EE Department, UET, Lahore
Faisalabad Campus

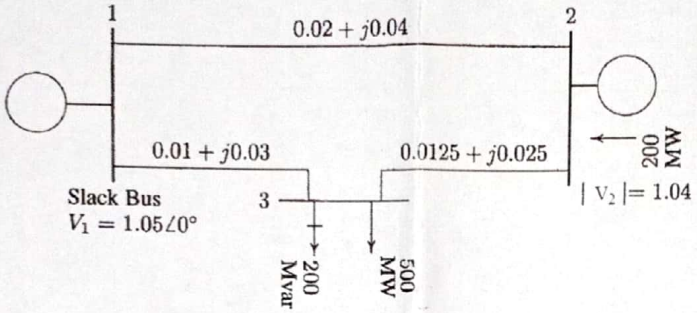
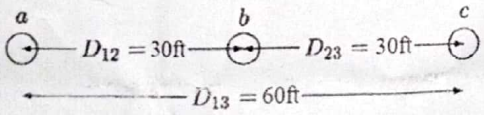
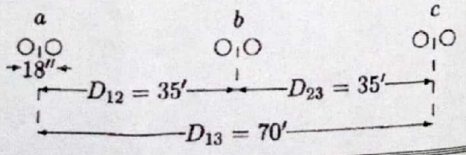
Reg. No. 2017-EE-434

EE357 Power System Analysis

Comprehensive Exam (26 Aug. 2020, Session 2017)

- Start solution of every new question on a new page.
- All the related parts of a question must be solved together.
- Time division suggestion: CLO1 – 20 mins, CLO4 – 50+10=60 mins

Time Allowed: 180 Minutes
Total Marks: 70

Q.1	Three single-phase two-winding transformers, each rated 300 MVA, 13.8/199.2 kV, with leakage reactance Xeq = 0.10 per unit, are connected to form a three-phase bank. Winding resistances and exciting current are neglected. The high-voltage windings are connected in Y. A three-phase load operating under balanced positive-sequence conditions on the high-voltage side absorbs 800 MVA at 0.90 p.f. lagging, with V_{AN} =179.28 /0° kV. Use the transformer bank ratings as base quantities and apply the per unit model to determine the voltage Van at the low-voltage bus if the low-voltage windings are connected in Y.	10	CLO1
Q.2	The figure shows a simple three bus power system- line impedances are on a 100MVA base. Apply one iteration of Fast Decoupled load flow analysis with the aim to find the unknown bus voltage(s) – (the analysis to find slack bus power or line losses is not to be provided). Use reasonable assumptions where required. The Ybus matrix of the system is being provided for your convenience. Use 100MVA as base for the per unit system.  $$Y_{bus} = \begin{bmatrix} 20 - j50 & -10 + j20 & -10 + j30 \\ -10 + j20 & 26 - j52 & -16 + j32 \\ -10 + j30 & -16 + j32 & 26 - j62 \end{bmatrix}$$ In polar form (with angles in radians), $$Y_{bus} = \begin{bmatrix} 53.85165\angle -1.9029 & 22.36068\angle 2.0344 & 31.62278\angle 1.8925 \\ 22.36068\angle 2.0344 & 58.13777\angle -1.1071 & 35.77709\angle 2.0344 \\ 31.62278\angle 1.8925 & 35.77709\angle 2.0344 & 67.23095\angle -1.1737 \end{bmatrix}$$	15	CLO4
Q.3	For the solution of the system in Q#2 via the use of Newton Raphson load flow technique, expand the under-mentioned equation for this system. Mention the actual voltage variables, power variables and Jacobian entries (again in form of partial derivatives of variables e.g. $\partial P_2/\partial V_2$) which will exist in the expansion of this equation. $$\begin{bmatrix} \Delta P \\ \Delta Q \end{bmatrix} = \begin{bmatrix} J_1 & J_2 \\ J_3 & J_4 \end{bmatrix} \begin{bmatrix} \Delta\delta \\ \Delta\lvert V \rvert \end{bmatrix}$$	5	
Q.4	A certain transmission line is composed of an ACSR conductor with horizontal configuration as shown. The conductors have a diameter of 1.5 inches and a GMR_L of 0.6 inches. Calculate the inductance and the capacitance per phase per kilometer for this line.  	10	
Q.5	A certain transmission line is composed of ACSR bundled conductors (bundle of two conductors per phase) as shown in the figure. Take the GMD of the system to be 44.097 ft. The radius of an individual conductor is 0.5 inch, the GMR i.e. Ds of a single conductor is 0.4 inches, and spacing between two conductors of a bundle is 18 inches. Calculate the inductance and the capacitance per phase per kilometer for this line.  	10	CLO2

Q.6	A three phase, 50 Hz completely transposed 345kV, 220-km line has the following line constants $z = 0.03+j0.27\ \Omega/km$ $y = j4 \times 10^{-6}$ S/km Full load at the receiving end of the line is 600MVA at 0.95 p.f. lagging and at 95% of rated voltage. Analyse this system using the medium line model and calculate the ABCD line parameters of the nominal pi circuit and then calculate the sending end voltage of this line.	10	CLO3
Q.7	A three-phase, 50 Hz 500kV transmission line is 350km long. The line inductance is 1mH/km per phase and the capacitance is 0.012μF/km per phase. Assuming it to be a lossless line, analyze this system and determine the line phase constant β, the surge impedance Z_c, velocity of propagation and the line wavelength λ. Furthermore, the load is receiving 1000MVA at 0.8 p.f. lagging at 500kV. Determine sending end voltage and current.	15	
Q.8	For the analysis of unsymmetrical faults via the use of sequence networks, sketch the interconnections of the Thevenin equivalent sequence networks for the following unsymmetrical faults. i. Single-Line to Ground (SLG) ii. Double-Line to Ground (DLG)	5	

Department of Electrical, Electronics & Telecom Engineering
UET (Lahore) Faisalabad Campus

Student Name: M Husnain Abbas Reg. No. 2017-EE-434

EE-425 Wireless Communication

Fall 2020, Session 2017 (7th Semester)
Final Exam

- All the related parts of a question must be solved together.
- Start the solution of every new part on a new page.

Time Allowed: 90 Mins
Total Marks: 40

Question – 1	a. When a mobile phone user is moving from one cell to another cell (call is going on), the call is suddenly terminated, even though all the functionalities of the transmitters and receivers are working properly. Explain why? b. What are the effects of fading? c. Differentiate between coherence time and coherence bandwidth of a wireless channel. d. Explain different diversity techniques that MIMO systems use to combat the multipath fading?	2+2+2+4 Marks	CLO-1	PLO-1
Question – 2	a) Discuss on Issues and Challenges in Designing a Sensor Networks? b) How does Flooding differ from the route discovery phase used in other reactive routing protocols such as DSR and AODV? c) What are the differences between DSR and AODV routing protocols? d) Name one advantage that DSR has over AODV due to its use of source-routing. e) Differentiate between reactive, proactive and hybrid routing protocols for WSNs. f) How does the Location Aided Routing algorithms reduce the flooding of control packets?	3+2+2+1+3+1 Marks	CLO-2	PLO-2
Question - 3	Using the Okumura Model, calculate the median loss relative to the free space loss at a distance of 40km Base station height is 200m, whereas mobile station height is 3m. The frequency of operation is 1 GHz. Assume urban environment and unity antenna gains. If the transmitter radiates an EIRP of 0.8kW, find the power received at the receiver.	4 Marks	CLO-2	PLO-2

DSR
AODV
CLSR
DADV

$$L = \left(\frac{4\pi d}{\lambda}\right)^2$$

$$L(dB) = 20\log\left(\frac{4\pi d}{\lambda}\right)^2$$

$$= -20\log\left(\frac{\lambda}{4\pi d}\right)^2$$

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Question – 4 ✓	**(CEP)** Zong telecom covers a certain geographical area with 84 cells and a cluster size of N. 400 Channels are available for the system. Offered load per user is 0.045 Erlang. Assume that blocked calls are cleared and P(Blocking) = 1%. Determine the maximum carried traffic per cell if cluster size N=4 is used. Repeat for cluster size N=7 and N=12. Determine the maximum number of users that can be served by the system for a blocking probability of 1% and cluster size N=4. Repeat for N=7 and N=12	10 Marks	CLO-2	PLO-2
Question – 5 ✓	What is the maximum Doppler shift for the GSM mobile cellular system on the "downlink" from the base station to the mobile unit (935 to 960 MHz RF band)? What is it on the "uplink" direction, or mobile to base (890 to 915 MHz RF band)? Assume a high-speed train travelling at a speed of v = 250 km/h.	4 Marks	CLO-2	PLO-2

$$\frac{2\pi\,\Delta l}{\lambda} = \frac{2\pi \cdot v\,\Delta t}{\lambda}\cos\theta$$

$$\therefore f_d = \frac{v}{\lambda}\cos\theta = \frac{1}{2\pi}$$

$$2\pi\,\Delta t$$

Department of Electrical, Electronics & Telecom Engineering
UET (Lahore) Faisalabad Campus

