

Code No: 152AC

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year II Semester Examinations, August - 2019

BASIC ELECTRICAL ENGINEERING

(Common to ECE, EIE)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

- 1.a) The voltage across 5Ω resistor is 10 volts, Find the current and power dissipated in that resistor? [2]
- b) Define RMS and Average value of an alternating quantity. [2]
- c) Write the relation among primary and secondary voltages, currents and winding turns. [2]
- d) What is rotating magnetic field? [2]
- e) What are the characteristics of batteries for longer life? [2]
- f) Explain Kirchhoff's laws. [3]
- g) What is the significance of form factor and peak factor? [3]
- h) Why rating of the transformer is given in KVA? Explain. [3]
- i) Draw the torque-speed characteristics of separately excited d.c. motors. [3]
- j) What is the significance of earthing? [3]

PART-B

(50 Marks)

- 2.a) For the circuit shown in figure 1 below, calculate the current I and voltage V_{ab} when
i) $R_x = 0\Omega$ ii) $R_x = 15\text{ K}\Omega$ iii) $R_x = \infty\Omega$.

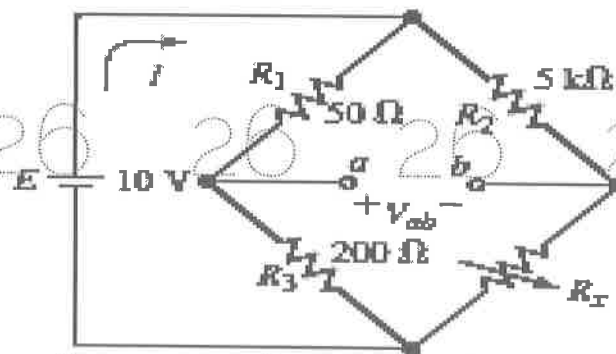


Figure: 1

- b) Calculate the current flowing through $R_L = 20\Omega$ of the network shown below in the figure 2 by using Thevenin's theorem. [5+5]

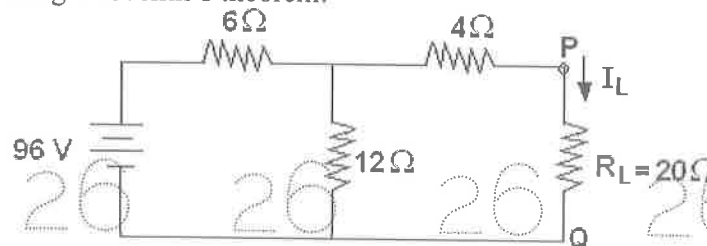


Figure: 2

OR

3.a) For the arrangement shown in figure 3 below find:

- The equivalent capacitance of the circuit and
- The voltage across a $4.5 \mu\text{F}$ capacitor.

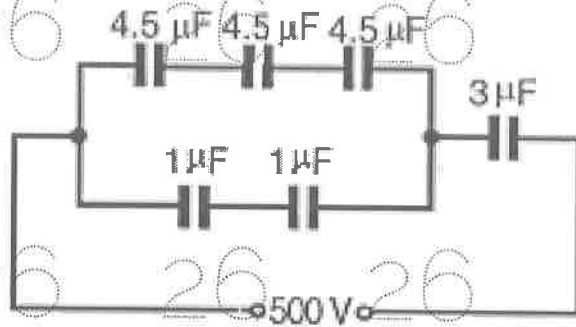


Figure: 3

b) Determine the current I in the network by using Thevenin's theorem in figure 4 shown below. [5+5]

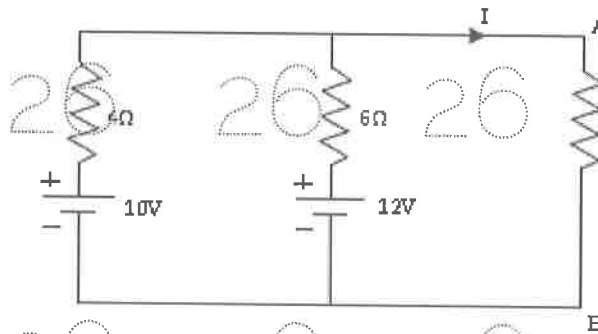


Figure: 4

4.a) Explain the following with an example:

- Addition and subtraction of phasors
- Multiplication and division of phasors.

b) In an a.c. circuit, $v = 200 \sin(\omega t + 300^\circ)$ V, $i = 15 \sin(\omega t - 300^\circ)$ A. Find the active and reactive power. [5+5]

OR

5.a) Find the impedance of series R-L-C circuit with $R=100\Omega$, $X_L=50\Omega$ and $X_C=20\Omega$.

b) Calculate:

- The admittance Y
- The conductance G and
- Susceptance B of a circuit consisting of a resistor of 10Ω in series with an inductor of 0.3 H , when the frequency is 50 Hz . [5+5]

6.a) Derive an expression for emf induced in a transformer.

b) What are the tests to be conducted on a single phase transformer to find efficiency and regulation of a transformer? [5+5]

OR

7.a) Determine the efficiency of a single phase 150 KVA transformer at 50% full load and 0.8 power factor lag if the copper loss at full load is 1600 watts and iron loss is 1400 watts.

b) With the help of diagram explain the principle of operation of transformer. [5+5]

- 8.a) Explain the working principle of single phase induction motor.
b) Explain the constructional details of synchronous generator. [5+5]

OR

- 9.a) A 3-phase, 60 Hz induction motor has 2 poles. If the slip is 2% at a certain load, determine:
i) The synchronous speed
ii) The speed of the rotor and
iii) The frequency of the induced e.m.f.'s in the rotor.
b) What are the merits and demerits of induction motor? [5+5]

- 10.a) What is the difference between MCB and MCCB, describe their schematic diagrams?
b) What are the different types of wires and cables? Explain. [5+5]

OR

- 11.a) Describe the operation of ELCB with its schematic diagram.
b) Give applications of the primary and secondary batteries. [5+5]

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year II Semester Examinations, August - 2019

PROGRAMMING FOR PROBLEM SOLVING

(Common to EEE, CSE, IT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART - A

(25 Marks)

- 1.a) Find and remove the error in the following C Statement. $a > b ? g = a : g = b;$ [2]
- b) How to declare string without specifying length? [2]
- c) Write about ftell function. [2]
- d) List the limitations of recursive functions. [2]
- e) How do you find the time complexity of a bubble sort? [2]
- f) Give a note on iteration statements in C language. [3]
- g) What is enumerated data type and write syntax and example. [3]
- h) How to handle errors with file functions? Explain [3]
- i) Discuss about allocating and freeing memory. [3]
- j) What is sorting and what is the importance of sorting? [3]

PART - B

(50 Marks)

- 2.a) Define variable. List the rules for declaring variable. Give valid and invalid examples.
- b) Write an algorithm to find HCF of two positive integer numbers. [5+5]
- OR
- 3.a) Explain the terms stdin, stdout and stderr.
- b) List and explain the different types of storage class. [5+5]
4. Discuss any five string handling functions in detail. [10]
- OR
- 5.a) Explain multidimensional arrays and give an example program to pass array as argument in functions.
- b) How to pass the structures to functions as an argument? Explain [5+5]
- 6.a) Write a program in C that copies the contents of one file to another file.
- b) How to use fseek() for randomly access the file content? Explain [5+5]
- OR
7. Briefly explain the pre-processor directives in detail. [10]
8. List and explain the some C standard functions and libraries. [10]
- OR
9. Explain with examples how arrays are passed as arguments in functions. [10]
- 10.a) Explain the algorithm for finding roots of a quadratic equation.
- b) Write a program to sort array of integers using selection sort. [5+5]
- OR
11. Define algorithm and write algorithm to generate prime number series between m and n, where m and n are integers. [10]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year II Semester Examinations, August - 2019

BASIC ELECTRICAL AND ELECTRONICS ENGINEERING

(Common to CE, ME, MCT, MMT, AE, MIE, PTM, CEE, MSNT)

Time: 3 hours

Max. Marks: 75

Note: This question paper contains two parts A and B

Part A is compulsory which carries 25 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART- A

(25 Marks)

- 1.a) State KVL. [2]
- b) Define power factor and what is its significance? [3]
- c) List the salient features of series resonant circuit. [2]
- d) State Tellegen's theorem. [3]
- e) Draw the characteristics of an Ideal diode. [2]
- f) Draw the full-wave rectifier circuit using centre-tapped transformer. [3]
- g) What is the necessity of biasing in BJT? [2]
- h) Draw the CB configuration of BJT. [3]
- i) Define pinch off voltage and what is its significance? [2]
- j) Draw the characteristics of tunnel diode and identify negative resistance region? [3]

PART-B

(50 Marks)

- 2.a) Obtain the equivalent resistance R_{ab} and use it to find current I for the circuit shown below figure 1.

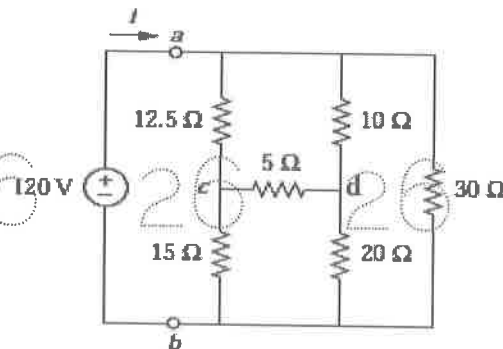


Figure: 1

- b) Find V_o and i_o in the circuit shown below figure 2.

