R16

I B.TECH. II SEM

SUPPLEMENTARY EXAMINATIONS

MARCH 2022

Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1201

I B.Tech II Semester Supple Examinations, March-2022

INTERACTIVE ENGLISH

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

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Write about a memorable event at school that influenced Kalam's career.
   (b) How did Hyderabad Public School influence Satya Nadella's personality?
   (c) Write briefly about any two international honours bestowed on Azim Premji.
   (d) Write two sentences about Sachin Tendulkar's Test debut.
   (e) What motivated Sam to focus on Indian Telecommunication System?
   (f) How did Nooyi begin her career in India?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Narrate the experience of Kalam as a graduate student at MIT.
   (b) Discuss how we can communicate effectively.

3. (a) Trace the career path of Nadella that led him to Microsoft.
   (b) How can one improve the skill of 'Active Listening'?

4. (a) As an Indian entrepreneur how did Azim Premji turn a small, family-owned business into a multi-national conglomerate?
   (b) Draft a report on your visit to a tourist spot. The report may include the following headings: history or introduction, how to reach it, places of attraction, describe what you did there, budget for the trip and your experience.

5. (a) Discuss how an eleven-year-old cricket enthusiast became a "Little Master/ Master Blaster."
   (b) Convert the following into Indirect speech
      i. She said to him, "Quit playing games with my heart."
      ii. The teacher said to the artist, "What a wonderful performance!"
      iii. They said to me, "Shall we watch the game at your place or ours?"
   (c) Convert the following into passive voice
      i. Did they tell you that we were talking to him?
      ii. Prasad had delivered the letters.

6. (a) Discuss Sam Pitroda's contribution to our country as a Chairman of the National Knowledge Commission (NKC).

(b)Correct the following sentences wherever necessary.

i. Look at the dog chasing it's tail.
ii. I am accountant.
iii. I will like to have a better job.
iv. They have been living here since they are born.
v. It hurt my feeling.
vi. Are you work here?

(c) Fill in the blanks in the sentence pairs with words that either sound or spelt same

i. _____ two chums are running very fast. (their / there)
ii. They painted that _____ room in just five hours. (hole / whole)
iii. The new jet streaked _____ the clouds. (threw / through)
iv. Please _____ for me. (pray / prey)

7. (a) Sketch the character of Indra Nooyi as a powerful woman entrepreneur from India.

b) Write one-word substitutes for the following words.

i. The study of earthquakes and volcanic activity
ii. To be forgetful
iii. A combination of pleasant sounds and words.
iv. A group of worshippers
v. Someone who is the custodian or keeper of a museum
vi. Huge fire for celebration

c) Replace the underlined word in each sentence with a suitable synonym

i. Janet came here to <u>appease</u> you.
   a. pacify b. argue c. play d. slap
ii. That was an awful story.
   a. interesting b. horrible c. funny d. romantic

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Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1202

I B.Tech II Semester Supple Examinations, March-2022

INTEGRAL TRANSFORMS AND VECTOR CALCULUS

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

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Find the Laplace transform of $e^{-2t}3^t$.

   (b) Find the Z-transform of $(\cos\theta+i\sin\theta)^n$.

   (c) For the Fourier series to represent the function $f(x)=x^2-2$ in $(-2,2)$, find the Fourier coefficient b_n.

   (d)Find the Fourier transform of e^{-x^2}.

   (e) Find the unit vector normal to the surface $x^3+y^3+3xyz=3$ at the point $(1,2,-1)$.

   (f) Evaluate $\iint_S \vec{F}.\vec{dS}$ where $\vec{F}=2\hat{i}+3\hat{j}+4\hat{k}$ and S is the surface of the unit sphere.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Find the Laplace transform of $t\sin t+\int_0^t \frac{e^t\sin t}{t}dt$.

   (b) Solve $t\frac{d^2y}{dt^2}+2\frac{dy}{dt}+ty=\sin t$, when $y(0)=1$ using Laplace transforms.

3. (a) If $U(z)=\frac{2z^2+3z+12}{z^3}$, find the values of u_2 and u_3.

   (b) Solve $y_{n+2}+4y_{n+1}+3y_n=2^n$ *with* $y_0=0, y_1=1$ using Z-transforms.

4. (a) Find the Fourier series for the function $f(x)=x-x^2, -1<x<1$.

   (b) Find the half-range cosine series of the function $f(x)=x$ in the interval $0<x<1$.

5. (a) Find the Fourier transform of $f(x)=\begin{cases}1-x^2, if\ |x|<1\\ 0, if\ |x|>1\end{cases}$ and hence evaluate

   $$\int_0^\infty \left(\frac{x\cos x-\sin x}{x^3}\right)\cos\left(\frac{x}{2}\right)dx.$$

   (b) Find the Fourier sine transform of $\frac{e^{-ax}}{x}, a>0$.