Student Name:_____ Reg. No. 2017-EE-434

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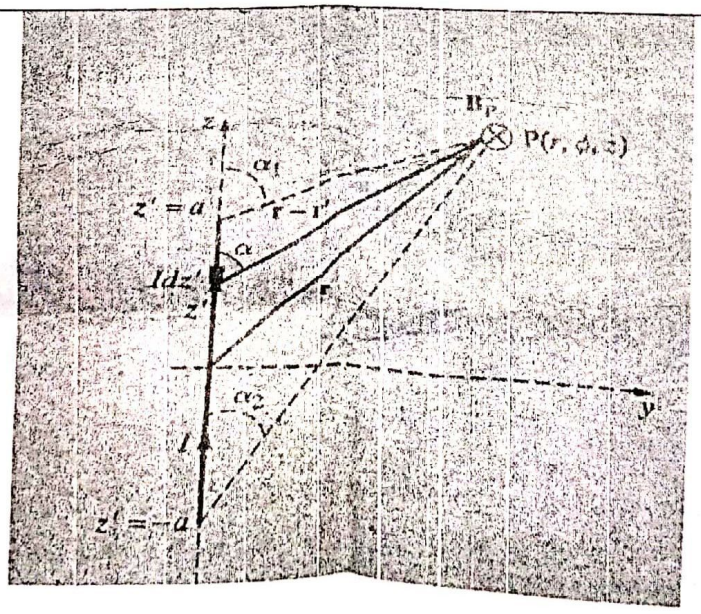
EE380 Electromagnetic Theory

Session 2017 (5th Semester)
Final-Term Exams

Time Allowed: 90 Minutes
Total Marks: 40

- All the related parts of a question must be solved together.
- Start solution of every new part on a new page.

Q 1	A ✓	Define Maxwell equations and Faraday's law of induction	06	CLO1	PLO2,
	B ✓	Define and drive expression for Poisson and Laplace 's equations	04		
Q.2	A ✓	Finite-length wire B at an off-axis point as shown in figure(a) evaluate B field at an arbitrary point p (r, Ø, z)	06	CLO4	PLO10, C2
	B ✓	Define electric and magnetic field of force and Lorentz 's force	06		
Q.3	A ✓	Find curl of **D**= $\frac{Qd}{4\pi r^3}[\hat{r}2\cos\theta + \hat{\theta}\sin\theta]$	04	CLO4	PLO10, C2
	(B)	Using Curl in the rectangular coordinate system prove that $\nabla \times B = \begin{vmatrix} \hat{x} & \hat{y} & \hat{z} \\ \frac{\partial}{\partial x} & \frac{\partial}{\partial y} & \frac{\partial}{\partial z} \\ B_X & B_Y & B_Z \end{vmatrix}$	07		
Q.4	✓	Find $\nabla \times B$ if $\boldsymbol{B} = \begin{cases} \hat{\varphi}\frac{\mu_0 Ir}{2\pi a^2}, & r \le a \\ \hat{\varphi}\frac{\mu_0 I}{2\pi r}, & r > a \end{cases}$	7	CLO4	PLO10,C2



Department of Electrical, Electronics and Telecommunication
University of Engineering and Technology Lahore (FSD Campus)

Power Distribution Systems

Final Term Exams (01-01-2020)

Fall 2019, Session 2017

Time Allowed: 90 Minutes
Total Marks: 40
Registration# 2017-EE-434

as
D = EE

NOTE: All the related parts of a question must be solved together.

		Marks	PLO CLO Cognitive Level
1.	a) **Discuss** the power factor tariff and three-part tariff. b) **Explain** kelvin's law for size of conductor for transmission. c) **Describe** the operating principles of circuit breaker.	5 5 3	PLO1 CLO1 C2
2.	A generating station has the following daily load cycle **Time(Hours)** 0-6 6-10 10-12 12-16 16-20 20-24 **Load(MW)** 40 50 60 50 70 40 4 3 2 3 1 4 **Draw** the daily load curve, load duration curve and **compute** units generated per day, average load and load factor.	7	PLO2 CLO2 C4
3.	a) Why are insulators used with overhead lines? **Demonstrate** the advantages and disadvantages of pin type insulators and suspension type insulators b) **Illustrate** an expression for the capacitance of a single core cable. c) The Varley loop test is used to find the position of an earth fault on a line of length 50Km. The resistance per kilometer of a single line is 30Ω. The fixed resistors have resistances of 250 Ω each. The fault is calculated to be 5 km from the test end. **To what** value of resistance was the variable resistor(S_1) set? d) A 132 kV, 3 phase 50Hz transmission line 200 km long consists of three conductors of effective diameter 20mm arranged in a vertical plane with 4 m spacing and regularly transposed. **Use** the given data and find the inductance and kVA rating of the arc suppression coil in the system.	5 5 5 5	PLO3 CLO4 C3

Department of Electrical, Electronics & Telecom Engineering
UET (Lahore) Faisalabad Campus

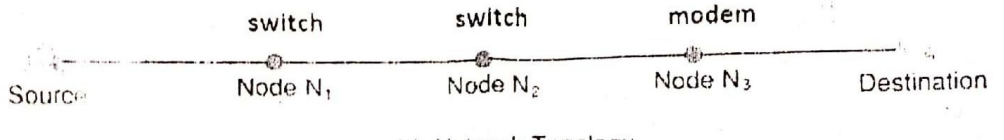
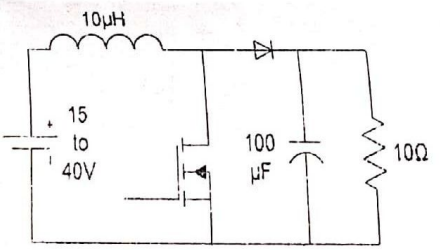
Student Name: M Husnain Abbas Reg. No. 2017-EE-434

EE456Smart Grid

Fall 2020, Session 2017 (07th Semester)
Mid-Term Exams

Time Allowed: 60 Minutes
Total Marks: 30

- All the related parts of a question must be solved together.
- Start solution of every new part on a new page.

Q.1	A ✓	**Describe** the layers in given communication network and also protocols while browsing the **google** from host computer?  (a) Network Topology	05	CLO1	PLO1
	B ✓	**Describe** in possible communication network of Smart Grid which subnetwork will be used in home, Distribution network and central generation systems? **Discuss** and shortly explain one communication technology in these subnetworks?	05		
Q.2	A	The boost converter shown in attached figure has input ranging from 15 to 40V and powers a fixed load of 1kW at 100Vdc. While operating in CCM, the inductor current ripple is to be kept below ±25% under all input voltage conditions.  1. Determine and **compare** the min switching frequency for the component values shown.	06	CLO3	PLO2
	B ✓	A PV array is connected with boost converter whose output is 500 V. The solar irradiance decreased from 4 to 6 seconds. What will be output of boost converter from 1 to 10 seconds if by decreasing the solar irradiance cause the decrease in output of boost converter only 10 % while output in remaining duration remain constant. Draw and **outline** the output voltage of boost converter having no PI controller and with PI controller from 1 to 10 sec?	04		

