pressure for 5% of the stroke. Determine the efficiency of the engine. Assume the engine working on the diesel cycle.	CO4	L3	6M

UNIT-V

9		Describe Simple steam power cycle with neat sketches.	CO5	L2	12M
		OR			
10		A simple Rankine cycle works between pressures 28 bar and 0.06 bar, the initial condition of steam being dry saturated. Calculate the cycle efficiency, work ratio and specific steam consumption.	CO5	L3	12M

***** END *****

O.P.Code: 20HS0802	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations July-2024

APPLIED CHEMISTRY

(Common to CAD, CSIT, CAI, CIC, CSE, CCC & CSM)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1		Define Electrode Potential. Derive the Nernst equation for a single electrode potential and write its applications.	**CO1**	**L1**	**12M**
		OR			
2	a	What is primary Battery ? Write a brief note on Zinc-Air battery .	**CO1**	**L2**	**7M**
	b	Write a short note on Ni-cd (NICAD) battery.	**CO1**	**L2**	**5M**
		UNIT-II			
3		Draw the molecular orbital diagrams of Oxygen molecule (O_2) and Nitrogen molecule (N_2). Explain their magnetic nature and bond order.	**CO2**	**L3**	**12M**
		OR			
4	a	Write De-Broglie's equation.	**CO2**	**L2**	**6M**
	b	Explain Heisenberg Uncertainty principle.	**CO2**	**L2**	**6M**
		UNIT-III			
5		Explain the mechanism of Addition polymerization.	**CO3**	**L2**	**12M**
		OR			
6		Write the preparation, properties and application of Buna-S rubber and Buna-N rubber.	**CO3**	**L2**	**12M**
		UNIT-IV			
7		Explain the principle, working and applications of Thin layer chromatography .	**CO4**	**L2**	**12M**
		OR			
8		Explain the working principle of Atomic Absorption Spectrometer (AAS) and How will you determine the nickel using by AAS?	**CO4**	**L2**	**12M**
		UNIT-V			
9		Explain in detail about principle and application of semiconductors.	**CO5**	**L2**	**12M**
		OR			
10		Write a brief note on Fullerenes and Carbon nano tubes.	**CO5**	**L1**	**12M**

***** END *****

Q.P.Code: 20HS0804	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations July-2024
ENGINEERING CHEMISTRY
(Common to CE & AGE)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	Describe the estimation of hardness by EDTA method.	**CO1**	**L3**	**12M**
	OR			
2	Describe the Zeolite or permutit process for softening of water. what are the advantages and disadvantages of zeolite process.	**CO1**	**L3**	**12M**

UNIT-II

3	Define Electrode Potential. Derive the Nernst equation for a single electrode potential and write its applications.	**CO2**	**L1**	**12M**
	OR			
4	Discuss in detail about electrochemical or wet corrosion.	**CO2**	**L3**	**12M**

UNIT-III

5	Explain the mechanism of addition polymerization.	**CO3**	**L2**	**12M**
	OR			
6	Describe the method employed for the refining of petroleum with neat sketch.	**CO3**	**L3**	**12M**

UNIT-IV

7	What are Refractories ? Write their Classification. .Discuss in detailed about properties of Refractories.	**CO4**	**L1**	**12M**
	OR			
8	Define Cement. Explain in detailed about manufacture of Portland Cement?	**CO4**	**L4**	**12M**

UNIT-V

9	Write any two methods synthesis of colloids with suitable examples.	**CO5**	**L1**	**12M**
	OR			
10	Write a brief note on Applications of Colloids and Nano materials.	**CO5**	**L1**	**12M**

***** END *****

O.P.Code: 20HS0848	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations July-2024
ENGINEERING PHYSICS
(Mechanical Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

