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Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

11/4/22

End Semester – April 2022 Examinations

F.Y. M.Tech (Power Electronics & Power Systems) Sem I

Program: M. Tech PEPS | **Duration: 3hr** (Theory)

Course Code: PC MTPX 101 | **Maximum Points: 100**

Course Name: Advanced Power Electronics | **Semester: I**

Notes:

- Attempt **any five** questions.
- Assume suitable data **if** required and justify.
- Refrain from using any unfair means during this exam.

Q.No.	Questions	Points	CO	BL	PI
Q1	Attempt any **two** i) Multilevel inverters. ii) Zero Voltage Switching or Zero Current Switching resonant converter iii) Sine PWM method of modulation	20	CO1	L2	1.6.1
Q2a)	A MOSFET manufacturer's datasheet lists the junction-to-ambient thermal resistance RΘ ,JA as 62° C/W. The maximum junction temperature is listed at 175° C, but the designer wishes for it not to exceed 150° C for increased reliability. If the ambient temperature is 40° C, determine the maximum power that the MOSFET can absorb. The datasheet for the MOSFET above lists the thermal resistance from the junction to case as 1.87° C/W and the thermal resistance from the case to the heat sink as 0.50° C/W. (a) If the device is mounted on a heat sink that has a thermal resistance of 7.2° C/W, determine the maximum power that can be absorbed without exceeding a junction temperature of 150°C when the ambient temperature is 40°C. (b) Determine the junction temperature when the absorbed power is 15 W. (c) Determine RΘ,SA of a heat sink that would limit the junction temperature to 150° C for 15 W absorbed.	10	CO	L3	2.4.1
b)	Explain Flyback or push pull converter topology.	10	CO1	L2	1.6.1

Q3	Explain in detail the modification of power circuit for four quadrant operation of single phase H- bridge or full inverter (forward and reverse motoring, and regeneration).	20	CO1	L2	1.6.1
Q4a)	Elaborate in detail the reason for current control in converters and how can the compensation be achieved.	10	CO1	L2	1.6.1
b)	Design a Cuk converter that has a in input of 25 V and an output of - 30 V. The load is 60 W. Specify the duty ratio, switching frequency, inductor values, and capacitor values. The maximum change in inductor currents must be 20 percent of the average currents. The ripple voltage across C1 must be less than 5 percent, and the output ripple voltage must be less than 1 percent	10	CO2	L3	2.4.1
Q5	Write short notes on any **two** i) Industrial applications of power electronic converters ii) Residential application of power electronic converter iii) Protection and gate drive circuit for MOSFET or IGBT	20	CO1	L2	1.6.1
Q6	Obtain State space model of buck converter, small signal model, and the transfer function. **OR** The three-phase inverter has a Y-connected load of R = 5 Ω and L = 23mH.The inverter frequency is f0 = 60Hz and the dc input voltage is Vs = 220V.(a) Express the instantaneous line-to-line voltage vab (t) and line current ia (t) in a Fourier series. Determine (b) the rms line voltage VL, (c) the rms phase voltage Vp, (d) the rms line voltage VL1 at the fundamental frequency, (e) the rms phase voltage at the fundamental frequency Vp1, (f) the THD, (g) the DF, (h) the HF and DF of the LOH, (i) the load power Po, (j) the average transistor current IQ1av2, and (k) the rms transistor current IQ1rms2.	20	CO1 CO2	L2 L3	1.6.1 2.4.1
Q7	Elaborate any Multi pulse ac-dc converters using Diode and thyristor based converters topology. (6 or 12 pulse)	20	CO1	L2	1.6.1

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Munshi Nagar, Andheri (W) Mumbai – 400058

Re-Exam – July 2022 Examinations

F.Y. M.Tech (Elect) PEPS Sem I

Program: M. Tech PEPS **Duration: 3hr**

Course Code: PC MTPX 101 **Maximum Points: 100**

Course Name: Advanced Power Electronics **Semester: I**

15/7/22

Notes:

- Attempt **any five** questions.
- Assume suitable data **if** required and justify.
- Refrain from using any unfair means during this exam.

Q.No.	Questions	Points	CO	BL	PI
Q1	Attempt any **two** i) Multilevel inverters. ii) Zero Voltage Switching or Zero Current Switching resonant converter iii) Sine PWM method of modulation	20	CO2	L2	1.6.1
Q2a)	The three-phase inverter has a Y-connected load of $R = 5\ \Omega$ and $L = 23$mH.The inverter frequency is $f_0 = 60$Hz and the dc input voltage is Vs = 220V.(a) Express the instantaneous line-to-line voltage v_{ab} (t) and line current ia (t) in a Fourier series. Determine (b) the rms line voltage V_L, (c) the rms phase voltage V_p, (d) the rms line voltage V_{L1} at the fundamental frequency, (e) the rms phase voltage at the fundamental frequency Vp1, (f) the THD, (g) the DF, (h) the HF and DF of the LOH, (i) the load power Po, (j) the average transistor current I_{Q1av2}, and (k) the rms transistor current I_{Q1}rms2.	10	CO2	L3	2.4.1
b)	Explain Flyback or push pull converter topology.	10	CO1	L2	1.6.1
Q3	Explain in detail the modification of power circuit for four	20	CO1	L2	1.6.

	quadrant operation of single phase H- bridge or full inverter (forward and reverse motoring, and regeneration).				1
Q4a)	Elaborate in detail the reason for current control in converters and how can the compensation be achieved.	10	CO1	L2	1.6.1
b)	Design a Cuk converter that has a in input of 20 V and an output of - 30 V. The load is 80 W. Specify the duty ratio, switching frequency, inductor values, and capacitor values. The maximum change in inductor currents must be 20 percent of the average currents. The ripple voltage across C1 must be less than 5 percent, and the output ripple voltage must be less than 1 percent.	10	CO2	L3	2.4.1
Q5	Write short notes on any **two** i) Industrial applications of power electronic converters ii) Residential application of power electronic converter iii) Protection and gate drive circuit for MOSFET or IGBT	20	CO1	L2	1.6.1
Q6	Obtain State space model of buck converter, small signal model, and the transfer function.	20	CO1	L2	1.6.1
Q7	Elaborate any Multi pulse ac-dc converters using Diode and thyristor based converters topology. (6 or 12 pulse)	20	CO1	L2	1.6.1

