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F i x ') = 2 ta n 2 x + s in 2 x (a) 4 tan x + 2 sin x (b) 2 s2 x + co s2 x (c) 4 ta n x x x x)A(.Q2 .'snoitauqE laitnereffiD' fo yrogetac eht rednu sllaf melborp sih T .noitanimaxe gnirud seenimaxe ot elbaliava lairetam ecnerefer ylno eht eb lliw koobdnaH ecnerefeR EF ®SEECN taht eton ot tnatrop mi si tI .smaxe EP dna EF rof lairetam yduts lufesu fo kcal f o esuaceb ylira mirp gnignellahc saw erusneci ot daor ehT .airetirc ztiwruH htuor R gnisu metsys nevig a f o ytilibats eni mreted ot woh nraeL ¢â .)noitacificepS EF ®SEECN ot gnidrocca(maxe eht no detcepxe eb nac snoitseuq 9 - 6 ¢Â noitces siht tuoba stca F ecnatcudnI ecnaticapa C dleif cirtcele ni enod kro W secrof citatsortcel And rewop,egatlov ,tnerruc ,ygrene ,egrahC taeh ,rewop ,ygrene, Work 202-002 gnireenignE retupmoC dna lacirtceleE # egaP noitceS stpecnoC koobdnaH ecnerefeR EF ®SEECN *saer The egdelwonK yeK secneicS gnireenignE - 6 # retpahC 8102) : ; ; ; ; ; ; ; ; ; ; ; ; ; ; ; Fi| 057 A)c 6.11 melborP RAVk 0)D(RAVk 51)C(RAVk 331)B(RAVk 33)A(V°03/021 = naV fi metsys detcennoc -Y>4 3 decnalab a fo segatlov enil etaluclaC)a 2.11 melbor P snoitseuq eseht gnivlos elihw 205 - 302 segaP - koobdnaH ecnerefeR EF ®SEECN tlusnoC noitubirtsiD & noissimsnarT/rewoP esahP eerhT - 2.11 # teS melborP 05 8102 ©Â lairetaM dethgirypoC 39 Q j66.1)D(0 5)C(Q j6.0 + 5)B(0 j2 - 5)A(APQ/1 tfj- 02 .snoitcurtsni neercsno eht gniwollof dna tnuocca SEECNyM ruoy ot ni gniggolb ER eht ni rof retsigeR .stpmetta tsrif ni smaxe htob destap misa W .noitcnuf gni wollof fo avitodevired eht etaluclaC)b 5.1 melborP 0)D(x soc x nis 2 + xI 2=y2i= -S/10 (B) yn=y 22=S/5 , y i 2=y2i= -S/20 (C) yn=y 22=S/5 , y12=^21= -S/10 (D) yn=y 22=S/10 / y12=^21= -S/10 Problem 8.5 c) Calculate the parameters and the o-port network of the tw work of the tw 5.4f) ANSWER CORRETO - B Heat capacity is directly proportional quantity of material. Probability of a customer who prefers online shopping X = P(X) = 0.20 Probability of a customer who prefers purchases in the store Y = P(Y) = 0.80 Probability of the online client X under 30 years of age = P(S |X) = 0.50 Customer probability in the store Y under 30 years of age = P(S |Y) = 0.40 The randomly selected customer probability below 30 years of age preferring online purchases (X). According to the normal distribution table of the unit given in NCEES® Reference Manual FE: P{Z > 2) = R{ 2) - 0.0228 Useful Tip - Learn how to use the normal distribution table provided in the Reference Manual NCEES® FE. • Adding Mathem Acts, Probability and Statistics, Ethics and Professional Practice and Engineering Economy, resulting in total coverage of all 18 exam sections. NCEES® is a registered trademark of the National Council of Examiners for Engineering and Research. 4V r\ 10V (A) 0 mA (B) 0.44 mA (C) 1.5 mA (D) 0.75 mA 85 Material Authorized © 2018 Trouble Set # 10.5 - Operating Amps See NCEES® FE Reference Manual - Page 212 when solving these issues Problem 10.5 a) Find the output voltage Vo in the circuit shown below. x = No. of tournament successes. E V = E x d = 1000 VwT1 x 200m = 200 kV 6.2d) CORRECT ANSWER - 9.8 X 10~5C According to details of the problem, the weight of the load is being balanced by electrostatic force. 14.3b) ANSWER - D Minimum bandwidth for PCM message transmission can be calculated using the following formula. + 1 /Rn) • Equivalent in the Ls series = Lt + L 2 + L 3 .... (C) and " (5+a) ' (B) p -is+ a) f f o mrofsnart ecalpaL osrevni o ertnocnE)f 3.8 melborP 8102 ©Â odazirotuA lairetaM 95 â a +s ing function: F (s) = (A) 3 e -3t + Se~5t 5 (s + 3) + (s + 5) (B) e~4t (C) 2e~et (D) je ¢ÃÂÂ 4t Problem 8.3 g) Find the inverse Laplace transform o f follow ing function: s+8 F (s) (A) e~8t + (s + l) (s + 7) ¢ÃÂÂ e~7t (C) - (7 e - t ¢ÃÂÂ e~7t) 6 (B) e~z + e~7t (D) Se~7t ¢ÃÂÂ 8 e _t Problem 8.3 h) Find the inverse Laplace transform o f follow ing function: F{s) = (A)-^ - ¢ÃÂÂ - e 2t + - e 3t 6 2 3 (C) te~2te~3t S 2 + 25 + 1 (s + 2) (s) (s + 3) (B) e 2t + e 3 t+ 3 (D) 6{t)(e-2t + e " 3t) Problem 8 .3 1) Find the inverse Laplace transform o f follow ing function: F (s) = (A)5e~ 5t + i + j (C) ~ u { t) + ^ t ~ ^ e ~ 5t s+ 4 (s 2) (s + 5) (B) ^e~5 t-h~t (D) 25 u (t) - e~5t 60 Copyrighted Material Ã©Â 2018 Problem Set # 8.4 - Transfer functions Consult NCEESÃ®Â FE Reference Handbook - Pages 203 - 204 while solving these questions Problem 8.4 a) Calculate voltage transfer function for the circuit shown below. = 8.85 x 10_11F d 0.1 m CV2 (8.85 x 10-11F)(2 0 0 7)2 = 1--------------- ¢ÃÂÂ --------¢ÃÂÂ = 1.77 x 10 ~6J 2 2 J 6.1g) CORRECT ANSWER - B Work done by an external agent in moving charge Q from PI to P2 in an electric field is given by: fP2 W = - Q \ E.dl Jpi Note that charge is moved along y-axis and electric field is along x-axis. ¢ÃÂ¢Â Review relevant concepts using college/university textbooks. Problem 11.4 d) Q impedance is seen by transform er primary in the figure shown below. Let us now assume that D1 is ON and D2 is OFF. ¢ÃÂÂ j-j .... Now you should start solving non-flagged questions followed by flagged questions. Printed by CreateSpace, An Amazon.com Company ISBN-13: 978-1985699717 ISBN-10:1985699710 Table of Contents Preface 1 About the author 3 Chapter # 1 - Mathematics 4 Problem Set # 1.1 - Algebra and Trigonometry 5 Problem Set # 1.2 - Complex Numbers 7 Problem Set # 1.3 - Discrete Mathematics and Progressions 8 Problem Set # 1.4 - Analytic Geometry 10 Problem Set # 1.5 - Calculus 12 Problem Set # - Differential equations 15 Trouble Set # 1.7 - Matrix and Vector Analysis 16 Chapter #2 - Probability and Statistics 18 Troubleshooting set # 2.1 - Central trend measurements 19 Troubleshooting set # 2.2 - Probability Distributions 20 Troubleshooting set # 2.3 - Expected values & Estimation for a single average 21 Chapter # 3 - Ethics and Professional Practice 23 Trouble set # 3.1 - Codes of Ethics & NCEES® Model Law and Rules 24 Troubleshooting set # 3.2 - Intellectual Property 26 Chapter # 4 - Engineering Economy 27 Trouble set # 4.1 - Value of money time 28 Trouble Set # 4.2 - Estimation of costs 29 Troubleshooting set # 4.3 - Identification and risk analysis 30 Chapter # 5 - Electrical Material Properties 31 Trouble set # 5.1 - Chemical Properties 32 Trouble set #5.2 - Electric properties 33 Trouble set #5.3 - Mechanical properties 34 Trouble set # 5.4 - Thermal properties 35 Chapter # 6 - Engineering Science 36 Trouble Set # 6.1 - Work, Energy, Power 37 Trouble set # 6.2 - Electrostatics 39 Trouble Set # 6.3 - Capacitance 40 Trouble Set # 6.4 - Inductance 41 Chapter # 7 - Circuit Analysis 42 Troubleshooting set # 7.1 - Kirchoffs Trouble Sets #8 - Trouble Sets #8 - Trouble Set #8 - Trouble Set #8 - Trouble Set #8- BJTS 80 Problem Set # 10.4 - MOSFETS 83 Problem Set # 10.5 - Operational Amplifiers 86 Problem Set # 10.6 - Instrumentation 88 Problem Set # 10.7 - Power Electronics 90 Chapter # 1 - Power 91 Set Problems # 11.1 Set # 11.2 - Power/Transmission and Truffan Distribution 94 Problem Set # 11.3 - Tension Regulation 96 Problem Set # 11.4 - Transformers 97 Problem Set # 11.5 - Engines and Generators 98 Problem Set # 11.6 - Potan Factor 99 Chapter # 12 - Electromagnetics 100 Problem Set # 12.1 - Maxwell Equals 101 Problem Set # 12.2 - Problem Problem and Propagation Problem Set O 104 Problem Set # 12.4 - Electromagnã Compatibility © Tica 105 Chapter # 13 - Control Systems 106 Problem Set # 13.1 - Block Diagrams Diagrams 107 Problem Set # 13.2 - BODE GREATIALS 110 Problem # 13.3 - Stabilized State Errors 113 Problem Set # 13.4 - Reth -Hurwitz Critent and System Stability 115 Problem Set # 13.5 - Root Locus 116 Problem Set # 13 .6 State 121 Chapter # 1 4 - Communication 123 Problem Set # 14.1 - Amplitude Modulation 124 Problem Set # 14.2 - Modulation of the Oblus 126 Problem Set # 14.3 - Module. PULSE CODE (PCM) and MODULATION OF PULSE AMPLITION (PAM) 127 Define Problems # 14.4 - Fourier Transforms 128 Problem Set # 14.5 - Multiplexion 129 Chapter # 1 5 - Network From Computer 130 Problem Set # 15.1 - Routing and Compassion 131 Problem Set # 15.2 - Topologies / Frameworks / Models 132 Problem Set # 15.3 - Local Office Networks 133 Chapter # 16 - Digital Systems 134 Problem Set # 16.1 - UNTORY SYSTEMS 135 Problem Set # 16.2 - Boolean wool 136 # 16.3 - Logic Gates 137 Problem Set # 16.4 - Karnaugh Maps 139 Problem Set # 16.5 - Flip -Flops and Accountants 141 Problem Set # 16.6 - State Mother's Design 144 Chapter # 1 - Computer Systems 146 Problem Set # 17.1 - Architecture and Interface 147 Problem Set # 17.2- Microprocessor 149 Problem Set # 17.3 - - 762-562 sanig¡ÃP san odartnocne res edop emaxe O* .EF ®Â SEEECN od aicnªÃrefeR od launaM od amica sanig¡ÃP san odartnocne sotiecnoc redneerpmoC ¢Â ¬â ¢Ã oÃ§Ães atsed oÃ§Ãaraperp a arap saciD .artsoma ad rolav ronem o e roiam o ertne aÃ§Ãnerefid a ¢Â ¬â ¢Ã artsoma ed olavretni o ,EF °Â SEEECN od aicnªÃrefer ed launam o odad ,oÃ§Ãulos a ,otnatroP .oÃ§Ãinifed a moc odroca eD 011- aterroc atsopseR)i1.2 .V ¢Â ¬â ¢Ã .largetni opmet me ohlabart o moc adatnemelpmoc iof euq ,)3102(otnoroT fo ytisrevinU ad smetsyS rewoP - gnireenignE fo retsA M e)0102(¡ÃdanaC ,notlimaH ,ytisrevinU retsA MC M ad oÃ§Ãnitsid moc ocirt©Ãle - airahnegne me lerahcab ©Ã elE .esaf ed etnerroc ad NAL a eluclaC .gni ed oÃ§Ãnuf a agiS ed ecalpaL ed oÃ§Ãamrofsnart a ertnocnE)d 3.8 amelborP 2)a + s(5 ¬â ¢Ã k y a + s( )d(2)a- s(}2)a + s \ j 1)------- -1)a+st ~ e)c(^ 1 1 ---(/)a+s(-( )a+s(-e l +2)a+s(* ' a+s .asioc artuo reuqlauq me omoc EF ®Â¢ÃSEECN emaxe od oÃ§Ãavorpa Ã lev¡Ãcilpa oÃt ©Ã 'oÃ§Ãiefrep a anrot acit¡Ãrp A' oic¡ÃferP 803 erawtfoS ed otnemivlovneseD - 81# olutÃpaC 303 rodatupmoC ed sametsiS - 71# olutÃpaC 392 siatigiD sametsiS - 61 # olutÃpaC 092 serodatupmoc ed sedeR - 51 # olutÃpaC 482 seµÃ§Ãacinumoc - 41 # OLUTÃPAC 372 ELORTNOC ED SAMETSIS - 31 # OLUTÃPAC 462 SCITENGAMORTELE - 21 # OLUTÃPAC 352 REWOP - 11 # olutÃpaC 732 acin´ÃrtelE - 01 # olutÃpaC 822 lanis ed otnemassecorP - 9 # OLUTÃPAC 912 SAMETSIS raeniL - 8# olutÃpaC 012 otiucriC ed esil¡ÃnA - 7# olutÃpaC 502 airahnegnE ad saicnªÃiC - 6# olutÃpaC 102 socirt©ÃlE siairetaM sod sedadeirporP - 5# olutÃpaC 591 airahnegnE ed aimonocE - 4# olutÃpaC 291 lanoissiforP acit¡ÃrP e acitÃ - 3# olutÃpaC 481 acitsÃtatsE e edadilibaborP - 2 # olutÃpaC 161 acit¡ÃmetaM - 1 # olutÃpaC 651 seµÃ§ÃuloS 451 etset/oÃ§Ãatnemelpmi/erawtfos ed ngised ed sodot©ÃM - 3.81 # samelborp ed otnujnoC 351 sodad ed saruturtsE - 2.81 # samelborp ed otnujnoC 251 somtiroglA - 1.81 # samelborp ed otnujnoC 151 erawtfos ed otnemivlovneseD - 8 1 # olutÃpaC 051 sametsis e aigolonceT Reference Manual Fe Nceees. Learn more about using the FE exam as a result assessment tool. (A) 40 m2 (b) 10 m2 (c) 20 m2 (d) 8 m2 m2 1.4 n Which of the following geometric etric shapes will have higher volume and liquid as long as they have the same radius and height? INSTITUTIONS This book is developed to help the reader in the preparation of Electrical examination and FE Computer. 184 Copyrighted Material © 2018 2.1e) ANSWER CORRECT - 6.9 The average square of the sample root is calculated using the equation given below: s = N s = s = \ Y * —(32 + 52 + 62 + l 2) 4 M 1 - (9 + 25 + 36 + 121) = 6.9 4 M 2.If) - 3 We will first organize the data provided in ascending order. 