I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BCC2TH01 **COMMUNICATIVE ENGLISH-II**

Time: 3 hours (Common to CE, EEE, ME, ECE, CSE, IT) Max. Marks: 60

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No.		Questions	Marks
		Unit-I	
1	a	i) How did Rahul contribute to the growth of the automobile industry in India?	[6M]
		ii) Enlist the features of human communication.	[6M]
		OR	
	b	i) In what way did the Government of India acknowledge Rahul Bajaj's contribution?	[6M]
		ii) You are an engineering graduate. Write an e-mail application letter in response to an advertisement for the project engineer in a well-known petrochemical company.	[6M]
		Unit-II	
2	a	i) 'Ratan sensed the consumer revolution.' How did he turn his vision into profitable business?	[6M]
		ii) Write **antonyms** for the following words and use them in your own words. A) Tarnish B) Helm C) Unprofessional D) Separation	[6M]
		OR	
	b	i) Describe the types of verbal and non verbal communication.	[6M]
		ii) You are a student of I-II B.Tech (Civil Engineering) at Narasaraopeta Engineering College. Apply to the Regional Manager of L&T Corporation as you want to take part in their internship programme during summer holidays.	[6M]
		Unit-III	
3	a	i) What are the advantages and disadvantages of social media?	[6M]
		ii) Use the following homophones in your own words. A) Hour – Our B) Meet – Meat C) Right – Write	[6M]
		OR	
	b	i) In your own words describe the story of the invention of Hotmail.	[6M]
		ii) How can one become an effective listener?	[6M]
		Unit-IV	
4	a	i) How did Woz and Jobs create Apple?	[6M]
		ii) What are the persuasion strategies in communication skills?	[6M]
		OR	

	b	i) Write **one word substitutes** for the following: A) A person who is mentally ill B) A lover of mankind C) One who can use either hand with ease D) Persons living at the same time E) A person who dislikes humankind and avoids human society F) Someone who walks in sleep	[6M]
		ii) TCS Calcutta, requires software engineer with good communication skills and knowledge of IOT & Block Chain technologies. Draft your resume with a covering letter stating your competencies.	[6M]
5		Unit-V	
	a	i) Describe some of the work done by Sudha Murthy in the field of philanthropy and social work.	[6M]
		ii) Enlist the telephone etiquette one should follow.	[6M]
		OR	
	b	i) As the Director, Softech Private Ltd., write a report to the vice-president of the company on the poor performance of the night-shift workers.	[6M]
		ii) State the note making format and procedure.	[6M]

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I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BCC2TH02   DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS
Time: 3 hours   (Common to CE, EEE, ME, ECE)   Max. Marks: 60

Note: Answer All FIVE Questions.
All Questions Carry Equal Marks   (5 X 12 = 60M)

Q.No.		Questions	Marks
		Unit-I	
1	a	i) Solve $\left(ye^{xy}+4y^3\right)dx+\left(xe^{xy}+12xy^2-2y\right)dy=0,\ y(0)=2$	[6M]
		ii) An emf e = 200 e^{-5t} is applied to a series circuit consisting of 20 ohm resistor and 0.01 F capacitor. Find the charge and current at any time assuming that there is no initial charge on capacitor	[6M]
		OR	
	b	i) Solve $y^4dx=\left(x^{-3/4}-y^3x\right)dy$	[6M]
		ii) Find the orthogonal trajectories of families of semi cubical parabolas $ay^2=x^3$, where a is parameter	[6M]
		Unit-II	
2	a	i) Solve $(2+3x)^2\dfrac{d^2y}{dx^2}+3(2+3x)\dfrac{dy}{dx}-36y=3x^2+4x+1$	[6M]
		ii) Solve $(D-1)^2\left(D^2+1\right)y=e^x+\sin^2\dfrac{x}{2}$	[6M]
		OR	
	b	i) Solve $\left(D^2+1\right)y=\cosec x$	[6M]
		ii) Solve $D^2y=x-2;\ D^2x=y+2$	[6M]
3		**Unit-III**	
	a	i) Form a partial differential equation by eliminating arbitrary function f from the relation $z=y^2+2f\left(\dfrac{1}{x}+\log y\right)$	[6M]
		ii) Solve the partial differential equation $x^2p+y^2q=(x+y)z$	[6M]
		OR	
	b	i) Form a partial differential equation by eliminating a, b, c from $\dfrac{x^2}{a^2}+\dfrac{y^2}{b^2}+\dfrac{z^2}{c^2}=1$	[6M]

		ii) Solve $(x^2 - yz)p + (y^2 - zx)q = z^2 - xy$	[6M]
		Unit-IV	
4	a	i) Find the values of a and b such that the surface $ax^2 - byz = (a+2)x$ and $4x^2y + z^3 = 4$ cut orthogonally at (1, -1, 2).	[6M]
		ii) Show that $\nabla^2(r^n) = n(n+1)\, r^{n-2}$	[6M]
		OR	
	b	i) Show that $\nabla^2 f(r) = f''(r) + \dfrac{2}{r} f'(r)$	[6M]
		ii) If u = x + y + z, v = x² + y² + z², w = yz + zx + xy, prove that grad u, grad v, grad w are coplanar.	[6M]
		Unit-V	
5	a	i) Find the work done in moving a particle in the force field $F = 3x^2 I + (2xz - y)J + zK$ along the curve defined by $x^2 = 4y$, $3x^3 = 8z$ from x = 0 to x = 2.	[6M]
		ii) Verify Green's theorem for $\int_C \left[(xy+y^2)\,dx + x^2\,dy \right]$, where C is bounded by y = x and y = x².	[6M]
		OR	
	b	i) If $A = (3x^2 + 6y)I - 14yzJ + 20xz^2K$, evaluate $\int A.dR$ from (0, 0, 0) to (1, 1, 1) along the path x = t, y = t², z = t³.	[6M]
		ii) Evaluate $\int_S (a^2x^2 + b^2y^2 + c^2z^2)^{-1/2}\,dS$, where S is the surface of the ellipsoid ax² + by² + cz² = 1.	[6M]

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I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BCC2TH03   **ENGINEERING CHEMISTRY**

Time: 3 hours   (Common to CE, ME, ECE)   Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 12 = 60M)