A—
P—
S—
N→
OL
P

$$I_L = \frac{Vs}{(1-D)^2 R}$$

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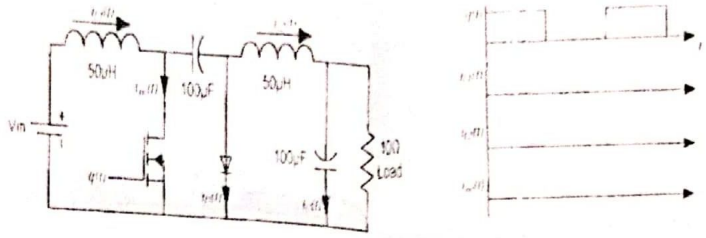
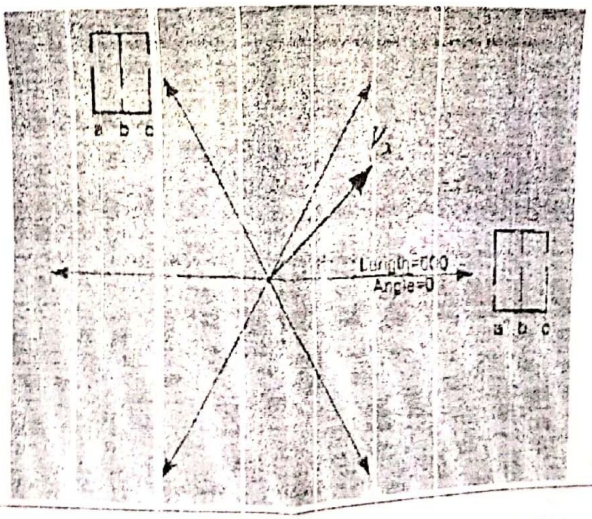
Q.2	C	For the Ćuk converter shown, below, draw and **Analyze the** currents i_{L1}, i_{L2} and i_{sw} in timing relation with the switching function of the transistor 	03	PLO2 CLO3
	D	• In three phase inverter you are to synthesize a three-phase voltage vector $v_{abc} = [200 \quad 73 \quad -273.25]^t$. Convert this voltage in d-q frame of reference v_x and **analyze** it. • Using space vector PWM calculate t_a, t_b and t_o. • Assume the switching interval is 100 µs. exactly identify the inverter states corresponding to those computed time intervals by drawing the inverter switch states corresponding time interval T_0, T_1 and T_2. $t_a = U\left[\cos\alpha - \frac{1}{\sqrt{3}}\sin\alpha\right]$ $\quad V_a = \frac{2}{\sqrt{3}} \cdot V_x \cdot \sin\left(\frac{\pi}{3} - \alpha\right)$ $\quad T_{abc-dq} = \sqrt{\frac{2}{3}}\begin{bmatrix} 1 & -\frac{1}{2} & -\frac{1}{2} \\ 0 & \frac{\sqrt{3}}{2} & -\frac{\sqrt{3}}{2} \end{bmatrix}$ $t_b = \frac{2}{\sqrt{3}} \cdot U \cdot \sin\alpha$ $\quad V_b = \frac{2}{\sqrt{3}} \cdot V_x \cdot \sin\alpha$ • 	07	

Department of Electrical Engineering
UET (Lahore) Faisalabad Campus

Student Name: M Husnain Abbas Reg. No. 2017-EE-434

Islamic and Pak Studies -201

7th Semester Session 2017
End-Term Exams
Time: 90 Min.

- All the related parts of a question must be solved together.

	Islamic Studies			
Q.1	Explain **Islamic criminal law about Murder** قتل عمد اور قتل خطا.	08	CLO2	PLO8
Q.2	Translate the following Hadith and write note on Human rights in the light of last sermon of Holy prophetﷺ عَنْ أَبِي هُرَيْرَةَ – رضي الله عنه – قَالَ: قَالَ رَسُولُ اللَّهِ ﷺ مَنْ أَحَبَّ أَنْ يُبْسَطَ عَلَيْهِ فِي رِزْقِهِ, وأَنْ يُنْسَأَ لَهُ فِي أَثَرِهِ, فَلْيَصِلْ رَحِمَهُ (أَخْرَجَهُ اَلْبُخَارِيُّ) ..	08	CLO2	PLO8
Q.3	Translate the verse and note about the rules of privacy in Islam. يَا أَيُّهَا الَّذِينَ آمَنُوا لَا تَدْخُلُوا بُيُوتًا غَيْرَ بُيُوتِكُمْ حَتَّىٰ تَسْتَأْنِسُوا وَتُسَلِّمُوا عَلَىٰ أَهْلِهَا ذَٰلِكُمْ خَيْرٌ لَكُمْ لَعَلَّكُمْ تَذَكَّرُونَ (27) فَإِنْ لَمْ تَجِدُوا فِيهَا أَحَدًا فَلَا تَدْخُلُوهَا حَتَّىٰ يُؤْذَنَ لَكُمْ وَإِنْ قِيلَ لَكُمُ ارْجِعُوا فَارْجِعُوا هُوَ أَزْكَىٰ لَكُمْ وَاللَّهُ بِمَا تَعْمَلُونَ عَلِيمٌ (28) لَيْسَ عَلَيْكُمْ جُنَاحٌ أَنْ تَدْخُلُوا بُيُوتًا غَيْرَ مَسْكُونَةٍ فِيهَا مَتَاعٌ لَكُمْ وَاللَّهُ يَعْلَمُ مَا تُبْدُونَ وَمَا تَكْتُمُونَ (النور29)	08	CLO2	PLO8
	Pakistan Studies			
Q.4	Write Pakistan and Iran relations.	08	CLO3	PLO 12
Q.5	Write comprehensive note on Organization of Islamic cooperation.	08	CLO3	PPLO12

Department of Electrical, Electronics & Telecom Engineering
UET (Lahore) Faisalabad Campus

Student Name: M Husnain Abbas Reg. No. 2017-EE-434

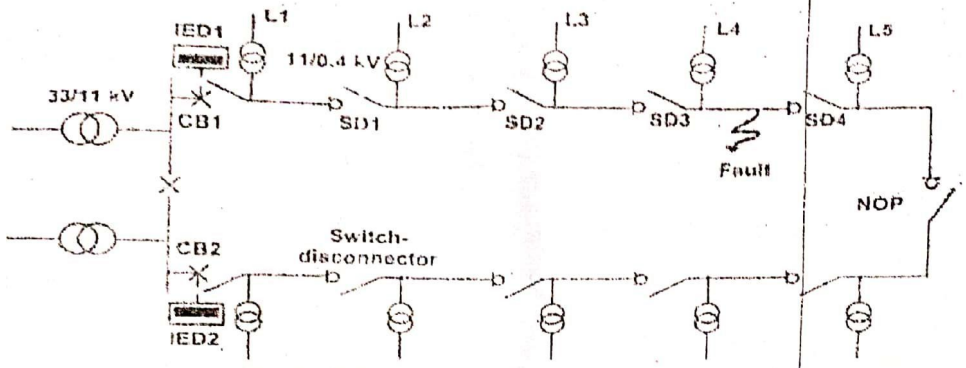
EE456Smart Grid

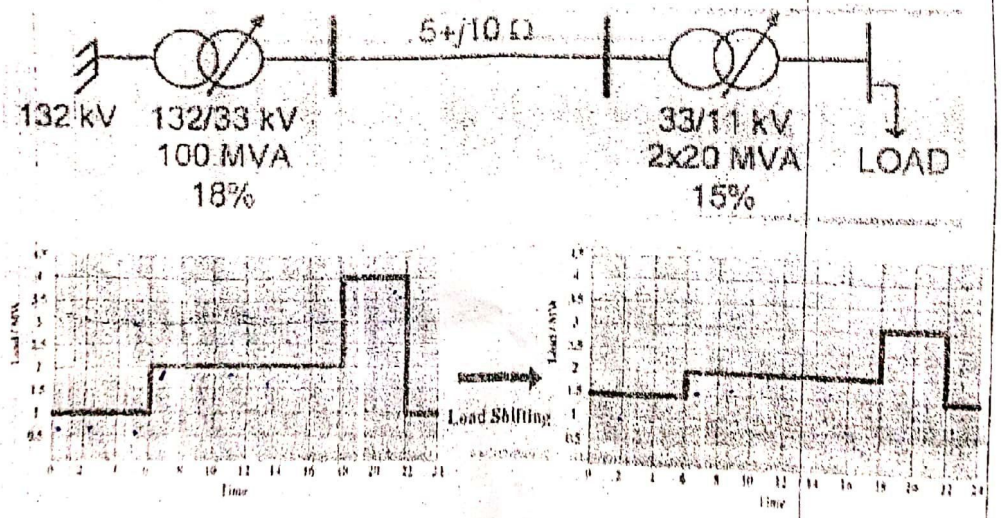
Fall 2020, Session 2017 (07th Semester)
Final-Term Exams

Time Allowed: 90 Minutes
Total Marks: 40

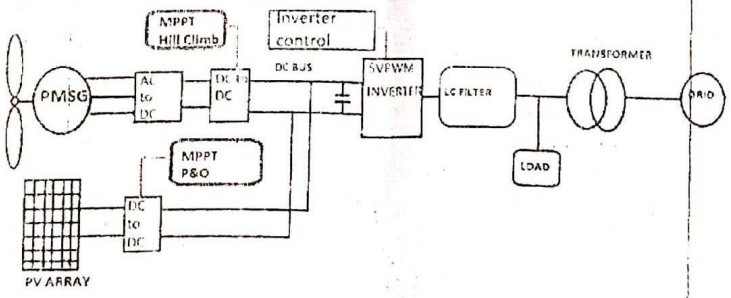
- All the related parts of a question must be solved together.
- Answer should be to the point. Start solution of every new part on a new page.