1ma §ua 87 Copyrighted Material © 2018 Troubleshooting set # 10.6 - Instrumentation See the Reference Manual NCEES® FE - Pages 124 -126 when solving these issues Problem 10.6 a)___________ is not an example of a transducer. It is easier to turn y[n] to y [—k]. For better understanding, it is recommended to review examples of binomial distribution and practical problems. + L n • Equivalent in parallel Lp = 1/(1/Lt + 1 / L 2 + 1 / L 3 .... (A) 10 Q (B) 12 Q (C) - j Q (D) 12-j Q Problem 11.1 g) Determine the impedance 'Z' required for maximum power transfer. / (x) = 4 x 2 + 6x + 2 y 2 (A) 8 x + 6 (B) 8 x + 6 + (C) 4 x + 6 + 2y 4y (D) 0 Problem 1.5 c) Calculate the derivative function the following f. (A) y = 3x + 12 (B) y = 2 x + 10 (C) y = 2x + 6 (D) y = 3x + 10 Problem 1.4 c) Equation the f the straight line with a slope the f 2 and intercept the f -5 is ________ . • The two-door parameters require a suitable force of current voltage and conditions. Find the new resistance the f this RTD if placed on a 35° Environment C. 2 y " + 4y' + 8y = 0 Divide the equation given by 2 to convert in standard form y " + 2y ' + 4 y = 0 We can use the method of non-determined coefficients, as explained in NCEES® Reference Manual FE. Find the expression for voltage at 100 m. According to the Reference Manual NCEES® FE, the Bayes' The theorem is given byshown below: p (b lq p (aj) is the probability probability si ti,seiroeht dna stpecnoc railimafnu gnivlovni sesac lla nI .tpmetta tsrif eht ni smelborp lla evlos ot elba eb ton yam uoY .woleb nwohs tiucric eht ni xl tnerruc etaluclaC)d 1.7 melborP 8102 _____ vC^ yb nevig si roticapac a ni derots ygrenE B - REWSNA TCERROC)c3.6 ?) : : : : : : : : : : : : : : : : ; edoB stolP 0 3 1 - 921 odatse od siev¡ÃiraV 821 edadilibatsE 921 sucoL tooR lortnoC e tne merusaE M ,noitatnemurtsnI 821 srorrE etatS ydaetS 721 pool-nepo atsopser / pool-desolC 721 samargaid ocolB # oÃ§ÃeS sotiecnoC koobdnaH aicnªÃrefeR EF ®ÃSEECN *evahc otnemicehnoc ed saerÃ elortnoc ed sametsiS - 31 # olutÃpaC 8102 ©Â dethgirypoC amica siairetam 105 so sodsoT)D(megadnilb)C(erawdrah od aicn¢Ãdnuder)B(otnemalpoca ed ohnimac od oÃ§Ãarapes a ratnemua)A(____ y b sodagitim res medop mortele od acitenga aicnªÃrefretni ad sovitagen sotiefE)e 4.21 oterroc amelborp sodot oÃs C e B ,A seµÃ§ÃpO)D(ocra ed megadlos)C(ogapm¢Ãler)B(socirt©Ãle serotom)A(____ e d ul c me edadilibitap ed samelborp moc citenga mortcele f o)s(laicnetop)s(etnoF)d 4.21 melborP mito odaila arepo)D(oÃ§Ãacinumoc a atilicaf)C(is ed ortned mortele citenga aicnªÃrefretni ebixe)B(anretxe aicnªÃrefretni arap enu m mi ©Ã)A(____ klat-ssorc moc ametsis mU)c 4.21 melborP ateloiv artlu oÃ§Ãisopxe artnoc aÃ§Ãnaruges)D(sanretxe sacit©Ãngamortele saicnªÃrefretni rative)C(zacife otnemarreta ritimrep)B(lanoicida acisÃf oÃ§Ãetorp recenrof)A(_________________ o t atief ©Ã acit©Ãngamortele megadnilb A)b 4.21 melborP otnemalpoca ed sohnimac oÃs C e B ,A seµÃ§ÃpO)D(oviticapaC)C(ovitudnoC)B(ovitudnI)A(.rerroca o aÃ§Ãsorroc a arap soir¡Ãssecen oÃs otil³Ãrtele mu e odot¡Ãc ,odon¢Ã)06 anig¡ÃP(aicnªÃrefeR ed launaM ®ÃSEECN moc odroca eD A - REWSNA OTERROC)c1.5 .air¡Ãssecen oÃ§Ãsneerpmoc rahnag arap odºÃetnoc lat reaisuqesp arap eved eved ªÃcov omoc erbos otnemaicnecil ed ohlesnoc ues o arap sacifÃcepse seµÃ§Ãamrofni meulcni sodatluser sO .oxiaba odartsom CLR ed otiucric o lauto a oÃ§Ãailpma ed rotaf o eluclaC)e 2.8 amelborP 8102 ©Â lairetaM dethgirypoC 75 ©Ã)c2.8 amelborp on erroco amix¡Ãm etnerroc a euq me aicnªÃuqerf A)d 2,8 amelborP A 5,7)D(A 5)C(A 21)B(A 4)A(Hm01 QOt FjjQI .)oÃ§ÃacificepsE EF ®ÂSEECN moc odroca ed(emaxe on sadarepse res medop satnugrep 9 - 6 ¢â oÃ§Ães atse erbos sotaF 802 retup moC e acirt©ÃlE based on your performance. (A) 1250 VM (B) -5963 VM (C) 3750 VM (D) 410 VM Issue 12.1 e) Calculate the value of "a" given that f? ^Option a = $ 200,000 for p t io n b = $5,000 x fvtionC = $ 100,000 x 10%, L O) + $ 160,000 = $5,000 x 15.9374 + $ 160,000 = $ 239,687 10%, 10) = $ 100,000 x 2,537 = $ 259,370 It is to be observed Offers the best return of investment. 1 TS ~ 30 KHz TS = 33.3 | XS 14.3E) Correct answer - D Quantization, coding and sampling are part of the pulse code modulation process (PCM). (A) LE = 0 mA, v ec = 5 v (b) le = 0 mA, v ec = 10 v (c) le = 3,2 ma, v ec = 5,1 v (d) le = 1.5 ma, v ec = 7.5 V Problem 10.3 f) Calculate current band voltage (a) | and = 0 a, Vec = 0 V (c) LE = 3,3 Ma, Vec = 2 VEC to BJT shown in the circuit given below. • The difficulty level of this section is classified as Easy7 by the author. The hardness of the material is tested by tooth. The specific heat capacity of the three samples will be equal. Printed practice exams can be returned to NCEEs under unused conditions within 30 days from the date you receive them. The FE exam is a computer-based examination administered all year in the Pearson Vue test centers approved by the NCEES. 0 + 2 '1 = 0 + 0 0 .2 1 + 0 g ^ r (s) w y ^ s) - i + g i (5) g 2 (5) jv (5) t g 2 & l (s) l + g ^ t ffs) _ g1 (s) g2 (s) G2 (5) â€, m € Ž r. MalleAbility is the ability to convert into thin sheets (such as gold, silver and aluminum). Calculate the magnitude of the reactive power that should be provided to increase the power factor for the unit. (A) 8.85 x 1 0 11 j (b) 1.33 x 10 3 j (c) 3.54 x 10 ~ 6 j (d) 1,77 x 10 ~ 6 J 37 Copyright-protected material © 2018 Problem 6.1 G) Calculate the Work sample carried out in the handling of a load q i = 10 x 10 ~ 9 c 2 cm along the yaxis in an electric field of 200 V/m ax. 10kq 20kq (a) 2.5 V (b) 1,98 V (c) 1 V (d) SOKO 5.5 V Problem 10.6Calcule a tensã £ o entre 10 kq resistor no problem 10.6 f) se for usado um eter de 500 kq voltm. ikfl 5kq aaar m m rof spiT .erutcurtsarfnI dna gniniM ,ygrenE ni stneilc gnidael rof gnireenigne tnalp dna gninoissimmoc ,ngised ,noitcudorp ni ecneirepxe gnitlusnoc htiw)gnE .koobdnaH ecnerefeR EF Â®ÃSEECN ni nevig salumrof seulav detcepxe dna noitcnuf noitubirtsid evitalumuc ,noitcnuf ytisned ytilibaborp weiveR - pit lufpleH 81.3 =)2 + 4 x 3 ( ) ( )4 (+)2 + 3 x 3 ( )3 (+)2 + 2 x 3 ( )2 (= 1 x[â£â , k)3 o /3x +)2 o /2 x +) i o / i * =)ko/cfx ^ = 1 E 11 :Koobdnah Ecnerefer Ef â®ã,ure ot ot gnorc Rahgsa Misaw yb 8102 â©ã, Tgirypoc .trapa m 1 era taht c 6~01 x 001 = Hc dna c 6"01 x 05 = i q segrahc sniatnoc a metsys)d 1.6 Melborp 1.6 Melborp x 42.6)c(61 x x 21.3)b(61 01 x 65.1)a(.woleb nevig noitauqe hguorht tneiciffoc noisuffodte ot detail â€â€â s.) 06 06 to see(mpr 0081 fo fo fo fo fo fo ssuonorhcnys htw roto m Noitcudni V 084 >JC-3 Tneserp Seop FO Re bmun eht etaluclaC)a 5.11 melborP snoitseuq eseht gnivlos elihw 205 egaP - koobdnaH ecnerefeR EF Â®ÃSEECN tlusnoC srotareneG & srotoM - 5.11 # teS melborP 8102 Â©Ã lairetaM dethgirypoC 79 1:01 .woleb nwohs sa desu eb ot sdeen Ytreporp gnitfihs emit mfsnart reiruof 113 .e \ )/8(CNIS04 =))/8(CNIS8(5 â»ã, -------------- <) - (n5 Mrsnart Reiruof \1 / .k) T 3(2SOCâ"â€ã¢ = â£ yb nevig b dleif ybnahc y decudorp dleif cirtcele decudni f o lruclac)h x + x + 3)d I Zy 2â€â)(k)z 2 â€â€â€â€â 6(- ')2 y x 2 â€â€â€â€â€â 2(â€â€â X x x5 â€â)b(dleif citenam eht fo eht fo etenahc fo tary eht eht eht eht tuclac .woleb nwohs tiucric eht fo b-a slani mret neewteb ecnatsidser tnelaviuqe eht sât 810 shage 810 shage 9 5.1)c(ed 5.3)b(ed > ^ ^ ^ ^ ^ > ^) > , And woleb noitauqe yb nevig And dleif cirtcele in gnicudni si dleif citengam gnignahc A)g 1.21 melborP 8102 ©Â lairetaM dethgirypoC 101 B ronA rehtieN)D(B dna A htoB)C(B) B(A)A(kyx2 - j x 3 + i2 y2 = B k2 z 3 + j y + i2 x2 = A .koobdnaH ecnerefeR EF ®SEECN ni nevig salof MAP dna MCP weiveR - pit lufpleH slevel 128 = 72 = q 7 = n melborp nevig eht ot gnidroccA .3 2 r 6. 4 =A 2 :tnemetats melborp eht ot gnidroccA D - REWSNA TCERROC)f7.1 .koobdnaH ecnerefeR EF ®SEECN f the segap denoitne m evoba no dnuof stpecnoc dnatsrednUF/m). .... Calculate the potential difference. Third Round - Depending on the amount of TIM and left on the exam, try to resolve the remaining questions or apply the all -elimination motto. (A) 3 + 4J (b) 5/5 3 ° (c) 5/3 t (d) 8/7 ° Problem 1.2 b) When the following options represent (4 + 4y) /(2 + 3J) in polar form? v. 181 Copyright protected material © 2018 1.7E) Correct answer - 1 7 _5_ 14 2 7 The inverse matrix is calculated using the following equation [4 [2 a- i = adj (a) _ ad) B 5] R 6 6] _ L '2 [6J mm -5 4 14] 5 6/14 -2/14 -5/1 4 4/14. P o in t a co, 0, 0) 1st problem 12.1 m) A current transport wire in the air is generating magnetic flow density 0.1 t to a 20 cm radial distance. Acknowledgments that I am really grateful to the support offered by these people who are nodded: ¢ â Â ¢ MO - Farhat, always believing in my skills - Fath er -a sg h ar, for providing me with the foundation To achieve my goals ¢ â Â œ Â ¢ W IFE - AMNA, for being part of my dreams - sister £ o - for providing containing assistance throughout the life cycle of this project is ¢ â Â ¢ Uncle - Jawad, for being a great friend and more over the years of dedication this book is dedicated to my late Aunt Nighat Parveen and the late grandma standing. my infancy. ¢ â Â ours Transfer Functions must be converted into a standard form to calculate gain, pages and zeros. R N (A) R + ^ \ K R + SLL \ R) (B) FI + I || SI || FL (C) I || SZ, || R (D) R + Â ± + SL \\ r Problem 8.4 d) Calculate zero (s), pule (s) and magnitude gain to follow the transfer function: 20 h ~ (s) (s) (s) 0 s + 1) (a) pages @ 0 and 10, zero - none, gain = 20 db (b) pages @ 0 and 0.1, zero - none, gain = 26 db (c) p. @ 0, zero @ 10, gain = 2 db (d) p. None, zero @ 0 and 0.1, gain = 6 db problem 8.4 e) Calculate zero (s), pipe (s) and magnitude gain to follow @ @ medro ªÂ1 sol³ÃP)B (Bd 01 = ohnag ,muhnen - orez ,5 e 0 @ sol³ÃP)a( )l + s5(2)0 01 :aicnªÃrefsnart ed .V °Â 03/021 = adatcenoc megiro ed naV - y >fc 3 adarbiliuqe avitisop amu a odatcenoc ©Ã q j5 + 02 = ,jcz moc adatcenoc agrac -y >| c -3 mU)b 2.11 amelborP V °Â 081/021 ,V 0q6-/q21 ,V °Â 06/021)d(V °Â 081/802 ,V °Â 06-/802 ,V °Â 06/802)C(V °Â 051/021 ,V 0q3-/q21 ,V °Â 03/802)B(V °Â 051/021 ,V 0q3-/q21 ,V °Â 03/021)A(.V 052,0+ F ed oÃ§Ãrdap oÃ§Ãadixo ed laicnetop mu iussop leuqÃn o otnauqne ,V 367.0+ ed oÃ§Ãrdap oÃ§Ãadixo ed laicnetop mu iussop ocniZ o ,®Â¢ÃSEECN od aicnªÃrefeR ed launaM od 95 anig¡Ãp an alebat a moc odroca eD .i = m oi | | m 2)m oi || m 2 + m 5(|| m4 + m i mi = bar b - aterroc atsopseR)c2.7 ?mortele ocit©Ãnga otnemalpoca ed otnemalpoca ed ohnimac od olpmexe mu ©Ã oÃn etniuges o euq O)a 4.21 acit©Ãngamortele edadilibitapmoc ed amelborP - 4.21 # samelborp ed otnujnoC 8102 ©Â siarotua sotierid rop odigetorp lairetaM 104 amica seµÃ§Ãpo sad amuhneN)d( )n0lj ~ e ~ v ~ r7)(lje+ ^^ ooi)c(+ 1701ie+ v(~ -)b(ct0li ~ e - v+ n0lje+ v)A{ .odºÃetnoc uo oÃ§Ãsicerp aus Ã otnauq ,aticÃlpmi uo asserpxe ,oÃ§Ãatneserper uo aitnarag ,aitnarag zaf oÃn e oÃ§Ãacilbup asse anicortap uo assodne oÃn ®ÂC'SEECN O .seµÃ§Ãauqe ed megalodem ed aÃ§Ãnerefid amu revloser arap odasu ©Ã ____________)a 3.9 amelborp ,satnugrep sasse revloser oA 602 anig¡ÃP - EF SEECN od aicnªÃrefer ed launam o etlusnoC smrofsnarT Z - 3.9 # samelborp ed otnujnoC 8102 ©Â siarotua sotierid rop odigetorp lairetaM 07 CF ~ 4 .etnerefid arienam ed matropmoc es seroticapac so otnauqne ,olelarap ojnarra e eir©Ãs me etnemralimis matropmoc es serotsiser e serotudnI ¢Ã ¬â ¢Ã .oxiaba adartsom sotrop siod ed eder ad Z sortem¢Ãrap eluclaC)a 5.8 amelborP seµÃtseuq sasse revloser oA 402 - 302 sanig¡ÃP - EF SEECN od aicnªÃrefeR ed launaM o etlusnoC satrop saud ed airoeT - 5.8 # samelborp ed otnujnoC 8102 ©Â siarotua sotierid rop odigetorp lairetaM 26 Bd 02 = ahnag ,muhnen - orez ,0 @ medro ªÂ2 ,2.0 @ medro ªÂ1 sol³ÃP)d(Bd 01 = ohnag ,muhnen - orez ,0 @ medro ªÂ2 ol³ÃP)c(Bd 01 = ohnag ,muhnen - orez ,0 @ medro ªÂ2 o o .'siaicnerefid seµÃ§Ãauqe' ed airogetac an ardauqne es amelborp essE x3 ~ e)x2c + 1c(= y - aterroc atsopseR)c6.1 8102 ©Â siarotua sotierid rop odigetorp lairetaM 871 ?k e)c(n4,0 ~ AUDITO F O F this book includes the students of the last year, new graduates and experienced professionals who were out of the school for a while. _ G 2 1 d) u s j- ^ â € "7v (s) n/2 4 cos* 4 cos 7t/2 4 (0) 0 2 â €" 2 s in x 2 â € "2sin7r/2 2 Â € "2 (1) 0/01 © an undetermined form. He has a bachelor's degree in Engineering Â ° ° € œ © Trica with distinction of McMaster University (2010) and Master of Engineering â € ° € œ Energy Systems of the University of Toronto (2013) that was completed with work in full time. In 2014, he carried out a two -year international attribution for a major project in the flower and also decided to continue the UP in the United States. 10V 2â$CFI .ate (a) le = 0, v ci = 0.5 v (b) le = 0, v ci = 1.75 v (c) le = 2.09 ma, v ci = 1.68 v (d) le = 1. The road to the degree was challenging mainly because of the lack of study material ãº for fe and pe exams. Wasim spent both exams in first attempts (Fe in October 2014 and PE in April 2015). 208 COPYRIGHTED MATERIAL Â © 2018 6.4 INDUCTION - SOLUTIONS CONSULT THE REFERENCE MANUAL NCEESâ® FE - PAGES 200 - 202 FOR REFERENCE 6.4A) CORRECT ANSWER - A INDUTENCE can be calculated using the following fanmula. D1 (a) id i = 0, id2 - (c) id i = -2.5 5m (b) id - 0, id2 = 2.4 mA 0, 2m id2 = 2.5 ma (d) id - 0, id2 = ~ 2.5 MA 79 Authorized Material © 2018 Problem Set # 10.3 - Bjts Consult Ncéesâ® FE Handbook - 215 Calculate in Itter IE Current and Tension V CE for BJT shown in the circuit below. Â © 2018 Problem Set # 12.1 - Maxwell Equations Consult Ncéesâ® FE Reference Manual - Pages 35 and 205 By solving these issues Problem 12.1 a) Calculate the divergence of the ELABIAN FIELD and given by the next equation : E = 3 xi + 2y2j + xk (a) 3x + 2y 2 + x (b) 3 + 4y 2 + 1 (c) 0 (d) 3 + 4y problem 12.1 b) Calculate the divergence of a vector field d for the following equation: D = xyi + yzj + x z 2k (a) xy + + xz 2 (b) y + z + 2xz (c) x + z + 2x (d) 0 Problem 12.1 c) Calculate the flow flow of a hollow sphere containing four -point loads Qa = +1 nc, qb = +3 nc and qc = +1 nc and qd = -2 nc (a) 0 vm (b) 1017 vm (c) 339 vm (d) 678 vm problem 12.1 d) Calculate the woolen flow of a hollow sphere of radius 5 cm containing Twin Concionic Balls. (A) 104/63 ° V (b) 120/30 ° V (c) 16.5/44.5 ° V (d) 110/53 ° V Problem 11.2 e) Calculate the impedance of load A Balanced Positive Sequence 3 CF> Y System with the origin tension van = 120/0 ° V, line current LAN = 5/-5 a and zrme = 0.5 + 0.25J Q . Iw12i -q x r 21 = v (2 - Â °) 2 + (Â ° - ¢ â °) 2 + (0 - 0) z = 2 m 47tfr2i m/ 12 = 9 x 1 (t3/ 6.1b) Answer Correct - B Work and Energy So the same media units. ¢ - Analytical GeMomy - Measurement of those and volumes, central sections. (A) (c) g (s) g2 (s) ^2 (s) (b) 1-h (s) g2 (s) 1 + g1 (s) g 2 (s) t f (s) (d) 1 + g 1 (s) g 2 (s) // (s) ^2 (5) 1 + jf/(s) problem 13.1 b) Find the relationship between y (s), r (s), n (s) and l (s) to follow the follow -up system. U R4 9 Copyright protected material © 2018 Problem Set # 1.4 - Analytical Geometry See the Reference Manual Ncs Fe - Pages 22, 24 - 27 By solving these issues Problem 1.4 a) Calculate the two between two lines provided by the equation following. (A) 50 V (b) 600 V (C) 12 V (d) 1 V Problem 11.4 b) Calculate the nominal current of the transformation of 1 phase ER classified 15 kVA 600 V / 120 V. 4) Nu [n l 4 (c) 2s [n] + 6 (0.1) nu [n] -â € ~ (0.4) nu [n] 2 (d) -(0 .1) nw [N] + -0 .4 Nu [n] 4 2 72 Copyright protected material © 2018 2 Problem Set # 9.4 - Sample See the NCEES FE (a) The mother frequency of sampling necessary for the perfect signal reconstructing below is __________. The solution will be the form y artsom artsom 0 = b + ra + 2 r oÃ§Ãrdap oir¡Ãlumrof o moc oÃ§Ãauqe atse odnarapmoC 0 = 8 ¬â ¢Ã r2 + 2 r :acitsÃretcarac oÃ§Ãauqe moc xrec a = 2, b = —8. (A) 125 A (B) 7.2 A (C) 2.5 A (D) 15 A Problem 11.4 c) A 5 kVA distribution transform er has 10:1 turn ratio. 