6. (a) Find the constants a, b, c so that $\vec{F}=(x+2y+az)\hat{i}+(bx-3y-z)\hat{j}+(4x+cy+2z)\hat{k}$ is irrotational. Also find the scalar potential.

   (b) Prove that $curl(curl\,\vec{V})=grad(\vec{V})-\nabla^2\vec{V}$.

7. Verify divergence theorem for $\vec{F}=4x\hat{i}-2y^2\hat{j}+z^2\hat{k}$ taken over the region bounded by the cylinder $x^2+y^2=4, z=0, z=3$.

Narasaraopeta Engineering College (Autonomous)

NEC KotappakondaRoad, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1203

I B.Tech II Semester Supple Examinations, March-2022

ENGINEERING PHYSICS

(Common to ~~ECE & CSE~~ CE, EEE, ME)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of Part-A and Part-B.

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Mention the types of diffraction and give the differences between them.
   (b) For an optical fiber fractional index change is 0.14 and refractive index of cladding is 1.3. Calculate refractive index of core.
   (c) What is primitive cell and how does it differ from unit cell?
   (d) What is meant by the reverberation and reverberation time?
   (e) Define the Fermi level and write the expression.
   (f) Explain the position of Fermi level in p-type semiconductor.

[2+2+2+2+2+2]

PART-B

4X 12 = 48

2. (a) Explain the formation of Newtons's rings. Describe how Newtons's rings are used to determine the radius of curvature of plano-convex lens.
   (b) Find the minimum thickness of half wave and quarter wave plates for a light beam of wavelength 589.3 *nm*. If $\mu_o = 1.65833$ and $\mu_e = 1.48640$ [8 + 4]

3. (a) Derive the relation between the probabilities of spontaneous emission and stimulated emission in terms of Einstein coefficients.
   (b) What is meant by acceptance angle for an optical fiber? Obtain mathematical expression for acceptance angle and numerical aperture. [6 + 6]

4. (a) Describe the seven crystal systems with neat diagrams.
   (b) State and explain Bragg's law of X-ray diffraction. [8 + 4]

5. (a) What are the ultrasonic waves? Describe the production of ultrasonic waves by Piezoelectric method.
   (b) What are the basic requirements of the acoustically good halls? [8 + 4]

6. (a) What are the various drawbacks of classical free electron theory of metals and explain the assumptions of made in quantum free electron theory to overcome the drawbacks.
   (b) Derive the time independent Schrodinger wave equation. [6 + 6]

7. (a) Explain the classification of materials into conductors, semiconductors and insulators based on the band theory of solids.
   (b) Show that for n-type semiconductor the Hall co-efficient $R_H = (-1/ne)$. [6 + 6]

Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1204

I B.Tech II Semester Supple Examinations, March-2022

ENGINEERING CHEMISTRY

(Common to ECE & CSE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Define condensation polymerization with a suitable example.
   (b) What are thermotropic liquid crystals? Give any two examples.
   (c) What happens when a zinc rod is immersed into the solution of nickel sulphate in water? Explain.
   (d) Explain knocking in petrol engine.
   (e) Write down the chemical structure of disodium salt of EDTA and its complex with Ca^{2+} ion.
   (f) State Stark-Einstein Law.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain Ion-exchange method for softening of hard water with a neat diagram. [6M]
   (b) 50 ml of standard hard water containing 1 mg of pure $CaCO_3$ per ml consumed 25 mL of EDTA. 50 mL of a water sample consumed 25 mL of the same EDTA solution. Using Eriochrome Black T as indicator, calculate the total hardness of water sample in ppm. [4M]
   (c) What is boiler corrosion? [2M]
3. (a) State the differences between thermoplastics and thermosetting plastics. [4M]
   (b) What are conducting polymers? Differentiate between intrinsic and extrinsic conducting polymers. [4M]
   (c) Write a short note on the synthesis and applications of Bakelite. [4M]
4. (a) Describe the green synthesis of Ibuprofen and adipic acid. [6M]
   (b) Discuss the properties and applications of carbon nanotubes. [6M]
5. (a) Explain the working principle H_2-O_2 fuel cell with a neat diagram and chemical reactions involved in it. [6M]
   (b) Distinguish between galvanizing and tinning. [4M]
   (c) An electrochemical cell consists of Zn^{2+}/Zn and Cu^{2+}/Cu electrodes. Calculate the standard EMF of the cell if standard half-cell potential of Zn^{2+}/Zn and Cu^{2+}/Cu electrodes are -0.76V and +0.34 V, respectively. [2M]
6. (a) Explain the refining process of crude petroleum and mention boiling point ranges, and uses of three important fractions of petroleum. [5M]
   (b) When 0.935 g of a fuel underwent complete burning, the increase in temperature of water in a bomb calorimeter containing 1365 g of water was found to be 2.4 °C. The water equivalent of calorimeter is 135 g and latent heat of steam is 587 cal/g. If the fuel contains 8% hydrogen, calculate the gross and net calorific values of the fuel. [4M]
   (c) What is meant by cracking? Mention the advantages of catalytic cracking over thermal cracking. [3M]