Q.1	A	The below diagram shows the distribution system when fault occur between line 5 and line 4? When system is fully automated draw block diagram with automation and **outline** four points how system will respond?	06	CLO2	PLO2
	B	Consider the circuit shown in Figure below. The 33/11 kV transformer has an on-load tap changer which maintains the load voltage at 11 kV. Calculate the percentage reduction in energy loss in the 33 kV line if load shifting shown in Figure below is managed. Ignore the 33/11 kV transformer losses?	08		





Student Name: Reg. No.

V3	C	Draw the control diagram of Grid Tie inverter? **Outline** the value of Id and Iq for unity power factor and .8 power factor?	06		
Q.2 V	A	Draw the block diagram of type 3 and type 4 wind turbine? **Outline** for which type generator turbine the type 3 and type 4 are used? **Compare** which type from type 3 and type 4 is less complex for controlling the active and reactive power when integrated with utility grid? (answer within 2 to 3 lines) When DFIG is integrated with utility grid from where it takes reactive power? (answer within 2 to 3 lines)	08		
✓	B	Maximum value of Power Coefficient of Wind turbine CP is 16/27 when a=1/3. What will be variation when $a = {}^1/_4$ and $a = {}^1/_5$ just **analyze** it? $$P_T = [4a(1-a)^2]\left(\frac{1}{2}\rho A_1 u^3\right)$$	03		
✓	C	In the below diagram of hybrid microgrid 5Kw solar system and 5 Kw wind turbine is integrated with utility grid and load is 10 KW under normal conditions? Draw the waveform of • active and reactive power of microgrid • active and reactive power of utility grid **Draw** waveform duration is 1 to 10 sec while system is operating at unity power factor in grid tie mode.  **Case 1:** Wind operating at maximum efficiency, PV radiation decrease from 3 to 5 sec causes the decrease of Solar system power from 5KW to 2 KW while load remain constant at 12 KW (1 to 10)? **Case 2:** Load set at 15 KW in duration 1 to 10 sec while wind and solar operating at maximum efficiency? **Case 3:** Load set at 5 KW in duration 1 to 10 sec while solar operating at maximum efficiency and output power of wind turbine decreases from 5KW to 2 KW in duration 3 to 5 sec?	09	CLO3	PLO2

Department of Chemical Engineering
UET (Lahore) Faisalabad Campus

Student Name:_____ Reg. No. 2017-EE-434

Islamic and Pak Studies -201

7th Semester, Session 2017
Mid-Term Exams fall 2020
Time: 60 Min.

- All the related parts of a question must be solved together.

	Islamic Studies			
Q.1	Define Ijaz ul Quran and write a note on scientific miracle of Quran قرآن کریم کا سائنسی اعجاز	06	CLO1	PLO8
Q.2	Translate the following verse and write note on Hazrat Luqman's advises and its role in character building. 17) يَا بُنَيَّ أَقِمِ الصَّلَاةَ وَأْمُرْ بِالْمَعْرُوفِ وَانْهَ عَنِ الْمُنكَرِ وَاصْبِرْ عَلَىٰ مَا أَصَابَكَ ۖ إِنَّ ذَٰلِكَ مِنْ عَزْمِ الْأُمُورِ	06	CLO2	PLO8
Q.3	Translate the following Hadith and right note about Manners of *salam* and greeting Muslims and non-Muslims. وَعَنْ أَبِي هُرَيْرَةَ - ﷺ - قَالَ: قَالَ رَسُولُ الله -ﷺ-: «لِيُسَلِّمِ الصَّغِيرُ عَلَى الْكَبِيرِ، وَالْمَارُّ عَلَى الْقَاعِدِ، وَالْقَلِيلُ عَلَى الْكَثِيرِ. وَفِي رِوَايَةٍ لِمُسْلِمٍ: وَالرَّاكِبُ عَلَى الْمَاشِي.	06	CLO2	PLO8
	Pakistan Studies			
Q.4	Write role of women in Pakistan movement.	06	CLO3	PLO 12
Q.5	Write comprehensive note on China Pakistan economic corridor (CPEC).	06	CLO3	PPLO12

MID Term Exam

Power Distribution Systems (EE-358)

Reg.# 2017-EE-434

Marks: 30
Allowed Time: 01 hour

	Statements	Marks	CLO / PLO / Domain / Taxonomy Level
1	a. Mechanical energy is supplied to a DC generator at the rate of 4000 J/s. The generator delivers 32 A at 120 V. How much energy is lost per hour of operation?	2	CLO1 PLO1 Cognitive 02
	b. Briefly explain interconnected distribution systems. Also, draw its block diagram.	2	
	c. Write any four advantages of DC transmission over AC transmission?	2	
	d. What is the major advantage of the synchronous motor over static capacitor to improve the power factor?	1	
	e. What is a booster? Explain how it can be used on a feeder.	2	
	f. Define the most economical power factor? Write its formula.	1	
2.	(a) A DC 3-wire system with 500 volts across outers supplies 800 A on the positive side and 550 A on the negative side and 1500 A across the outers. The rotary balancer has each an armature resistance of 0·2 Ω and takes 5 A on no load. Each machine has the 249V back e.m.f. Find the current loading of each balancer machine.	6	CLO2 PLO2 Cognitive 04
	(b.) An electric train runs between two sub-stations 6 km apart maintained at voltages 600 V and 590 V respectively and draws a constant current of 300 A while in motion. The track resistance of go and return path is 0·04 Ω/km. Calculate the point along the track where minimum potential occurs.	4	
3	In a 3-phase, 4-wire system, two phases have currents of 10A and 6A at lagging power factors of 0·8 and 0·6 respectively, while the third phase is open-circuited. Calculate the current in the neutral wire.	4	
4	A 3-phase, 50 Hz. 3000 V motor develops 600 H.P. (447·6 kW), the power factor being 0·75 lagging and the efficiency 0·93. A bank of capacitors is connected in delta across the supply terminals and power factor raised to 0·95 lagging. Each of the capacitance units is built of five similar 600-V capacitors. Determine the capacitance of each capacitor.	6	