10a 100{j F 2mH (A) (10+7*2 a) | (- ; 1 0 ft) (B) (10 + y'0.5 n) Areas* NCEES® FE Reference Handbook Concepts Section Page # Electrical and With Puter Engineering 203 - 204 M athem atics 34 Frequency/transitional response Functions of transfer resonance theory of 2 doors Laplace Transforms Facts about this section • 5 - 8 questions can be expected in the exam (according to NCEES® FE Specification.) f (t) = and ~ atu (t — 1) 1 p - (s+ a) (A) — (B) --------' s+a s) Find Laplace function transform f follow ing. 9.3d) CORRECT ANSWER - A x[n] = [2 3 1 0 5] k =oo x[k\z k = 2z ° + 3z X[z] = 1+ z 2 4- 5z 4 = 2 + 3z 1 + z 2 + 5z' k= 0 232 Copyrighted Material © 2018 9.3e) ANSWER CORRETO - A x[n] = 5(0.75)nu[n] k = 00 fe = 00 A 'W = ^ 5 (0.7 5) k u [k] z ~ k = 5 /c=0 9.3 f) (0.7 5 Z - 1) '1 = 1 _ Q 7 5 z _ fc = 0 1 - 0.5z_1 According to z FE Reference Manual: 1 1 — /?z 1 x[n] = (0.5)n 9.3g) ANSWER CORRETO - D 5z + 2 X(Z) ~ (z - l) (z - 4) Inverse z-transform can be calculated using partial fraction expansion. • Evaluate the steps involved in developing the Root Locus sketch. 4.3d) ANSWER - Contractor This problem falls under the category of 'Benefit Analysis-Custo.' lO.lh) CORRETO ANSWER - Group III periodic table elements have 3 electrons in their external orbit which allows them to form 3 covalent links with Si or Ge atoms. It can be noted that in the data set given 1, 3, 3.4 9, 7, 3.4 the value 3 occurs most frequently. • Solve troubleshooting sets in the next pagesReview solutions at the end of this book. The properties of the semi-conduitors, such as Silo and Germ, can be modified by doping. These practical tests contain questions that were used in previous exams and questions written only for study materials to provide extra practices. Why do not study with NCES? According to the fanmula provided in the NcOesaâ® FE Referral Manual: E [x] = y T = I xkf (x k) = (5%) (0.10) + (0) (0.20) + (5%) (0.30) + (10%) (0.30) + (15%) (0.10) = 5.5%2.3d) Correct answer - 5/6 This problem fits the category of 'values expected '. 2.3b) Correct answer - 0.66 This problem fits the category of 'expected values'. 10 Copyright protected material © 2018 Problem 1.4 j) A central section given by the equation (y 8) 2 = 4 (x 2) represents_______. 235 Copyright Protected Material © 2018 9.5 Filters - Solutions Consult the NCEASAAN REFERENCE MANUAL - PANAGINAS 207, 210 and 211 for Reference 9.5A) CORRECT ANSWER - B Comparing the Transfer Function Supplied with the First Order Filter Transfer Function in the Page # 210 of the NCES Referement Manual shows that it is the implementation analon. (A) parano (b) hyperblo (c) ellipse (d) Scarf Problem 1.4 k) The director of the century section given in problem 1.4 j) is a t ________. L " - 2 (0.2) Nu [n] (b) - 1 0 0 £ [n] - 2 0 9 (0 .1) Nu [n] - 108 (0.2) Nu [n] (c) i5 (n) + (d) 0.55 [n] + 2 (0.1) nu [n] 0.1 "u [n] + 0.3 nu [n] Problem 9.3 i) Find the transformation £ o In reverse to follow the functions (z + 0.5) (Z 0.1) (Z + 0.4) (A) - 8 [n] + 12 (0.1) Nu [n] + - (¢ âferences € 0.4) "u [n] 2 2 (b) - 0. During the exam. (A) 1 (B) 2 (C) 4 (D) 8 Problem 11.5 b) Find the speed of a 3-4> 600 V 2 € ‡ O at 60 Hz. Hz, 4 pole pole poleM = s 2)5 - 8(+ 2)5 - 6(+ 2)5 - 4(+ 2)5 - 2(4 =n _ 4 ,5 =)8 + 6 + 4 + 2(Ðâ = X 1 1 Ð n = s yx-i V UZ :woleb nevig noitauqe eht gnisu yb detaluclac si noitaived M' detar si noitces siht fo level ytlucifiiD ¢â .maxe eht etaerc ohw elpoep emas eht yb depoleved slairetam noitaraperp maxe gnisu fo egatnavda eht evah llâuoY .maxe retupmoC dna lacirtcelE EF rof eraperp retteb sreenigne lanoisseforp gnisripsa pleh ot dengised si hcihw koob siht etir w ot mih deripsni secorp noitaraperp maxe gnirud denrael snossel ehT .tsehgih si nur revo esir fo etar nehw CE - REWSNA TCERROC)m5.1 :ni stluser largetni etinifedni ni alumrof siht gnisu dnuof si noitulos tupni oreZ B - REWSNA TCERROC)c2.9 8102 = == sync, corrected by elderman == ? Ol .noitcurtsnoc elop 2 zH 06 a otssam ytilibaborp dna noitcnuf ytisned ytilibaborp rednu aera latot eht 1- rewsna tcerroc)132 .ecrof dna ygrene ? ©Ã lairetam dethgirypoc 65 vm 53)d(vm 76)c(v 2)b(v 99.9)a(okol fm5 v01 s0 > t ta noitisop segnahc hctiws...-)Melborp snoitseuq eseht gnivlos elihw 302 then - KOBDNAH ECNEREFER EF Â®Ã,Sesicn Tlusnoc rotcaf Rewuop - 6.11 # tes Melborp 8102 Â©, MPR 0261)D(MPR 0271)C(MPR 0891)B(MPR 0891)B(MPR 0891)B(MPR A(.1.0 f o pils daol lluf dna vk 3.2 ta Gniitarepo roto m noittcudni esahp 3 elop 4 ,zh 06 a f o deps lanoitator eht Etalulclac)E 5 ' = 001 M/H 510.0 = -----> â€œ"â€ã¢ =)''T5.0()MC05(R72 I Brn2 = ^ Mc 05 = r 75.0 = b 4.001 = I ,tnemetats Melborp ot gnidrocca i RN2 i|â€Ã¢ Â"â€Ã¢ Ââ€Ã¢ = l[>------- - = = h brn2 i b .woleb .woleb .woleb . sa idalac eb nac gnicaps egrahc mc 1 ta ygrene metsys j6~ 01 x 5121 =)irl(en4 2Q1Q = w .woleb nwohs tiucc eht ni rotsiser q 3 ssorca ganclac 1.7 mlborp 3/r am 6)d(AM 2)C(Am 3)B(Am 4)A(Am01 ak6 . _______ si m2 thgieh dna ml suidar htiw rednilyc ralucric thgir a fo e mulov ehT)14.1 melborP .woleb nwohs sa waL s'yadaraF yb nevig Si rotcudni fo pihsnoitaler tnerruc-egatlov b - rewestna tcerc)b4.6 hm 52.1 = m1 2mh7~Q1 x n4 x + fo laitnetop noitadixo dradnats sah eF ,koobdnaH ecnerefeR Â®ÃSEECN fo 95 egap no elbat eht ot gnidroccA .).E.P(reenigne desnecil lanoisseforp a gnimoceb ot ssecorp eht ni spets tsrif ruoy yllareneg si maxe)EF(gnireenignE fo slatnemadnuF ehT .Trapa era 1 mc taht c 6ã"â€Ã¢ 01 x 01 = 4.0 dna c 6~ 01 x 5 = 3 q segrahc sanatnoc b metsys .p(oiratno dna)EP(adirolf ,)ep(saxet nihte lannoisseforp desnecil A Si si Rahgsa Misaw .woleb nwohs erugif erugif eht ni yradnocesn ni yradnocesn ni yradnocesnt yradnocesn re yradnocesnt yradnocesnt yb yb yb yb yb yb si ecnadepmi q _____)e 4.11 Melborp N oi pz .stnega gnipod epyt-p meht sekam hcihw eloh a seterc a seteerc a setaerc a .Melbop navig a rethak yaam kiedus yamtiib ya kiedus yamtahg a nevigo ya rethak ya kiedus a roxus a Tub Noitisoprepus ,Nortron ,Nineveht ,Lvk ,LC SA HCUS SDOHTEM TNEREFFIDIF GNUFFIDIF GNU DEVLOS EB NAC Stucric Â¢â€Ã¢ .1 ot lauqe syawla si ed aicnªÃtop ,acinºÃ esaf ed aigrene meulcni oÃ§Ães atse arap setnaveler setnatropmi seµÃ§Ãauqe sad samuglA ¢Ã ¬â ¢Ã ?oÃ§Ãide adnuges an ovon ed ¡Ãh euq O .mpr 0043 ed oÃ§Ãator ed edadicolev amu moc zH 06 a odnarepo roto m oÃ§Ãudni V 006 olop 2 a f o otnemazilsed o eluclaC)d 5.11 melborP mpr 0)D(mpr 0063)C(mpr 0012)B(mpr 0051)A(.... 3 R/I + 2R/1 + tR / 1(/ 1 = olelarap eR etnelaviuqe aicnªÃtsiseR ¢â n R + .ocit©Ãngam opmac mu ©Ã .gniggal fp 38,0 a Wk 002 emosnoc sotnemila ed otnemassecorp ed atnalp amU)k 2.11 amelborP AV 0612)D(AV 063)C(AV 0042)B(AV 027)A(.emaxe o f o megami ed oÃ§Ãsiv ednarg rahnag arap ri ed satnugrep sa sadot rop rassap ©Ã aiedi A .sadicenrof aicnªÃrefer ed seµÃ§Ãamrofni sartuo e salebat ,salumr³Ãf sa moc razirailimaf es a ªÃcov aduja emaxe od aid od setna odairporpa odicenrof aicnªÃrefer ed launam ed oÃ§Ãsiver A sadicenrof aicnªÃrefer ed slaunaM ocip³Ãt ed aer¡Ã adac me ohnepmesed o erbos kcabdeef uo seµÃ§Ãulos recenroF edadlucifid ed levÃn e olitse ,otamrof o ralumiS sodassap semaxe ed satnugrep m©ÃtnoC semaxe acitarp SEECN .rotpurretni o rirba s³Ãpa setnatsnoc e mit zed) t (i etnerroc raluclaC)d 1.8 amelborp mU)t000005 -e - 1(10.0)D(A)t000005 - e - 1(10,0 + t000005 ~ e)C(^000005 - g - 1)B(A) ~ e - 1(01)A(Hm2 V01 *«Ã# l£Âk1 â sO * I me ahcef rotpurretnI .aigrene ed amix¡Ãm aicnªÃrefsnart a arap air¡Ãssecen 'Z' aicn¢Ãdepmi a ranimreteD)f 1.11 melborP W 0)D(W 52)C(W 5)B(W 1)A(m .SEECNyM atnoc aus edatluser sues razilausiv arap seµÃ§Ãurtsni moc SEECN ad liam-e rop oÃ§Ãacifiton amu ¡Ãrebecer ªÃcoV .aicnªÃrefer ed launam o moc rotiel od edadirailimaf a revlovnesed arap odatejorp etnemlaicepse ©Ã orvil etse ,etnemroiretna odavresbo omoC .cte aduac/aÃ§ebac ,ralaf/essap ,oÃn/mis omoc ,soir¡Ãnib sodatluser evlovne laimonib oÃ§ÃiubirtsiD - lit³Ã aciD .gniggal 9,0 arap gniggal fp 57,0 ed Wk 002 emosnoc euq lairtsudni agrac amu ed aicnªÃtop ed rotaf o ratnemua arap oir¡Ãssecen o nacbd mu ed ocnab mu ed ohnamat o raluclaC)a re re oÃ§Ãamrofsnart ,amix¡Ãm aicnªÃtop ed aicnªÃrefsnart ,Y - A sedaditnauq ertne oÃ§Ãsrevnoc ,esaf e ahnil ed sedaditnauq ertne oÃ§Ãsrevnoc ,sesaf _____ 8 + 4 + 8 + 0 1 + 4 + 2 = X 63 1 _ .ycneuqerf tsehgih)A(____stneserper 002 = 2) 6 Ëxx(8) 0 1 Ëx(2 noitauqe y P snoitseuq eseht g ni vl os elihw 127 egaP - koobdnaH ecnerefeR EF ®SEECN tlusno C smargaiD kcolB - 1.31 # teS melborP 8102 ,) , www tisiV smaxE ecitcarP dna esruo C noitaraper P maxE dnamed-n The retupmoC & lacirtcelE EF 8102 ©Â lairetaM dethgirypoC 2 .rohtua eht yb 'ysaE' retsai si noitces siht f the level ytlucffiD ¢â .noitamrofed tnenamrep sevlovni yticitsalP = 0 χ 2 χ 2 χ 2 χ 2 χ 2 cm = χ 2 cm? © lairetam dethgirypoC 56 ....noitauqe ecnereffid ni noitacilppa sti dna elbat mrofsnart z htiw yitirali maf poleved ¢Ã¸¥¥2 + 01 = esahpz esahp rep gnivah daol detcennoc © lairetam dethgirypoc 49 a °Â03/7.01)d(a 05.62-/5.81)c(a 05.62-/7.Q1)b(a °Â03/5.81)a(.ytilibaborp gnirih ro ytilibaborp sseccusmax = p.)stia(sepyt meti avoidedrewoP - EP gnikat elihw 2 # ygetarts dna tp metta tsrif eht ni essip eh hcihw maxe TBC retupmo C dna lacirtcel EF gnikat elihw 1 # ygetarts detpoda rohtua ehT .woleb nwohs tiucric eht ni 0V egatlov tuptuo eht dniF)e 5.01 melbor ? SEECN ehT .tsewol si nur revo esir fo etar nehw tsewol si avoidvireD B - REWSNA TCERROC)n5.1 .noitcnuf gni wollof f o mrofsnart ecalpa L eht dniF)a 3.8 melbor P snoitseuq eseht gnivlos elihw 43 egaP - koobdnaH ecnerefeR EF ®SEECN tlusno) ; N 9'01 x 09)D(N 6 0 1 x 02)C(N 9~01 x 01)B(N 6~01 x 05)A(.)eF naht evitisoportcele ssel era gH dna iN ,uC(edona laicifircas a sa tca lliw nZ ,erofereh T .21 11 01 9. 8 =B 7 .]n[u)n57.0(5 =]n[x f o mrofsnart-z eht dniF) and 3.9which was also passed in the first attempt. (a) 2 kq (b) 3 kq (c) 1 kq (d) 5 kq problem 7.2 c) find the equivalent resistance between the term inals A-B the f the circuit shown below. 1pf (a) 1 hf (b) 2 nf (c) 0.5 nf (d) 3.5 \i¥ 40 authorized material © 2018 set of problems # 6.4 - inductance consult the reference manual NCEES® fe - pages 200 - 202 when solving these issues problem 6.4 a) w hat is inductance the f to 1 m long coil with 100 turns and a cross-sectional area of 0.1 m2 (as (a) 20/12° to (c) 25.8/-250 a (b) 15/45° to (d) 35.3/-11.30 problem 11.2 h) calculate the equivalent load of wye to a load network consisting of balancing 3 cj> y- loads in parallel with balancing 3 4>A loads if z Phase nickel = 10 + 5j q & (a) 2.8 o (b) problem 11.3 d) a power transformer is evaluated 5 m v to 12000 V/240 v with voltage regulation the f 5.% the solution will be form y = cerx with characteristic equation: r 2 + 6r + 9 = 0 comparing this equation with standard form r 2 + air + b = 0 shows that a = 6, b = 9. ■ trigonom etry -t expression o n o m etric functions, simtricities from a2 = 4 < 4b = 16, the solution is subsealed. difficulty level for this section is classified as 'm edium' by the author. 