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Munshi Nagar, Andheri (W) Mumbai – 400058

13/4/22

End Semester April 2022 Examinations

F.Y. M.Tech (COREP) PEPS Sem I

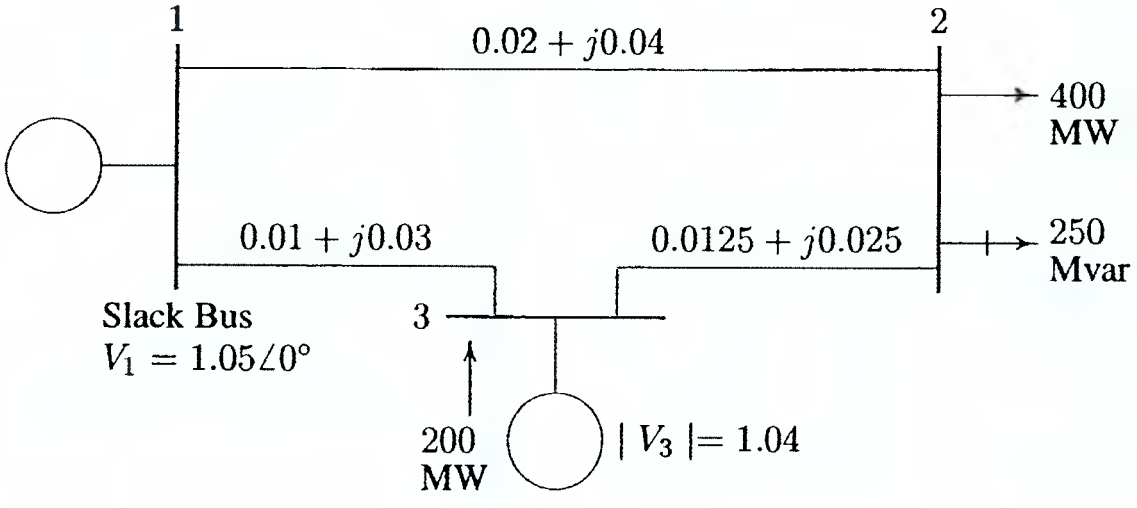
Program: M. Tech. Electrical (PEPS) **Duration: 3 hour**

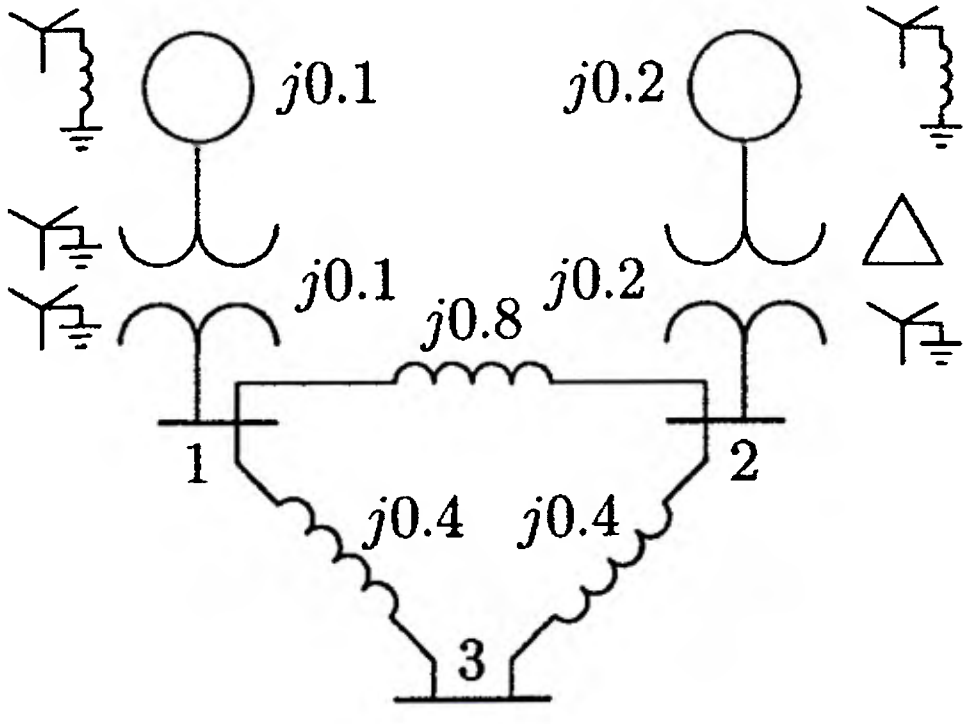
Course Code: PC-MTPX102 **Maximum Points: 100**

Course Name: CAPSA **Semester: I**

Note: Attempt any 5 questions

Computer Aided Power Systems Analysis

Q. No.	Question	Points
1a	Starting from Jacobain matrix, explain neatly the Newton Raphson method to solve the load flow equations of a power system	10
1b	Draw the flow chart to use Gauss Seidel method to solve the load flow equation of a power system	10
2	Figure shows a 3 bus system with power and voltages as marked on it. Line impedances are marked in per unit on 100 MVA base. Magnitude of generator bus voltage V3 is fixed to 1.04 and slack bus V1 is fixed to 1.05 Assume initial value of V2 =1+j0 and using Newton Raphson Method find magnitude of V2 and angle of V2,V3 after 1 iteration.  $$Y_{bus} = \begin{bmatrix} 20 - j50 & -10 + j20 & -10 + j30 \\ -10 + j20 & 26 - j52 & -16 + j32 \\ -10 + j30 & -16 + j32 & 26 - j62 \end{bmatrix}$$	20