Q.No		Questions	Marks
		Unit-I	
1	a	i) Define Regeneration and explain how do you regenerate Cation resin and Anion Resin with equations	[6M]
		ii) What are the limitations of Zeolite method?.Give the equations involved	[6M]
		OR	
	b	i) Give definition and significances of D.O;B.O.D;C.O.D	[6M]
		ii)Write a note on Bleaching agents with suitable examples	[6M]
		Unit-II	
2	a	How do you assess the quality of Petrol and Diesel fuels?.Give the definitions of each and their importance	[12M]
		OR	
	b	i) Give the mechanism of Free radical Polymerisation	[4M]
		ii) Differentiate between Thermoplastics and Thermosetting resins	[4M]
		iii)What is the difference between Natural rubber and Gutta Percha rubber	[4M]
		Unit-III	
3	a	i) With the help of a neat diagram the preparation of Nano material by Laser Ablation method	[6M]
		ii) What are Fullerenes?.Give any four applications	[6M]
		OR	
	b	i) Name the the components of a Composite and give few applications	[6M]
		ii) Mention the types of liquid crystals with suitable examples	[6M]
		Unit-IV	
4	a	i) What are Reference Electrodes?.Explain the construction of a Metal-Metal ion Electrode	[6M]
		ii) Fuel cells are the future source of Energy.Justify your answer	[6M]

		OR	
	b	i) Explain about any three factors responsible for Corrosion	[6M]
		ii) Write a note on Galvanisation and Tinning	[6M]
5		Unit-V	
	a	i) Define Lubricant and give its Important characteristics	[6M]
		ii) Write a note on Fluid Film Lubrication	[6M]
		OR	
	b	i) Give the components of Portland Cement and their functions	[6M]
		ii) Explain about any two important properties of lubricants	[6M]

Sub Code: 19BEC2TH04   NETWORK ANALYSIS
Time: 3 hours   (ECE)   Max. Marks: 60

Note: Answer All **FIVE** Questions.
All Questions Carry Equal Marks   (5 X 12 = 60M)
1

Unit-I

a. i) State and explain the Kirchoff's voltage and current laws with an example   [6M]

ii) Find the Loop currents in the following circuit?   [6M]
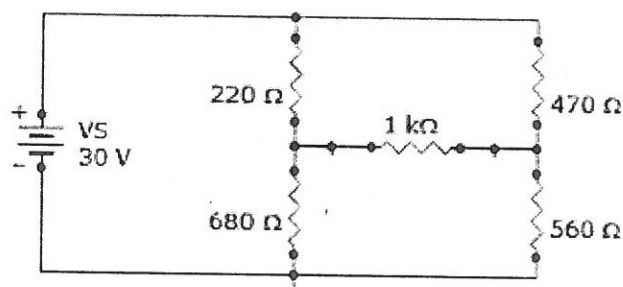
OR

b i) Derive the equivalent resistances in star connection from delta connection?   [6M]

ii) Determine the power supplied by the dependent source shown in figure [6M]
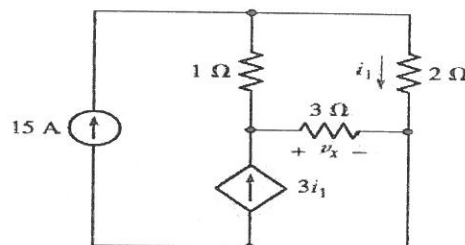
2

Unit-II

a

i)   Explain dot rule of coupled circuits? [6M]

ii)   Find Form factor of the following wave form? [6M]
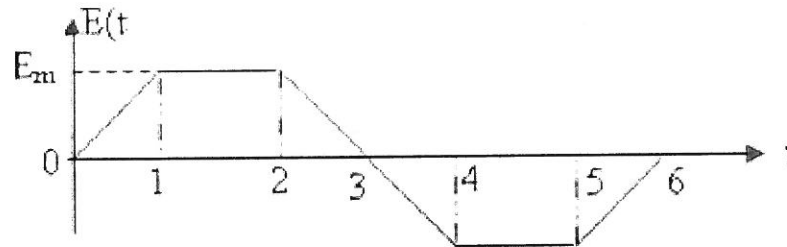
OR

b i) What is coupling coefficient? Derive the expression for it.[6M]

ii) Explain about phasor representation and write the advantages of it.[6M]

3

Unit-III

a. I) Determine equivalent impedance of the following network if operating frequeny is 5 rad/sec   [6M]
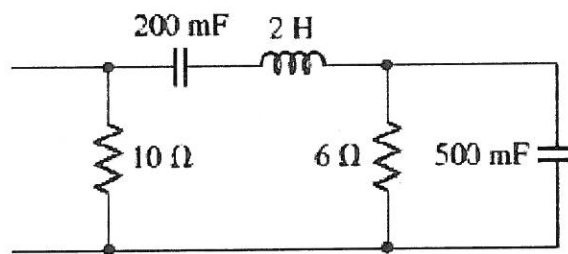
ii) State and explain Maximum power transfer theorem in DC circuits with derivation? [6M]

OR

b.i) A series RLC circuit consists of a resistance of 20 Ω, inductance 0.5 H, capacitance of 200 μF is connected a supply of 230V, 50 Hz. Find the total impedance, current, power, power factor, voltage across coil and capacitance.[6M]

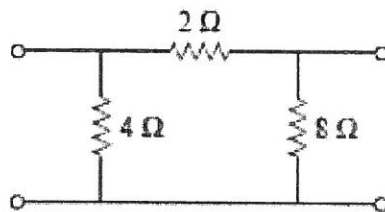i)   Find V_0 in the following circuit by using super position theorem? [6M]
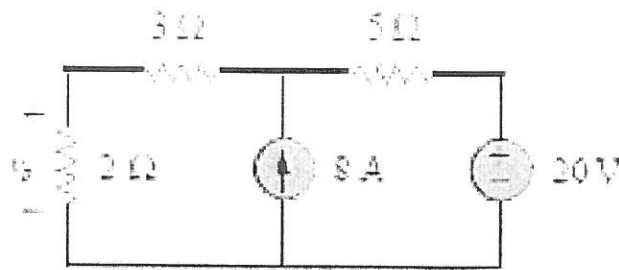
4

Unit-IV

a.i) Draw the parallel resonant circuit and derive the expression for resonant frequency. [6M]

ii) Find Z and Y — parameters of the following circuit [6M]