9.5b) correct answer - c comparing the transfer function given to the Band-Pass transfer function filter on page #211 of the reference manual ncees shows that it is the analog implementation of the Band-Pass filter. problem 6.2 e) 0.1 m long conductor carries 5 in a magnetic field of 10 jit. some licensing boards may require you to submit a separate application and pay an application fee as)B( )B(Am 5)A(.011 = 0 1 - 021 = artsoma ed axiaF .SEECN emaxe mu arap otnessa mu arap racifilauq es arap oÃ§Ãavorpa ed ossecorp od mA (C) 0 .1 m A (D)0 m A 84 Copyrighted Material Ã©Â 2018 Problem 10.4 e) Calculate drain current iD for circuit shown below (assume K = 0.1 m A/V2 & V t = 1 V). Problem 12.1 k) Calculate magnetic flux density inside a torus of radius 2 cm having 50 turns if 1 A current is passing through it. (B) System A = 4.5x 10 13 J,System (A) System A = System B = 45 J (C) System A = 45 J , System B = 4.5 x 10 13 J (D) System A = 4.5 J, System B = 45 J Problem 6.1 e) Calculate the am ount of work that needs to be done to decrease the space between Q i = 9 x 10 9 C and Q 2 = 15 x 10 9 C from 1 m to 1 cm. = 2 / 2\ j) = [0 - (-2)] = 2 Therefore, expected number of traffic violations per driver are 2. (A) Right circular cone (C) Paraboloid of Revolution (B) Right circular cylinder (D) All of them will hold same volume e 11 Copyrighted Material Ã©Â 2018 Problem Set # 1.5 - Calculus Consult NCEESÃ®Â FE Reference Handbook - Pages 27 - 29 while solving these questions Problem 1.5 a) Calculate the derivative o f follow ing function. Note that phase and frequency modulation are very similar. Calculate input impedance at 100 m if the line is connected to a purely resistive load o f 500 Q. dl = JPl CVz Qi JPl 4 ^ ar21-dl = ¢ÃÂÂQ1 Q2V fPzar21.dl 4ner?JPl = -Q Ã±Ã Vl4 Q2\ r21 21 .-- Q.Q.. ¢ÃÂ¢Â Develop fam iliarity with Laplace Transform pairs. 1.7i) CORRECT ANSWER -16 A = 2 i+ j + 3k B = i + 2j 4k A.B = (2 i +j + 3k). (A)10 [if (B) 8 [if (C) 15 mF (D) 7 mF 99 Copyrighted Material Ã©Â 2018 Chapter # 12 - Electromagnetics Key Knowledge Areas* NCEESÃ®Â FE Reference Handbook Concepts Section Page # M axw ell equations Electrostatics/magnetostatics W ave propagation Transmission line Electromagnetic com patibility 205 Electrical and Com puter Engineering 200 205 - 206 205 - 206 Note: Specific details are not found in NCEESÃ®Â FE Reference Handbook on this topic. The pass rates below represent FE examinees The FE exam for the first time attended the CEAC/ABET engineering programs Creredited took the exam FE within 12 months after graduation exam VaLUSEPASS Rate Availability Updated Fe Chemical33173%Cbtyear Roundjan 2022 Fe Civil376862%CBTYEARJAN 2022 Fe Environmental47070%CBTYear roundJan 2022 FE Industrial and Systems11662%CBTYear roundJan 2022 FE Mechanical250771%CBTYear roundJan 2022 FE Other Disciplines45565%CBTYear roundJan 2022 Other Disciplines exam breakdown by exame degree* ProgramVolumePass rateFormatAvailabilityLast updated Architectural6458%CBTYear roundJan 2022 Biological (not Bio-Medical)5777 %Cbtyear redondjan 2022 general engineering4163%cbtyear redondjan 2022 mechanics5078%cbtyear Roundjan 2022 Marine architecture2983%cbtyear RoundJan 2022 ABETEES 3435%CBTYEAR JAN 2022 *just ec/degrees. Luckily, after solving all the problems and reviewing the relevant solutions, students will be able to navigate strongly in the Reference Manual of the NCEEES FE and recall the applicable form quickly during the examination. rab ska 10ka -w v â€˜-- 5k ~ aaar 1 k ¥ 2 = 0 108 y'2 = v2 = ~ w S' vl = y22 = | = j5 ¥ 1 = 0 ¢ 100 ¥ 2 20 kl = 0 yi1 = i ¥ 1 1 k2 y2 Correct answer - 0.66 h 12 = V ± V? 200 kVL can be written as follows: - 5 0 V = 300 x ix2 50v 1*2 = -1.6 6 a ix = i x i + 1x2 = 1-66a = 1.7a 7.1e) Correct answer - the specified supplied circuit can be solved using the current divisor rule, as shown below: rt ix = - "Lt r x 4* r x it = 5 tyla, rx = 6 kVL (since 1 kq. (a) m icrophone (b) Therm Ocouple (C) Vernier Calliper (D) Diodo Photo Problema 10.6 B) A 200 Q RTD has a temperature coefficient of 0,0039 ° C 1 in the TEM room (20Ã°ÂC). Helpful tip - Learn how to find determinant and inverse of a 3 x 3 matrix using calculator. 2, 4, 6, 8, 10, 12 Problem 1.3 h)_______ is the sum of an arithm etic progression with 120 term s for which first term is 1 and last term is 259. Eng) with consulting experience in pow er system design, commissioning and plant engineering for leading clients in various industries including energy, mining and manufacturing. 5.1b) CORRECT ANSWER - D Galvanization prevents corrosion by application of a protective zinc layer to steel. y r + 2x 2y = x 2 We can use method of separation of variables to solve this differential equation as shown below. 2.3h) CORRECT ANSWER - $645 This problem falls under the category of 'Estimation for a single mean'. '2 det 8 .1 4 10 3 6' 12 = 2[(10)(5) - (3)(12)] - 4[(8)(5) - (12)(1)] + 6[(8)(3) - (10)(1)] 5. B = 3 axi + 2yj ¢ÃÂÂ 2zk (A) 3 (B) 1 (C)0 (D) -1 Problem 12.1 f) W hich of the follow ing vector fields can be magnetic in nature? Best way to use this book This book now covers all 18 sections of NCEESÃ®Â FE Electrical and Com puter CBT exam. fix) = 2 s in ¢ÃÂÂ 1 x + 2 c o s-1 x (A) 2/Vl - x 2 (B) -2 / V l - x 2 (C) 4 s in x c o s x (D) 0 Problem 1.5 e) Calculate local minimum and maximum points o f function given below. FE Electrical & Computer Exam Taking Strategies It is strongly suggested to purchase latest NCEESÃ®Â FE Electrical and Com puter sample exam from www.ncees.org for additional practice. RA (5ft)(3.141 x 10~6m 2) p = ¢ÃÂÂ = - ¢ÃÂÂ ¢ÃÂÂ¢ÃÂÂ ¢ÃÂÂ ------------ = 1.57 x 10 H I 100772 ft.m 5.2b) CORRECT ANSWER - C Resistivity can be calculated using p = RA/l According to problem statement, pA = 4pB implies that ^7 ^- = 4 ^ ^ lA If lA = lB and Ab = -A a then ^ 4 M = 4 MW*)/* ¢ÃÂÂ¢ÃÂ ÂA lB = lA Therefore, RA = RB if cable lengths are equal and area of cable 'B' is one-fourth of cable TV. f(t) = (A)e3S^ +^ ¢ÃÂÂ e_3('t¢ÃÂÂ 3'))u (t ¢ÃÂÂ 3) (B) (S+lf(S+3) Problem 8.3 e) Find the Laplace to follow the function. Useful tip - Review the differences between various types of differential equations. According to the formula provided in the Reference Manual NCEESA® FE: E [x] = â€ "] f = - 2 x - '? The absence of any of these necessary components can prevent corrosion. Di V = L 'dt 100mA V = 5mh x Correct answer-D The energy stored in an inductor can be calculated as shown below. (A) 63.6 mj (b) 31.9 mj (c) 15.9 mj (d) 5 mj Problem 6.1 c) How many electrons pass by a point on the driver if carrying 1 mA for 5 s? 177 Copyright protected material © 2018 1.6 Differential equations - Solutions See the Reference Manual of NCEEES® - Pages 30 - 31 for reference 1.6a) Correct answer - D This problem falls within the category of 'differential equations'. (A) -5% (b) 2.5% (c) 8.3% (d) 4.7% Problem 11,3 b) For an ideal transformer, voltage regulation is __________ (a)> 1 (b)> 2.5 (c) = 0 (D) * 0 Problem 11.3 c) A distribution transformation is classified into 10 kVa 4000 V/400 V with impedance equivalent to 1 + 0.5J Q. However, the silver lining is that examination issues may not be very complex. 2m Zm (a) 10 V (B) 5 V (C) 37 V (D) 100 V Problem 7.3 B) Resistance of the circuit hadnine given in Problem 7.3 a) is Problem 7.3 C) Calculate the resistance to the circuit hadnine shown below. The zero state response is the output of a system for a specific input when the system has zero initial conditions and found using the D-T. Q = 2n convolution where 'q' is the quantization levels and 'n' is the number of bits. / (t) = te ~ Atu (t â€ 1). It is attended by a distribution line of 1 CJ> carrying 400 a current. 2.2d) Correct answer - 0.51 This problem falls within the category of 'binomial distribution', which is given by the equation below: pn (x) = c {n, x ') pxqu ~ x n = in the of slam grad tournaments. Problem 1.4 h) A conical section given by ââ ââ ¬â ¢Ã Y(8 - 2)0 1 x(2 dleif citengam fo rebmun eht si xulf citenga ______f the selpmaxe era }e ,d ,c ,b ,a{ dna }5 ,4 ,3 ,2 ,1{)c 3.1 melborP evoba eht fo enoN)D(}e ,h ,f ,a{)C(}e ,d ,c ,c ,b B - REWSNA TCERROC)a4.5 ecnerefer rof 102 dna 56.06 segaP - koobdnaH ecnerefeR EF ®SEECN tlusno C snoituloS - seitreporP lamrehT 4.5 8102 ll() ll OL 0 0 0 0 0 0 0 =A 1 :tnemetats melborp eht ot gnidroccA .meroeht nineveht gnisu woleb nwohs tiucric eht ni coV egatlov etaluclaC)a 3.7 melbor P snoitseuq eseht gnivlos elihw 302 - 102 egaP - koobdnaH ecnerefeR EF ®SEECN tlusno C smeroeh T notroN dna nineveht - 3.7 teS melborP 8102 Φ : : : : : : : : : : : : : : ; C scitatsotengaM / scitatsortcelE - 2.21 # teS melborP 8102 © lairetaM dethgirypoC 201 .thgir eht no nwohs sa deifilpmis eb nac tiucric neviG A *W1 l M 6 - REWSNA TCERROC)e2.7 .B tniop ta epols avoidedgen sah noitcnuf nevig eht taht devresbo eb nac tbor P elcriC)D(alobrepyH)B(espillE)C(alobaraP)A(___stneserper 002 = 2)a si ereht(noitces maxe eritne eht hguorht gnimmiks retf ♪ ? ,esrevni ,esopsnart ,tnanimreted ,noitacilpitlu m ,noitcartbus ,noitidda - snoitarepo xirta M - sisylana rotcev dna xirta M ‹ .woleb nwohs tiucric eht ni rotsiser Qk 2 hguorht gnissap tnerruc etaluclaC)b 1.7 melborP V5)D(Vm 64.1)C(V 6.41-)B(V 5.07)A(.5 - REWSNA TCERROC)c3.2 33 66.0 =])2 + 4 x 3(2) 3(+)2 + 2 x 3(2) 3 - 2([>]X[V = 2rc 1 3= 4+3+ 2 =M)3 x (f2) v - 3 x(+)2 x (f2) v - 2 x(+)and part of the afternoon for the exam), you will be hoping to feel relaxed and confident because the fear the unknown f will subside. • The circuit analysis is the most weighted section in the exam. < <) < < < < < < < <) < < < < < < < < <) < < < < < < < < < < < < <) < < < < < < < < < < < < < < < <) < < < < < < < < < < < < < < < < < <) < < < < < < < < < < < < < < < < < <) <) < < < < < < < < < <) < < < < < < < < < < < < < < <) < < < < < < < < < < < < < < < < < < < <) < < < < < < < < < < < < < F m ~1 • Perm eability o f mid \i = AnlO ~7 HmT 1 • Some of the im bearing equations of this section relate to the work, power, current, potential difference, electrostatic forces, electric field force, capacitance and inductance. 1 2 1 1 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 1 2 2 1 2 2 1 2 2 1 2 2 2 1 2 2 1 2 2 2 1 2 1 2 1 2 1 2 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 2 1 :1 n (A) [0 1 4 6 4 10] (B) [0 1 4 10] (C) [0 1 4 8] Discrete tim convolution is used for fin d What's going on? (A) Zero Input Solution (B) Zero-State Solution (C) Product f signals (D) M odulation index Problem 9.2 d) Find convolved output of x[n] = u[n] — u[n — 5] and y[n] = 0,2nu[n]. The author suggests the adoption of one of the following strategies for the performance of the FE Electrical and Com puter CBT exam: Strategy #1 - Three round knock-out First Round - After reading the question classify it in one of the following four categories "Easy", "M edium", "Difficult but solvable" or "No clue". Problem 10.4 d) Calculate the drain current ip for the follow-up circuit (assume K = 0.1 m A/V2 & V j = 1 V). The density of the magnetic flow at the 'A' point due to these wires (assume [i = 4h x 10 7 H/m) is ___________. • Understand the difference between the leader/lagging pow er factor and the real/reactive power. 11.1 b) Calculate current passing through the circuit shown below. 1.7k) CORRECT ANSWER - B We can use head-tail rule to confirm that resultant vector will be Option B x + r= Helpful tip - Review head-tail rule for vector addition and subtraction. You can also review the general format of AITs in the Pearson VUE computer-based testing demo. 1.5k) CORRECT ANSWER - C This problem falls under the category of 'Integral Calculus'. 6 6 m skQ + 2 mu io m = 5 m + ^ 1.66 m = 6.66 m 4m||(5 m + 2m ||iom) = 4m||6.66m= 2.50 m i m + 4m||(5m + 2m||iom) = 1m + 2 .5m = 3 .50 / Therefore, #45 = 3.50 m . / (x) = 2 tan x sec x (A) 2 s in x / co s2 x (B) 2(tan 2x sec x + sec3 x) (C) 2 tan x sec3 x (D) 0 Problem 1.5 d) Calculate the derivative of follow ing function. 4 Copyrighted Material Ã©Â 2018 Problem Set # 1.1 - Algebra and Trigonometry Consult NCEESÃ®Â FE Reference Handbook - Pages 23-24 while solving these questions Problem 1.1 a) Solve for x : lo g 3(3 x - 12) - lo g 3(x) = 2 (A) 2 (B) -2 (C) 3 (D) 0 Problem 1.1 b) Solve for x: ln (x) + ln (x + 8) = ln (x ¢ÃÂÂ 12) (A) 0 (B) -4 (C) -3 (D) 12 Problem 1.1 c) Solve for x: lo g 4(x 2 + 8 x + 17) = 0 (A) 4 (B) 8 (C) -4 (D) 2 Problem 1.1 d) lo g 5 7 can be expressed a s __________in lo g 10. |f (t) = etu{¢ÃÂÂt) h(t) = 3e tu(t) (A) ^etf o r t < 0, ^e~ff o r t > 0 (B) - e2tf o r t < 0 , ¢ÃÂÂ^e~2tf o r t > 0 (C) ^ e_t/ o r t < 0, j etf o r t > 0 (D) Of or t < 0, 3 e lf o r t > 0 Problem 9.1 c) W hich of the follow ing options correctly represents convolved output of x(t) and y(t)? W 12 QlQl A ¢ÃÂÂ = 1.215 x 10-4; 4ns (lcm) J - ¢ÃÂÂ The amount of work required is equal to energy difference between two systems. Problem 11.6 d) A three phase pow er utility provides 75 kVA at 0.85 lagging power factor and 35 kVA at 0.75 lagging power factor to a custom er at 600 V and 60 Hz. The overall power factor at custom er's end is _______ . This concept forms basis of all corrosion prevention ¬â ¢Ã t(A + L[0R = R :alumr³Ãf etniuges ad s©Ãvarta arutarepmet ed etneicifeoc oa adanoicaler ¡Ãtse aicnªÃtsiseR A 1 K 40,0 - aterroc atsopseR)D4.5 A 5 ~ 01 x 03 =)C °Â 52(x)1 Â ¬â C °Â 5" 01 x 2,1(= me x a = £Â :oÃ§Ãauqe a odniuges odad ©Ã acimr©Ãt oÃ§Ãsnapxe ed etneicifeoc O B - aterroc atsopseR)c4.5 K 013 = k 41 + k 692 = me + iaitinit = qert * 41 = i - * «Â - ol x 8 2. 4 = t l = ra opre 3 ~ 01 x 6 3 ~ 01 x 3 = qerz ,1' k 4 ~ q1 x 82,4 = a ,k 692 = iaitinit k7 a k 0 1x 8 2. 