3	The single line diagram of a three phase system is as shown below. Assume pre-fault bus voltages to be 1 pu at each bus. The Ybus is given as $$\mathbf{Y}_{bus} = \begin{bmatrix} -j8.75 & j1.25 & j2.5 \\ j1.25 & -j6.25 & j2.5 \\ j2.5 & j2.5 & -j5.0 \end{bmatrix}$$ a) Find Zbus from Ybus by matrix inversion. b) A three phase fault with fault impedance Zf = j0.16 p.u. occurs at bus 3. Using Zbus method, find fault current, bus voltages and line currents i.e., I_{12} I_{13}, I_{23} during the fault. 	20
4a	Write down the properties of a vector norm. Calculate 2-norm, 1-norm, and infinity norm for the vector X = [1, -3, 2, 1, 5, -4].	10
4b	Write down the properties of a matrix norm. Calculate Frobenius norm, 1-norm, and infinity norm for the matrix $A = \begin{matrix} 1 & 2 & 3 \\ 2 & 1 & 5 \\ 3 & 4 & 2 \end{matrix}$	10

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End Semester April 2022 Examinations

5	Consider a 2 by 2 matrix , $A = \begin{matrix} 1000 & 999 \\ 999 & 998 \end{matrix}$ a) Find condition number of matrix A. What can you conclude from this condition number about condition of the matrix? Use any norm to find condition number. b) Now if AX = b, where b is given as, $b = \begin{matrix} 1999 \\ 1997 \end{matrix}$ Then find X. c) Now, again if AX = b, but b is given as, $b = \begin{matrix} 1998.99 \\ 1997.01 \end{matrix}$ Then find X. d) Compare and Comment on the values of X in both above cases. How is it related to the condition number of matrix A?	20
6a	Use Lagrange multiplier method for solving constrained parameter optimization to determine the minimum distance from origin of X-Y plane to a circle described by $(x-8)^2-(y-6)^2=25$ The minimum distance is obtained by minimization of the distance square, given by $f(x,y)=x^2+y^2$	10
6b	Find the minimum of $f(x1,x2,x3)=x_1^2+2x_2^2+3x_3^2+x_1x_2+x_2x_3-8x_1-16x_2-32x_3+110$	10
7a	Solve for x1 and x2 using least square method for following set of equations $3x_1+2x_2=1$ $2x_1+3x_2=3$ $5x_1+5x_2=5$	10
7b	Given are the data points which fits to a straight line equation given as $Y=mX+c$ Now these data points contain some noise, so estimate the slope m and constant c such that it best fits the data. Hint : use least square method.	10

X	0.8	1.4	2.7	3.8	4.8	4.9
Y	0.69	1.00	2.02	2.39	2.34	2.83

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

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Munshi Nagar, Andheri (W) Mumbai – 400058

End Semester Re-Exam July 2022 Examinations

F. Y. (M. Tech) Electrical (PEPS) 19/7/22

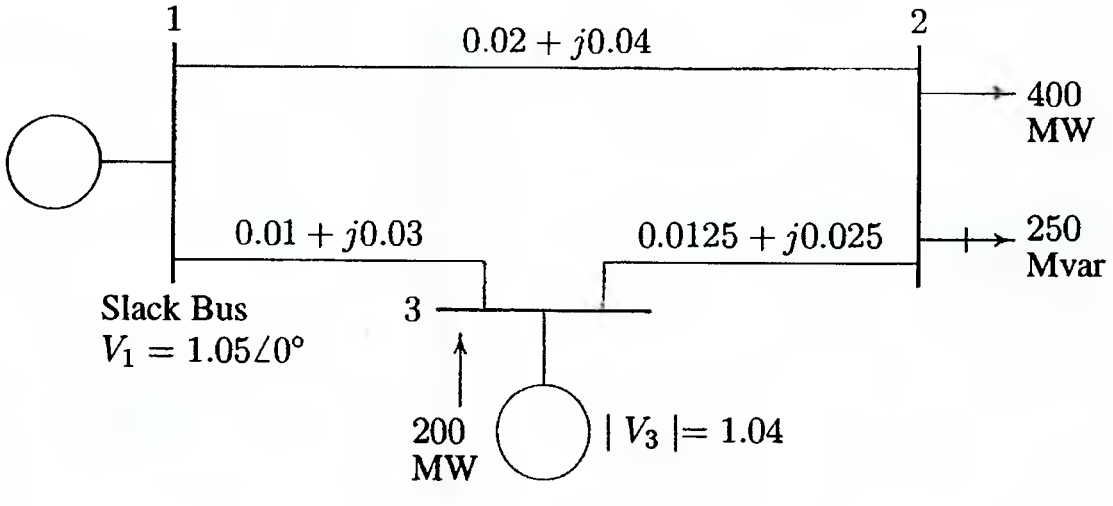
Program: M. Tech. Electrical (PEPS) **Duration: 3 hour**