Date: 01-11-19

Instructor: Ms. Munazza Sadaf

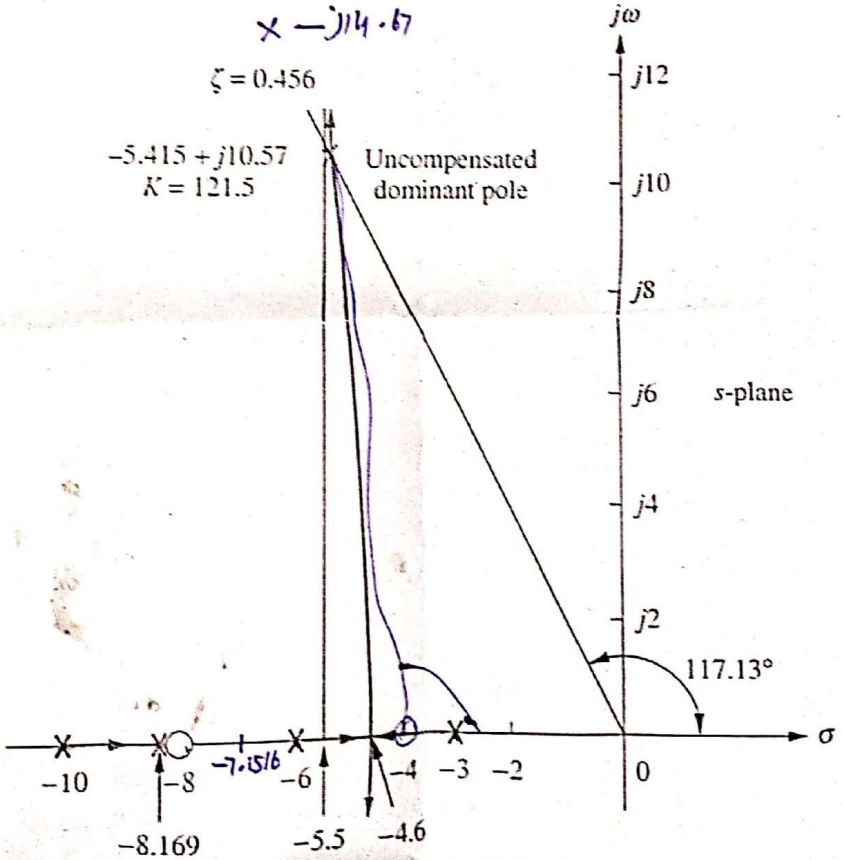
Student Name: _____ Reg. No. _____

Q.3	A	***Analyze*** the unity feedback system with feedforward transfer function given below and design a PID controller so that the system can operate with a peak time that is two thirds that of the uncompensated system at 20% overshoot and with zero steady-state error for step input. Find the value of all three gains, also draw the root locus of compensated system.	12	CLO3	PLO2, C4

$$G(s) = \frac{K(s+8)}{(s+3)(s+6)(s+10)}$$

Additional information, if required:

1. Peak time of uncompensated system is 0.297 at K = 121.5
2. If needed, you may only add zeros at the location -0.5 on the real plane when designing PID
3. The compensated PID controller touches the constant 20% overshoot line at -7.516+j14.67



: Root locus of uncompensated system

$T_p = \frac{\pi}{\omega_n\sqrt{1-\zeta^2}}$

$T_p = \frac{\pi}{\omega_d}$

$s^4 + 7s^3 + 14s^2 + 8s + 1Ks + 3K$

$s^4 + 7s^3 + 14s^2 + s(8+K) + 3K$

Zain Murtaza

EE Department, UET, Lahore
Faisalabad Campus

Student Name: M Hussain Abbas Reg. No. 2017-EE-434

MGT211 Principles of Management

Mid Term Exam (Fall 2020, Session 2017)

- Start solution of every new question on a new page.
- All the related parts of a question must be solved together.
- No typo in the paper, understanding the question is part of examination.

Time Allowed: 60 Minutes
Total Marks: 30

Q.1(a)	Define *organization culture*. Also make comparison between strong and weak culture.	10	CLO2
Q.1(b)	Discuss in detail the eight steps of *decision making process*.	10	
Q.1(c)	Describe in detail the six key elements in *organization design*.	10	

Good Luck

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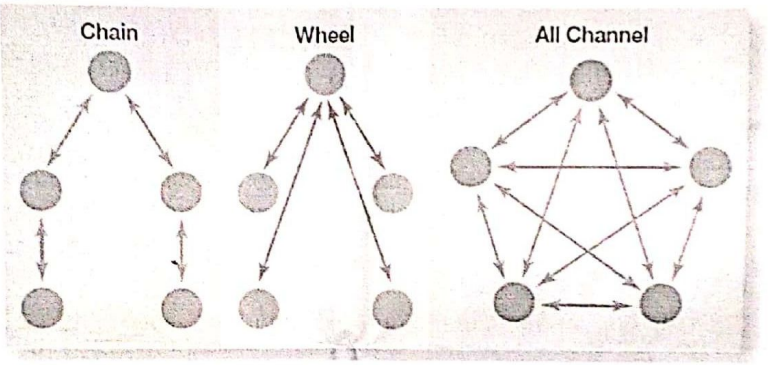
EE Department, UET, Lahore
Faisalabad Campus

Student Name: M Hushain Abbas Reg. No. 2017-EE-434

MGT211 Principles of Management
Final Term Exam (Fall 2020, Session 2017)

- Start solution of every new question on a new page.
- All the related parts of a question must be solved together.
- No typo in the paper, understanding the question is part of examination.

Time Allowed: 90 Minutes
Total Marks: 40

Q.1(a)	Define the "selection process" in human resource management and also enlist all the tools involved in selection procedure.	10	CLO3
Q.1(b)	The figure shows various "Organizational Communication Networks". Make a comparison between them based on the criteria of speed, accuracy, emergence of leader and member satisfaction. 	10	
Q.1(c)	Define Motivation, Also make a comparison between Equity and Expectancy theory of motivation.	10	
Q.1(d)	Define Leadership and discuss your opinion in detail about "Gender and Leadership"	10	

Good Luck

A
W
P
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P

A→
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M
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P

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C
G

$\rho = \frac{Q}{V}$

$\theta =$

Department of Electrical, Electronics & Telecom Engineering
UET (Lahore)Faisalabad Campus

Student Name:_____ Reg. No. _____

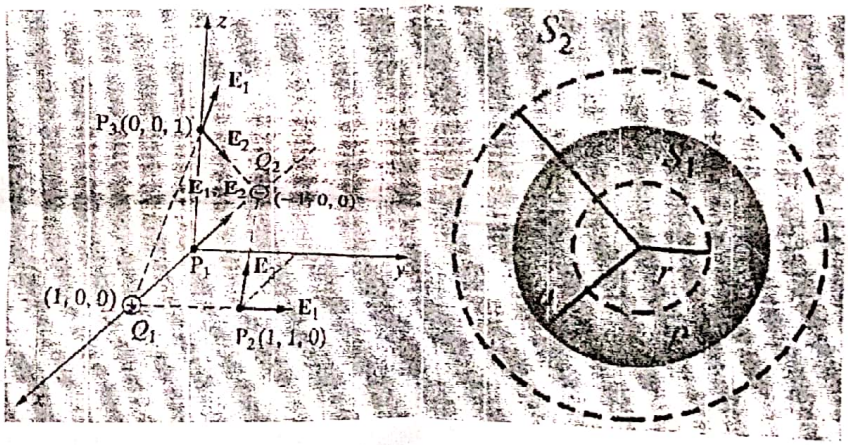
EE380 Electromagnetic Theory

Session 2017 (5th Semester)
Mid-Term Exams

Time Allowed: 60 Minutes
Total Marks: 30

- All the related parts of a question must be solved together.
- Start solution of every new part on a new page.

Q.1	A	***Find divergence of*** $A1 = \hat{x}(1/2)x^2 - \hat{y}xy, A2 = \hat{x}\sin y - \hat{y}\cos x,$ $A3 = \hat{x}\sin x - \hat{y}\cos y$	04	CLO2	PLO1, C5
	B	Consider two-point charges Q1=+5nC and Q2=-5nC located at points(+1, 0, 0)m and(-1, 0, 0) as shown in figure (a) Calculate the electric field at points P1(0, 0, 0), P2(1, 1, 0) and P3(0, 0, 1) respectively	06		
Q.2	A	Define integral form of Maxwell equations of electromagnetism and define these equations in vacuum	06	CLO1	PLO2, C2
	B	Using capacitor concept derive equation for displacement current	04		
Q.3	A	Find divergence of **D**= $\frac{Qd}{4\pi r^3}[\hat{r}2\cos\theta + \hat{\theta}\sin\theta]$	04	CLO2	PLO1, C5
	B	Using Gauss 's Law calculate electric field E(r) and electric potential$\emptyset(r)$ both for $r < a$ *and* $r > a$ where a is a spherical cloud charge radius as shown in figure (b). The electric charge is uniformly distributed over the spherical volume with volume charge density ρ, so that the total charge in the cloud is $Q = 4/3\pi a^3\rho$	06		



(a) (b)

Department of Electrical, Electronics & Telecom Engineering
UET (Lahore) Faisalabad Campus