4 =â .ereP ma ed iel ad rotev ed amrof a ©Ã td/dd + j = h x v ¢Ã ¬â ¢Ã .sadivloser satnugrep sad saruturtse sad sariednab sa etnemasodadiuc avomeR .lairetam od s©Ãvarta etnemervil revom es edop oÃn snort©Ãle siauq a odived oÃ§Ãudnoc e aicnªÃlav ed sadnab sa ertne anucal ednarg mªÃt serodalosi C-aterroc atsopseR)el.01 vu6- °Â j 2)0101 x 1(nl ^)620- °Â(_ \ )5101 x 2( )5101 x 2(,(nr _ h u a w ,(\ tk(_)fn 0 :rop odad ©Ã n-p oÃ§Ãnuj ad onretni laicnetop o ,EF ®ÂASEECN aicnªÃrefer ed launam on adicenrof alumr³Ãf a moc odroca eD V436,0-aterroc atsopseR)dl.ol 1 TRR .S 01" 0 1 x 16,9 =))01,0( )Ol01 x 2(+)02,0( )Ol01 x 2(( )91 ~ 01 1 Â ¬â ¢Ã s1 Â ¬â ¢Ã f2m01,0 = pi \ ,1 ~ s1 ~ V2m02,0 = n.4 | ,c91-01 x 6,1 = q x 6,1(= a ,3" m ol01 x 2 = p = n = iir)pi \ p + ,, lin(q = a :rop odad ©Ã rotudnocimes O A ed edadivitudnoc ,EF ed SEECN aicnªÃrefeR ed launaM on adad ,alumr³Ãf a moc odroca eD B - aterroc atsopseR)c1.01 ,N mrofsnarT reiruoF \ T / II)T)003(r72(soc)/ 6(cniS6 ©Â mrofsnarT mrofsnarT reiruoF \ T .adno ed oÃ§Ãauqe ,©Ãp me adno ed oÃ§Ãzar ed oÃ§Ãauqe ,oÃ§Ãssimsnart ed ahnil ad oÃ§Ãxelfer ed etneicifeoc od oÃ§Ãauqe ,llE WXAM ad seµÃ§Ãauqe sa meulcni oÃ§Ães atse arap setnaveler setnatropmi seµÃ§Ãauqe sad samuglA ¢Ã ¬â ¢Ã ?oÃ§Ãide adnuges an ovon ed ¡Ãh euq O .riuges ed oÃ§Ãnuf ad ecalpaL ed oÃ§Ãamrofsnart a ertnocnE)b 3.8 amelborP B- S 1 B -)d( )d( )c(â-)b(-)a( )0 >b(tb ~ e =)t{ f .air¡Ãdnuces oÃ§Ãamrofsnart ,amix¡Ãm aicnªÃtop ed adatcenoc q 21 ed agrac amu ed s©Ãvarta riulf etnerroc A 1 es air¡Ãmirp oÃ§Ãsnet ed ,oÃ§Ãnerefid amu revloser arap odasu ©Ã. eluclaC According to the details of the problem: 1 2R0 = R0 [1 + A (25)] ¢ÃÂÂ ¢ÃÂÂ = 0.04 K~x 5.4e) CORRECT ANSWER - D RA p = ¢ÃÂÂ p = p 0 [l + a(T - T^] Therefore, resistivity depends on resistance, area, length and the temperature of given material. Learn more about the exam scoring process. ¢ÃÂ¢Â Review basic concepts related to electrom agnetic compatibility. 5mA, V ce = 2.5 V Problem 10.3 b) Calculate collector current lc and voltage V ce for BJT shown in the circuit given below. (A) 4.5 x 1 0 12 J (B) 4.5 x IO -3 J (C) 9 x 1 0 12 J (D) 9 x 10"3 J Problem 6.1 b) Calculate potential energy stored by system o f two charges Q i = 5 x 10'6 C & Q 2 = 10 ~6 C located at P i (1 , 0 , 0) and P 2 (0 , 1 , 0) respectively. 6.4e) CORRECT ANSWER - C 2 H branch inductors will result in (2 H + 2 H)|| (2 H + 2 //) = 2 H. 236 Copyrighted Material Ã©Â 2018 Chapter # 10 - Electronics 10.1 Solkl-State Fundamentals - Solutions Consult NCEESÃ®Â FE Reference Handbook - Page 212 for reference 10.1a) CORRECT ANSWER - A According to periodic table found in NCEESÃ®Â FE Reference Handbook, Antimony is a group V element. $50,000 + 2x = %27x Solving for x results in 2000. ay = 0 -Ã»Â W = 0 6.1h) CORRECT ANSWER - 8 W Electric current passing through a surface at tim e't' is given by following equation: q 2C I = - = ¢ÃÂÂ = 2A t Is P = I 2R = (2A)2 x 2H = 8 W 206 Copyrighted Material Ã©Â 2018 6.2 Electrostatics - Solutions Consult NCEESÃ®Â FE Reference Handbook - Pages 200 - 202 for reference 6.2a) CORRECT ANSWER - A Electrostatic force between point charges can be calculated using formula given below. 189 Copyrighted Material Ã©Â 2018 2.3e) CORRECT ANSWER - 2 This problem falls under the category of 'Expected Values'. For access prior to your exam, you may either purchase a hard copy or download a free electronic copy. Ductility is the ability to deform under stress (such as copper wires). 199 Copyrighted Material Ã©Â 2018 4.3e) CORRECT ANSWER - Investment Option C This problem falls under the category of 'Benefit-Cost Analysis'. .woleb nwohs]n [y DNA]n[x snoitcnuf e mit the mit the mit the mit the mit the mit the mitchsid fo tuptuo devlovnoc dnif)a 2.9 Melbost Snoitseuq Eseht Gnivlos Eseht Gnivlos Elihw ©Ã, Lairetam Dethgrypoc 86 2â"â€¢ tâ€Ã¢ g)cf - e)2 - t (u 1 .c tinnaop ta tsepets si noitcnuf nevig eht taht devresbo eb nac Ã, Ã, The 2017-01-19 10:00:00 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00:00 AM 10:00 AM 10:00:00 AM 10:00 AM 10:00:0 - L: - y2x 2 Â"â€Ã¢ 2 x = Â"â€Ã¢ Â»Â,- 2 x = y2 x 2 + Â"â€¢ .Devreser STHGIR lla .7 - Rewsna Tcerroc). Deeps suonorhcnys sti ni egnahc eht etal .Maxe no noitces dethgiews dethgiews dethgiews ylivaeh som eht s acitsa mehtam Â¢â€Ã¢ .Gniggaal rotcaf REWUP ht daol detcenocnoc-y esahp erht a otcenocnoc si zh06 ,Vâ°ã,0/021 = Nav Ecruos Ecneuqes Evitisop Evitisop 3 Decnalab a)e Esctam' fo yrogetac eht rednu sllaf melborps siht a - rewon tcerc)c7 Xirtam .2 > z sa emas eht si 2â€Ã¢ < Z ,Taht Eton ------ Â"â€Ã¢ ----- = ----- = ----- = Z 047 Â "â€Ã¢ 007 I\ Â"â€¢ x :woleb nwohs sa dezidradnats Eb dluohs noitubirtsid siht 1 â€œ & 0 & ,ECni .Gnidnatsrednu poleved t koobdnah ecnerefer ef Â®Ã,12 -012 segap no nevig STUCRICRIC STUCC RETLIF Golana fo snoitcNuf refsnart etaluclac Â¢â€Ã¢ .Setats detinu ni erusnecil esnecil eusnecil eusnecil eusnecil eusnecil eusnecil eusnecil eusnecil eusnecil eusrup ot dedidiced ni tcejorp rojam a rof tnemngissa krow lanoitatinretanretanratni Ray-oist a kootrednu eh ,4 SIICELOV YRADNOCES DETAR AND TNERRUC Yramirp Yramirp Step-by-step solution of problems requiring detailed explanation. (A) 22.5 mV (B) 100 kV (C) 200 kV (D) 1 kV Problem 6.2 d) A charged particle 'Q' with mass 0.01 kg is suspended between two parallel plates with potential difference of 100 V. In this case, the two matrices do not have same dimensions. 2.1g) CORRECT ANSWER - 80 Let us first arrange the given data in ascending order. Wyi = rÃ±Â2 = V(1 - 0)2+ (0 - l)2+ (0 - 0)2 = V2 W12 = 31.9 m/ 6.1c) CORRECT ANSWER - B d{i) ¢ÃÂÂ dq(t)/d(t) -Ã»Â dq(t) = i(t) x d(t) = 1mA x 5s = SmC Electron charge = 1.6022 x 10-19C Number of electrons = _____5mC/1.6022 x 10-19C = 3.12 x 1016 6.Id) CORRECT ANSWER - A Potential energy of System A can be calculated as follows: W12 = 4 Q1Q2¢ÃÂÂ = 45/ neri2 Potential energy of System B can be calculated as follows: T.r Q3Q4 = 4^ Arj = 4S} Therefore, potential energies of both systems are equal. D = p is the vector form o f Gauss' Law for electric field. y " + 2y' - 8y = 0 y(0) = 6 y '(0) = 0 We can use method of undetermined coefficients, as explained in NCEESÃ®Â FE Reference Handbook. ¢ÃÂÂ2 det 8 .1 4 10 3 6¢ÃÂÂ 12 = 2(14) - 4(28) + 6(14) = 0 5. T ip s f o r p r e p a r i n g t h i s s e c t i o n ¢ÃÂ¢Â Understand concepts found on above mentioned pages of NCEESÃ®Â FE Reference Handbook. 2 ,3 ,7 ,1 ,4 ,9 ,0 ^ 0 ,1 ,2 ,3 ,4 ,7 ,9 It can be observed that the median of given data set is 3 because it bisects the data set. ¢ÃÂ¢Â Learn how to calculate dot product and cross product. Standard error of mean (SEM) of problem 2.3g) can be calculated as shown below: a Vn = $5,000 - = $645 V60 Therefore, SEM is $645. (A) 5.8/-1Q40 A (B) 5.8/16Ã°Â A (C) 22/30Ã°Â A (D) 22/-12Q0 A Problem 11.2 c) Calculate line current L supplied by a balanced positive-sequence 3 4Ã»Â Y- connected source Van = 277/0Ã°Â V to a balanced 3 cj>Y network with (A) 15/0^ A (B) 195/-150 A (C) 33/-450 A (D) 3.3/-450 A = 5 + 5j Q and Zime = 1 + l j Q. A x B is not always equal to B x A. Since, \i =Ã£Â 0 V5.4 = ECV ,am 5 = EI)d(v2.0 = ec v ,am 0= el)b(ec v01 =ec v01 =ec v ,am 0= el)c(v7.2 =ECV ,am 4.2 el)A(q w .wleb nwohs tiucric fo Tnerruc rosahp Ethahp Etaluclac)C 5.7 Melborp v °Ã,04-7051)A(.'Sectam' fo yrogetac eht rednu rednu redan sllaf melborp siht C - Rewmy Tcerc)A7 7.1 8102 Â©Ã, Lairetam DethgryPoc] 5 0 1 3 2[=]n[x f o mrofsnart-z eht dnif)d 3.9 Melborp)1" Z 2. 0 - 1(/ 1)1 " z - l (/ 2 ..QK 4.3 = Bar ,erofereht .WK 001 semusnoc dna 6.0 fo rotcaf re wap gniggal a sah)V 084(roto m noitcudni zh 06 a gnivah tnalp ivah otuma na)B 6.11 Melborp FN 685)D(and| 307)C(and| 307)c(and| 392) B(and| 004)A(.Meht newteb ecaps m 1 Evah saxa sixa sixa sixa sixa z gnola detacol)ylevitcepser m/c 1- dna m/c 2 + f o seitisned egrahc enil gnivah(serew leave gnol yletinifni owt) Ã,SP)D(E/SP2)C(Â£,/SP)B(0)A(ylevitcepser s P - DNA SP Seitesned Egrahc Gnivah Enalp Y-X Etaluclac)C 2.21 Melborp M/V 05)d(M/V 009)C(M/V 001)B(M/V 0)A(.)h2.11 Melbourp F o Daol a Tnelaviuqe Etaluxe Etaluculc 2.11 Melborp Seulav detcepxe' fo yrogetac eht rednu rednu sllaf melborp shet 81.3 - Rewsna Tcerroc)A3 Amish DNA Seulv Detcepxe 3.2 8102 Â©Ã, Laretam DethgryPoc 881 4.0 =)B(P 2.0 =)A(P I.O =)BN A(p u 05.0 = 01.0 - 04.0 + 02.0 =)b + A(P)b , A(P -)B(p +) A(P =)b + A(P :woleb Noitauqe YB Nevig si hcihw 'Ytilibaborp latot fo Wal' fo yrogetac rednu red red red red red sllaf melborp siht 05.0 - Rewsna Tcerc)g2 - 2779.0 =)1 (f -)2 (f =)2 z < â died,Z{p 2 z < â±Ã,z 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 -- = = = = 2 z 4 0 1- 4 1 2 0 1- 2 1 :WOLEB NWOHS SA DEZIDRADNATTS EB dluohs Noitubirtsid siht Copyright © 2018 Issue 10.3 e) Calculate in itter current Ie and V voltage Ec to BJT shown in the circuit below. (A) z _1 + z -2 + z -3 + z -4 (B) 1 + z _1 + z ~ 2 + z ~ 3 + z ~ 4 (C) 5z " 5 (D) 1 + z -1 + z ~ 2 + z -3 + z " 4 + z -5 Problem 9,3 c) Find the z-transform of x [n] = 0.2nu[n] Therefore, at least 2000 chairs need to be sold before making any profit. -1 The diffusion coefficient can be calculated using the following equation. The solutions are grouped at the end to facilitate the review. 3 Copyrighted Material © 2018 Chapter # 1 - Mathematics Key Knowledge Areas* NCEES® FE Reference Handbook Concepts Page # M athem atics 2 -3 6 Algebra and trigonom etry Complex numbers Discrete mathematics Analytical geometry Calculus Differential equations Linear algebra Vector analysis Facts about this section • 1 1 -1 7 questions can be expected in the exam (according to the NCEES® FE specification). x = No. of hiring. • Understand the difference between work, strength, energy and power. We can compare options given by looking at your current value of your costs. 1.7b) ANSWER CORRETO - D This problem falls under the category "Matricas". They are collectively called angular modulation. We can calculate coefficient using initial conditions as shown below: y(0) = 6 6= C and(-2X°) C. Therefore, y = 6e~2t -~x3 1.6b) CORRECT ANSWER - y = ... P[Bj) is the probability of event Bj in the population of B. 2y' + 4y = 0 y(0) = 6 Standard shape of 1st different order equation with constant In our case, a = 2. Useful tip - Matrix operations (sing, subtraction, multiplication, reverse) using calculator can save time and reduce the chances of error. 20 = — 30 2 = - = 0.66, 3 2Q ¥2 = 0 12 . Jt_ 2 229 Copyrighted Material © 2018 9.2 Discrete Time- Solutions Consult Reference Manual NCEESâ® FE - PANINE 206 For Reference 9.2A) Correct Answer - B F [n] = x [n] * y [n] = x [k] y [n - k] . Online practical examinations are not most disposingable. A = (1,215 x 10â € œ 4/) - (1.215 x 10â € œ 67) = 1.202 x 10â € œ 47 6.if) CORRECT ANSWER - D Energy stored in a capacitor is given by CV2F 2 SA (8.85 x 10 ~ 12f / m) (lm 2) C =-= = ----------- ...... (a) 7.5 ma (b) 15 mA (c) 5 ma (d) 12 mA problem 7.3 e) circuit req given in problem 7.3 d) © 48 CopyRighted Material © 2018 Problem Set # 7.4 - WaveForm Analysis Consult NcOesâ® FE Reference Manual - Pages 201 - 203 at Solve these issues problem 7.4 a) Calculate the mother tension of the full rectified wave if its effective value is 10 (a) 20.5 V (B) 5 V (C) 1 4.1V (D) 10V Problem 7.4 b) Sum of the following breasts: V i = 10cos (500t) (a) 25cos (600t + 45) v2 = 15cos (100t + 45â °) (b) 10cos (500t) - (c) 150cos (500t) cos (100t + 45) 10.6cos (100t) + 1 0.6 sin (1 0 t) (d) 1 0 c o s (5 0 t) + 10.6cos (100t) - 10.6sin (100t) Problem 7.4 c) Sinusoidal signal frequency of 1 0 c o (5 0 t + 50 °). LO.LG) Correct ANSWER - Group V The elements V of the Perion Table Tan 5 ELA ELABRITE in their external ribitis, which allows them to form 4 covalent bonds with SI or GE. Calculate the necessary capacity by phase o f a Bank of connected capacitors and balanced if the potential factor needs to be improved for Lagging 0.95. € ¢ Transfer transfer function derived from the negative feedback block diagram designed in the NCEESâ® Reference Manual (Pãina 127) to obtain a understanding of block diagrams and response. LOOP / OPEN LANGEE CLOSED. Solving R 2 + 6R + 9 = 0 results in R1 = R 2 = â € "3 From A2 = 4b = 36, the solution is critically amortized and can be represented as follows. â € ¢ The diversity of a magnetic field is zero. C Â € ™^ = (t) + Â © + Â © = " F Useful Tip - Adding serial and parallel capacitance is iseht rof nosaer eht nialpxe esaelP .V 0.7 = noV gnimussa tiucric gni wollof ni stnerruc edoid dniF)e 2.01 melborP V8 0k01 V01o rAAA o- j 02 , , woleb nwohs noitcnuf refsnart yb nevig epyt retlif eht yfitnedI)c 5.9 melborP retliF tcejeR dnaB)d(retlif ssap dnab)c(retlif ssap wol)b(retlif ssap hgih)A(0001 + 00â€ + 00â€ + y>aj(--------) w Noisnapxe noitcirf laitrap mrofrep ot woh nrael Â¢â€¢ .Q â°â,0/02 Ecnadepmi Daol Gnideef v Â°Ã,0/021 = Nav Without Ecruus Sah Krowten Y-Y>J < -3 Decnaalab Ecneuqes News j 2.11 Melborp q 6.21)d(q 4.8)C(q 2.4)b(q 2.4)b(q 2.4)b(q 8.2)A(.Alumrof Gniwollof Gniwollof GNU Detaluclac Eb Nac Slevel Noitazitnauq 821 - Rewsna Tcerroc)A3 Ã, noittaludom editilpma eslup &)MCP(Noitataludom Edoc 3.41 8102 Â©Ã, Laretam Dethgrypoc 682 zhk 02 = b zhk 01 x 2 = b ZHK 01 = W 1.0 = d ,tnemetats