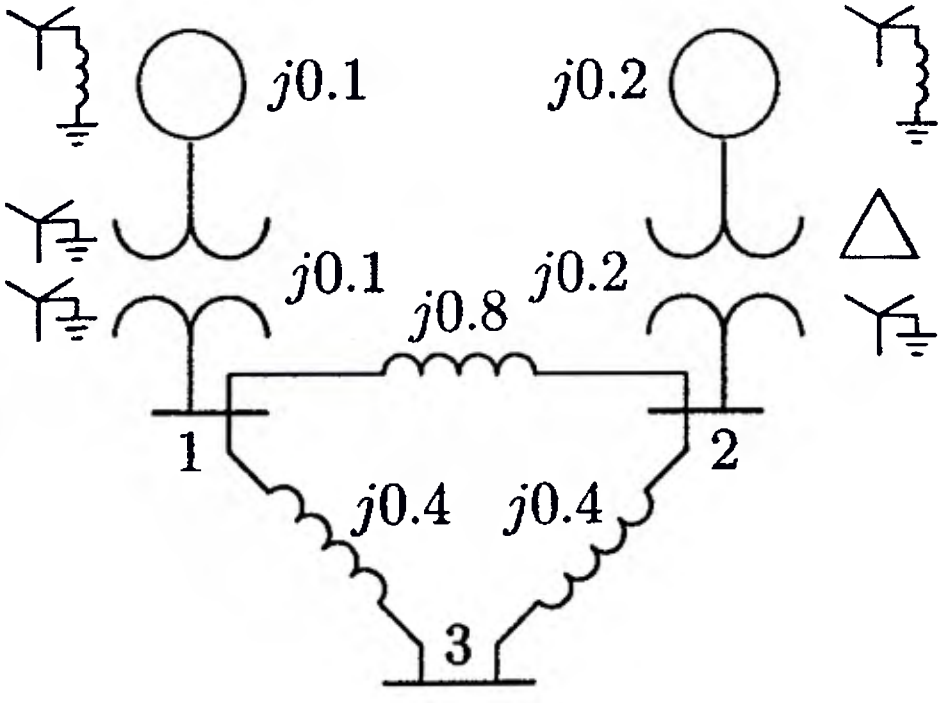
Course Code: PC-MTPX102 **Maximum Points: 100**

Course Name: CAPSA **Semester: I**

Note: Attempt any 5 questions

Computer Aided Power system Analysis

Q. No.	Question	Points
1a	Write down the properties of a matrix norm. Calculate Frobenius norm, 1-norm, and infinity norm for the matrix $A = \begin{matrix} 1 & 2 & 3 \\ 2 & 1 & 5 \\ 3 & 4 & 6 \end{matrix}$	10
1b	Write down the properties of a vector norm. Calculate 2-norm, 1-norm, and infinity norm for the vector X = [6, -3, 8, 1, 5, -4].	10
2	Figure shows a 3 bus system with power and voltages as marked on it. Line impedances are marked in per unit on 100 MVA base. Magnitude of generator bus voltage V3 is fixed to 1.04 and slack bus V1 is fixed to 1.05 Assume initial value of V2 =1+j0 and using Gauss Siedel method find magnitude of V2 and angle of V2,V3 after two iterations.  $$Y_{bus} = \begin{bmatrix} 20 - j50 & -10 + j20 & -10 + j30 \\ -10 + j20 & 26 - j52 & -16 + j32 \\ -10 + j30 & -16 + j32 & 26 - j62 \end{bmatrix}$$	20

3	The single line diagram of a three phase system is as shown below. Assume pre-fault bus voltages to be 1 pu at each bus. The Ybus is given as $$\mathbf{Y}_{bus} = \begin{bmatrix} -j8.75 & j1.25 & j2.5 \\ j1.25 & -j6.25 & j2.5 \\ j2.5 & j2.5 & -j5.0 \end{bmatrix}$$ a) Find Zbus from Ybus by matrix inversion. b) A three phase fault with fault impedance Zf = j0.16 p.u. occurs at bus 3. Using Zbus method, find fault current, bus voltages and line currents i.e., I_{12} I_{13}, I_{23} during the fault. 	20
4a	Starting from Jacobain matrix, explain neatly the Newton Raphson method to solve the load flow equations of a power system.	10
4b	Explain Gauss Seidel method to solve the load flow equation of a power system.	10

5	Consider a 2 by 2 matrix , $A = \begin{matrix} 1000 & 999 \\ 999 & 998 \end{matrix}$ a) Find condition number of matrix A. What can you conclude from this condition number about condition of the matrix? Use any norm to find condition number. b) Now if AX = b, where b is given as, $b = \begin{matrix} 1999 \\ 1997 \end{matrix}$ Then find X. c) Now, again if AX = b, but b is given as, $b = \begin{matrix} 1998.99 \\ 1997.01 \end{matrix}$ Then find X. d) Compare and Comment on the values of X in both above cases. How is it related to the condition number of matrix A?	20
6a	Use Lagrange multiplier method for solving constrained parameter optimization to determine the minimum distance from origin of X-Y plane to a circle described by $(x-8)^2-(y-6)^2=25$ The minimum distance is obtained by minimization of the distance square, given by $f(x,y)=x^2+y^2$	10
6b	Find the minimum of $f(x1,x2,x3)=x_1^2+2x_2^2+3x_3^2+x_1x_2+x_2x_3-8x_1-16x_2-32x_3+110$	10
7a	Solve for x1 and x2 using least square method for following set of equations $3x_1+2x_2=1$ $2x_1+3x_2=3$ $5x_1+5x_2=5$	10
7b	Given are the data points which fits to a straight line equation given as $Y=mX+c$ Now these data points contain some noise, so estimate the slope m and constant c such that it best fits the data. Hint : use least square method.	10

X	0.8	1.4	2.7	3.8	4.8	4.9
Y	0.69	1.00	2.02	2.39	2.34	2.83

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F.Y. M. Tech (ETRX) PEPS Sem I 22/4/2022

END SEMESTER EXAMINATION April 2022

Program: M. Tech PEPS | **Duration: 3hrs.**

Course Code: PE-MTPX 108 | **Maximum Points: 100**

Course Name: Electric Vehicle Technology | **Semester: I**

Notes:

- Attempt any **five** questions.
- Assume suitable data **if** required and justify.
- Refrain from using any unfair means during this exam.