7. (a) Explain fluorescence and phosphorescence with the help of a neat Jablonski diagram. [6M]

(b) State Lambert-Beer's Law. [2M]

(c) Calculate the molar extinction coefficient of a 0.6 X 10^{-3} M solution, which has an absorbance of 0.17, when the path length is 1.3 cm. [4M]

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1206

I B.Tech. II Semester Supple Examinations, March-2022

ENGINEERING MECHANICS

(Common to CE & ME)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) State the principle of transmissibility of a force
   (b) Define the terms i) Angle of friction ii) Angle of repose iii) Coefficient of friction.
   (c) Define the terms centroid and centre of Gravity.
   (d) State Parallel axis theorem.
   (e) How do you determine Mass moment of inertia for a rigid body?
   (f) State the factors that are related to work energy principle.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. A string ABCD is fixed at A & D as shown in Fig.1. Two weights 400 N & 'W' N are attached at B & C. The strings AB, BC & CD are making angles of 60°, 10° & 45° with horizontal respectively. Find the weight W & tensions in the strings. (12M)

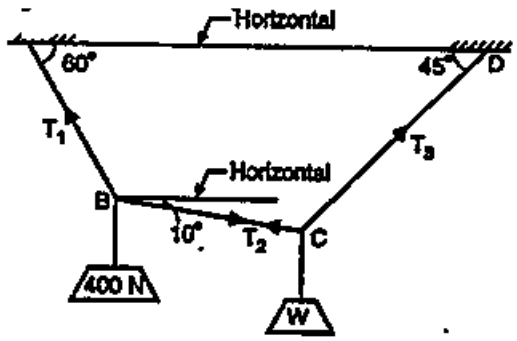

Fig.1

3. Find the least value of P required to cause the system of blocks shown in Fig.2 to have impending motion to the left. The coefficient of friction under each block is 0.20. (12M)

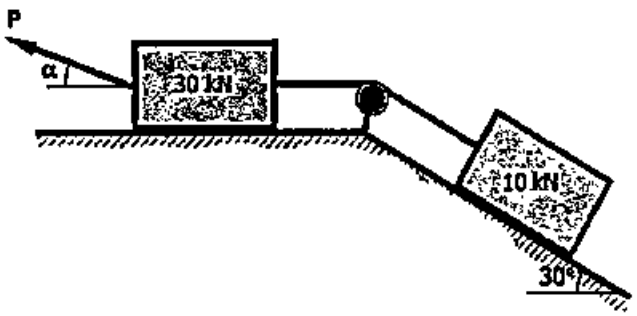

Fig.2

4. Locate the centroid of the composite shape as shown in Fig.3 (12M)

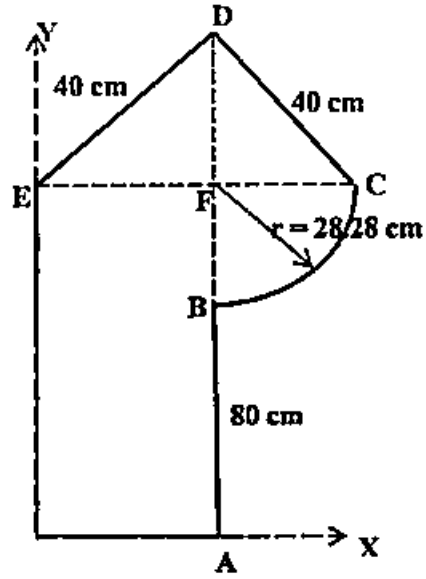

Fig.3

5. Find the moment of inertia of the lamina with a circular hole of 30 mm diameter about the axis AB as shown in Fig.4 (12M)

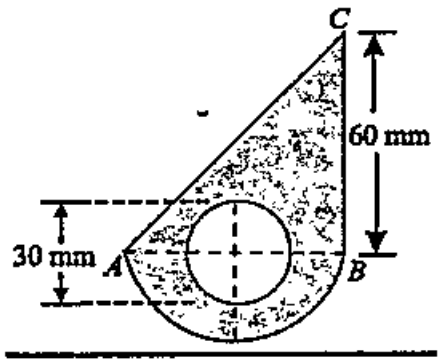

Fig.4

6. Derive an expression to determine Mass moment of Inertia of a sold sphere. (12M)

7. Two weights 80 N and 20 N are connected by a thread and move along a rough horizontal plane under the action of a force 40 N, applied to the first weight of 80 N as shown Fig.5. The coefficient of friction between the sliding surfaces of the wrights and the plane is 0.3. Determine the acceleration of the weights and the tension in the thread using work-energy equation. (12M)