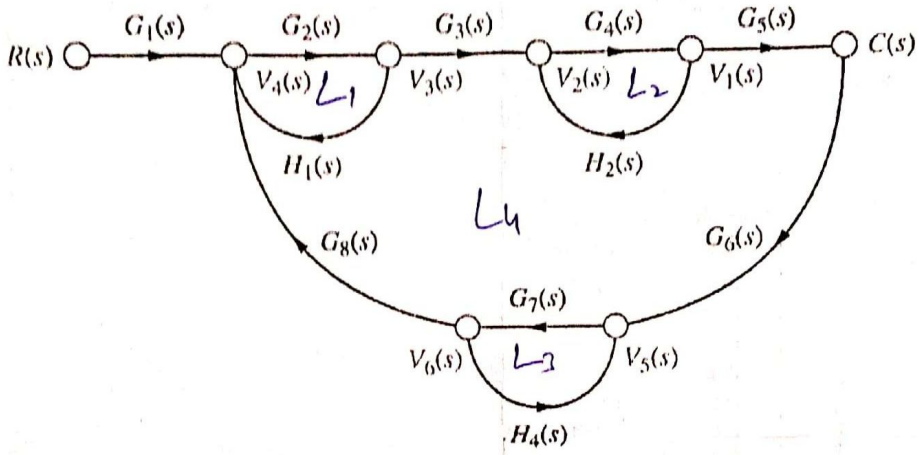
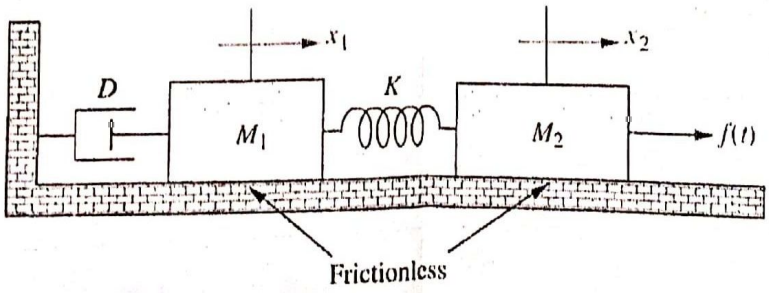
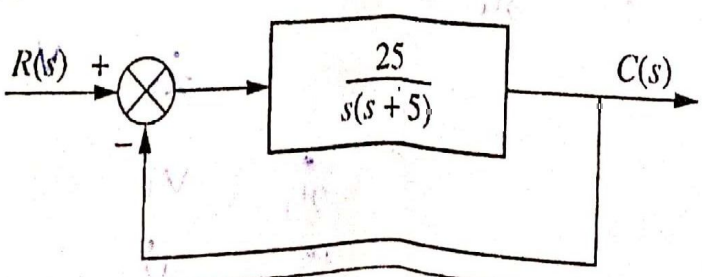
Student Name: M Husnain Abbas Reg. No. 2017-EE-434

EE340 Control Systems

Fall 2019, Session 2017 (05th Semester)
Mid-Term Exams

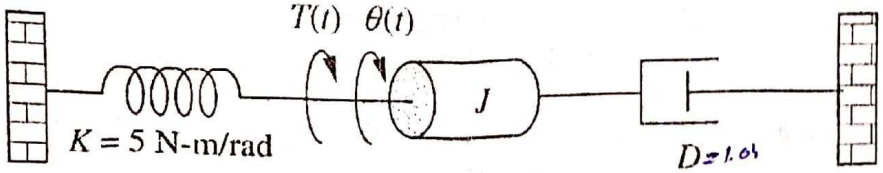
Time Allowed: 60 Minutes
Total Marks: 30

- All the related parts of a question must be solved together.
- Start solution of every new part on a new page.
- Raise your words, not your voice

Q.1				
	A	***Apply*** mason's rule to find the transfer function of the following signal-flow graph 	05	CLO1 PLO1, C3
	B	***Apply*** the state-space representation to find out the state equations in matrix form for the translational mechanical system given below. 	05	
	C	***Apply*** the state-space formulation for the feedback system given below to find the state space representation in phase variable form. 	06	

$$\frac{\frac{25}{s(s+5)}}{1+\frac{25}{s(s+5)}}$$

Student Name: Reg. No.

Q.2	A	***Select*** the values of J and D to yield 20% overshoot and a settling time of 2 sec for a step input of torque T(t) for the system given below 	07	CLO2	PLO3, C5
	B	***Evaluate*** the natural frequency, damping ratio, settling time and rise time, rise time of the system whose transfer function is given below and if the response is underdamped also find the peak time and percentage overshoot for the system $$G(s) = \frac{361}{s^2 + 16s + 361}.$$	07		

Damping ratio	Normalized rise time
0.1	1.104
0.2	1.203
0.3	1.321
0.4	1.463
0.5	1.638
0.6	1.854
0.7	2.126
0.8	2.467
0.9	2.883

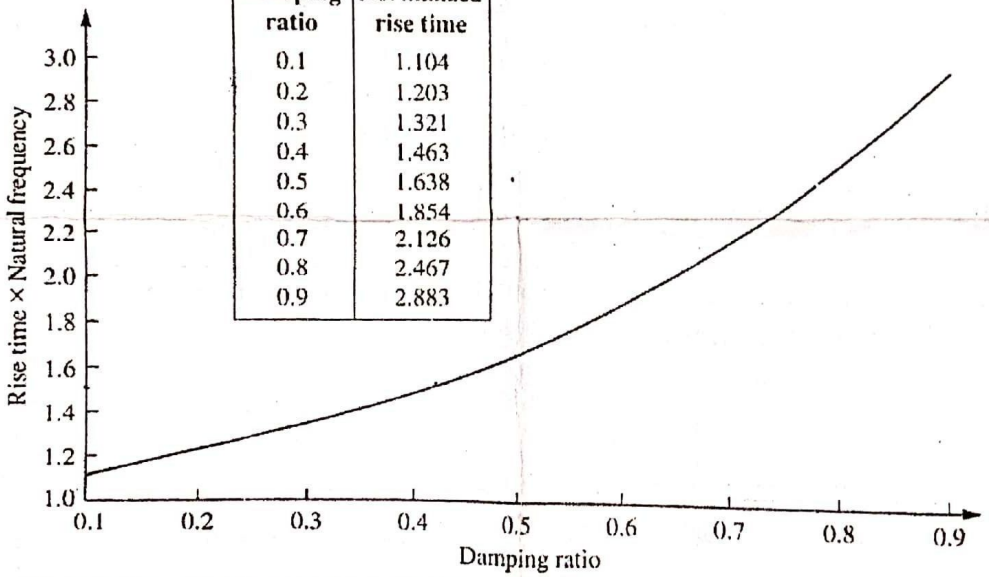


Figure 1: Normalized rise time versus damping ratio for a second order underdamped response.

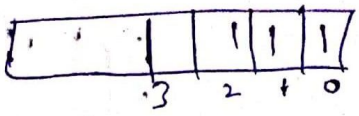
$x_1 = x_1$
$\dot{x}_1 = x_2$

so $\dot{x}_1 = x_2$

Let
$\ddot{x}_1 = \dot{V}_1$
$\dot{x}_1 = V_1$

so
$\dot{x}_1 = V_1$
$\ddot{x}_1 = \dot{V}_1$

and
$\dot{x}_2 = V_2$
$\ddot{x}_2 = \dot{V}_2$



Electrical Engineering Department
UET, FSD Campus

MID Exam **Date:30-10-2019** **EE-273 Microprocessor Systems** **Reg. No. 2017-EE-434**
Time: 60 minutes, Marks=30 **5th Semester (Session 2017)**

Q1	List different methods that can be used for debugging an embedded system. Also explain the job of an assembler. Can the object code generated by an assembler be executed directly without linking.	CLO1	Cognitive Level 1 PLO1	04
Q2	The processor uses multiple buses including ICode, DCode, and System bus to access different regions in the memory address space. Which of these buses is used to access data memory region? Also Draw the block diagram of the system Bus for memory, peripherals and debug interfaces.	CLO2	Cognitive Level 2 PLO1	06
Q3	Give two different assembly procedures to clear register R5 to zero. You may not use any register other than R5	CLO3	Cognitive Level 6 PLO5	04
Q4	Develop an efficient assembly code that can implement the following expression. $X = Z/8 - Y$	CLO3	Cognitive Level 6 PLO5	06
Q5	Develop an assembly code that can perform 64-bit subtraction. Assume that the registers R1, R0 contain first operand while registers R4, R3 hold the second operand that is to be subtracted from the first operand.	CLO3	Cognitive Level 6 PLO5	04
Q6	Develop an assembly program to generate the sequence {1, 3, 9, 27, 81, 243} iteratively. The sequence can be generated using the relation, $S_t = 3S_{t-1}$, with initial value s0 = 1 and executing the relation for five iterations. The result at each iteration should be stored in the destination register, R3. After five iterations, when the program terminates, the contents of the destination register should look like as shown in figure below. R3 S_5 S_4 S_3 S_2 S_1 S_0	CLO3	Cognitive Level 6 PLO5	06