OR

b. i) Define Quality factor? Derive if for series resonant circuit? [6M]

ii) Obtain Z — parameters interms of Y and ABCD parameters?[6M]

5

Unit-V

a. i) For an RC series circuit, a DC voltage is applied at t = 0sec. Find the expression for transient current using differential equation approach.   [6M]

ii) In a series RL circuit, R=6 ohms, L=1 H. A DC voltage of 40 V is applied at t=0. Obtain the expression for i(t) using differential equation approach.   [6M]

OR

b. For an R-L series circuit, a DC voltage is applied at t = 0sec. Find the expression for transient current.   [12M]

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3

NARASARAOPETA ENGINEERING COLLEGE
(AUTONOMOUS)

I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BCC1TH05   **PROBLEM SOLVING WITH PYTHON**

Time: 3 hours   (ECE)   Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 12 = 60M)

Q.No		Questions	Marks
		Unit-I	
1	a	i) Describe the Structure of a Modern Computer System	[6M]
		ii) Define an Algorithm? Write an algorithm for Binary Search.	[6M]
		OR	
	b	i) Illustrate Data Representation in computers.	[6M]
		ii) Explain in detail about Hardware Architecture.	[6M]
		Unit-II	
2	a	Explain about Programming Control Structures in Raptor with examples.	[12M]
		OR	
	b	i) Illustrate different types of Raptor flowchart symbols.	[4M]
		ii) Outline a raptor flowchart for finding minimum of three numbers.	[4M]
		iii) Describe Sub chart in Raptor with example.	[4M]
		Unit-III	
3	a	i) Explain about different Data Types in python.	[6M]
		ii) Illustrate different types of Looping Statements in python with example.	[6M]
		OR	
	b	i) Explain about Recursive function in python with example.	[6M]
		ii) Illustrate String Operations.	[6M]
		Unit-IV	
4	a	i) Explain about Traversing Dictionaries in python with example.	[6M]
		ii) Define Searching? Explain different types of Searching Methods.	[6M]
		OR	
	b	i) Discuss about Sorting.	[6M]
		ii) Explain about Tuple Packing and UnPacking with example.	[6M]
		Unit-V	
5	a	i) Outline a bar chart using turtle in python.	[6M]
		ii) State Polymorphism? Discuss different types of	[6M]

		Polymorphism.	
		OR	
	b	i) Illustrate timer events.	[6M]
		ii) Explain about exception handling concept.	[6M]

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I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BEC2TH05

BUSINESS MANAGEMENT CONCEPTS FOR ENGINEERS

Time: 3 hours   (ECE)   Max. Marks:60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks   (5 X 12 = 60M)

Q.No		Questions	Marks
1		**Unit - I**	
	a	What is demand? Explain law of demand and its exceptions.	[12M]
		OR	
	b	From the following records of a Company you are requested to calculate BEP.	[12M]

	First year	Second year
Sales	Rs. 80,000	Rs. 90,000
Profit	Rs. 10, 000	Rs. 14, 000

Q.No		Questions	Marks
2		**Unit - II**	
	a	Explain the characteristics, merits and demerits of perfect competition?	[12M]
		OR	
	b	From the following business transactions write necessary journal entries in the books of Soorpanaka for the month of August 2015. **August. 1** Soorpanaka commenced a business with Cash Rs. 42, 000; Buildings Rs. 2, 00, 000; Machinery Rs. 58, 000. **August. 6** Cash withdrawn from Bank in order to pay her daughters college fee Rs. 8, 200. **August. 14** Sold old Type Writer for Rs. 800. **August. 16** Bought goods from Lakshman Rs. 30, 400; and received cheque for Rs. 10, 400. **August. 21.** Sold goods to Ravana Rs. 61, 000. **August. 28** Received goods returned by Ravana Rs. 6, 000.	[12M]
3		**Unit - III**	
	a	What is management? Explain the Henry Fayols 14 Principles of Management	[12M]
		OR	
	b	Explain the element of scientific management and why scientific management is still respected.	[12M]
4		**Unit - IV**	
	a	Define marketing. Explain the functions of marketing.	[12M]
		OR	
	b	What is Production and Explain the advantages of Production Management	[12M]
5		**Unit - V**	
	a	Discuss the procedure and rules for the construction of network diagram.	[12M]

b) A small engineering project consists of six activities. The three time estimates in number days for each activity are given below

activity	optimistic	Most likely	pessimistic
1-2	2	5	8
2-3	1	1	1
3-5	0	6	18
5-6	7	7	7
1-4	3	3	3
4-5	2	8	14

i) Draw the project network.
ii) Find out the critical path
iii) Calculate the duration of the project

[12M]

Q.No		Questions	Marks
		Unit-I	
1	a	i) Define algorithm. Write an algorithm for finding the maximum of three numbers.	[6M]
		ii) Explain the structure of C program with an example.	[6M]
		OR	
	b	i) Define Flowchart. What are the symbols used to construct flowchart. Explain with an example.	[6M]
		ii) Define data type. Explain the basic data types available in C language with an example to each.	[6M]
2		Unit-II	
	a	Explain different types of iterative statements with an example to each.	[12M]
		OR	
	b	i) Write a c program to find the factorial of a given number using recursion.	[6M]
		ii) Write a C program to implement calculator operations using switch statement.	[6M]
3		Unit-III	
	a	i) Define Array. Write a C program to perform the multiplication of two matrices.	[12M]
		OR	
	b	i) Explain different types of String manipulation functions with an example.	[6M]
		ii) Write a C program to read n elements into an array, and print sum of their squares as output.	[6M]
4		Unit-IV	
	a	i) Define pointer.How to pass a pointer as a function argument. Give an example program.	[6M]
		ii) Compare and contrast structures & Unions in brief.	[6M]
		OR	
	b	i) Explain the concept of pointer arithmetic.	[4M]
		ii) Write a C program to display the list of books	[8M]

		available in your library. Like Title of the book, author of the book, publisher, volume, edition..etc	
		Unit-V	
5	a	i) Write a program to copy the contents of one file to other file.	[12M]
		OR	
	b	i) Define File. Explain the different types of operations performed on files, explain with an example.	[6M]
		ii) How read the input through command line. Explain with an example program.	[6M]

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I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BCI2TH08　　　**PROBABILITY AND STATISTICS**