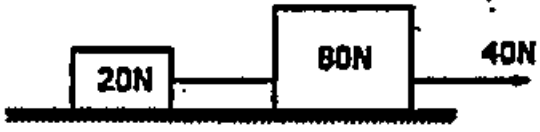

Fig.5

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CC1207

I B.Tech II Semester Supple Examinations, March-2022

ENGINEERING DRAWING

(Common to CE & ME)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of Part-A and Part-B.

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) A line 68 mm long, divide this line into 5 equal parts.

(b) Draw the projections of the following points on the same ground line keeping the projectors 25mm apart

i)Point 'A' is in the HP,20mm behind the VP

ii)Point 'B' is 40mm above HP and 25mm infront of VP

(c) Explain about traces of a line in engineering graphics.

(d) A regular pentagonal plane of 25mm side has one side on the ground and perpendicular to the VP draws its simple projections.

(e) Draw the projections of a cone base diameter 40 mm, axis 80 mm long, its base is resting on H.P.

(f) Draw isometric view of a cube of 50mm long edge.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) 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?

(b) On a map the distance between two points is 14 cm. The real distance between them is 20Km. Draw a diagonal scale for this map to read kilometres and hectometres and to measure up to 25km. shows a distance of 17.6km on this scale.

3. (a) A point A is 20mm above the HP and in the first quadrant. Its shortest distance from the reference line XY is 40 mm. draw the projections of the point and determine its distance from the VP

(b) A line RS 40 mm length is parallel to both the planes. It is 20 mm above the HP and 15 mm in front of VP. Draw its projections

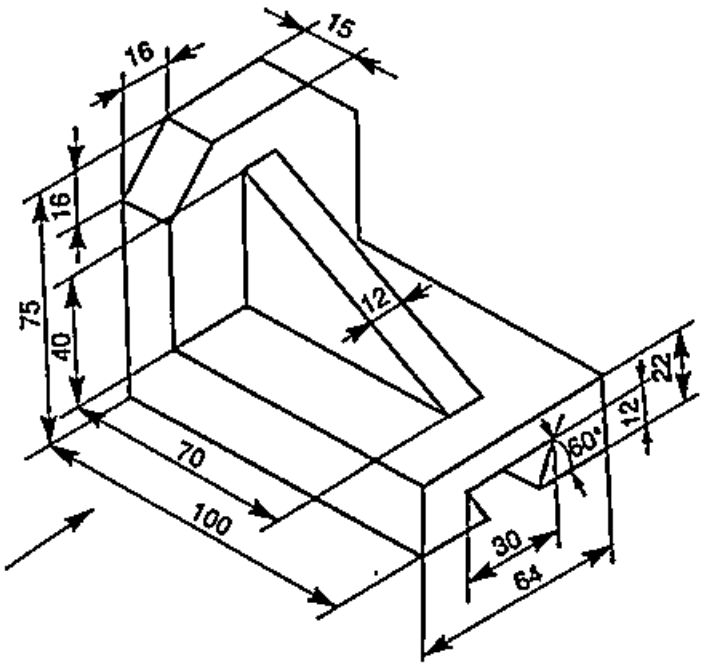
4. A straight line AB has its end A 20mm above HP and 30mm in front of VP. The end B is 80mm above HP and 70mm infront of VP. If the end projectors 60mm apart.Draw the projections of the line, determine its true length and inclinations with reference line

5. (a) A regular hexagon of 25mm side, on the V.P is plane inclined at 45°to V.P and perpendicular to H.P.draw its projections and show its traces.

(b) Draw the projections of a circle 50mm diameter resting in the H.P on a point 'A' on the circumference its plane inclined at 45° to the H.P,the top view of diameter AB making 30° angle with the V.P.

6. 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 ground and parallel to the VP. Draw its projections

7. Draw the top, front and right side views to the object shown in fig.



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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EE1208 1

3117

I B.Tech II Semester Supple Examinations, March-2022

ENGINEERING GRAPHICS

(EEE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1.(a) What do you Mean by R.F.? What is The Unit of R.F.?

(b) Give Two Practical Applications of Conic Curves Like Ellipse And Hyperbola

(c) What do you infer when the top view & front view of a point are 15mm below the xy line ?

(d) What is The Difference B/W True Inclination of a Line and Apparent Angles?