Melborp ot gnidrocca w2 = b :alumrof GNIWOF GISU DETALC EB NC htdiwdnab Rewop % 89 D - Rewsna Tcerroc)E2 Neht ,4 htiw 9 ecner ew and elpmaxee st ni ,ecnats rof .Koobdnah ecnerefer Â®o Â®Seecn f o 762-562 segap no dnuof eb nac NOITACIFIREPS MAXE* €Ã¢] n[u =]n[x f o mrofsnart-z eht dnif)B 3.9 Melborp Noittargetni)d(mrofsnart z)c(NOITULOVNOC TERCSID)B(mrofsnart ecapal)A(.emit gnol a rof notisop detacidni ni Neb sah woleb tiucric ni nwohs hctiws taht emussA)a 1.8 melborP snoitseuq eseht gnivlos elihw 402 - 302 segaP - koobdnaH ecnerefeR EF Â®ÃSEECN tlusnoC esnopser tneisnart / ycneuqerF - 1.8 # teS melborP 8102 Â©Ã lairetaM dethgirypoC 45 .02 = a ,047 = i(,007 = *tnemetats Melborp eht ot ot ot ot ot ot otildrocca .Wopeb nwohs tieucc eht ni ov imptuo eht dnif)c 5.01 Melbop r .ecnatcudni DNA ecnatsiser mrof Ã©Â Difficulty level of this section is rated 'M edium ' by the author. (A) {(l,a),(l,b),(2,a),(2,b)} (B) {(l,a),(l,b),(l,c),(l,d),(2,a),(2,b),(2,c),(2,d)} (C) {(a,l),(b,l),(c,l),(d,l),(a,2),(b,2),(c,2),(d,2)} (D) None of the above Problem 1.3 e) Which o f the follow ing relation(s) is not an example of a function? Solving r 2 + 2 r ¢ÃÂÂ 8 = 0 results in rt = 2,r 2 = ¢ÃÂÂ4 Since a2 = 4 > 4b = ¢ÃÂÂ32, solution is overdamped and can be represented as shown below: y = CiLer'lX + C2erzX y' = C1r1eriX + C2r2er2X We can calculate coefficients using initial conditions as shown below: y(0) = 6 6= + C2e ^ m = Cx + C2 -> = 6 - C2 y ,(0) = 0 -* 0= + C2(- 4) e (" 4)(0) = 2 ^ - 4C2 = 0 2 2(6 - - 4C2 = 0 C2) - 4C2 = 0 12 - 2C2 - 4C2 = 0 Solving these equations results in = 4 and C2 = 2. (A) {(l,b),(l,c),(l,d)} (B) {(1,a),(2,a),(3,a) } (C) {(l,a),(2,b),(3,c)} (D) None of the above Problem 1.3 f) {(a,l),(b,l),(c,2),(d,2)} is an example o f _______ function. ¢ÃÂ¢Â Some of the im portant equations relevant to this section include steady state error - final value theorem, root locus parameters, Routh-Hurwitz parameters, state equations, Bode Plot. ¢ÃÂ Â Complex Numbers - Rectangular form, Polar form, Conversions between Rectangular and Polar forms, addition, subtraction, m ultiplication and division, Euler's identity. W V .... x (t) = s in (t) (u (t) ¢ÃÂÂ u (t ¢ÃÂÂ 7r)) y (t) = u (t) ¢ÃÂÂ u (t ¢ÃÂÂ ri) (A) co s(t) 0 < t < n, ¢ÃÂÂco s (t) n < t < 2 n (B) s in (t) 0 < t < n, 1 ¢ÃÂÂ sin (t) tc < t < 2 n (C) co s(t) ¢ÃÂÂ 1 0 < t < 7 r , 1 ¢ÃÂÂ co s(t) n < t < 2n (D)l ¢ÃÂÂ co s(t) 0 < t < n , 1 ¢ÃÂÂ co s(t) n < t < 2 n 67 Copyrighted Material Ã©Â 2018 Problem 9.1 d) W hich o f the follow ing options correctly represents convolved output of x(t) and y(t)? 36 Copyrighted Material Ã©Â 2018 Problem Set # 6.1 - Work, Energy, Power Consult NCEESÃ®Â FE Reference Handbook - Pages 200 - 202 while solving these questions Problem 6.1 a) The am and the necessary work to bring a load q i = 10 ~ 6 c to p i (0, 0, 0) in the presence o f another load CH = 2 x 10 ~ 6 C located in p 2 (2, 0, 0). (in English) [in English] .2 - M N - *]) 9.2E) Correct ANSWER - C x [n] = U [n € "2] Y [n] = 0.4nu [n] k = ~ o Fc = o Fc = -00 fc = n k = n 231 CopyRighted Material © 2018 9.3 Z Transforms - Solutions Consult Reference Manual NcOesâ® Fe - Page 206 For Reference 9.3A) Correct Answer - C Z Transforms SÃ £ Laplace transforms equivalent into differences in difference. The members of this group are 3 Elão de Valaça that make them suitable for doping type p. Frequency of alias = | Signal frequency - n x sampling frequency | = 1200 Hz - 1 x 300Hz | = 100 Hz. 9.4E) Correct ANSWER - A According to Nyquist Therem, the signal needs to be

sampled or above a nyquist rate for perfect reconstruction. Therefore, y = 4e2* + 2e ~ 4x 179 Authorized Material © 2018 1.6e) Correct Answer - UnderDamped This problem falls under the category of "differential equations". We can compare given options, looking at your future. ENG, M. Calculate the field ELÃ © Trico halfway between the wires (A) 3 V/m (B) 0 V/M (C) 2 x 10 10 V/M (D) 1 x 10 11 V/M Problem 12.2 e) Calculate the Force in a 2 2 m long current conductor in a uniform 0.5 tic field (I assumed that the conductor between the conductor and the field is 30 Â °). Second Round - It is through the list of signposted questions and try to resolve 'Difficil, but solvable' questions. (A) decrease the tensioning through it (B) increasing the number of curves (C) increasing its length (d) options a, b, correct problems 6.4 and) calculate induct equivalent circuit shown below. 0 .4 n- 'Â £; : (D) 0.42 and ^ 0. For x v5kn = 4,375k v5kfi iskn - 5ko 4,375 v 5ko = 875 ^ia 211 Copyright © 2018 SKA 5V 7.2 Parallel series/equivalent Circuits - Solutions consultations FE Reference Manual - Pages 201 - 203 For Reference 10kfl 7.2a) Correct answer - D Rab Toka Aa ....^ = Ska \\ (io M + 2 M | i m) oj6ko 2 kq \\ l kq = 0.66 m 10 m + 2 m || i m = 10,66 m rab = 5 m i l 10,66 kq = 3.4 kq. 3 ir x {n] 2 3 yw 2 l1 1 1 ii | II I! 1? 182 Copyright protected material © 2018 1.7J) Correct answer - - 4 I +; + 10k a = 3 i + 2j + k b = i + 4/ 4- ok i 2 x s = (3 £ + 2; + fc) x (£ + 4/ + ok) = 3 j 2 1 4 k 1 0 a x b = (2 x 0 - 1 x 4) i - (3 x 0 - 1x 1)/ + (3 x 4 - 2 x L) fc a x b - 4i + Juse the calculator to find VectorProduct. m h (t) x (t) = 4 (u (t) - u (t â€ 4)) y (t) = 2 (u (t) - u (t - 2) 66 copyrighted material © © © © ©Gniyduts retpa thgir retpahc hcae morf morf smelborp tpmetta ot dednemmocer you are .V 056 f o Emplov Yrадnoces Daol-On Htiw v ,Liretam DethgryPoC 59 V 006)D(v 982) C(v 002)B(v 002)B(v 614)A(.noitacifilpmim rof oc/ol htiw noitauqe eht ylpitlum v01 ok 5 ok 2 0 Â"â€¢ nk5v Â"â€Ã¢ 5 OK 01 n k s v- qi nk5v .m 01 si ecnadepmi citsiretcarahc q 002 gnivah enil Noissimsnart a f htgneleva w)d 3.21 Melbop q 005) D(Q 002) B(Q 001) B(Q 001).) A (.5.0 fo t tneiciffeoc noiticifeoc noititcelfer a wolla llew taht ecnadepmi daol f o edutingam etaluclac .woleb nwohs nwohs nwohs tiucric eht yb debrosba)sttaw ni(rewop latest esalot etaluclac) B(A V 03.76-/QQ2)C(av Â°Ã,09/02)A(.Koobdnah Ef Â®,Sesicn nivig salumrof salumrof noitutaludom elgna weever - pit lufpleh zh 00054 = b Zh00001 x)1 + 52.1(2 = b w)1 + d(2 = b zhk01 = w 1 2dv DNA 0>1di ECni 0 < v 3 3. 2- = t tk 2 x am 66.1 - V L = 2DV am 66.1 = lâ£ã,k 3 1 dl v5 .Margop detdercca-teba/cae na morf erged gnirged gnirgrednu na gniihsinif ot esolc ot esolc ot ulc lanoitidda rof smaxe ecitcarp htgnel-lluf 3 morf tifeneb osla nac stnedutS .)noitacificepS EF Â®ÃSEECN ot gnidrocca(maxe eht no detcepxe eb nac snoitseuq 5 1 - 0 1 Â¢Ã¢ noitces siht tuoba stcaF ecnadepmI srosahP sisylana mrofeva W sisylana pool dna edoN s meroeht notroN dna nineveht stiucric tnelaviuqe lellarap/seireS LVK ,LCK - swaL s'ffohcriK 302 - 102 gnireenignE retup moC dna lacirtcelE # egaP noitceS stpecnoC koobdnaH ecnerefeR EF Â®ÃSEECN *saerA egdelwonK yeK sisylanA tiucriC - 7 # RETPAHC 8102 Â©Ã, Lairetam DethgiryPoC 14 h 8)d(H h 4)c(h 6)a(m h1 .reisae noitces siiht yam gnreenigne rewor rojam a htiw standuts j¢â€Ã¢ ?)T(H DNA)T(F fo tuptuo devlovnoc stneserper yltcerroc Snoitpo Gni Wollof eht fo ht fo ht fo ht fo ht fo ht fo ht fo ht fo Hcih w)b 1.9 Melbop concepts. 237 CopyRighted Material © 2018 Lo.lf) Correct ANSWER - The Mother Speed when the ELABRES move under the influence of an ELABY FIELD is called the drift speed and directly proportional to the field © Applied Trick. y1 = x 1 + 4 y2 = sx2 + 6 (a) 78.6â ° (b) 11.3â ° (c) 38.6â ° (d) 33.7 ° Problem 1.4 b) Find the equation of a straight line passing through points (2.10) and (3.12). RT IX =----- Â € "H R X" I- R F IX = Ã ° °, T = 40, RX = 40 30 + 2 0 | 12 O -H 40 30 + 2 0 | 2 o, It = isource 1.25a = 0.625a v3n = ha x 30 = 0.625a x 30 = 1,875 v 210 Authorized material © 2018 20 to 7.id) Correct VW free downloads and purchases for preparation for exams sao Made through your account Mynces account. Your licensing council may have additional requirements. ENGINEERING FUNDAMENTS STUDY GUIDE (FE) ELABLE AND WITH PUTER CBT EXAM has been well reviewed by students. Let X and Y indicate customers Online and in the store, respectively. and 5 ko. About the author W Asghar is a professional engineer licensed in Texas (PE), flower (PE) and onion (P. P = Success Probability. SM (A) 3.1 ma (b) 5 mA (c) 2.5 mA (d) 1.5 mA problem 7.1 f) Calculate the current that passes through resistor 5 kQ in the circuit shown below. university / university textbooks. FAKE MATERIAL REFERENCE MATERIAL THAT CAN BE USED DURING THE EXAMINATION. Sample # 3 will have the highest heat capacity because it contains the largest on the substance being tested. (A) 2 kW (b) 20 kW (c) 10 kW (d) 0 kW problem 11.2 m) Calculate the phase tension at the entrance of a hospital (which consumes 125 kW) that is being fed by a 3 4> balanced Y network, providing 300 the line current at 0.694 pow er factor. (A) v + ej2n + v ~ e ~ j2n (b) v + ej10n + v ~ e - jl0n (c) v + ej200n + y - e ~ j200n (d) ^ (v + ej2n + v 'e ~ j2n) 12.3 g) In Issue 12.3 f), find an expression for current at 100 m. I TE 86 copyrighted material © 2018 Issue 10.5 d) Find the output voltage V0 in the circuit shown below. (A) 5 V (B) 0.25 V (C) I V (d) 0 V Problem 6.4 C} Calculate the energy stored in a 100 mH current carrier i (t) = t 2 (to t> 0) per 10 s. Problem 1.4 d) Select the options representing a straight line perpendicular to the line given below. 1.7g) Correct answer - to this problem fails in the category of 'matrixes'. Hi2-100 x 10 ~ sh x (100v4) 2 = ------------------------------- = 5 0 °; 6.4d) Correct answer - B The energy stored in an inductor can be calculated as shown below. (A) 2 cos (3 t) i (b) sin2 (3 t) k (c) - 6 cos (3 t) sin (3 t) k (d) 5 sin (3 t) j Problem 12.1 i) Calculate the voltage induced in a coil with 20 turns if the flow passing through it changes from 0.1 W B to 1.5 W B in 2 s. In other words, it is a measure of inclination. *10.66kq 5ks2 7.2b) Correct answer - a toko - Problem a r rab = 5 kq \\ 10 kq \\ (2 kq + 4kq \\ 8kq) 2hcs a "aaaar ..." â â â â €-y* 4 m | 8 m = 2.66 m Calculate the energy stored in a magnetic field with force of 2 to/m in 2 m 3 Volum and (assum | i = 4tt x 10 ~ 7 h/m). • Identify the signal with the highest frequency to properly apply the Nyquist theorem. They are in series), RT = 10 ko lkfl 6 ko + 10 ko 10 kq. 202 Copyright protected material © 2018 5.3 Mechanical Properties - Solutions See the NCEES ® FE reference manual - pages 60 - 62 for reference 5.3a) Correct answer - strength B is related to stress and area through the followingF cj = ----> a f = ox A according to the details of the problem, o = 2000 x iq8 pa, a = n r 2 = n ¢ â € n x 10 ~ 6 m 2 f = a a A = (2000 x 108 Pa)(n x 1G¢ÃÂÂ 6 m 2) = 628.3 kN 5.3b) CORRECT ANSWER - B Young's modulus (E) can be calculated using following equation: o F AL 5.3c) CORRECT ANSWER - 0.095 True strain eT can be calculated using following equations. 20 (A) 5 - 3jS l (C) 1 + 2jS l (B) 2 - 3j Ã£Â l (D) 10 j a 52 Copyrighted Material Ã©Â 2018 Problem 7.6 c) Determine equivalent impedance of circuit shown below (assume 60 Hz frequency). 10.1b) CORRECT ANSWER - D According to periodic table found in NCEESÃ®Â FE Reference Handbook, Boron is a group III element. Sacrificial anodes are used to protect metals against corrosion. n = 2 tan ¢ÃÂÂ = oo 2 dx 1.5j) CORRECT ANSWER - D This problem falls under the category of 'Integral Calculus'. (A) 1.25 mH (B)1000 H (C) 0.625 mH (D) 2.5 mH Problem 6.4 b) Calculate the voltage induced in a 5 mH inductor if current in the inductor is increased from 0 to 100 m A in 2 ms. It leaves one electron free which makes them n-type doping agents. (A) 5 /(1 - 0.75Z"1) (B) 5(0.75nz " n) (C) 5(1 - 0.75nz_1) (D) 0.5nz ¢ÃÂÂ n Problem 9.3 f) Find the inverse z-transform o f X (z) = ' K J 2-0.5 (A) 1 /(1 - 0 .5 z-1) (B) 0.5n_1u[n] (C) 0.5nw[n] (D) 1 - 0.5n Problem 9.3 g) Find the inverse z-transform o f X (z) = Sz+2 (A) ^ (4 nu[n] ¢ÃÂÂ 1nu[n] -1- Ã£Â[n]) (B) (C) ^4 nu[n] + i u[n] (D)^S[n] - ^u[n] + ^ 4 nw[n] 71 Copyrighted Material Ã©Â 2018 cos[n] ¢ÃÂÂ 4 nu[n] Problem 9.3 h) Find the inverse z-transform o f follow ing function , , (z - 2) (z + 1) (z - 1)(z - 2) (z + 1) (z - 0.1) (z - 0.2) (A) i o . 9.5c) CORRECT ANSWER - A Comparing the given transfer function to First-Order High-Pass Filter transfer function on page # 210 of NCEES Reference Handbook shows that it is analog implementation of First-Order High-Pass Filter. 0 3 0 2' 0 1. In our case, n = 1 as shown below. Once the underlying theory is understood, you should revisit the problems and attem pt them again. (A) 11.5Ã°Â (C) 90Ã°Â (B) 0Ã°Â (D) 1.145Ã°Â 39 Copyrighted Material Ã©Â 2018 Set # 6.3 - Capacitance Consult NCEESÃ®Â FE Reference Handbook - Pages 200 - 202 while solving these questions Problem 6.3 a) Calculate voltage applied across parallel plate capacitor carrying 400 [xC charge w ith a 0.02 m2 plate surface area and 0.01 m plate spacing (assume Ã£Â = 8.85 x 1 0 12 F/m). Calculate induced voltage if current is increased from 50 m A to 100 mA in 1 s (assume \i = 4n x 10 '7 H/m). 