		UNIT-I			
1		Describe the formation of Newton's rings with necessary theory with relevant diagram and derive the expressions for dark and bright fringes.	CO1	L3	12M
		OR			
2	a	Define diffraction.	CO1	L1	2M
	b	Distinguish between Fraunhoffer and Fresnel diffraction.	CO1	L4	10M
		UNIT-II			
3	a	What is (i) Unit cell (ii) Basis (iii) Bravais Lattice iv) Lattice Point.	CO2	L1	4M
	b	Explain the various types of crystal systems with neat sketch and examples.	CO2	L4	8M
		OR			
4	a	Explain how the X-ray diffraction can be employed to determine the crystal structure.	CO2	L4	9M
	b	The Bragg's angle for reflection from the (111) plane in a FCC crystal is 19.2^{o} for an X-ray wavelength of 1.54 A.U , Calculate cube edge of the unit cell.	CO2	L4	3M
		UNIT-III			
5	a	Derive Sabine's formula for reverberation time.	CO3	L1	6M
	b	Mention factors controlling the reverberation time.	CO3	L1	6M
		OR			
6	a	How will you classify sound waves based on their frequencies?	CO3	L3	6M
	b	Discuss the important applications of ultrasonic waves.	CO3	L1	6M
		UNIT-IV			
7	a	Define i) Young's modulus ii) Bulk modulus iii) Rigidity modulus iv) Poisson's ratio	CO4	L1	4M
	b	Derive the relation between different elastic moduli.	CO4	L4	8M
		OR			
8	a	Deduce an expression for energy stored per unit volume in stretched wire.	CO4	L4	8M
	b	Estimate the work done in stretching a wire of cross section 1.25 mm^2 and length 1.9 m through 0.14 mm. The Young's modulus of wire is 45 $x10^9$ N/m^2.	CO4	L4	4M
		UNIT-V			
9	a	Prove that super conductor is a very good diamagnetic material.	CO5	L4	8M
	b	Write the properties of Superconductors.	CO5	L1	4M
		OR			
10	a	What are the techniques available for synthesizing nanomaterials?	CO5	L1	4M
	b	Explain ball milling technique for synthesis of nanomaterial.	CO5	L4	8M

***** END *****

O.P.Code: 20HS0849	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations July-2024
APPLIED PHYSICS
(Common to EEE & ECE)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Describe the formation of Newton's ring with necessary theory with relevant diagram and derive te expressions for dark and bright fringes.	CO1	L3	9M
	b	Define Interference and write their conditions.	CO1	L1	3M
		OR			
2	a	Explain the theory of Fraunhofer diffraction due to single slit.	CO1	L4	9M
	b	Distinguish between Interference and Diffraction.	CO1	L4	3M

UNIT-II

3	a	Describe the electrical conductivity in a metal using quantum free electronic theory.	CO2	L3	8M
	b	Write advantages quantum free electron theory.	CO2	L1	4M
		OR			
4	a	State and Explain Gauss's Theorem for divergence .	CO2	L4	6M
	b	State and Explain Stoke's Theorem for curl.	CO2	L4	6M

UNIT-III

5	a	Describe the construction and working principle of NdYAG Laser with the help of a neat diagram.	CO3	L3	9M
	b	Calculate the wavelength of emitted radiation from GaAs which has a band gap of 1.44eV.	CO3	L4	3M
		OR			
6	a	Describe optical fiber communication system with block diagram.	CO3	L3	7M
	b	Write the various applications of optical fibers.	CO3	L1	5M

UNIT-IV

7		Explain the formation of p-type and n-type semiconductors with diagram.	CO4	L4	12M
		OR			
8	a	Describe the Hall Effect in semiconductors.	CO4	L1	8M
	b	Explain the formation of p-n junction.	CO4	L2	4M

UNIT-V

9	a	Prove that super conductor is a very good diamagnetic material.	CO5	L1	6M
	b	Write the applications of superconductors.	CO5	L2	6M
		OR			
10	a	Explain Sol-Gel technique for synthesis of nanomaterial.	CO6	L4	8M
	b	Write the applications of nanomaterials in different fields.	CO6	L1	4M

***** END *****

O.P.Code: 20CS0501	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year II Semester Supplementary Examinations July-2024
C PROGRAMMING AND DATA STRUCTURES
(Common to ME, EEE & ECE)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Explain the C language elements with example.	CO1	L2	6M
	b	Define type conversion. What are different types of type conversions? Explain with example.	CO1	L3	6M

OR

2	a	List the different decision statements available in C.	CO1	L3	6M
	b	Discuss each decision statement with suitable example.	CO1	L4	6M

UNIT-II

3	a	Distinguish between call by value and call by reference with an example programs.	CO2	L3	6M
	b	How to use Array as Function argument? Explain with an example program.	CO2	L4	6M

OR

4	a	Describe about scope and distinguish between local and global variable.	CO2	L2	6M
	b	Examine the types of storage class available in C.	CO2	L4	6M

UNIT-III

5	a	Describe about pointers and arrays.	CO3	L4	6M
	b	Distinguish between malloc(), calloc(), realloc() and free()	CO3	L4	6M

OR

6	a	Describe about array of structures.	CO3	L2	6M
	b	Illustrate the use of typedef with suitable example.	CO3	L4	6M

UNIT-IV

7	a	Differentiate between stack and queue.	CO4	L2	6M
	b	Explain briefly about various types of linked lists with suitable examples.	CO4	L3	6M

OR

8	a	Distinguish between singly linked list and doubly linked list.	CO4	L3	6M
	b	List the applications of linked list.	CO4	L4	6M