(e) What Is Difference between Prism and Pyramid.

(f) Differentiate between Isometric Projection And Isometric View?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. The distance between two stations by road is 200 km and it is represented on a certain map by a 5 cm long line. Find the R. F. and construct a diagonal scale showing a single kilometer and long enough to measure up to 600 km. Show a distance of 467 km on this scale.

3. (a) A line AB 50 mm long has its end A 30mm above HP and 25 mm in front of VP. The line is kept inclined at 40^0 to HP and parallel to VP. Draw its projections and make its traces.

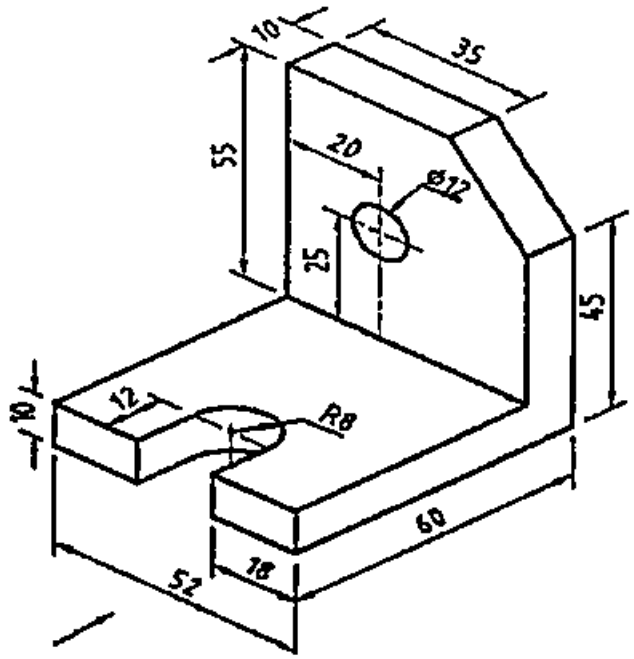
(b) A line AB 60 mm long has its end A 30 mm above HP and 15 mm in front of VP. Its front view has a length of 45 mm and parallels to HP. Draw its projections and find the inclination of the line with VP.

4. A line PQ has its end P, 10 mm above the HP and 20 mm in front of the VP, the end Q is 35 mm in front of the VP. The front view of the line measures 75 mm. The distance between the end projectors is 50 mm. Draw the projections of the line and find its true length and its true inclinations with the VP and HP.

5. A regular pentagon of 30 mm sides is resting on HP on one of it's sides with it's surface 45^0 inclined to HP. Draw it's projections when the side in HP makes 30^0 angle with VP

6. A regular hexagonal pyramid side of base 30 mm and height 60 mm is resting vertically on its base on H.P. such that two of its sides of the base are perpendicular to V.P. It is cut by a plane inclined at 40° to H.P. and perpendicular to V.P. The cutting plane bisects the axis of the pyramid. Obtain the development of the lateral surface of the truncated pyramid.

7. Draw the front, top and right side views of the object shown in Fig.



Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EE1209

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3117

I B.Tech II Semester Supple Examinations, March-2022

ELECTRIC CIRCUIT ANALYSIS - I

(EEE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

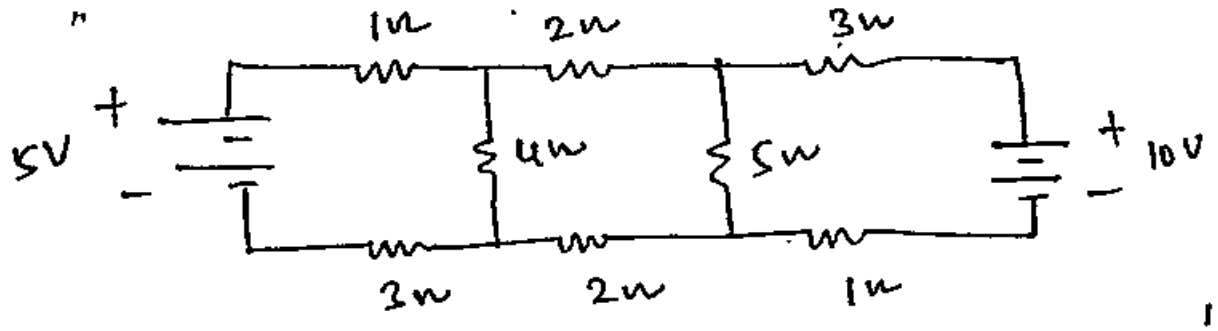
1. (a) State the Ohm's law?
(b) Define Phase and Phase difference?
(c) Write the expression for the resonant frequency of RLC circuit?
(d) What are the terms associated with network graphs?
(e) Write the statement of Maximum power transfer theorem?
(f) Define Self inductance?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) State and explain Kirchhoff's Laws? **[6M]**
(b) Find the currents in all branches of the network shown in Figure by mesh method? **[6M]**