Time: 3 hours　　　　　(Common to CSE, IT)　　　　Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks　(5 X 12 = 60M)

Q.No			Questions	Marks
			Unit-I	
1	a		i) Define Conditional Probability ?	[2M]
			ii) State Baye's theorem	[2M]
			iii) In a bolt factory, machines A, B and C manufacture 25%, 35% and 40% of the total . Of their output, 5%, 4% and 2% are defective bolts. A bolt is drawn at random from the product and is found to be defective. What are the probabilities that it was manufactured by the machines A, B and C?	[8M]
			OR	
	b		i) For the Binomial distribution, write the mean and variance.	[2M]
			ii) Define mean, mode for discrete random variable.	[2M]
			iii) Out of 800 families with 5 children each, how many would you expect to have (I) 3 boys (II) 5 girls (III) either 2 boys or 3 boys ? Assume equal probabilities for boys and girls.	[8M]
			Unit-II	
2	a		i) A continuous random variable has the probability density function $f(x) = ke^{-|x|}, -\infty < x < \infty$. i) Determine K (ii) Mean (iii) Variance.	[6M]
			ii) Explain Gamma distribution.	[6M]
			OR	
	b		i) In a normal distribution, 31% of the items are under 45 and 8% are over 64. Find the mean and standard deviation of the distribution.	[6M]
			ii) Fit a normal curve to the following distribution.	[6M]

x	2	4	6	8	10
f	1	4	6	4	1

Q.No			Questions	Marks
			Unit-III	
3	a		i) State central limit theorem.	[2M]
			ii) If a population is 4, 8, 12, 16, 20, 24. (i) List all possible sample size of 2, that can be taken without replacement and with replacement from the finite population, (ii) Calculate the population mean (iii) Calculate Standard deviation of the population (iv) Calculate the mean of each of the sampling distribution of means.(v) Find the standard deviation of sampling distribution of mean.	[10M]
			OR	
	b		i) For a given sample of 200 items are drawn from a large population, the mean is 65 and the standard deviation is 8. Find the 95% confidence limits for the population mean.	[4M]
			ii) A normal population has a mean 0.1 and a standard deviation of 2.1. Find the probability that the mean of simple sample of 900 members will be negative.	[6M]

		iii) Define sample and population.	[2M]

Unit-IV

		i) Define level of significance and degree of freedom	[2M]
		ii) Explain Type I and Type II errors. — $\overline{5}$ 9-9.4	[4M]
4	a	iii) A mechanist is making engine parts with axle diameters of 0.700 inch. A random sample of 10parts shows a mean diameter of 0.742 inch with a S.D of 0.040 inch. Compute the static you would use to test weather the work is meeting the specification at 0.05 level of significance. — 6 $\overline{5}$ — 5x-(1).	[6M]

OR

		i) Explain Testing of hypothesis? — 5 82	[6M]
	b	ii) A group of 10 rats fed on a diet A and another group of 8 rats fed on different diet B, recorded the following increase in weights:	[6M]

Diet A(gm)	5	6	8	1	12	4	3	9	6
Diet B(gm)	2	3	6	8	10	1	2	8	

Does it show the superiority of diet A over that of B ?

Unit-V

		(i) Draw the control chart for $\overline{X}$, R chart for the following data for $A_2 = 0.483$	

Sample	1	2	3	4	5	6	7	8	9	10
Mean	43	49	37	44	45	37	51	46	43	47
Range	5	6	5	7	7	4	8	6	4	6

[10M] (a)

		(ii) Write the expression for the control line and three sigma for mean Chart	[2M]

OR

5	b	The following data show the values of sample mean X and the range R of 20 samples for The sample of size 4 each. Calculate the values for central line and control limits for mean-chart and range chart and determine whether the process is in control	[12M]

Sample No.	1	2	3	4	5	6	7	8	9	10
X	1.75	1.32	1.18	0.18	2.30	1.25	1.52	1.78	1.90	1.72
R	1.0	1.3	0.4	1.3	1.4	1.9	1.0	1.3	2.4	2.0
Sample No.	11	12	13	14	15	16	17	18	19	20
X	2.40	3.20	2.52	2.05	1.68	2.00	1.28	1.92	1.00	1.35
R	1.9	2.7	1.7	0.6	0.5	3.1	2.6	2.7	1.0	1.7

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I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BCC2TH09   **ENGINEERING GRAPHICS**
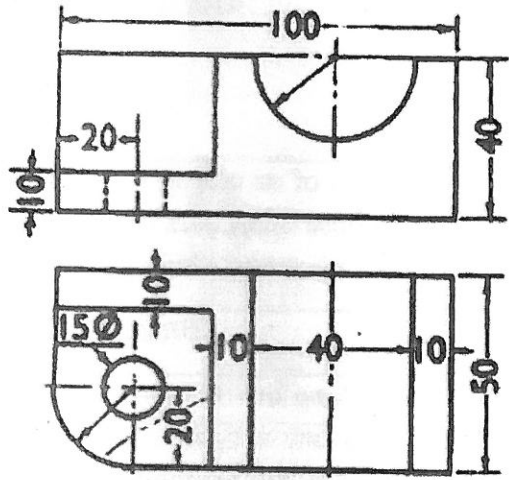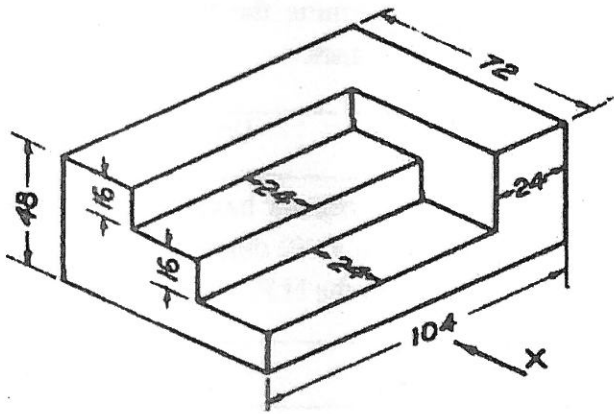
Time: 3 hours   (Common to EEE, CSE, IT)   Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 12 = 60M)