Q. No.	Questions	Points	CO	BL	PI
Q1a)	Discuss in brief the design parameters of EV/EHV? How will u size the motor, and traction power electronics system?	10	CO1	L2	1.3.1
b)	A 400-tonne electric train has its speed reduced by regenerative braking from 100 to 40 km/h over a distance of 2 km along down gradient of 2 %. Assuming specific train resistance as 50 N/t, rotational inertia effect 10 % and conversion efficiency of the system 75%. Calculate: a) Electrical energy returned to line. b) Average power returned to line.	10	CO2	L4	1.4.1
Q2a)	Derive with neat diagrams the dynamic equation of the tractive effort required to propel the electric vehicle on road.	14	CO2	L2	1.3.1
b)	Assume a vehicle has r_{wheel} of 0.25 m. Convert speeds of a) 1200 rpm into kmph and m/sec b) 2.5 m/sec into kmph and rpm c) 60 kmph into m/sec and rpm	06	CO2	L4	1.4.1
Q3	Write short notes on any **two**: i) Ultra-capacitors as energy sources for EV/HEV. ii) Electric Vehicle drive-train topologies. iii) Reluctance motors in EV.	20	CO4 CO2 CO3	L2	1.3.1

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Q.No.	Questions	Points	CO	BL	PI
Q4a)	Explain with neat diagrams and equations related to torque , power, and speed with their characteristics the Advanced Permanent magnet motors used in EV/HEV	15	CO3	L2	1.3.1
b)	A 3.5V battery is at 2.7V at SoC of 0% and 4.3V at SoC of 100%. This implies the voltage of the battery lies in between 3.5 ± Δ% volts. What is Δ?	05	CO4	L4	2.4.1
Q5a)	Explain how will you size the electric motor for EV application.	10	CO2	L2	1.3.1
b)	A train weighing 450 ton is going down a gradient of 20 in 1,000, it is desired to maintain train speed at 50 kmph by regenerative braking. Calculate the power fed into the line and allow rotational inertia of 12% and the efficiency of conversion is 80%. Traction resistance is 50 N/ton.	10	CO2	L4	2.4.1
Q6	Based on India perspective comment on the future scope of EV vehicles and also explain what are the limitations of EV vehicles on road and how can it be accomplished. You can take an example of any manufacturing company in India .	20	CO4	L4	1.4.1
Q7a)	Explain what is the Energy Management Strategies in EV/HEV.	15	CO5	L2	1.3.1
b)	A 34 kWh battery is charged at SoC of 64%. What is energy it contains. A 34 kWh capacity battery is voltage 350V. What is its capacity in Ah.	05	CO4	L4	1.4.1

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F.Y. M.Tech (ETAS) PEPS Sem I

RE EXAMINATION JULY 2022

Program: M. Tech PEPS

Duration: 3hrs.

Course Code: PE-MTPX 108

Maximum Points: 100

Course Name: Electric Vehicle Technology

Semester: I

20/7/22

Notes:

- Attempt any **five** questions.
- Assume suitable data **if** required and justify.
- Refrain from using any unfair means during this exam.

Q. No.	Questions	Points	CO	BL	PI
Q1a)	Discuss in brief the design parameters of EV/EHV? How will u size the motor, and traction power electronics system?	10	CO1	L2	1.3.1
b)	A 500-tonne electric train has its speed reduced by regenerative braking from 110 to 50 km/h over a distance of 2 km along down gradient of 2 %. Assuming specific train resistance as 50 N/t, rotational inertia effect 10 % and conversion efficiency of the system 75%. Calculate: a) Electrical energy returned to line. b) Average power returned to line.	10	CO2	L4	1.4.1
Q2a)	Derive with neat diagrams the dynamic equation of the tractive effort required to propel the electric vehicle on road.	14	CO2	L2	1.3.1
b)	Assume a vehicle has r_{wheel} of 0.25 m. Convert speeds of a) 1200 rpm into kmph and m/sec b) 2.5 m/sec into kmph and rpm c) 60 kmph into m/sec and rpm	06	CO2	L4	1.4.1
Q3	Write short notes on any **two**: i) Ultra-capacitors as energy sources for EV/HEV. ii) Electric Vehicle drive-train topologies. iii) Reluctance motors in EV.	20	CO2 CO2 CO2	L2	1.3.1

Q.No.	Questions	Points	CO	BL	PI
Q4a)	Explain with neat diagrams and equations related to torque , power, and speed with their characteristics the Advanced Permanent magnet motors used in EV/HEV	20	CO3	L2	1.3.1
Q5a)	Explain how will you size the electric motor for EV application.	10	CO2	L2	1.3.1
b)	A train weighing 400 ton is going down a gradient of 10 in 1,000, it is desired to maintain train speed at 40 kmph by regenerative braking. Calculate the power fed into the line and allow rotational inertia of 10% and the efficiency of conversion is 80%. Traction resistance is 40 N/ton.	10	CO2	L4	2.4.1
Q6	Based on India perspective comment on the future scope of EV vehicles and also explain what are the limitations of EV vehicles on road and how can it be accomplished. You can take an example of any manufacturing company in India .	20	CO4	L4	1.4.1
Q7a)	Explain what is the Energy Management Strategies in EV/HEV.	20	CO5	L2	1.3.1

27/4/22

Bharatiya Vidya Bhavan's

Sardar Patel College of Engineering

(A Government Aided Autonomous Institute)

Munshi Nagar, Andheri (West), Mumbai – 400058.