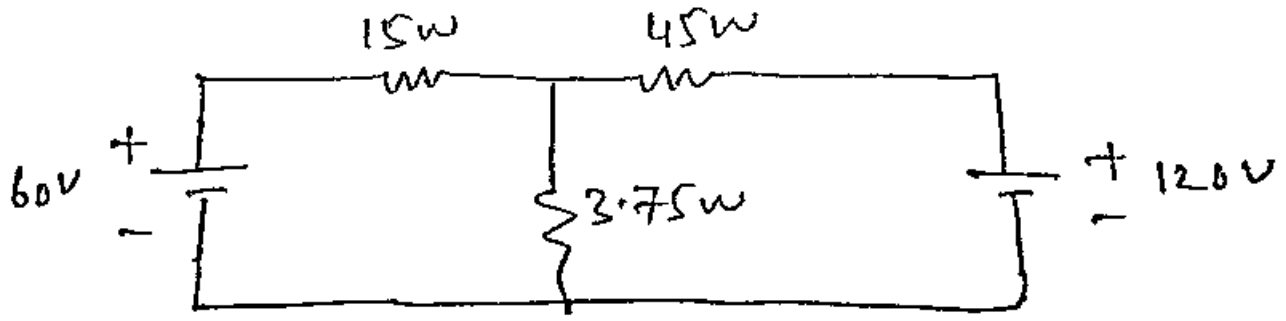


3. An RLC series circuit has R=10 Ohm, L=0.5H and C=10 micro Farads connected across a 200V, 50 HZ supply. Find i) Reactance ii) Impedance iii) Current iv) Phase angle v) Power factor vi) Voltage across R, L and C? **[12M]**

4. (a) Give the difference between series and parallel resonance circuit? **[6M]**
(b) A series RLC circuit has a bandwidth of 600 HZ. The quality factor is 10. If the value of L is 0.01H, Find the value of C? **[6M]**

5. (a) State the properties of tree of a Graph? **[6M]**
(b) Explain the principles of duality? Write a graphical procedure to draw a dual network? **[6M]**

6. (a) State and explain the Thevenin's theorem? **[6M]**
(b) Find the current through 3.75 Ohm Resistor in the circuit shown in figure by Super position theorem? **[6M]**



7. (a) State and explain the Faraday's laws of electro magnetic Induction? **[6M]**

(b) Two coup0led coils with self inductances L_1 and L_2 have 500 turns and 1000 turns respectively. The coefficient of coupling between them is 0.8. The position of flux that links both the coils when a current of 5A flows through coil is 0.9 wb. Find the values of L_1 and L_2? **[6M]**

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Narasaraopeta Engineering College (Autonomous)

NEC Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC1210

I B.Tech II Semester Supple Examinations, March-2022

PROGRAMMING WITH C

(ECE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) What is the difference between pre-increment and post-increment operation?
   (b) Give the differences between entry controlled and exit controlled loops.
   (c) What is a static variable? When should it be used?
   (d) What is dangling memory problem?
   (e) Write the differences between structures and unions?
   (f) What is the use of fseek() function?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain arithmetic, logical and bitwise operators with examples.
   (b) What is type casting? Explain the difference between type casting and type conversion with examples?

3.(a) Explain about switch statement. And write the importance of break and continue in switch statement with examples.
   (b) Write a C program to perform the operation of addition of two matrices

4. (a) Demonstrate passing an array argument to a function with example program.
   (b) Explain different storage classes with example.

5. (a) How to initialize and access pointer variable? Explain pointer to a function with example.
   (b) Write a C program to access the values of an array of elements using pointer.

6. (a) What is the need of nested structures? Explain with suitable example.
   (b) Define union? Explain the need of union with example program.

7. (a) Write a C program to add the contents of one text file at the end of another text file.
   (b) Write a C program to read and display the contents of a text file.

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16EC1211

I B.Tech II Semester Supple Examinations, March-2022

NETWORK ANALYSIS

(ECE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in **Part-A** is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

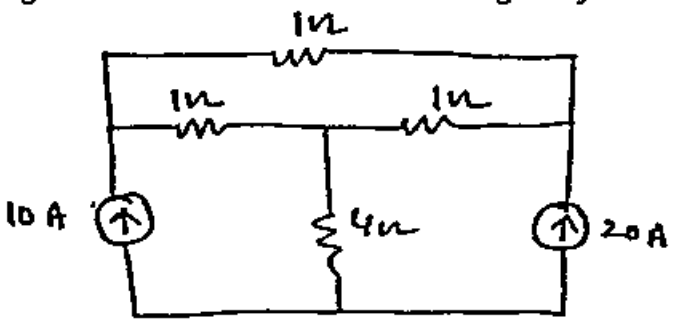
1. (a) State Whether an ideal voltage source may be Converted into an equivalent current source?
(b) Define average value?
(c) In a series Resonance circuit, what is the impedance at half power frequencies?
(d) State Reciprocity theorem?
(e) Define a two-port Network?
(f) Define the time constant of a RL circuit?