1.7h) CORRECT ANSWER - 0 This problem falls under the category of 'Matrices'. ¢ÃÂ¢Â Thevenin resistance calculation requires 'short circuiting' external voltage sources and 'open circuiting' current sources. ¢ÃÂ¢Â Some o f the im portant equations relevant to this section include RC and RL transient circuits, RLC series and parallel resonance circuits, Laplace Transforms pairs and Two-port parameters. Therefore, it is im portant to gain fundam ental understanding of all topics (more on exam taking strategy later). *Exam specification can be found on pages 265-267 of NCEESÃ®Â FE Reference Handbook. (A) 70/10Ã°Â A (B) 10007-80Ã°Â A (C) 2665/100Ã°Â A (D) 55Q/-1Q0 A Problem 7.5 e) The frequency domain impedance 'Z' of circuit given below is 50 *1OJ0 2m 51 Copyrighted Material Ã©Â 2018 -p a Problem Set # 7.6 - Impedance Consult NCEESÃ®Â FE Reference Handbook - Pages 201 - 203 while solving these questions Problem 7.6 a) Determine equivalent impedance of circuit shown below. (A) Disjoint (B) Proper (C) Sub (D) Overlapping Problem 1.3 d) W hat is the cartesian product of {1, 2} x {a, b, c, d}? Laplace transforms are used in differential equations. (A) 100/60Ã°Â A (B) 12.5/-3Q0 A (C) 7Q.7/-3Q0 A (D) 1.87-120Ã°Â A Problem 7.5 b) Express v (t) = 2 1 2 sin(a)t + 50)1/ in phasor form. The author has made efforts to add challenging practice problems, introduce new concepts, offer detailed solutions and update content in general based on latest exam form at and student feedback. Alternatively, you may perform conversion by hand and _____ Y decnalab>jc 3 a gnirewop V°03/802 = b3 V ecrus A fo gnisirp moc krowten a ni al tnerruc enil etaluclaC)f 2.11 melborP)A(0)C(1_ zn2.0)B(17)1 - z 2.0( )A(2 si oitar evaw gnidnats fi)ecnadepmi cits 05(Q 005) D(Q 002) C(Q 0053) B(Q 0 0 1) A(.)sTIA(sepyT metl-evitanretl ¢Ã Â Â Â Â Â Â2 = a ,01 = i\ 41 = 2 x 21 = tx tnemetats melborp eht ot gnidroccA 9531.0 - REWSNA TCERROC)f2.2 . Q j05 + 003 a ot detcennoc si ecnadepmi citsiretcarahc Q 001 htiw enil noissimsnart 3.21 melbor P snoitseuq eseht gnivlos elihw 602 - 502 segaP - koobdnaH ecnerefeR EF ®SEECN tlusno C noitagapor P evaW dna seniL noissimsnarT - 3.21 # teS melborP 8102 ♫ ♫ ♫ P snoitseuq eseht gnivlos elihw 302 - 102 segaP - koobdnaH ecnerefeR EF ®SEECN tlusno C stiucriC tnelaviuqE lellaraP / seireS - 2.7 # teS melborP 8102 © lairetaM dethgirypoC 44 ok2 0k01 .woleb nwohs sa trapa segrahc peek ot deriuqer krow fo tnuoma eht lauqe si metsys nevig fo ygrene laitnetoP .yticapac taeh tsewol eht evah lliw tibus eroferehProfessional engineers prepare better for the latest CBT format of the Electrical and Computing Engineering Exam. The sacrifice node prevents corrosion the more positive electro metal costs, which is purposely introduced. 185 Copyright protected material © 2018 2.2 Probability Distributions - Solutions See the NCEEES FE - PAGES 38 - 39 Reference Manual for Reference 2.2A) Correct Answer - C This problem fits the category of category 'Law of Total Probability', which is given by the equation below: P (A + B) = P (A) + P (B) ~ P (A, B) Let's identify the probabilities as shown below: Probability of sunny climate = P (a) = 0.25 climate probability = P {b) = 0.35 Probability of sunny and cloudy climate = P (A, B) = 0.15 Probability of sunny climate, climate climate or both = p (a + b) = 0.25 + 0.35 ¢ â Â € 0.15 = 0.45 2.2b) Correct Answer - 0.24 This problem fits the category of 'bayes' Theorem '. 3, 9, 27, 81 Problem 1.3 j) ______ is the sum of a geoman progressive for which the first term is 1, the last term is 19683 and the common proportion © © 3. It is centered on 'problem -based learning'. 205 Copyright protected material © 2018 6.1e) CORRECT ANSWER - D The amount of work necessary to reduce the space will be equal to the energy of the Differential System in LM and 1 cm. 14 2 7 - Tip Âº - Learn how to find the opposite of a 2 x 2 matrix using the calculator. 183 Copyright protected material © 2018 Chapter #2 - Probability and Statistics 2.1 Central Trend and Dispersion Measurements See the Reference Manual ÇS Â® FE - Page 37 For Reference 2.1A) Correct Answer - 6 Mother Aritman © Tica of the specified data set can be calculated as shown below. (A) 7.5 (b) 4.77 (c) 9.54 (d) 10.6 Problem 7.4 e) The value of the current waveform 2c 2c q _ 2 + z5 z)Z(X .Q J oL + 01 = daoiZ e Q J L + 2 = EN ,rZ htI W etnoF V °Â 06/021 = naV me etsisnoc euq edeR y-y >JC 3 odaecnalaB avitisop aicnªÃuqes amu ed agrac ed o£Ãsnet a eluclaC)d 2.11 amelborP .____ ©Ã oxiaba adartsom - 1)(z ¢ÃÂÂ 4) C3 z z ¢ÃÂÂ 1z - 4 5z + 2 = Cx(z - 1)(z - 4) + C2(z)(z - 4) + C3(z)(z - 1) Letz = 1 , 7 = C2(¢ÃÂÂ3) -Ã»Â C2 = Let z = 4, 22 = C3 (12) -> C3 = ¢ÃÂÂ L e t z = 0, 2 = C1(¢ÃÂÂ1)(¢ÃÂÂ4) 11 6 X (z) 1 7 z 2z 3(z ¢ÃÂÂ 1) + 1 Cj = - 11 6 (z ¢ÃÂÂ 4) 1 7z llz ^) =2 o - ^3(z 7 ¢ÃÂÂ- 1) TT + 6 (z - 4) 1 7z llz 2 3 z (l - z x) 6 z (l - 4z x) r n S[n] 7(1") , (11)(4n) x[n\ = ¢ÃÂÂ --------------- -1---- ----- 233 Copyrighted Material Ã©Â 2018 9.3h) CORRECT ANSWER - B X(z) = X(z) z (z - 2) (z + l) (z ¢ÃÂÂ0.1)(z ¢ÃÂÂ 0.2) C3 z ¢ÃÂÂ 0.2 (z - 2) (z + l) Ci C2 ¢ÃÂÂ ---- 1---- r¢ÃÂÂr + z(z ¢ÃÂÂ 0.1)(z ¢ÃÂÂ 0.2) z z ¢ÃÂÂ 0.1 (z - 2)(z + 1) = Ct (z - 0.1)(z - 0.2) + C2(z)(z - 0.2) + C3(z)(z - 0.1) L e tz = 0.1, -2.0 9 = C2(-0.01) -> C2 = 209 Let z = 0, -2 = -2 .1 6 = C3(0.2)(0.1) -> C3 = - 1 0 8 L e t z = 0.2, X (z) (0 - 0.1)(0 - 0.2) -¢ÃÂ¡Â ^ = - 1 0 0 -1 0 0 X(z) = - 1 0 0 209 108 (z - 0.1) (z - 0.2) 209z X(z) = - 1 0 0 w (z ¢ÃÂÂ 0.1) -> 209z 108z (1 - O .lz-1) z (l - 0.2z_1) 108z 6(z - 0.2) x[n] = ¢ÃÂÂ1005[n] - 209(0.1n) - (108)(0.2n) 9.31) CORRECT ANSWER - A X(z) (z + 0.5) (z ¢ÃÂÂ 0.1) (z + 0.4) (z + 0.5) X(z) z z(z ¢ÃÂÂ 0.1)(z + 0.4) C2 CÃ±Â C3 ¢ÃÂÂ ------ 1-----------¢ÃÂÂ r + z z ¢ÃÂÂ 0.1 z + 0.4 (z + 0.5) = C i(z - 0.1)(z + 0.4) + C2(z)(z + 0.4) + C3(z)(z - 0.1) 0.6 = C2(0.1)(0.5) -Ã»Â C2 = L e tz = 0.1, Let z = -0.4, Let z = 0, 1 0.1 = C3 (¢ÃÂÂ0.4)(¢ÃÂÂ0.5) ^ C 3 = -2 5 0.5 = C iC -O .l)^ ^) -> CÃ±Â = ¢ÃÂÂ X (z) __ - 2 5 12 1 ¢ÃÂÂT ~ ~ ~2z~ + (z - 0.1) + 2(z + 0.4) -2 5 *0) = 12 _ -2 5 12z z * (z) " T " + (z - 0.1) + 2(z + 0.4) 12z z + ~r ,¢ÃÂÂ rr + z (l ¢ÃÂÂ O .lz x) 2 z (l + 0.4z_1) -2 5 (¢ÃÂÂ0.4n) x[n] = ¢ÃÂÂ S[n] + 12(0.l) n + ¢ÃÂÂ - ¢ÃÂÂ Helpful tip - Review partial fraction expansion for calculating inverse Z-Transform. Work done on a point charge to in moving it from p i to p2 in the presence of an electrical field is given by: W12 = -Q fPzE. Median is marginally influenced by outliers. 9.5g) CORRECT ANSWER - D Sampling, A/D and conversation of D/A are important processes involved in digital filtering where, as a phase modulation applies to the analonic domain. mm Problem 10.5 b) Find the value the f resistance 'r' in the circuit shown below if you will be 12 V. (A) -28 V (b) -14 V (c) -1.4 v (d) -1 0 v problem 12.1 j) A coil of length 20 cm has 50 turns and a cross -sectional o F 2 cm 2. Problem 12.3 b) Calculate the waveform of the wave of pion f o f a transmission line with impedance Characteristics O f 50 Q and load impedance O F 500 + 25J Q. 2.1J) Correct ANSWER - Influenced by Outliers Mean is highly influenced by outliers. 200 Copyright Â © 2018 Chapter #5 - Material Properties ELÃ © Tricos 5.1 QUINIC PROPERTIES - SOLUTIONS CONSULT NCEESâ® FE REFERENCE MANUAL - PAGES 59 - 60 FOR REFERENCE 5.1A) CORRECT ANSWER - A METALS WITH OXIDATE POTENTIES Higher standard standard are becoming the corrosion process. 1 - C V 2 {t) = - (2 x 10 ~ 6 f) {240SIN377TV) 2 = 5.76 Sin2 377t J 6.3d) Correct Answer - B A given by the following equation. 100 1) CopyRighted Material © 2018 Problem 11.1 e) Calculate the Mother Pow Er absorbed by 5 0 resistor shown in the circuit below. (A) 0 ma (b) 1.5 mA (c) 2.5 mA (d) 3.2 mA problem 10.4 b) Find the transistor's operating state shown below (assumes k = 0.5m a/v2 v j = m sv IV 8m aa/ V Q 6V 83 Authorized Material © 2018 Problem 10.4 c) Calculate VDS for the Mosfet Circuit shown below (assumes k = 0.2 m to / v2 & (a) 0. 5.2E) Correct ANSWER - 0.015 h / m can be calculated using the following equation. 14.2c) Correct ANSWER - Frequency Modulation B results in variation in the frequency of the wave wave wave. (A) 1 % (B) 2 % (C) 2.5 % (D) 5 % 89 Authorized Material © 2018 Problem Set # 10.7 - Electrical Problem of Electrical 10.7 a) energy that changes DC to retrevnocolcyC retrevnocolcyC)D(rodacifiteR)C(reppohC)B(retrevnI)A(__________ d ell a c ©Ã V 042)d(V 063)c(V 252)b(V 672)a(.aigolodotem e satsopser ramrifnocer arap orvil etsed lanif on seµÃ§Ãulos sa rasiver a odavitnecni ©Ã ªÃcoV .2 SEECN od aicnªÃrefeR ed launaM on odacilpxe emrofnoc ,sodanimretedni setneicifeoc ed odot©Ãm o rasu somedoP 0 = y9 + ' y6 + " y .rodamrofsnart etsed o£Ãsnet ad o£Ã§Ãaluger a eluclaC | 4.5)A(.)v 1 = tv e 2v/a m 5,0 = k amussa(otiucric o riuges arap PI meganerd ed etnerroc a eluclaC)a 4.01 amelborP seµÃtseuq sasse revloser oA 712 anig¡ÃP - ®ÂSEEECN ed aicnªÃrefeR ed launaM o etlusnoC STEFSOM - 4.01 ºÂn samelborp ed otnujnoC 8102 ©Â siarotua sotierid rop odigetorp lairetaM 28 V V 2 = CE V ,Am 5,1 = EL)d(V5 = ce v ,Am 57,7 = EL)B(.lanis od aicnªÃuqerf x 2< megartsoma ed aicnªÃuqerf a euqrop ¡Ãrerroco gnisaila O .zH 0002 = megartsoma ed aicnªÃuqerf e zH 0051 = lanis od aicnªÃuqerf)0 + t)0051(r72(soc =)t(x amelborp od o£Ã§Ãaralced a moc odroca ed C - aterroc atsopseR)b4.9 .zH 0002 = zH 0001 x 2 >res eved air¡Ãssecen megartsoma ed axat a ,otnatroP .etimil esse railava arap latipsoH od arger a rasu somasicerp ,otnatroP .]n[una0 =]n[y e]2 ¬â ¢Ã n[u =]n[x ed adÃulovnoc adÃas a ertnocnE)e 2.9 amelborP n 3 8102 ©Â siarotua sotierid rop odigetorp lairetam 96 *- "2,0)d(k ~ n2,0)6 ~ n2,0 - n2,0(52,0 -)b(- eF" n2-00 == k mc{ 52,0)A(.q 5 ed rotsiser mu a odatcenoc e ACV 011 ed etnof amu rop odatnemila ©Â ocis¡Ãfonom adno aiem rop odalortnoc rodacifiter mU)e 7.01 retrevnocolcic ed amelborP)d(rodacifiter)c(oretp³Ãcileh)b(rosrevni)a(__________ d ell a c ©Ã AC arap AC ed adum euq aicnªÃtop ed ocin´Ãrtele rosrevnoC)d 7.01 retrevnocolcic ed amelborP)d(rodacifiter)c(oretp³Ãcileh ed rodacifiter)b(rosrevni)a(__________ d ell a C ©Ã AC arap CC a aretla euq aigrene ed ocin´Ãrtele rosrevnoc)b 7.01 that noitived dradnats .woleb nwohs tiucric f o ecnaticapac tnelaviuqe eht eht eht eht eht eht eht eht eht eht 3.6 Melborp 4)d(AM 2.0)b(A m 1)a(.noitCerid rottev elur elur elur elur elur elur elur elur elur eur el el elev nrael â€â€â .Rohtua eht fos noissimrep nettirw roirp tuohtiw ,gnidrocer ,gnipocotohp ,la on .)kcabdeef Ytinu(pool kcabdeef in seod in Esuaeb Evisricer-Non he)rif(retlif estomopser estupmi Etinif a - rewsna tcerroc)e5.9 meroeht notroN gnisu krowten gni wollof eht ni xl rof)csl(tnerruc tiucric trohs etaluclaC)d 3.7 melborP 8102 Â©Ã lairetaM dethgirypoC 74 Qk 3)D(Qk 5.2)C(Qk 5)B(Qk 52.1)A(. llec noisoroc siht Edona eht sa TCA Liw nz ,erofeeraht .smelborp ecitcarp yes dnarb +001 â€â€ãt¢ :EDulcni Noide dnoces eht by Segnahc . reisae si tI .ytivitcudnoc taeh hgih ot sdnopserroc yllacipyt ytivitsiser lacirtcele wol taht devresbo eb nac ti ,koobdnaH ecnerefeR Â®ÂSEECN fo 16 egap no elbat slairetaM fo seitreporP ot gnirrefer yB B - REWSNA TCERROC)d2.5 .'suluclaC largetnI' FO yrogetac eht rednu sllaf meht siht 4 \ 4 ^ - Rewsna Terroc)15.1 8102 â©ã Lairetam Dethgirypoc 671 x = xd 1 j 1nim 2nige edni ednic + x norm edis edis â€â€â X 2SOC -4 x 2NIS :Koobdnah Ecnerefer Ef â®ã NEvig Ytitnedi cirtemongirt eht ot gimnidroc xd 2niem 2niuq Siht of ? Mr. Ralugnatcer Ni â££,03/6 + â£,03/4 tneserper snoitpo gni wolof eht f o hcihw)d 2.1 Melborp J7.5 7.5)c(â (2 V + 8)b(â V + 8)c(â V + 8)C. £,5 4/8)a(.hx1 1 rotcudnoc no gnitluser Ecrof eht fi dleif dna rotcudnoc neewteb elg eht Dnif)e 3.11 3.11 of dispersion. 90,60,70,110,50,40,200,210 40,50,60,70,90,110,200,210 It can be noted that we have up to the number of terms (n = 8) due to which the median will be average (j) and terms ^ + lj. According to the formula given in NCEES® Reference Manual: E[X] = r x f (x) d x = C x(4 x - 1)dx E[X] = j (4x2 - x) d x = ^4x3 ~^x2]l = 5 - 0 = - = 0.83 6 Therefore, the expected value of the study time spent by the student in doing assignment is 0.83 or 83%. 201 Copyrighted Material © 2018 5.2 Electrical Properties - Solutions Consult NCEES® FE Reference Manual - Pages 60, 200 and 201 for reference 5.2a) CORRETO ANSWER - D Resistivity is related to resistance, area and length through the following equation: p =— A = nr 2 = n ^— — J = 3.141 x 10 ~ 6m 2 I = 100 m R = 5ft. 4.3c) ANSWER CORRETO - 2000 This problem falls under the category of break-even analysis. Therefore, it is suggested to make a note of concepts that require additional revision. • Students with a major in communication engineering can find this section easier. (A) 500 V (B) 200 V (C) 600 V (D) 0.5 V Problem 11.2 I) Calculate losses f a l c[>distribution line is provided 200 A to a small unicipality that consumes 100 kW to 600 V and 0.85 pf lagging. Tips for preparing this section • Understand concepts found in the above mentioned pages of the Reference Manual NCEES® FE. + 1 / L n) • Equivalent capacitance in parallel Cp = Ct + C2 + C3 ....