End Semester Exam

April 2022

Max. Marks: 100

Duration: 3 Hours

Class: Electrical

Semester: I

Program: M.Tech Electrical

Name of the Course: English for research Paper Writing

Course Code: AU-MTPX-101

- ***Each question is of 20 marks***
- ***Question 01 is compulsory***
- ***Out of remaining 06 questions attempt any four.***

		Marks	Co
Q.1.	The Government of Maharashtra has appealed the Directorate Technical education to start offline Lectures and practical for Engineering students of Mumbai. As Sardar Patel College of Engineering being an aided institute is requested to submit a feasibility report on starting the offline lectures and practical for the month of January for all branches and all semesters. Your Principal In-charge Dr Mohan Murudi has requested you to submit a feasibility report in the capacity of Electrical Engineering Head. Keeping the academics, Infrastructure, hostel facility, Mess facility, PG facility, and the looming pandemic situation submit a letter report to Directorate Technical Education along with your recommendations. (Apply minimum four procedures to collect the required data).	20	03
Q.2	[illegible]. A student complained that she was having trouble with the following Foreword, that it was more like an Introduction to the Discussion than a Foreword (and she was right). Turn it into a Foreword by eliminating details unnecessary for a managerial reader. Feel free to rewrite sentences or to move information around. -04- Foreword Flutter is a phenomenon in which structural instabilities arise from aerodynamic loads. In aircraft, these instabilities are often characterized by divergent oscillations of the wings, resulting in structural failure and possible loss of the aircraft. Flight flutter testing involves the tracking of damping estimates of the excited vibration modes at different flight conditions. The violent nature of flutter makes safety an important concern during flight flutter testing. As with any flight test program, cost is also a major concern. Our objective at Smith is to provide safe testing at the	(20)	02

	lowest cost. Costs can be lowered by decreasing flight time. This requires utilizing the fastest analysis techniques that will meet the accuracy requirements that safety demands. Presently, we have available two software package for data analysis during flight flutter testing. They are 1. The Power Spectral Density (PSD) Package 2. The Random Decrement (Random Dec) Package The main objective of each package is to determine damping estimates of the structural modes. I was assigned to do a comparison study of the two packages looking at two questions: 1. How accurate are the damping estimates? 2. How much time is required for the analysis? These questions are concerned with safety and cost, respectively. The purpose of this report is to present the findings of my study and to make some recommendations concerning future testing.		
Q.3.	. Case Study: Megha was amongst the brilliant students in her MBA class. She was liked by all for her behavior and Merit. With a smiling face she would accept any responsibility entrusted to her by her teachers. However, there was one task; she would always run away from: giving a presentation. Whenever the teachers assigned a group task that she, she would do all the analysis, but would never give a presentation for fear of speaking in front of an audience. She somehow managed to avoid having to give a presentation during her two years as an MBA student. When she started working, things remained the same. She used to do all the behind- the –scenes work and hand over the responsibility of giving a presentation to someone else. Megha later realized that because of fear of addressing an audience she was not able to come to the limelight. The hard work was done by her, but some other person who presented took away the credit that was due to her. The situation continued for quite a few years. All her plans to improve failed, and she started out on losing out on promotions. The bosses never came to know that she was extremely hard in the background to get things done. Megha was frustrated and decided to leave the company. She started sending applications to companies. Finally, a company based in Noida wanted to interview her. Megha flew to Delhi and attended the interview. The chief executive officer (CEO) was extremely happy with what she had been doing and was looking for a person with a similar profile to fill a vacancy. The interview was almost over, but the CEO wanted to test her for last time. Megha was asked to give a presentation on a topic of her choice to all the senior managers of the company and was given a day to prepare. Megha	20	05

chose the topic 'Functioning of the stock market: Recent trends' as the company was a big name among stock broking firm.

However her fear of giving presentations, which she had been fighting for years, again came to haunt her. She could not run away anymore. This was a very good company and the profile was good. She first prepared the outline for the presentation on the topics that needed to be covered and then made the presentation. The CEO had given her 30 minutes for the presentation. She had made a mistake. She did not take in to account or ask the CEO as who would be the audience and whether he wanted something specific. To be covered.

The first step she took was to get the slide deck in place. She prepared a very broad outline on her computer directly, for her presentation. She also did not spend sufficient time to plan her content. The outline looked something like this.

TOPIC: Functioning of the stock market: Recent Trends

SCOPE: discuss the recent trends in the market.

1. History of the stock Markets. (15 minutes)
   < History of the markets, Liberalization of the markets>
2. Functioning of the stock markets (10 minutes)
   < How stock markets function today, the electronic exchanges, and transparency>
3. Recent trends in the stock markets (5 minutes)
   < recent trends in the stock market and the interaction with SEBI (Securities and Exchange boards of India), future of the stock markets, and conclusion>

Since the time left for her was very little she did not note down the details of what needed to be covered under each heads. Time was flying, and she had to do some surfing on the Internet to get the slide deck in place. She started searching the stock market sites and quickly collected the information and started putting them in one of the three categories. There was so much of information that she was not able to judge what was relevant and what was not relevant for the presentation. Megha had, until then, avoided presenting and she was not confident about how much to prepare. She gathered over 60 slides for her 30 minute presentation.

She also had to prepare the 'script' to deliver. Over the years, she had not practiced to deliver extempore talks and felt that memorizing a script would be the best way. She quickly drafted a script and practiced over and over again for the entire night.

The next morning, when the time for her presentation came, she realized that the PPT file got corrupted. She forgot to carry a backup with her and finally realized that she mailed this PPT to her friend for approval. She managed to retrieve the file and started her presentation. Due to her fear she faltered, she forgot what she had written down. Seeing the audience she became nervous and all big people Wizards in stock marketing, highly experienced people were in front of her. She