[5+5]

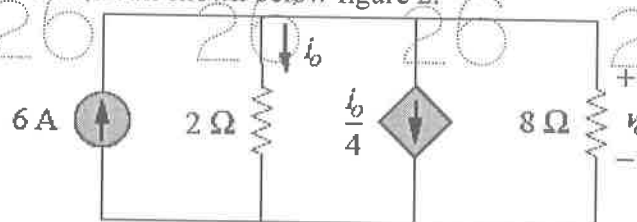


Figure: 2

OR

- 3.a) A resistance of 50Ω is connected in series with a capacitance of $20\mu\text{F}$. If a supply of 200V , 100 Hz is connected across the arrangement find: i) the circuit impedance, ii) the current flowing, and iii) the phase angle between voltage and current.
- b) Determine the RMS value of the current waveform shown below figure 3? If this current waveform is passed through 2Ω resistor find the average power absorbed by the resistor? [5+5]

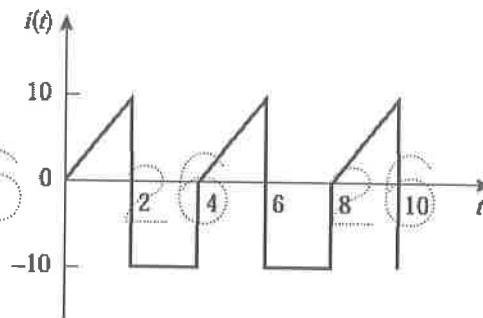


Figure: 3

- 4.a) State and explain compensation theorem with an example.
- b) Find the maximum power that can be delivered to the resistor R in the circuit shown below figure 4. [5+5]

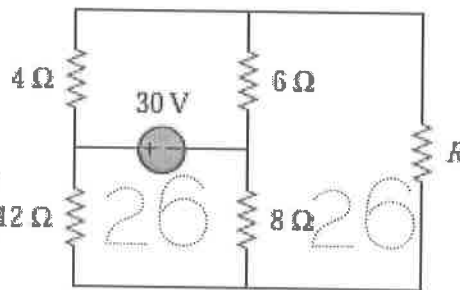


Figure: 4

OR

- 5.a) A coil of inductance 80mH and negligible resistance is connected in series with a capacitance of $0.25\mu\text{F}$ and a resistor of resistance 12.5Ω across a 100V , variable frequency supply. Determine: i) the resonant frequency, and ii) the current at resonance, iii) How many times greater than the supply voltage is the voltage across the reactance's at resonance?
- b) For an R.L series circuit, with R varied from 0 to ∞ , show that current locus is a semi circle. [5+5]
- 6 a) Draw and explain V-I characteristics of a PN junction diode.
- b) Derive the expression for Ripple factor of a half wave rectifier. [5+5]
- OR
- 7.a) Draw the energy band diagram of PN junction diode and explain.
- b) Explain about different types of filters used in rectifiers and explain their role. [5+5]
- 8.a) Explain the analysis of BJT in CE configuration using h-parameters.
- b) Explain the necessity of biasing in transistor? Also, explain the voltage divider bias? [5+5]

OR

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9.a) Draw and explain the hybrid model of BJT? Determine the h-parameters from the transistor characteristics.

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b) Briefly explain the comparison of CE, CC and CB configurations. [5+5]

10.a) Explain the small signal model of JFET.

b) Explain how zener diode is used as a regulator. [5+5]

OR

11.a) Explain the principle of operation of varactor diode and also draw its characteristics.

b) Explain the characteristics of Zener diode. [5+5]

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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B.Tech I Year II Semester Examinations, August - 2019

ENGINEERING GRAPHICS
(Common to EEE, ECE, EIE)

Time: 3 hours

Max Marks: 75

Answer all five questions
All questions carry equal marks

- 1.a) Construct a conic when the distance between its focus and directrix is equal to 50 mm and its eccentricity is one. Name the curve. Draw a tangent and normal at any point on the curve.
- b) Draw an involute around a hexagon of side 25 mm. [9+6]

OR

- 2.a) Draw epicycloid of a circle of 40 mm diameter, which rolls outside on another circle of 150 mm diameter for one revolution clockwise. Draw a tangent and normal to it at a point 95 mm from the center of the directing circle.
- b) A room of 1000 m³ volume is represented by a block of 125 cm³ volume. Find RF and construct a plain scale to measure up to 30 m. Measure a distance of 18 m on the scale. [10+5]