UNIT-V

9	a	Explain the difference between merge sort and quick sort.	CO5	L3	6M
	b	Compare binary search and linear search techniques.	CO5	L4	6M

OR

10	a	Explain binary search algorithm for finding given element is in the list or not.	CO5	L2	6M
	b	Define sorting. Explain any three sorting techniques with example.	CO5	L4	6M

***** END *****

O.P.Code: 20CS0503	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations July-2024

DIGITAL LOGIC DESIGN

(Common to CAD, CSIT, CAI, CIC, CSE, CCC & CSM)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1		Explain about complements with examples.	CO1	L2	12M
		OR			
2	a	Express the Boolean function, F=A+B'C in sum of min terms form.	CO1	L1	6M
	b	Convert Y=A(A+B+C) to standard POS form.	CO1	L6	6M

UNIT-II

3		Simplify the Boolean expression using K-MAP and draw the AOI logic diagram. F(A, B,C,D,E)=∑m(0,2,4,6,9,13,21,23,25,27,29,31)	CO1	L6	12M
		OR			
4	a	Design the circuit using NAND gates for the given function. F= ABC'+DE+AB'D'	CO5	L6	6M
	b	For the given function, design the circuit using NOR gates. F= (X+Y). (X'+Y'+Z')	CO5	L6	6M

UNIT-III

5	a	Explain about Binary Half Adder with truth table and logic diagram.	CO2	L2	6M
	b	Design and draw a full adder circuit.	CO5	L3	6M
		OR			
6	a	Design and implement a 2-bit Magnitude comparator.	CO3	L3	6M
	b	Explain in detail about Priority Encoder.	CO4	L2	6M

UNIT-IV

7	a	Explain the working principle of SR and JK flip-flops. Also give their characteristic table.	CO3	L2	6M
	b	Explain the analysis procedure of sequential circuits.	CO4	L2	6M
		OR			
8	a	What is a synchronous counter? Draw the Block Diagram of 2- bit UP Counter.	CO4	L1	6M
	b	Design and implement Mod-6 synchronous Counter using clocked T-flipflop.	CO5	L5	6M

UNIT-V

9	a	What is an Error in digital systems? List the sources of errors.	CO4	L1	6M
	b	Explain about Error correction & Detection Codes with examples.	CO1	L2	6M
		OR			
10	a	What is ROM? Explain combination of PLD's.	CO4	L1	6M
	b	Design internal logic of a 32 x 8 ROM.	CO4	L6	6M

***** END *****

O.P.Code: 20EE0254	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech. I Year II Semester Supplementary Examinations July-2024
ELECTRICAL TECHNOLOGY
(Electronics and Communications Engineering)

Time: 3 Hours **Max. Marks: 60**

(Answer all Five Units **5 x 12 = 60** Marks)

UNIT-I

1	a	Derive expression for generated EMF of a D.C generator.	CO1	L1	6M
	b	A 4-pole, long shunt, lap wound generator supplies 25kw at a terminal voltage of 500 V. The armature resistance is 0:03, series field resistance is 0:04 and shunt field resistance is 200. The brush drop may be taken as 1 V. Determine the EMF generated.	CO1	L2	6M
		OR			
2		Explain the characteristics of D.C generator.	CO1	L3	12M

UNIT-II

3		Explain the method used to control the speed of a dc shunt motor above the rated speed.	CO2	L3	12M
		OR			
4		Explain various losses and Efficiency of a D.C. machine.	CO2	L3	12M

UNIT-III

5	a	A single-phase 600/230V,50Hz transformer has a core area of 400cm2and amaximum flux density of 1.18Wb/m2.Calculate the number of turns in Primary& Secondary windings.	CO3	L3	6M
	b	Compare Core type &Shell type transformer.	CO3	L2	6M
		OR			
6		What is the Procedure for conducting O.C. test and S.C on a single-phase transformer, explain with neat diagram.	CO3	L3	12M

UNIT-IV

7	a	Explain construction features of wound rotor machine.	CO4	L3	6M
	b	A 12 pole 3 φ alternator driver at speed of 500 r.p.m. supplies power to an 8 pole 3 φ induction motor. If the slip of motor is 0.03p.u, calculate the speed.	CO4	L3	6M
		OR			
8		Explain the principle of operation of 3-phase induction motor with neat sketch.	CO4	L3	12M

UNIT-V

9		Explain the working principle of a synchronous motor.	CO5	L3	12M
		OR			
10		Sketch and explain the open circuit and short circuit characteristics of a synchronous machine how voltage regulation can be calculated by the use of their results.	CO5	L3	12M

***** END *****