+Cn • Equivalent capacitance in series Cs = 1 / (1 / ^ + 1 / C2 + 1 / C 3 ....+1 / Cn) • Sinusoidal signals require conversion to a standard (cosine) form for phasor representation. 9.4c) CORRETO ANSWER - D According to problem statement x (t) = cos(27r(250)t + 0) Signal frequency = 250 Hz and sampling frequency = 500 Hz. Aliasing will not occur because the sampling frequency = 2 x 250 Hz = 500 Hz. 9.4d) CORRETO ANSWER - C According to the problem statement x (t) = cos(27r(200)t 4- 9) megartsoma megartsoma e zH 002 = lanis ed = 300 Hz. Aliasing will occur because the sampling frequency s f ,erofeerht w2 >s ,meroeht gnilpmas tsiuqyn ot ot gmnidrocca b - rewsna Tcerroc)c3.41 zh 0061 = B 2 = B .GNIPOD EPYT-N ROF Elbatius Meht Sekam Hcihw Snortcele EcNalav 5 Evah Puorg Siht Forn = 6, / [6] = 0 Therefore, f [n] = [0 4 10 14 10 4 0] 9.2b) Correct answer - C f [n] = x [n \ * y [n] = x [k] y [n - k]. â ¢ V.B = 0 is the form of Gauss' law vector for the magnetic field. • Control engineering students can find this section easier. 287 copyrighted material © 2018 14.4 Fourier Transform - Solutions See the Reference Manual NCEESA® - Pages 31 - 33 For reference 14.4a) Correct answer - 40 SINC (8 /) The function provided is a rectangular pulse centered on t = 0, amplitude of 5 and duration of 8, i.e. 511 Fourier Transform can be calculated using pairs provided in the Reference Manual NCEESA® FE, as shown below. yw = u (t) - y (t) (b) 2 {el - (a) 0 (c) 2 (e ~ t+2 - and ~ l) t _ (d) e. AM PS 2 1 2 3 4 Time 49 Material copyrighted © 2018 Trouble set # 7.5 - Phasors Refer to the Reference Manual of NCEEES FE - Pages 201 - 203 In resolving these issues Problem 7.5 a) Calculate circuit fasor current shown below. Doing this will allow them to save precious in the exam and help prove their performance. • Review the basic circuit theory using your university electric power book/faculty. + 10MA = 0 VIOKA = € »v10kn = -1 4 .6 3 7 14630 7.1b) Correct answer - d _ We will denote the voltage in 2 ko resistor as v2kn- We can write KCl in V2KN as follows: i 'v2kn - 0 10ma =, â€ + 3 t i' = ^2ka ~ q 2 ko to 173 v2kn â- ^2kn â- „¢ 1 0 m a = 2 k fl + 6 id t + 6 k n "v2kfi = 12V € Ž v2kn Correct answer - b 40 rcircuit = (20 + 40) + 4 0 11 (30 + 20 || 20) = 80 h ^ source 10 v ^ circuit ^ ^ = 1.25 a we can use the current divisor rule to calculate i3n. F i j 4 f 1 -d x = 4 ------- dx x+ 3 j x+ 3 according to For the indefinite integrals provided in the Reference Manual NCEESA® FE: 1 -d x = - i n | ax + b | j+ b a f i 1 replacing this formula in certain indefinite integral results in: 1 4 - i \ x + 3 | = 41n \ x + 3 | Useful tip - Tables of derivative review andelbayap i eef maxe 571$ a star star maxe maxe eef to tsom eht gniweiv gnitroper dna gnirocs gnidnatsredam slairetam Ehne Rep dna hm hm hm 001 f o ecnatcudni htgnel tinu rep Sah noissi msnart a)C 3.21 Melborp 5)c(2)b(1)a(1)a(1)a(1)a(1)a(1)a(1)a(1)a(.Koobdnah ecnerefer Eph FO ERUASEM WEIVER - PIT LUFPLEH 12.2 = 42V = s) 4()l()l(V = s n x ~ 3 x2 xx x y s s s :woleb nevig noitauqe eht -detaluccc)di.2 .)266,65$,833,35$(Ehocni Dlohesuoh naem eht rof lavretni ecnedifnoc 99 ,ereht 833,35$ < N < 266,65$ < x x[â"â€â€â€â€Tr (- 000,55$ 000,5$ 000, 5$ 2 %99 = i.c rof 2v Az + x < I/ < Az â€â€ã¢ X :Koobdnah Ecnerefer Ef â®ã yeecn Nevig Alurof Eht Ot Gnidrocca %99 = I.C 00,5$ = 5$ = x :sliated gniwof htw Noititsids evah ew ,tnemetats Melborp eht ot ot gnirocca Srucco taht Eulav eht s tes atdad nevig that FO Edom 3 - rewsna Terroc)h1.2 08 = 2/)09 + 07(= Namim ,Mayem ,erofereht ..... i ? mf Ralugnatcer ni â££,51/4 x â£,03/2 tneserper snoitpo gni Wollof eht f o hcihw)c 2.1 Melborp â£,7/ 8)(â£Ꝕsome 5.1)c(â£,35/5)b(J4 + 3)a(- ^ ft)s(2g) s (l g 1)s(VI)s(1 g +)s (L)s(2g)s(R)s(^g , - y im)r[_ ^ (Y \A . .LENNAHC Ebuy SEECN eht because Erom Nrael)Stelumim 52(kaerb deludehcs) Setunim 02 dna sruoh 5(Maxe)Stetom 8(Lairotut)Stutim 2(tnemeerga earsulsulsulsunsulsunsulcsan sudlcni dna gnol sruoh 6 the emit tnemtnioppa maxe eht . 2 .slairetam perp maxe select tuoba eram nrael .Koobdnah Ecnerefer Ef â®îã,SEECN Nevig Slargeteni for ncees. Switch©pansit i~©$ (a) 0.5 a (b) 22.6 \ia (c) 1 to (d) 0.18 a problem 8.1 and) assume that the switch shown in the circuit below is in position indicated for a long time. any remaining tim and should be spent reverifying your answers. The aits include, but are not limited to the following: multiple correct ones - allows you to examine them to select multiple point responses and click - requires exams to click on a plot to answer drag and drop - requires exams to click and drag items to match, sort, classify, classify u label fill in white - provides a space for exams to enter a response to the aits question are incorporated in the practice exams for cbt exams. according to the given scenario: n = 4 x = 2.3.4 p — 0.40 q = 0.60 P4(2) = C{4,2)0.420.64~2 = 0.34 = 34% P4 (3) = C(4, 3)0.430.64 ~3 = 0.15 = 15% P4(4) = C(4, 4)0.440.64 ~ 4 = 0.025 = 2.5% pt = discrete m (a) 4 a (b) 3.5 a (c) 7 a (d) 1.7 a problem 7.1 e) calculation of the current passing through 1 ko resistor in the circuit shown below. ea (8.85 x 10_12F m -1)(0.02m2) c = = ----------------------------- = 1.77 x 1 0 "11 f d 0.01 m q 400 fic vc = l 11 r- = 22,6 106 c correct - b the current voltage relation of a capacitor is given by the following equation. • difficulty level for this section is classified as 'm edium' by author. and 3 x 1 0 -3 _. shipping expenses will not be refunded. calculate pow er generated by source if znne = 0. cost of the chair = $50,000 + %2x sale price of neve-kaerb neve-kaerb oN x72$ = 4=cf.]5 > n[u][u =]n[x B - REWSNA TCERROC)b3.9 .Fi| 2 = Fi\ 1 + Fi\ 1 ni tluser lliw yehT .derewsnanu noitseuq yna evael uoy dluohs secnatsmucric on rednU .deriuqer egdelwonk fo htdaerb eht si noitaraperp maxe EF ni devlovni egnellahc tseggib ehT .woleb nwohs noitcnuf refsnart yb nevig epyt retlif eht yfitnedI)b 5.9 melbor P retliF tcejeR dnaB)D(retliF ssaP dnaB)C(retliF ssaP woL)B(retliF ssaP hgiH)A(ocj 02 + 1 001 =) wj(H :woleb nwohs noitcnuf refsnart yb nevig epyt P snoitseuq eseht gnivlos elihw 112 dna 012 ,702 segaP - koobdnaH ecnerefeR EF ®SEECN tlusno C sretliF - 5.9 # teS melborP tcerroc 8102 ____________ The + tZ7004(soc =)t (x fo ycneuqerf desaila enimreteD)d 4.9 melbor P gnisaila on eb lliw erehT)D(zH 0)C(zH 052)B(zH 005)A(zH 005 ta elpmas si ti fi)6 + tr7005(soc =) t(x f the ycneuqerf desaila enimreteD)c 4.9 melborP gnilpmasrev ?J 5.2)C(J 01)B(J 001)A( ).tn0002(cnis e)tn0001(cnis enis seµÃ§Ãnuf saud ed amos amu ©Ã odad lanis O zH 0002 - OTERROC REWSNA)a4.9 aicnªÃrefer arap 902 anig¡ÃP - aicnªÃrefeR ed launaM EF ®ÂSEECN ratlusnoC snoituloS - gnilpmaS 4.9 8102 ©Â lairetaM dethgirypoC 432 moc.efrofvduts)5(soir¡Ãtnemoc son satnugrep uo stne mevorp mi ,sorre reuqsiauq rataler arap ervil es-atniS .0 0 0 0 0 2 0 0+0 2+1 0+0 2 + 0. 0+0 = B +A 0+ 1 2. 0 =B 0 .V 5 iof roticapac od s©Ãvarta laicini o£Ãsnet A .emaxe od zacife o£Ã§Ãaraperp a arap salu ramrof e sacifÃcepse sacid ocip³Ãt e o£Ã§Ães a f o edadlucifid ed levÃn oa o£Ã§Ãaler me stne m moc ,launaM aicnªÃrefeR EF siev¡Ãcilpa anig¡Ãp ed soremºÃn e seµÃ§Ães a aicnªÃrefer amu moc a§Ãemoc olutÃpac adaC orvil etsed o£Ã§ÃazinagrO 8102 ©Â odazirotuA lairetaM 1 ?uk2 .)etnemavitcepser ,orienaj e ohluj me adazilauta(orbmezed a ohluj uo ohnuj a orienaj ed o£Ã§Ãalupop a arap sadartsom o£Ãs EF ed megassap ed saxat sA .oxiaba otiucric on odartsom rotsisnart f o odatse o ranimreteD)c 3,01 melborP 8102 ©Â odazirotuA lairetaM 08 V 3,1 =ECV ,Am 31,1 = cl)D(V 1,0 =EC V ,Am 57,0 = cl)C(V 2 =ECV ,Am 5,1 = cl)B(V 5,0 =EC V ,Am 0 = cl)A(,om oot«Âp m VT .emaxe o rezaf ed setna ,ebas o£Ãn ªÃcov euq o e ebas ªÃcov euq o ranimreteD a ªÃcov maduja SEECN acit¡Ãrp ed semaxe sO .ovitagen odaredisnoc ©Ã agrac amu me onretxe etnega mu rop otief kro O ¢â . ________ ©Ã riuges a odad o£Ãssergorp ed odoÃrep o21 O)i 3.1 amelborP 8102 ©Â lairetaM dethgirypoC 8 .Qk 001 ed aicnªÃtsiser moc mtlov rete mu rop odidem Qk 01 ed rotsiser od s©Ãvarta o£Ãsnet a eluclaC)f 6.01 melborP 8102 ©Â lairetaM dethgirypoC 88 soterroc o£Ãtse C e B ,A seµÃ§ÃpO)D(DTR)C(egaG niartS)B(egdirB enotstaeh W)A(.0 £Â =]z[X oc=k 0=17 1 < r o / - - - = n r Ty OC :acirt©Ãmoeg eir©Ãs ad aicnªÃgrevnoc ed alumr³Ãf a moc odroca eD 0=cf = ef z]c/uk2,0 = k ^ = zf^J oo=cf]n[un2,0 =]n[x D - REWSNA TCERROC)c3.9 0=cf 0=k = k z)5â k[u â]k[u(4âr + 3 z + 2 z + 1 = Dethgirypoc 832 .ylno ecruos Tnerruc A01 Redisnoc tsrif Su tel xf / \ .euqinhnhcet gnivlos tneiciffe tneiciffe edam edam edam edam. fo yrogetac eht rednu sllaf melborp sihT C - REWSNA TCERROC)i3.2 8102 Â©Ã lairetaM dethgirypoC 091 .noitaidar citengamortcele morf noitprosba ygrene ot eud rettam morf noissime nortcele gnivlovni nonemonehp a si tceffe cirtceleotohP .ssecorp noisorroc gnirud edona emoceb slaitnetop noitadixo dradnats Rehgih htiw slatem b - rewsna Terroc)fi.5 1~lom.jk 2.652 =)22~01 x 3.1 by - 5 â€â€Trom = dq â€â€ã¢ 0D = d by :ni Stluser noitauqe Fo fo mhtirag larutan Tr E0d = DQ .)V 1 = TV V 57.1)d(v 0)b(v 03)b(v 5 .Ecnaticapac Esaercni htgners circteleid Gnisercni dna setterc neewteb ecnatsid gniserced ,erereht ' i c sesanercni \ I gnisarcni ^ c sesaserced :tahest Devresbo Eb nac d/a s = c = c nb nevig roticapac etalp lellap fo ecnaticapac d - rewsna Terroc)C2.5 .P ,ep rahgsa sepyt metl-evitanretla gnidulated ecbolos ecbolos smelborted RETUPUC & LACIRTCELE) (Gnireengine Fo Slatnemaf rof rof rof rof yduts moc.efrofydytts.www .EVWAKLANG YB ESAHP S'EVAK REIRRAC ON NOITIRav ni Stluser Noitualom Eshp C - rewsna - rewsna - rewsna - rewsna Sinobe nwohs krowten Trop-o Wt Fo n z Rete Marap-Z)d 5.8 Melborp 8102 â©ã, Lairetam Dethgirypoc 36 3/s- =i2y=2i y / 6/s=22 y)d (3/s. - -12^=21y /6/s=22 y=ny)C(6/s- =12^=21y , 6/s=22 y=ny)b(6/s- =i2y=2 I y / 3 /S=22 y=ny)a(2V D2 21 11 82 .IB nac Snoitseuq hcihw of Syaw Tuoba Kniht Dluohs Stilluds ,Troffe Noitaperp Maxe Fo Trap on ,eram nacretam scirt _________ y b desercni Eb nac rotcudni Fo yticapac Egarots yrene)d 4.6 Melborp j Ã©Â 2018 10.2 Diodes - Solutions Consult NCEESÃ®Â FE Reference Handbook - Page 214 for reference 10.2a) CORRECT ANSWER - A 1kft Let us first assume that both D1 and D2 are ON S V -IV i m = 3 mA (i v) iDl + lD2 2 ka = 0.5 mA iD2 = 0.5 mA ¢ÃÂÂiD1 = 0.5 mA ¢ÃÂÂ 3 mA = ¢ÃÂÂ2.5 mA iD2< 0, result is not consistent with assumption. (A)100 Q (B)300 Q (C)1000 Q (D)500 Q Problem 12.3 f) A transm ission line (wavelength 20m) has a characteristic impedance of 100 Q. Find the voltage across capacitor vc(t) after 5 tim e constants if it changes position at t = 0 s. iok0 AA/V m B (A) 5 kQ (B) 7.5 kQ (C) 2 kQ (D) 3.4 kQ Problem 7.2 b) Find the equivalent resistance between term inals A-B o f the circuit shown below. Please visit the website www.studyforfe.com to view confirm ed errata online. By using this book, the reader agrees to indemnify and hold harmless the author and publisher from any damages claimed because of the content of this book. ¢ÃÂ¢Â Initial conditions o f RC and RL transient circuit shall be established carefully. (a) 1 2 - j d, (C) 2 - 3j S l (B) 5 + 2y n (D) Oj Cl Problem 7.6 b) Determine equivalent impedance o f circuit shown below. 1.6f) CORRECT ANSWER - 2ndorder linear homogeneous differential equation y " + 8y' + 12y = 0 is an example of 2nd order linear homogeneous differential equation. V W ^ 200 12 Ã¥Â2 15S Problem 8.5 e) H-parameter h i 2 of tw o-port network shown below is Ã¥Ât 200 aon 64 Copyrighted Material Ã©Â 2018 V2 Chanter # 9 - Signal Processing Key Knowledge Areas* NCEESÃ®Â FE Reference Handbook Concepts Section Page # Convolution 206 Difference equations Z-transforms Electrical and Com puter Engineering Sampling Analog filters 209 2 1 0 -2 1 1 207 Digital filters Facts about this section ¢ÃÂ¢Â 5 - 8 questions can be expected on the exam (according to NCEESÃ®Â FE Specification). According to the problem statement: 1 A= 0 .0 0 1 0 O' 0 1. Boron and Aluminum are examples of p-type doping agents. It is to mark all difficult questions during the sequential reading process, but try not to resolve them immediately. NCEES® did not participate in the development of this publication. Gravity force in electron = electrostatic force in electron mg = qE (V V V V V V V £=r ms=,b) mgd (0.01) x (9.8ms-2) x (0.1m) V 100F 9.8 x 10" 5C 6.2e) CORRECT ANSWER - A force in a current conductor can be calculated using the following formula: F = IL x B = lLBsina a=sin_1Gfe) J 1 x 10 ~6N \ a = sin 1 (— ------- — ~r 7 = 11.5 \ SAx 0.1m x 10 ~ 6 / 207 Authorized Material © 2018 6.3 Ability - Solutions See Reference Manual NCEES® FE - Pages 200 - 202 fo r reference 6.3a) ANSWER CORRETO - A capacity of a parallel plate capacitor can be calculated as shown below. 100nF X 50ft (A) 50 + j 26525 SI (B) 50 - ;2 6 5 2 5 O (C) 50 + ;5 3 5 f l (D) 50 - ;5 3 5 £ 1 Problem 7.6 d) Determine the equivalent impedance the f circuit shown below (assume 60 Hz frequency).

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