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) State and explain the Kirchhoff's Laws? **[6M]**
(b) Find the current through 4 Ohm Resistor in the circuit of figure by nodal method? **[6M]**



3. A Resistor of 6 Ohm and an inductor of 25.5 mH are connected in series across a 220V, 50 HZ supply. Find i) the inductive reactance ii) Impedance iii) Current iv) Phase angle v) Power factor vi) Active power vii) Reactive power **[12M]**

4. (a) In a series RL circuit, a voltage $E = 50\,e^{-20t}$ is applied. Find the resultant current R=4 Ohm, L=0.4 mH? **[6M]**
(b) A series RLC circuit with R=100 Ohm, L=10 mH and C=1 micro Farads is connected to a 20V AC supply. Find the resonant power frequencies, Bandwidth and current resonance? **[6M]**

5. State and explain the Thevenin's theorem and super position theorem with suitable example? **[6M]**

6. (a) For a two port network, find the ABCD and Z parameters. The parameters of the network are $Y_{11} = 1$ Mho, $Y_{22}=0.5$ mho, $Y_{12}=Y_{21}=-0.2$ mho? **[6M]**
(b) Two coupled coils of self inductance $L_1=1H$ and $L_2=2H$ are coupled in i) Series adding ii) Series opposition iii) parallel aiding iv) parallel operation. If the mutual inductance is 0.5H, find the equivalent inductance in each case? **[6M]**

7. In a series RLC circuit, R=6 Ohm, L=1H and C=1 Farad. A dc voltage of 40V is applied at t=0. Obtain the expression for i(t) using different equation approach? Explain the procedure to evaluate the conditions? **[12M]**

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CS1213

I B.Tech II Semester Supple Examinations, March-2022

MATHEMATICAL METHODS

(CSE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Find the value of x such that $\begin{bmatrix}1 & 1 & x\end{bmatrix}\begin{bmatrix}1 & 0 & 2\\ 0 & 2 & 1\\ 2 & 1 & 0\end{bmatrix}\begin{bmatrix}1\\1\\1\end{bmatrix}=O$

(b) Transform the integration $\int_0^{\infty}\int_0^{y} dx\,dy$ to polar coordinates.

(c) Write the quadratic form of the matrix $\begin{bmatrix}0 & 1 & 2 & 3\\ 1 & 2 & 3 & 4\\ 2 & 3 & 4 & 5\\ 3 & 4 & 5 & 6\end{bmatrix}$

(d) Briefly explain Bisection method

(e) Prove that $\Delta = E\nabla = \nabla E$.

(f) State Simpson's 1/3rd and Simpson's 3/8th rule.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Find LU decomposition of $\begin{bmatrix}-3 & 2 & -1\\ 6 & -6 & 7\\ 3 & -4 & 4\end{bmatrix}$.

(b) Solve the following system of equations by Gaussian elimination method $x + y + 2z = 9$; $2x + 4y - 3z = 1$; $3x + 6y - 5z = 0$.

3. (a) Change the order of integration and hence evaluate $\int_0^{1}\int_0^{\sqrt{1-x^2}} y^2\,dy\,dx$.

(b) Find the area of the region bounded by the curves $y^2 = 4x$, $y^2 = 16x$, $x = 1$, and $x = 16$ in the positive quadrant.

4. (a) Find the characteristic roots of the matrix $A=\begin{bmatrix}1 & 4\\ 2 & 3\end{bmatrix}$ and verify Cayley-Hamilton theorem for this matrix. Also, express $A^5-4A^4-7A^3+11A^2-A-10I$ as a linear polynomial in A.

(b) Find the eigenvalues, eigenvectors for the following matrix $\begin{bmatrix}1 & 0 & -1\\ 1 & 2 & 1\\ 2 & 2 & 3\end{bmatrix}$.

5. (a) Solve $\sin x = 1-x$, by Newton-Raphson method.

(b) By Regula Falsi method solve $3x^2+5x-40=0$.

6. (a) Find a cubic polynomial of x by using Newton's divided difference formula from the following data

x	0	1	2	5
$f(x)$	2	3	12	147

(b) Find the value of $f(x)$ at $x=9$, given that

X	2	5	8	11
$f(x)$	94.8	87.9	81.3	75.1

7. (a) Solve $\frac{dy}{dx}=y^2+x$ given $y(0)=1$ using Taylor series method for $y(0.1)$ and $y(0.2)$.