Q.No		Questions	Marks
		Unit-I	
1	a	Construct a hyperbola when the distance between focus and directrix is 60mm. The eccentricity is 3:2. Also draw the normal and tangents at any point on the curve.	[12M]
		OR	
	b	The major and minor axis of an ellipse is 140 and 90mm respectively. Find the foci and draw the ellipse using arcs of circle method. Draw a tangent and a normal to the ellipse at a point of 40mm above the major axis.	[12M]
		Unit-II	
2	a	The top view of a 75mm long line AB measures 65mm, while the length of its front view is 50mm. It's one end A is in H.P. and 12mm in front of V.P. Draw the projections of AB and determine its inclinations with the H.P. and the V.P.	[12M]
		OR	
	b	The projections of ends of a line AB are 5cm apart. The end A is 2cm above the H.P. and 3cm in front of the V.P. The end B is 1cm below the H.P. and 4cm behind the V.P. Determine the true length and traces of AB, and its inclinations with the two planes.	[12M]
		Unit-III	
3	a	Draw the projections of a regular hexagon of 20mm side, having one of its side in H.P. and inclined to at 60 degrees to the V.P. and its surface making an angle of 45 degrees with the H.P.	[12M]
		OR	
	b	The circular plate of negligible thickness and 70 mm diameter appears as an ellipse in the front view, having its major axis 70 mm long and minor axis 50 mm long. Draw its top view when the major axis of the ellipse is horizontal.	[12M]

		Unit-IV	
4	a	A square prism, base 40mm side and height 65mm, has its axis inclined at 45 degrees to the H.P. and has its edge of its base, on the H.P. Draw its projections.	[12M]
		OR	
	b	Draw the projections of a cone, base 75mm diameter and axis 100mm long, lying on H.P. on one of its generators with the axis parallel to the V.P.	[12M]
		Unit-V	
5	a	Draw isometric view for the given orthographic projections. 	[12M]
		OR	
	b	Draw the (i) Front view (ii) Top view and (iii) Side view for the following figure. All dimensions are in mm. 	[12M]

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I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BCC2TH09　　　　**ENGINEERING GRAPHICS**
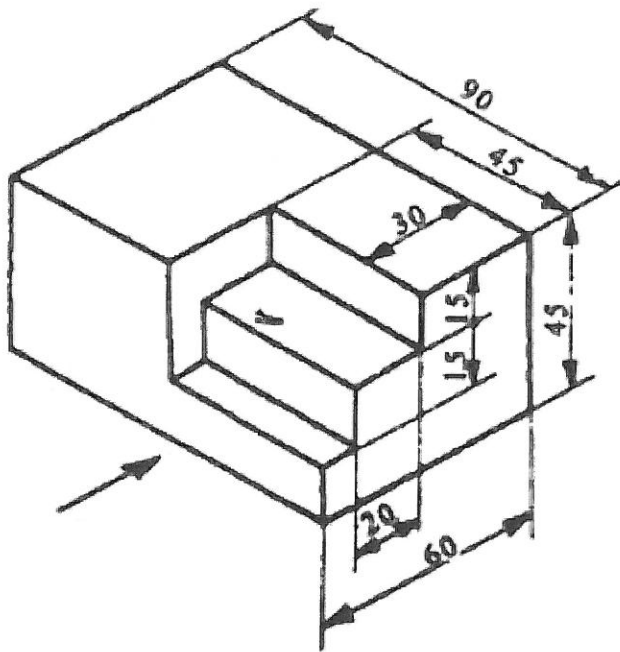
Time: 3 hours　　　　　　　　　(Common to EEE, CSE, IT)　　　　Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks　(5 X 12 = 60M)

Q.No		Questions	Marks
		Unit-I	
1	a	i) Construct a regular pentagon of side 30mm by using general method.	[4M]
		ii) The major axis of an ellipse is 150mm long and the minor axis is 100mm long. Find the foci and draws the ellipse by Arcs of circles method. Draw a tangent to the ellipse at a point on it 25mn above the major axis?	[8M]
		OR	
	b	Draw a hyperbola when the distance between its focus and directrix is 50mm and eccentricity is 3/2. Also draw the tangent and normal at a point 23mm from the directrix.	[12M]
		Unit-II	
2	a	A straight line AB has its end A 20mm above HP and 30mm in front of VP. The end B is 80mm above HP and 70mm infront of VP. If the end projectors 60mm apart. Draw the projections of the line, determine its true length and inclinations with reference line	[12M]
		OR	
	b	i) Draw the front view and top view .of a point P lies in the H.P and 22 mm behind the V.P.	[4M]
		ii) A Line PQ 40mm long is parallel to both the planes .It is 20mm above the H.P and 15 mm Infront of V.P. Draw its projections.	[4M]
		iii) Explain about traces of a line in engineering graphics.	[4M]
		Unit-III	
3	a	A semicircular plate of 80mm diameter has its straight edge in the VP and inclined at 45^0 to HP. The surface of the plate makes an angle of 30^0 with the VP. Draw its projections.	[12M]
		OR	
	b	A thin hexagonal plate of 35mm side has a central equilateral triangle hole of side equal to that of the plate. The plate is kept in such a way that one of its edges is parallel to the ground and inclined at 30^0 to the VP. The plate makes 45^0 with ground. Draw the projections of the plate and the hole. A side of the hole is parallel to the ground	[12M]
4		**Unit-IV**	
	a	A hexagonal pyramid, base 25mm side axis 50mm long, has an edge of its base on the ground. Its axis is inclined at 30^0 to the H.P and parallel to the VP. Draw its projections	[12M]
		OR	

	b	A cone, base 65 mm diameter and axis 75 mm long, has its axis parallel to the V.P and inclined at 45^0 to the H.P. Draw its projections.	[12M]
		Unit-V	
5	a	Draw the front view, top view and side view of the given figure. 	[12M]
		OR	
	b	Draw the isometric projections of cone of base 40mm diameter and height 60mm long. When it rest with its base on H.P. Draw its projections	[12M]

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I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BCI2TH10   NUMERICAL METHODS AND VECTOR CALCULUS

Time: 3 hours   (Common to CSE, IT)   Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 12 = 60M)