EE Department, UET, Lahore
Faisalabad Campus

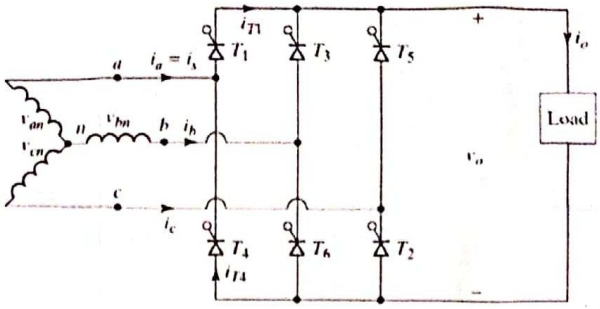
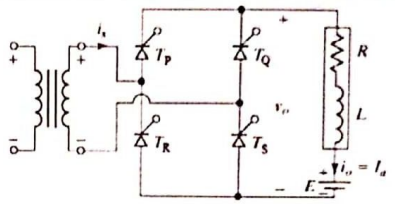
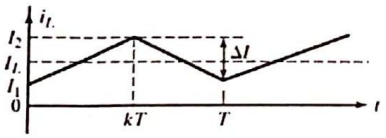
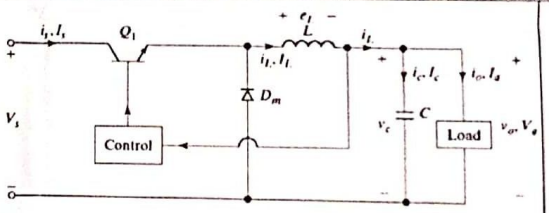
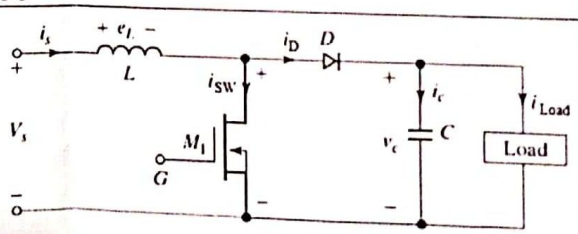
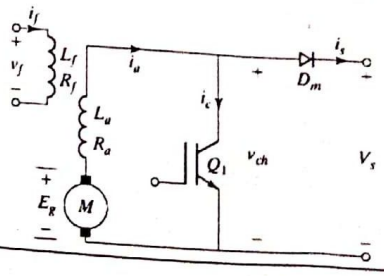
Reg. No. 2017-EE-434

EE312 Power Electronics

Comprehensive Exam (24 Aug. 2020, Session 2017)

Time Allowed: 180 Minutes
Total Marks: 70

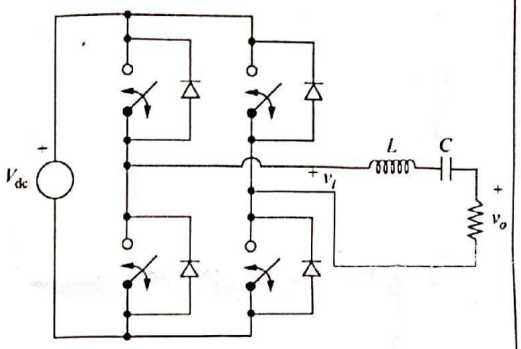
- Start solution of every new question on a new page.
- All the related parts of a question must be solved together.
- Time division suggestion – Q1- Q5 are like mid-term exam – solve in 60-70 mins

✓ Q.1	Consider a three phase full-wave converter as shown in the figure. It is operated from a three phase Y-connected supply with $V_{LL\text{-}rms} = 400V$, 50Hz $R_{Load} = 10\Omega$ The converter is operated with a firing angle $\alpha = 30°$. Analyze this system to calculate: a. The average i.e. dc value of load voltage. b. The rectification efficiency of the converter. For your ease, the equation for evaluating the rms output voltage, is being provided: $V_{rms} = \sqrt{3}\, V_m \left(\frac{1}{2} + \frac{3\sqrt{3}}{4\pi}\cos 2\alpha\right)^{1/2}$ Vm is peak value of line-neutral supply voltage. 	2 + 4	CLO1
✓ Q.2	For the analysis of a single phase, controlled rectifier as shown in the figure, sketch waveform one complete cycle of output voltage v_o for a firing angle α of 90°, when the circuit is in steady state. Assume a highly inductive load and a DC voltage source on the load side as shown. Furthermore, on the v_o waveform, clearly mention which pair of thyristors is conducting at what time – Thyristor names are given in the figure, use these names. 	4	
✓ Q.3	A DC/DC Buck converter is shown in the figure, Analyze this circuit and sketch its equivalent   circuits in on-state and off-state (i.e. mode 1 and mode 2) for the continuous conduction mode (CCM). Lastly, sketch one complete cycle of the inductor voltage e_L. Use the same polarity for e_L as shown in the figure. For your ease, the inductor current waveform is being given.	5	CLO2
✓ Q.4	Analyze the Boost DC/DC converter shown in the figure and sketch waveforms of one complete cycle for the following variables. Use the same direction for current as shown in the figure, and assume the converter to operate in steady state in continuous conduction mode. Also assume capacitor voltage to be smooth, ripple free. (a) i_S (b) i_D (c) i_C (d) i_{Load} (e) i_{SW} 	10	
✓ Q.5	A DC/DC converter is operating a DC motor in regenerative mode. The DC supply voltage is 500V, duty cycle k is 50% and the average armature current Ia is fixed at 250A. Analyze this system and calculate a. Average chopper Voltage V_{ch} b. The regenerated power P_g 	5	

Q.6 Design the LC filter for a single phase full bridge series resonant inverter as shown the figure. The load is 10 Ω – resistive and it requires a 1000-Hz, 100-Vrms sinusoidal voltage. The THD of the load voltage must be no more than 5 percent (include third harmonic only, ignore other harmonics). An adjustable dc source is available. Subsequent to designing your system, analyze its performance by evaluating the power delivered to the load at the fundamental frequency, and at the third harmonic frequency.
Relevant equations are being provided for your ease.

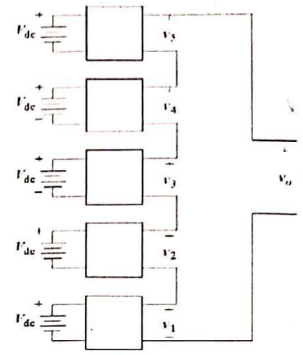
$$Q = \frac{\omega_0 L}{R} = \frac{1}{\omega_0 RC}$$

$$\frac{V_o}{V_i} = \frac{1}{\sqrt{1 + Q^2((\omega/\omega_0) - (\omega_0/\omega))^2}}$$



15 | CLO3

Q.7 A five source multi-level inverter is shown in the figure. Sketch its output voltage. Also sketch waveforms for individual voltages $v1$ – $v5$ while showing the concept of pattern swapping. Furthermore, write down simultaneous equations for delay angles that will eliminate harmonics 5, 7 and 11 from the output voltage v_o.

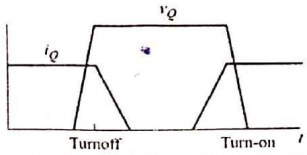


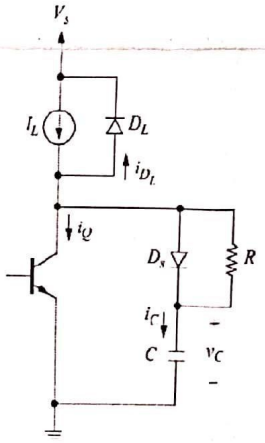
5

Q.8 a. A power MOSFET is connected in a circuit where it is dissipating 6.5W. A heat sink is connected with it. The ambient temperature is 30°C. The thermal resistances are given as follows. Calculate the junction temperature of this MOSFET and justify that the heat sink is functioning properly. $R_{JC} = 2.5°C/W$ $R_{CS} = 2°C/W$ $R_{SA} = 10°C/W$. $T_{J\text{-}max} = 150°C$.