	started reciting her script like a parrot, missing important lines and showing appropriate slides corresponding to her talk. She started reading verbatim from her script avowing eye- contact with the audience. The CEO, who was sitting in one corner along with some of the senior colleagues of his, noticed this. He began to lose confidence in Megha, because the job involved many client presentations. The CEO asked Megha three questions about her presenting skills. • Why is the scope so vague? Does it speak of any particular period? • Of the 30 minutes allotted, the actual presentation of trends came only after the first 25 minutes? Why? • Why were so many slides prepared, when the presentation was supposed to be for 30 minutes? Questions: 1. How do you suggest Megha should have approached the presentation? 2. What should Megha do to overcome her fear of Presentations? Provide ten effective tips for being a successful presenter.		
Q.4.	Explain the Socio Psychological barriers to Communication. Give reasons for developing socio Psychological barriers amongst individuals.	20	02
Q.5.	Format refers to the general plan of organization of the material and findings that a scientist or an engineer may want to include in his/her paper. Explain in detail the targeted format of a scientific or engineering paper.	20	01
Q.6.	Explain in detail the Eight Principles for choosing appropriate words and phrases in scientific and engineering communication.	20	04
Q.7	a. **Change the following sentences applying techniques of sentence and paragraph construction.** i. Original Sentence: There is a cell called the photo-electric cell, which is characterized by its ability to change its electrical characteristics when light falls upon it *Avoid unnecessary words.* **b. Original Sentence:** The experiment gives a clear indication of the effect of lower voltage on the power dissipation, while also showing strong correlation between high performance and excessive standby current. *One point at a time.* **c. Original Sentence:** The Doctor controlled the growth of cancer cells through chemotherapy.	08	01

	Use Active sentence d. Original Sentence: The Scientist came up with a new paradigm for arriving at an optimal route. *Substitute with concrete words.* b. Revise the paragraph given below, applying the ten principles of sentence and paragraph construction. A mobile phone can change your voice sounds into electrical signals, then into weal radio waves which are picked up by a transmitter receiver (TR), a part of the cellular network which changes the radio signals back into electrical ones and sends them to the local exchange. There the electrical signals were converted to flashes of laser light and sent along fiber-optic cables to the ground station, where the laser-light Signals it receives and beams them back down to another ground station two continents away where the signals were changed from radio waves into microwaves. These were beamed cross-country on a microwave link and at the main exchange; the microwaves became laser light signals again. After this conversion from light to electricity at the local exchange, the signals reach the headset and become sounds again.	12	

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W), Mumbai – 400058

End Semester - April 2022 Examinations

Lib

18/4/22

F.Y.M.Tech CETCD PEPS Sem I

Program: F.Y.M. Tech PEPS **Duration: 3hrs.**

Course Code: PE-MTPX102 **Maximum Points: 100**

Course Name: Power Electronics Application to Renewable Energy **Semester: I**

Notes:

- Attempt **any five** questions.
- Assume suitable data **if** required and justify.
- Refrain from using any unfair means during this exam.

Q.No.	Questions	Points	CO	BL	PI
Q1a)	Explain the performance with series parallel combination of solar cells with identical and non-identical cell combination.	10	CO2	L2	1.6.1
b)	Explain neatly the power curve of wind turbine	10	CO3	L2	1.6.1
Q2	Discuss any two MPPT methods for solar energy generation system.	20	CO2	L2	1.6.1
Q3	A house has the following electrical appliance usage: • Two 60Watt fluorescent lamp with electronic ballast used 5 hours per day. • One 300Watt fan used for 8 hours per day. • One 750Watt refrigerator that runs 24 hours per day with compressor run 12 hours and off 12 hours. The system will be powered by 12 Vdc, 110 Wp PV module. Size the solar PV system and draw the circuit diagram connecting in parallel. Approximate the cost of the entire system.	20	CO4	L4	2.6.1
Q4	Elaborate the technical regulations in detail for interconnection of wind farm with the power system. (Especially frequency and voltage control)	20	CO2	L2	1.6.1

Q5a)	Explain in detail one grid connected solar array topology.	10	CO3	L2	1.6.1
b)	Squirrel-Cage Induction Generators and Permanent-Magnet Synchronous Generators	10	CO1	L2	1.6.1
Q6a)	Explain one converter topology for grid connected wind energy system? (DFIG)	14	CO4	L2	1.6.1
b)	Differentiate between horizontal and vertical axis wind turbine	06	CO2	L2	1.6.1
Q7a)	The parameters of a wind turbine are the generator speed Ng = 870 rpm and the wind speed va = 6m/s. The turbine has a fixed TSR = 8 and a sweep diameter d = 12m. Calculate (a) the low speed of the gearbox or turbine speed Nt and (b) the gear ratio GRt.	05	CO2	L3	2.4.1
b)	Narrate medium power installation of either solar or wind energy system in india	15	CO4	L4	1.6.1

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

End Semester - April 2022 Examinations

M. Tech
F.Y. ~~M.Tech~~ (Civil) PEPS Sem I 18/4/22

Program: F.Y.M. Tech PEPS **Duration: 3hrs.**

Course Code: PE-MTPX102 **Maximum Points: 100**

Course Name: Power Electronics Application to Renewable Energy **Semester: I**

Notes:

- Attempt **any five** questions.
- Assume suitable data **if** required and justify.
- Refrain from using any unfair means during this exam.

Q.No.	Questions	Points	CO	BL	PI
Q1a)	Explain the performance with series parallel combination of solar cells with identical and non-identical cell combination.	10	CO2	L2	1.6.1
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SARDAR PATEL COLLEGE OF ENGINEERING

(Government Aided Autonomous Institute)

Munshi Nagar, Andheri (W) Mumbai – 400058

F.Y. M.Tech Comm Part I APRIL

END SEMESTER EXAMINATION ~~MARCH~~ 2022

Program: MTech PEPS

20/4/22

Duration: 3 Hrs

Course Code: PE-MTPX101 **Maximum Points: 100**

Course Name: Distributed Generation & Microgrid **Semester: I**

Notes: 1. Q.1 is compulsory Q.2 Solve ANY 4 from remaining questions

Q.No.	Questions	Points	CO	BL
Q.1	Enlist any 10 distributed generation sources and state pros & cons of each of them	20	1	2
Q.2	Draw neat schematics of various topologies of a Wind turbine and a Battery.	20	2	3
Q.3	Compare Centralized & Decentralized control of a Microgrid in detail	20	3	4
Q.4	Explain important grid integration rules as per CEA & also explain the concept of voltage ride-through capability.	20	4	1
Q.5	What is Islanding? Compare Passive, Active, Hybrid & Communication based islanding methods in detail	20	5	4
Q.6	Draw a neat schematic & describe 10 different power quality issues that can occur in a microgrid	20	6	3
Q.7	How active & reactive power flow of a DG inverter is controlled ? Explain with the help of a neat diagram.	20	7	5