Q.No		Questions	Marks
		Unit-I	
1	a	i) Find positive root between 0 and 1 of the equation $x=e^{-x}$ correct to four decimal places using bisection method.	[6M]
		ii) using Newton-Raphson method, derive a formula for finding the kth root of a positive number N and hence compute the value of $(25)^{\frac{1}{4}}$ correct to four decimal places.	[6M]
		OR	
	b	i) Give the geometrical interpretation of regula-falsi method for determining a real root of the equation $f(x)=0$. Using regula-falsi method to find a real root of the equation $x^3-x-4=0$ correct to three decimal places.	[6M]
		ii) Find a real root of the equation $\sin x=10(x-1)$ correct to three decimal places using iteration method	[6M]
2		**Unit-II**	
	a	i) Using Newton's forward interpolation formula, find the cubic polynomial which takes the following values: y(1) = 24, y(3) = 120, y(5) = 336, and y(7) = 720. Hence or otherwise, obtain the value of y(6).	[6M]
		ii) Find y(2) from the following data using Lagrange's formula.	[6M]

x	0	1	3	4	5
y	0	1	81	256	625

		OR	
	b	i) Prove that $\Delta=\mu\delta+\dfrac{\delta^2}{2}$	[4M]
		ii) Prove that $\mu\delta=\dfrac{\Delta+\nabla}{2}$	[4M]

		iii) Prove that $\Delta \nabla = \nabla \Delta = \delta^2$	[4M]
		Unit-III	
3	a	i) Using Runge-Kutta fourth order formula to find $y(0.2)$ correct to four decimal places, given that $\frac{dy}{dx} = 1 + y^2, y(0) = 0.$	[6M]
		ii) Compute the value of the integral $\int_1^3 \frac{1}{x} dx$ by Simpson's 1/3rd rule with four strips and also determine the error.	[6M]
		OR	
	b	i) Using Euler's modified method to find $y(0.2)$ correct to four decimal places, given that $\frac{dy}{dx} = x + y, y(0) = 0.$	[6M]
		ii) The distance (x cm) traversed by a particle at different times (t seconds) are given below. 	t	0.0	0.1	0.2	0.3	0.4	0.5	0.6	 	x	3.01	3.16	3.29	3.36	3.40	3.38	3.32	 Find the velocity of the particle at t = 0.3 seconds.	[6M]
4	a	**Unit-IV**	
		i) Find the angle between the normals to the surface $xy = z^2$ at the points (4,1,2) and (3,3,-3).	[6M]
		ii) Prove that $\nabla \times (\nabla \times F) = \nabla(\nabla.F) - \nabla^2 F.$	[6M]
		OR	
	b	i) If $F = (x+y+1)I + J - (x+y)K$, then Prove that **F**. Curl **F** = 0.	[6M]
		ii) Prove that curl curl curl curl **F** = ∇^4**F**, where **F** is solenoidal vector.	[6M]
5	a	**Unit-V**	
		Verify Green's theorem for $\oint_C [(x^2 + xy) dx + (x^2 + y^2) dy]$, where **C** is the square formed by the lines $x = \pm 1, y = \pm 1.$	[12M]
		OR	
	b	Verify Gauss's divergence theorem for $F = 4xz I - y^2 J + yz K$ taken over the cube bounded by $x = y = z = 0, \ x = y = z = 1.$	[12M]

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I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BCC2TH11   **ENGINEERING MECHANICS**   Max. Marks: 60
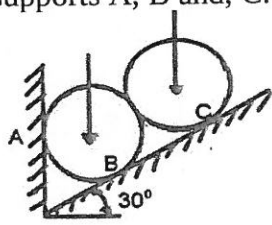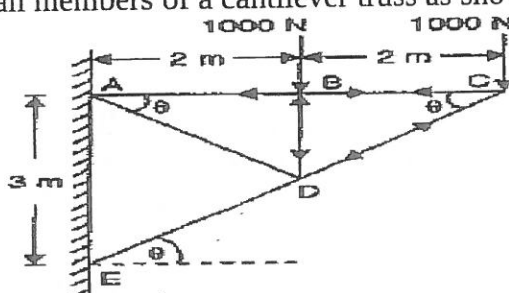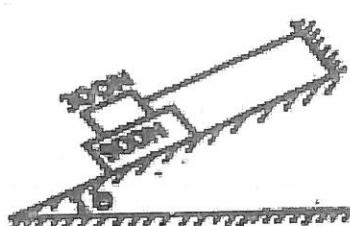
Time: 3 hours   (Common to CE, ME)

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks   (5 X 12 = 60M)

Q.No			Questions	Mark
			Unit - I	
1	a	i.	Explain Parallelogram Law of Forces.	[3M]
		ii.	Two identical rollers, each of weight 100N are supported by an inclined plane and vertical wall as shown. Find the reactions at inclined at the points of supports A, B and, C.	[9M]
			OR	
	b		Determine the two forces and angle between them when the resultant of two forces one of which is 3 times the other is 300N. When the direction of smaller force is reversed. The resultant is 200N.	[12M]
			Unit - II	
2	a		Determine the forces in all members of a cantilever truss as shown in figure.	[12M]
			OR	
	b		**What** should be the value of θ in Fig. which will make the motion of 900 N block down the plane to impend? The coefficient of friction for all contact surfaces is 1/3.	[12M]
			Unit – III	

1

3	a	Determine the centroid of remaining shaded area. A semi circular area is removed from the trapezium. (All dimensions are in mm)	[12M]
		OR	
	b	Reference to Fig., **Calculate** the moment of inertia of the shaded area with respect to a centroidal axis parallel to the x-axis.	[12M]

Unit - IV

4	a	Calculate the moment of inertia for the following composite area about its centriodal axis parallel to the base.	[12M]
		OR	
	b	Derive the expression for Mass Moment of Inertia of a solid sphere.	[12M]

5		**Unit - V**	
	a	Define work-energy principle. Two weights P and Q are connected by the arrangement shown. By neglecting the friction and inertia of the pulleys and cord. Find the acceleration *a* of the weight Q about its centriodal axis normal to rod.	[12M]
		OR	
	b	Find the work done in drawing a body weighing 1000 N through a distance of 10m along a horizontal surface by force of 500 N whose line of action makes an angle of 30^0 with the horizontal.	[12M]

NARASARAOPETA ENGINEERING COLLEGE

(AUTONOMOUS)

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Sub Code: 19BCI2TH12   **PYTHON PROGRAMMING**