- 3.a) Draw the projections of the following points, keeping the distance between the projectors as 25 mm on the same reference line:
- i) Point 'A' on HP and 20 mm behind VP.
- ii) Point 'B' 20 mm below HP and 30 mm behind VP.
- b) A line PQ is parallel to the VP and inclined at 30° to the HP. End P is 20 mm from both the reference planes and the top view measure 70 mm. Draw the projections of the line and determine its true length. [3+12]

OR

4. Draw an equilateral triangle of 75 mm side and inscribe a circle in it. Draw the projections of the figure when the plane is vertical and inclined at 30° to the VP and one of the sides is inclined at 45° to the HP. [15]
5. A pentagonal prism of side of base 25 mm and axis 40 mm long is resting on HP on a corner of its base. Draw the projections of the prism, when the base is inclined at 60° to HP, and the axis appears to be inclined at 30° to VP. [15]

OR

6. A cone of base 80 mm diameter and height 100 mm lies with one of its generators on HP and the axis is inclined to VP at an angle of 40° in the top view. Draw its top and front views. [15]
7. A triangular prism, side of base 30 mm and axis 50 mm long is lying on the HP on one of its rectangular faces with its axis inclined at 30° to the VP. It is cut by a horizontal section plane at a distance of 12 mm above the ground. Draw its front view and sectional top view. [15]

OR

8. Draw the development of the lower portion of a cylinder, diameter of base 50 mm and axis 70 mm, when it is cut by a plane perpendicular to the VP, inclined at 40° to the HP and passing through the mid-point of the axis. [15]

9. The figure 1 shows the side view and front view of a machine Block. Draw the isometric view of the block. All the dimensions are in mm only. [15]

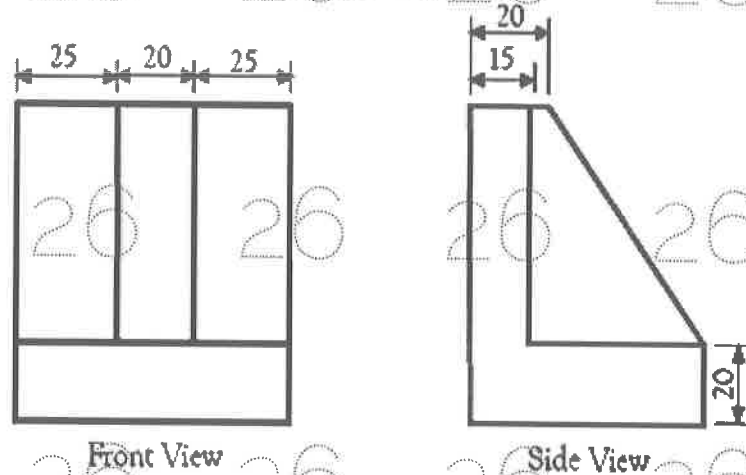


Figure: 1
OR

10. Draw the front view, top view and both side views of Tool Post slide shown in figure 2. All dimensions are in mm. [15]

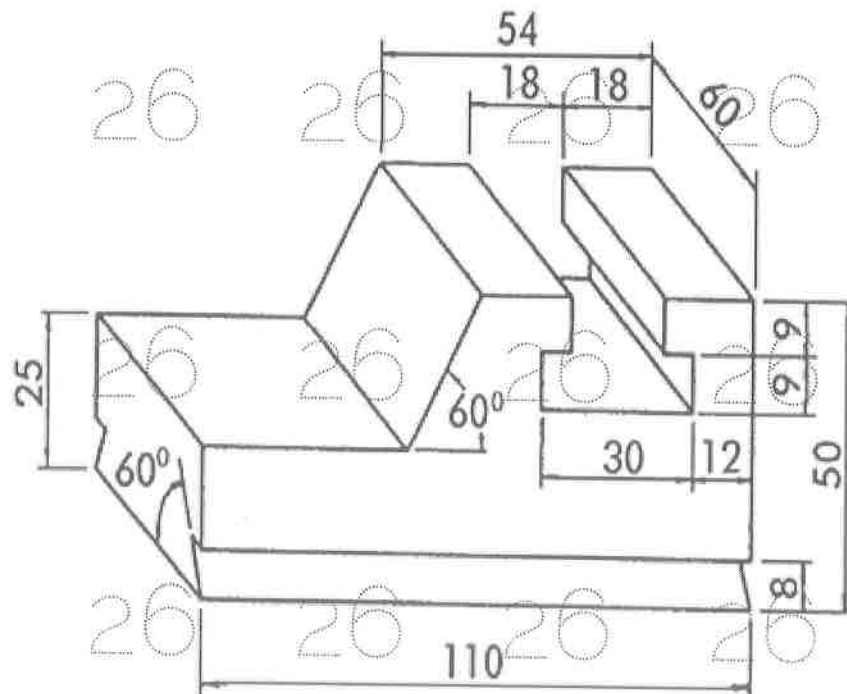


Figure: 2