Bharatiya Vidya Bhavan's

SARDAR PATEL COLLEGE OF ENGINEERING

(An Autonomous Institution Affiliated to University of Mumbai)

F.Y. M. Tech [illegible] PETS Sem I

END SEMESTER EXAMINATION

25/4/2022

Programme	MTech Structural Engineering	MTech Construction Management	MTech Power Sytems and Power Electronics
Course Code	MC-PG01	MC-PG01	MC-MTPX101

Subject : Research Methodology and IPR
Total Marks :100
Class: MTech, Sem:I,

Duration : 3 Hours
25th April 2022

- **Question 1 is compulsory**
- **Solve Any Four Questions from the remaining**
- Answers to all sub questions **must be** grouped together
- Figures to the right indicate full marks
- Assume suitable data wherever necessary

SN	Question statement	Points	Module	CO
Q1	Explain the following with suitable examples A. Guidelines for writing a Literature survey for a paper A. Statistical Hypothesis Test Procedures and the Criminal Trial Analogy B. Types of IPR and their significance C. Scatter Plot and Co-relation	20	M1,M3, M4, M6, M7	CO3, CO4
Q2A	A population is divided into four strata so that N1 = 8500, N2 = 4500 and N3 = 9500, N4 = 11500 Respective standard deviations are: s1=12, s2=14, s3=7, s4=6 . Costs in rupees to collect the strata are C1= 9000, C2=5000, C3=10000, C4= 12000. How should a sample of size n = 98 be allocated to the four strata, if we want optimum allocation using Cost Optimal Disproportionate sampling design?	10	M3	CO2
Q2B	Researcher conducted experimental investigations on concrete cubes, to study the influence of fly ash, GGBS and glass waste powder (GWP) individually, on the compressive strength of concrete. The cubes were casted for M30 grade of concrete and by random sampling method, tested after 28 days curing. For cubes in Group I, 30% fly ash was added, for Group II, 30% GGBS was added and in Group III, 30% GWP was added. The 28 days compressive strengths of cubes in N/mm^2 are given below. Check whether the mean compressive strength of the 3 different groups is same or not. Group I – 35, 29, 34, 35, 27, 29 Group II – 33, 29, 30, 29, 33 Group III – 34, 28, 29, 32, 33, 27, 28	10	M5	CO2

<table>
<tr><td>Q3A</td><td>A data of 450 construction Projects was reviewed to know association between type of construction project and success of construction project. The response by Type of Project are as follows. At alpha =0.05 do these data suggest an association between Type of Project and being successful?
<table>
<tr><td></td><td>International Projects</td><td>Domestic Project</td><td>Total</td></tr>
<tr><td>Successful</td><td>46</td><td>88</td><td>134</td></tr>
<tr><td>Not Successful</td><td>184</td><td>179</td><td>363</td></tr>
<tr><td>Total</td><td>230</td><td>267</td><td>497</td></tr>
</table></td><td>10</td><td>M5</td><td>CO2</td></tr>
<tr><td>Q3B</td><td>Manufacturer wants to test on the basis of sample size 35 determinations and at 0.05 and 0.01 levels of significance whether the thermal conductivity of a certain kind of plate is 0.34 units, as has been claimed. The mean of sample is 0.343. From the information gathered in similar studies , we can expect that the variability of such determinations is given by σ = 0.01. Assume any suitable data if necessary.</td><td>10</td><td>M1, M5</td><td>CO1, CO2</td></tr>
<tr><td>Q4A</td><td>A maker of golf shirts has been tracking the relationship between sales and advertising dollars. Use linear regression to find out what sales might be if the company invested $68,000 in advertising next year.
<table>
<tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td></tr>
<tr><td>Sales $ (y)</td><td>150</td><td>171</td><td>170</td><td>178</td></tr>
<tr><td>Advertisement expenditure</td><td>42</td><td>62</td><td>60</td><td>65</td></tr>
</table></td><td>10</td><td>M1, M5</td><td>CO1, CO2</td></tr>
<tr><td>Q4B</td><td>State the characteristics of Good research Problem</td><td>10</td><td>M1</td><td>CO1</td></tr>
<tr><td>Q5A</td><td>Differentiate between Research Paper and Review paper.
State the Guidelines to write the research article.</td><td>10</td><td>M2, M3</td><td>CO1, CO2</td></tr>
<tr><td>Q5B</td><td>Differentiate between Qualitative and Quantitative Research</td><td>10</td><td>M1, M2</td><td>CO1</td></tr>
<tr><td>Q6A</td><td>State the difference between Copyright Patent and Trademark</td><td>10</td><td>M5</td><td>CO3, CO4</td></tr>
<tr><td>Q6B</td><td>Draw the flow chart and explain the procedure to receive the patent.</td><td>10</td><td>M4, M6</td><td>(3, CO4</td></tr>
<tr><td>Q7</td><td>Explain the following with suitable examples
• Null Hypothesis and Alternate Hypothesis
• Type 1 error and Type 2 error
• Test Statistics
• Confidence Level and p value
• Limitations and advantages of Hypothesis Test
• Rejection Region
• Left Tail Test and Right Tail Test
• One Tail Test and Two Tail Test</td><td>20</td><td>M1</td><td>CO1</td></tr>
</table>

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