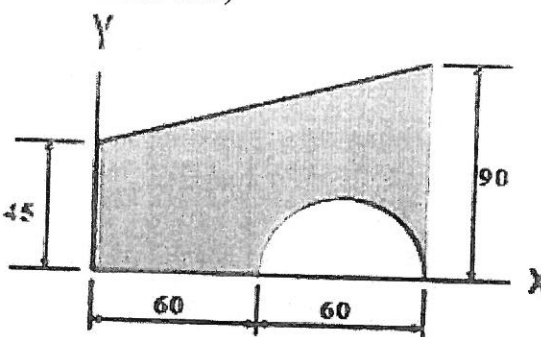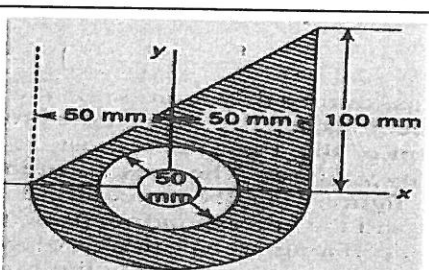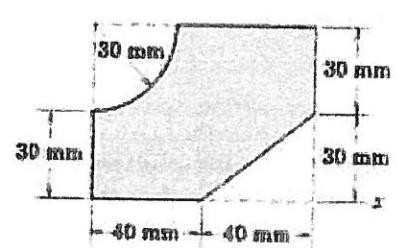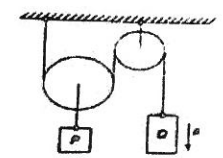Time: 3 hours   (Common to CSE, IT)   Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	Marks
1		**Unit-I**	
	a	i) Write about operators in detail?	[6M]
		ii) write a program to print Fibonacci series up to a given number	[6M]
		OR	
	b	i) List some of useful math functions?	[6M]
		ii) write a program to find the greatest among three given numbers	[6M]
2		**Unit-II**	
	a	i) Write a short note on Python Dictionaries?	[6M]
		ii) Differentiate between lists and tuples in Python	[6M]
		OR	
	b	i) Explain Immutable Data Structure in python with example.	[6M]
		ii) Illustrate files concept in python.	[6M]
3		**Unit-III**	
	a	i) Describe about default arguments with suitable program.	[6M]
		ii) Illustrate different Mouse events in python	[6M]
		OR	
	b	i) What are lambda functions in Python? Explain its usage with an example program.	[6M]
		ii) Explain about features of turtle graphics in python.	[6M]
4		**Unit-IV**	
	a	i) Write a short notes on constructors in python	[6M]
		ii) Explain about abstract classes in python	[6M]
		OR	
	b	i) Write about Errors and Exception Handling in Python programming?	[6M]
		ii) How to implement method overriding in Python? Explain with an example program	[6M]
5		**Unit-V**	
	a	i) Explain about pattern matching using regular expression with example.	[6M]
		ii) Write a Python program to match a string that contains only upper and lowercase letters, numbers,	[6M]

		and underscores.	
		OR	
	b	i) Explain about pattern search using regular expression with example.	[6M]
		ii) Write a Python program to replace all occurrences of space, comma, or dot with a colon	[6M]

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Sub Code: 19BEE2TH13   ELECTRICAL CIRCUIT ANALYSIS-I

Time: 3 hours   (EEE)   Max. Marks: 60

Note: Answer All FIVE Questions.
All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	Marks
		Unit-I	
1	a	i) State and explain kirchoff's laws?	[6M]
		ii) Define the following terms passive elements, super node and super mesh?	[6M]
		OR	
	b	i) Convert the given data network shown in fig(1).	[6M]
		ii) Find the current through 4 ohm resistor in the circuit of fig(2) by nodal method.	[6M]
2		**Unit-II**	
	a	Explain the following factors RMS value, average value and power factor?	[12M]
		OR	
	b	An RLC circuit has R=10 ohm, L=0.5H and C=10 micro farads connected across a 220V, 50 HZ supply. Find i) Reactance ii) Impedance iii) current iv) phase angle v) power factor vi) voltage across R, L and C	[12M]
3		**Unit-III**	
	a	Define the following terms i) graph ii) oriented graph iii) tree iv) co tree v) planner graph vi) link	[12M]
		OR	
	b	i) Explain the principles of duality? Illustrate the graphical procedure to draw a dual network?	[6M]

Unit-IV

4	a	A series RLC circuit with R = 100 ohm, L= 10mH and C=1 micro farad connected to a 20V ac supply. Find the Resonant frequency, Quality factor and bandwidth?	[12M]

OR

b	i) State the Faraday's laws of electromagnetic induction?	[6M]
	ii) Explain the following terms self-inductance, mutual inductance and co-efficient of coupling?	[6M]

Unit-V

5	a	State and explain the super position theorem with an example?	[12M]

OR

	b	Find the current and power through the load in the circuit shown in fig (3) by thevenin's theorem and Norton's theorem?	[12M]

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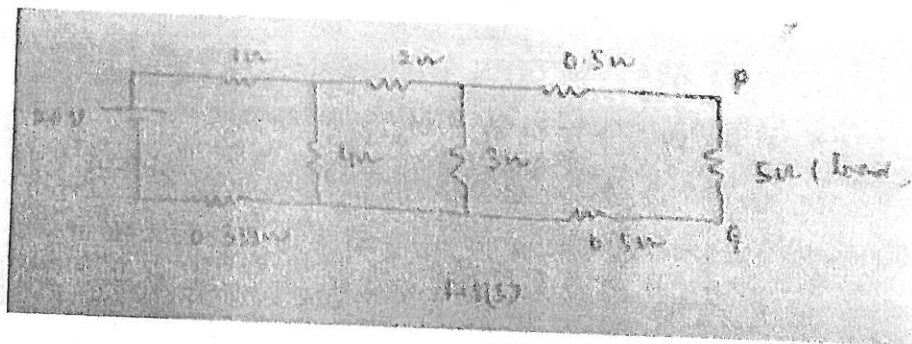
I B.Tech II Semester Regular Examinations, December-2020