(b) Find $y(0.8)$ correct to four decimal places by using Runge-Kutta method of 4^{th} order if $\frac{dy}{dx}=y-x^2$, $y(0.6)=1.7379$.

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Narasaraopeta Engineering College (Autonomous)

Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CS1214

I B.Tech II Semester Supple Examinations, March-2022

C PROGRAMMING

(CSE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of Part-A and Part-B.

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Write the difference between type conversion and type casting.
   (b) Write the difference between break and continue statement.
   (c) Write the difference between function declaration and function definition.
   (d) What are the drawbacks of pointers?
   (e) Write the use of *typedef* keyword with simple example.
   (f) Differentiate between text file and binary file.

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) List different types of operators used in C. Explain any four operators with examples. [6+6]
   (b) Write a program to swap two numbers without using third variable.

3. (a) Explain the importance of switch case statement. In which situation is a switch case desirable? Also give its limitations. [6+6]
   (b) Write a C program to merge two unsorted arrays.

4. (a) What is the purpose of storage classes in C. Briefly describe different types of storage classes in C with simple examples. [6+6]
   (b) Differentiate between call by value and call by reference with suitable examples.

5. (a) Write a short notes on pointer to pointer and explain with simple example. [6+6]
   (b) How are pointers used on two dimensional arrays? Illustrate with simple example.

6. (a) Is it possible to create an array of structures? Explain with the help of an example. [6+6]
   (b) Illustrate the use of nested structures with simple example.

7. (a) "To work with files, we have to follow some steps". Justify this statement by illustrating with example. [6+6]
   (b) Write a C program two merge two files into a third file. The names of these files must be entered using command line arguments.

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Narasaraopeta Engineering College (Autonomous)
Kotappakonda Road, Yellamanda (P.O), Narasaraopet- 522601, Guntur District, AP.

Subject Code: R16CS1215

I B.Tech II Semester Supple Examinations, March-2022

ELECTRONIC DEVICES AND LOGIC DESIGN

(CSE)

Time: 3 hours **Max Marks: 60**

Question Paper Consists of **Part-A** and **Part-B.**

Answering the question in Part-A is Compulsory & Four Questions should be answered from Part-B

All questions carry equal marks of 12.

PART-A

1. (a) Explain the difference between transition and diffusion capacitances of P-N diode
   (b) Compare PNP and NPN transistors.
   (c) List the pros and cons of fixed bias method.
   (d) Convert $(437.25)_8$ to Hexadecimal.
   (e) Convert JK Flip Flop to T Flip Flop.
   (f) Differentiate synchronous and asynchronous sequential circuits

[2+2+2+2+2+2]

PART-B

4 X 12 = 48

2. (a) Explain the operation of Bridge Rectifier In a bridge rectifier? **[4M]**
   (b) The transformer is connected to 200 V, 60 Hz mains and the turn's ratio of the step down transformer is 11:1. Assuming the diode is ideal and load is 600Ω, find (i) I_{dc} (ii) voltage across the load (iii) PIV **[4M]**
   (c) Design a Zener diode regulator to meet following specifications. Unregulated DC input voltage V_i=15±10V regulated DC output V_o=8V. I_{Zmin}=6mA, I_{Zmax}=85mA, Load current I_c=20. **[4M]**

3. (a) Explain the construction and working of Enhancement MOSFET.
   (b) Compare BJT, FET and MOSFET.

4. (a) Consider the self-bias circuit where Vcc=22.5V, Rc=5.6 k, R2=10 k and R1= 90 k, hfe=55,VBE=0.6V. The transistor operates in active region. Determine
   (i) operating point (ii) stability factor.
   (b) State barkhausen's criteria to sustain oscillations and also enumerate Wien bridge oscillator.

5. (a) Implement the following function using only NOR gates F=a. (b+ c.d) + (b. c).
   (b) Simplify the Boolean function F using the don't care conditions d, in (i) sum of products and (ii) product of sums.

$F=\acute{A}\acute{B}\acute{D}+\acute{A}CD+\acute{A}BC$ $d=\acute{A}B\acute{C}D+ACD+A\acute{B}\acute{D}$

6. (a) Define multiplexer and explain the procedure to implement 32×1 MUX by using 4×1 multiplexers.
   (b) Draw the circuit diagram of J-K flip flop with NAND gates with positive edge triggering and explain its operation with the help of truth table. How race around condition is eliminated.

7. (a) Draw the circuit and explain the function of 4-bit bidirectional shift register with flip-flops.
   (b) Discuss in detail about MOD-10 Counter with the help of neat diagram.

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