3

b. A turn-off snubber circuit for a BJT is shown in the figure. An increase in the value of snubber capacitance lowers the power loss across the switch – justify this by sketching waveforms of transistor voltage v_Q, transistor current i_Q and the corresponding power loss p_Q for three different values of C i.e. small, medium and large. For your convenience, v_Q, and i_Q waveforms for the snubber-less circuit are being shown as under.





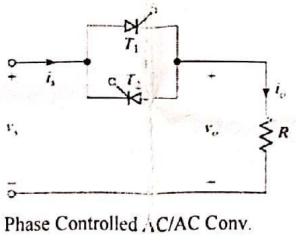
6 | CLO4

Q.9 Two options for AC/AC voltage control are shown. You have to answer the following questions.

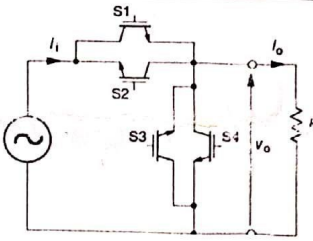
i. Which circuit is better in terms of ease-of-filtration for the harmonic content?

ii. Which circuit will have lower switching power loss?

Justify/Support each of your answers with detailed and valid arguments. (No marks without proper arguments)



Phase Controlled AC/AC Conv.



PWM AC/AC Conv.

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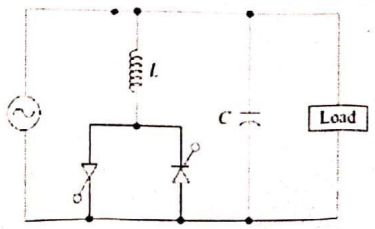
Q.10 Justify that the provided circuit can be used as a Static Var Compensator for loads of varying reactive power demand. (Assume that the load is always of lagging current). Only provide supporting arguments, any waveforms or equations are not necessary.



5

Electrical Engineering Department
UET, FSD Campus

Final Exam Date:26-12-2019 Time: 90 minutes, Marks=40	EE-273 Microprocessor Systems 5th Semester (Session 2017)	Reg. No. 2017-EE-434		
Q1	A timer is running from a clock frequency of 80 MHz. What would be the Resolution and Range of a 32-bit timer. Also draw the block diagram of the timer.	CLO3	Cognitive Level 4 PLO1	06
Q2	Explain the pull-up and pull-down transistor.	CLO3	Cognitive	04
Q3	Write C code to implement time-multiplexed 3-digit seven-segment display interfacing of common anode type. PORT A pins 2 to 4 (i.e., PA2 to PA5) are used for digit selection, while entire PORT B is interfaced with the eight pins corresponding to seven-segment connections and one dot point connection. Both Port A and B are configured are output ports. Port pin PF4 is configured as input and is used for user switch SW1 input. The switch is continuously scanned. On each switch press a counter variable labelled 'count' is incremented. The binary value of this counter is then converted to the equivalent BCD (binary coded decimal) value, which is displayed on the four-digit seven segment display. The counter is reset to 0 when its value exceeds the maximum three-digit value i.e. 999.	CLO3	Cognitive Level 6 PLO5	10
Q4	Draw the block diagram of the oscillators and clock configuration of the TM4C123 microcontroller.	CLO3	Cognitive	06
Q5	Explain the purpose of the RCGC and AFSEL registers.	CLO3	Cognitive	04
Q6	Write C code to control the seatbelt warning lamp of a car dashboard. • Port PA6 is connected to the seatbelt switch that indicates whether the seatbelt is fastened. • Port PF7 is connected to the safety warning indicator LED. Your system is supposed to turn on the LED if the seatbelt is not fastened.	CLO3	Cognitive Level 6 PLO 5	10

Register Addresses

GPIO Port A 0x40004000
GPIO Port B 0x40005000
GPIO Port F 0x40025000

Register	*Offset*
GPIO AFSEL	0x420
GPIO DEN	0x51C
GPIO DIR	0x400
GPIO PUR	0x510
GPIO PDR	0x514

Seven Segment Display Decoding

0	0xC0	8	0x80
1	0xF9	9	0x90
2	0xA4	A	0x88
3	0xB0	B	0x83
4	0x99	C	0xC0
5	0x92	D	0xA1
6	0x82	E	0x86
7	0xF8	F	0x8E

Mid Term Examination

Department of Electrical, Electronics and Telecommunication Engineering

Entrepreneurship MGT-414

Total Marks 30 **Time: 01 h**

Question.1 CLO 1

Discuss the ways an entrepreneur can adopt to avoid failures (4)

Question.2 CLO 1

How creativity can be enhanced (4)

Question. 3 CLO 1 (10)

What are advantages and disadvantages of partnership? Briefly discuss how we can make a partnership work

Question. 4 CLO 2 (6)

Discuss the right way to buy a franchise

Question. 5 CLO 2 (6)

What are myths of franchising?

Department of Electrical, Electronics & Telecom Engineering
UET (Lahore) Faisalabad Campus

Student Name: M Hussain Abbas Reg. No. 2017-EE-434

EE439 Introduction to Machine Learning

Spring 2021, Session 2017 (08th Semester)
Final Exams

- All the related parts of a question must be solved together.
- Start solution of every new part on a new page.

Time Allowed: 90 Minutes
Total Marks: 40

Q.1	A	A real-valued data set is given as: $X = \{1, 3, 5, 7, 8, 9, 12, 13, 15\}$ Assuming that the data belongs to only two classes, ***apply*** *k-means* clustering algorithm on the given data set to identify each class cluster. The initial mean values for two clusters are 5 and 6. Write down each step of the algorithm to point of finding each cluster data values.	10	CLO2	PLO3, C3
	B	Consider the given data set: X = {0.5, 0.7, 0.9, 1.8, 2.3, 6.2, 6.3, 7.4} ***Apply*** non-parametric machine learning algorithms for probability density estimation. (1) *Histogram Estimator* (2) *Naive Estimator* For each algorithm, use following bin sizes. (i) h=2 (ii) h=1 **Apply** *k-Nearest Neighbor* (k-NN) algorithm on the same data set for (i) k = 5 (ii) k = 3 Perform all the calculations and show estimation graphs.	15		
	C	Consider a Multi-Layer Perceptron (MLP) having one hidden layer with one node where activation function is Sigmoid of input layer. ***Apply*** at least two iterations of Back-Propagation algorithm for Neural Network training with initial data values given as: Input Layer: $x_0 = 0.32$, $w_0 = 0.09$, $x_1 = 0.1$, $w_1 = 0.19$ Hidden Layer: $z_0 = 0.59$, z_1 = Sigmoid(*inputLayer*), $v_0 = 0.29$, $v_1 = 0.41$ Learning rate: eta = 0.7 Output Label: for the given input data, the output should be 1, i.e. 'r = 1'.	15		

Final Term Examination

Department of Electrical, Electronics and Telecommunication Engineering

EntrepreneurshipMGT-414

Total Marks 40 **Time: 1.5 h**

Question. 1 CLO 2

Discuss the steps in acquiring an existing business (10)

Question.2 CLO 3

Explain value of market research and what are best ways to do market research (10)

Question. 3 CLO 2

Which five aspects of businesses should be examinedto define companies' competitive advantages? (6)

Question. 4 CLO 3

Discuses steps in breakeven analysis of a company (6)

Question. 5 CLO 3

Discuss the strategic management process? (8)

Q1. Analyze the time axis of the given signal (fig1) and apply signal reversal operations to find the g(-t). **(3)**

Q2. Differentiate between energy and power signals. **(2)**

Q3. Apply the mathematical tool to find similarity and **analyze** the correlation coefficient for x(t) and g(t). (fig2) **(5)**

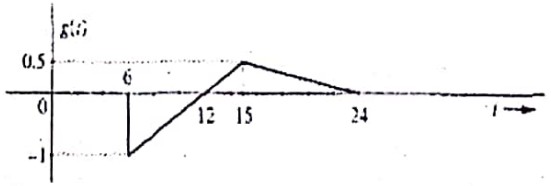
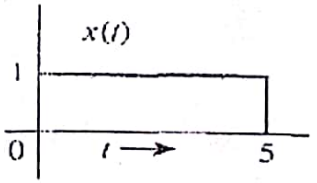


Figure1



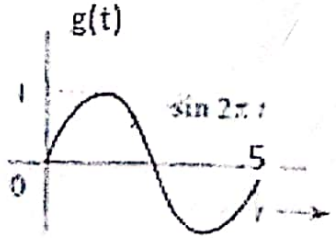


Figure 2