Sub Code: 19BCC2TH14

ELEMENTS OF ELECTRICAL AND ELECTRONICS ENGINEERING
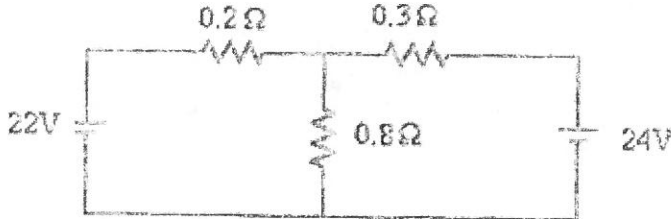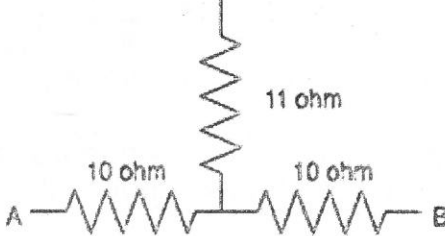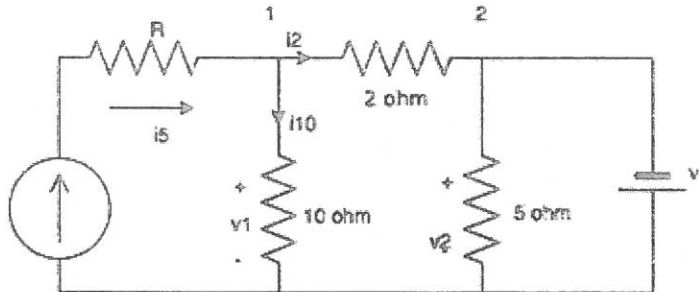
Time: 3 hours   (Common to CE, ME)   Max. Marks: 60

Note: Answer All FIVE Questions.

All Questions Carry Equal Marks   (5 X 12 = 60M)

Q.No		Questions	Marks
		Unit-I	
1	a	i) Calculate the branch currents and also calculate voltage across 0.8. Use Kirchoff's Law	[8M]
		ii) Find the equivalent resistance between A and B.	[4M]
		OR	
	b	i) Find the value of v if v1=20V and value of current source is 6A.	[6M]
		ii) Calculate the value of I3, if I1= 2A and I2=3A.	[6M]

		Unit-II	
2	a	i)Explain with neat diagram, the construction and working principle of DC generator	[12M]
		OR	
	b	ii) Explain the construction and working of Dc motor with a relevant diagram and derive the EMF equation.	[12M]
		Unit-III	
3	a	i) Derive the EMF equation of transformer.	[6M]
		ii) Why single phase induction motor is not self-starting?	[6M]
		OR	
	b	i)Explain any two starting methods suitable for single phase induction motor	[6M]
		ii) In a single phase transformer, N_p= 350 turns, N_s=1050 turns, E_p= 400V. Calculate the value of secondary voltage (E_s).	[6M]
		Unit-IV	
4	a	i) With neat circuit diagram and waveforms, elucidate the working principle of half wave rectifier.	[6M]
		ii) Describe the working principle of Zener diode and explain the terms (i) Zener Break down (ii) Avalanche Break down.	[6M]
		OR	
	b	i) Derive the diode current equation of PN junction diode.	[6M]
		ii) Draw the circuit diagram for full wave rectifier and explain its working.	[6M]
		Unit-V	
5	a	i) Explain the construction and working of PNP transistor.	[6M]
		ii) Distinguish CE, CB and CC configurations.	[6M]
		OR	
	b	i) Elucidate the operation and characteristics of NPN transistors with CE configuration with its characteristics diagram.	[6M]
		ii)How the transistor is working as an amplifier and switch? Explain with its characteristics example.	[6M]

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Sub Code: 19BEE2TH15
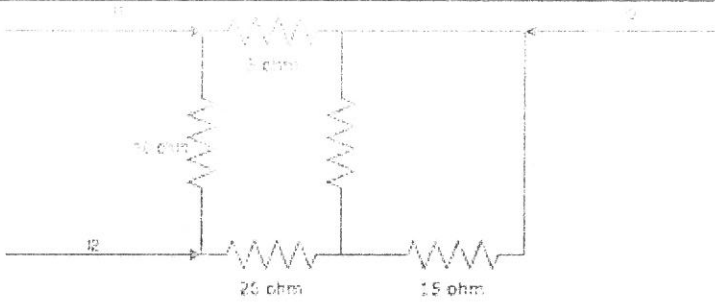
POWER GENERATION AND ECONOMIC ASPECTS

Time: 3 hours (EEE) Max. Marks: 60

Note: Answer All **FIVE** Questions.

All Questions Carry Equal Marks (5 X 12 = 60M)

Q.No		Questions	Marks
		Unit-I	
1	a	i) With a neat sketch explain the working of kaplan tubine.	[6M]
		ii) Explain merits and demerits of hydro electric power station	[6M]
		OR	
	b	i) Write about classification of pumped storage power plant.	[6M]
		ii) Draw a neat schematic diagram of a hydro-electric plant and write the functions of various components.	[6M]
		Unit-II	
2	a	Explain the operation of modern thermal power plant with neat lay out.	[12M]
		OR	
	b	i) What are the factors to be considered in the selection of site for thermal power station?	[4M]
		ii) Explain the operation of economizers in thermal power plant with neat diagram.	[4M]
		iii) Describe the operation of a boiler and safety precautions to be taken in its operations.	[4M]
		Unit-III	
3	a	i) Explain a concept of chain reaction in a nuclear power plant and how is it controlled?	[6M]
		ii) Discuss different types of control rods that are used in Nuclear reactors.	[6M]
		OR	
	b	i) Summarize the importance of breeder reactor in nuclear power station.	[6M]
		ii) Explain the operation of pressurized water reactor	[6M]
4		**Unit-IV**	
	a	i) Explain how wind energy is used for power generation?	[6M]
		ii) Justify the significance of solar in power generation.	[6M]

		OR	
	b	i) Describe various types of generators that may be used for wind power generation	[6M]
		ii) With the block diagram explain how solar energy is converted into electrical energy by means of photo voltaic panel?	[6M]
5		Unit-V	
	a	I) What is load factor? Explain its effects on cost of generation.	[6M]
		ii) Explain the following: i) Capacity factor ii) Utilization factor iii) Plant use factor	[6M]
		OR	
	b	i) A power station supplies the following loads to various consumers: Industrial load-1000 kW, Commercial load- 750 kW, Domestic load-500 kW, Domestic light-500kW. If the maximum demand on the station is 2500kW and the number of kWh generated per year is 45×10^5, examine the diversity factor and annual load factor.	[6M]
		ii) What is load curve and obtain load duration curve from load curve.	[6M]

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