FACULTY OF ENGINEERING
B.E. 4/4 (EEE) I -Semester (Old) Examination, July 2014

Subject : HVDC Transmission
(Elective-I)

Time : 3 Hours   Max. Marks: 75

Note: Answer all questions of Part - A and answer any five questions from Part - B.
PART – A (25 Marks)

1	List out the disadvantages of DC transmission.	(3)
2	Define short circuit ratio.	(2)
3	Define pulse number	(2)
4	Draw the equivalent circuit of inverter.	(3)
5	What are the basic means of HVDC control?	(3)
6	Draw the equivalent circuit of a 2-terminal DC link.	(2)
7	What is meant by ARC BACK?	(3)
8	What is meant by commutation failure?	(2)
9	List out the applications of MTDC systems.	(3)
10	Draw the circuit of a parallel connected mesh type MTDC system.	(2)

PART – B (50 Marks)

11 (a) Compare DC transmission over AC transmission in terms of its economy and
technical performance. (5)
   (b) Explain the types of DC links with neat diagrams. (5)

12 (a) Explain the analysis of Graetz circuit for 3-valve conduction mode. (5)
   (b) From fundamentals obtain the equivalent circuit of rectifier. (5)

13 (a) Explain the principles of DC link control. (5)
   (b) Explain the constant minimum ignition angle control. (5)

14 (a) Explain the protection against over voltages. (5)
   (b) Explain the operation of HVDC circuit breaker. (5)

15 (a) Explain the criteria for design of AC filters. (5)
   (b) Explain the choice of converter configuration in HVDC system. (5)

16 (a) Explain the combined characteristics of rectifier and inverter. (5)
   (b) Compare series and parallel MTDC systems. (5)

17 (a) Explain different types of MTDC systems. (5)
   (b) Explain two ACR method of control in MTDC systems. (5)

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FACULTY OF ENGINEERING

B.E. 4/4 (EEE) I – Semester (New) (Supplementary) Examination, July 2014

Subject : HVDC Transmission (Elective – I)

Time : 3 hours   Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.
PART – A (25 Marks)

1	Give two economic aspect of HVDC transmission.	2
2	Explain about corona loss of DC transmission system over AC system.	3
3	Draw the equivalent circuit of rectifier.	3
4	Give two properties of converter circuits.	2
5	Mention two desired features of control.	2
6	What is power reversal?	3
7	Give the difference between arc back and arc through.	2
8	Draw a single tuned filter.	3
9	Name the different types of MTDC systems.	3
10	How MTDC system is protected?	2

PART – B (50 Marks)

11 a) Draw the schematic diagram of a HVDC converter station. Explain in detail the function of each and every component.
    b) Give the applications of HVDC transmission system.

12 a) With the help of a neat schematic diagram, explain the operation of three phase, sine pulse, Graetz's circuit when operating with a firing angle of $\alpha = 30^0$. Neglect the reactance of the converter transformer.
    b) Draw the following wave forms to scale when working as a rectifier:
        i) Output DC voltage   ii) Value currents   iii) Voltage across valves
        Hence, estimate the average DC voltage on the output side.

13 a) Develop the complete equivalent circuit of HVDC link and obtain an expression for the currents in the DC link as $I_d = (U_{do1} \cos \alpha - U_{do2} \cos \delta) / R_{ci} + R - R_{C2}$ Where α, δ are the firing and extinction angles and R_{C1} and R_{C2} are the equivalent resistance of the converters as rectifier and inverter. R is the resistance of the DC line.
    b) Describe the individual phase control and equidistant pulse control schemes for firing angle control employed in a converter.

14 a) Discuss the draw backs of equidistant phase control over individual phase control.
    b) With a neat block diagram, explain the working of CEA controller.

15 Write short notes on :
    i) Over voltage protection   ii) Circuit breakers

16 a) Draw the equivalent circuits of rectifier and inverter.
    b) What are the various types of Harmonic filters that are employed in HVDC converter station? Discuss them in detail.

17 a) Classify MTDC systems and explain each of them.
    b) Explain about parallel operation of HVDC and AC systems.

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FACULTY OF ENGINEERING
B.E. 4/4 (EEE) I – Semester (Old) Examination, July 2014

Subject : Power Quality (Elective – I)

Time : 3 hours　　　　　　　　　　　　　　　　　　　　　　　**Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.
PART – A (25 Marks)

1　What are the remedies to improve power quality?
2　Define transients and interruption.
3　What is sag magnitude and sag duration?
4　What are the causes of voltage sag?
5　Name some of ASD's.
6　Define Harmonics.
7　What are the causes of harmonics?
8　Define THD and explain the term with respect to harminics.
9　What is the need of site surveys in PQ monitorings.
10　Write some of IEC-measures for harmonics.

PART – B (50 Marks)

11　a)　Define i) Spikes　　ii) Surveys　　　iii) Voltage Fluctuations
　　　　　iv) Over voltages　　v) Swell.
　　b)　Explain i) PQ data　ii) Data collection　　iii) Database structures

12　a)　Explain magnitude and phase angle jumps for 3Q unbalanced sags.
　　b)　Explain voltage calculation for non radial systems.

13　a)　What are the different types of sags and explain the effect of momentary voltage drops on operation of induction motor?
　　b)　Explain the operation of DC-ASD drive.

14　a)　Explain in detail harmonic effects on transformer.
　　b)　What are the different methods of evaluation of harmonic levels?

15　Write short notes on :
　　i)　Flicker meter
　　ii)　IEC & IEEE standards

16　Design philosophy of filters to reduce harmonic distortion.

17　i)　Give technical barriers in ASD's.
　　ii)　Decline power duality in terms of A) IEEE　　B) IEC　　C) Customer level

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FACULTY OF ENGINEERING
B.E. 4/4 (EEE) I – Semester (New) (Supplementary) Examination, July 2014

Subject : Power Quality (Elective – I)

Time : 3 hours **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.
PART – A (25 Marks)

1	What are the causes of transients?	2
2	Define the following terms	
	i) Notch ii) Voltage Sag iii) Voltage Slicker	3
3	Define THD and explain the term w.r.t. harmonics.	3
4	What are the causes of voltage sag and interruptions?	3
5	What is the effect of harmonics on transforms?	3
6	Give the equation for voltage sag in a non-radial system.	3
7	Explain the significance of power quality monitoring devices.	3
8	How is the data processed in power quality monitors?	3
9	What are ASD's? Write few applications.	2

PART – B (50 Marks)

10 a) What are the various power quality problems and comment on the remedies to improve power quality?
   b) What is the need of analyzing power quality data? What are the requirements for creating a PQ database. 10

11 a) Explain the methods of calculating voltage sag magnitude.
   b) What are phase angle jumps and explain the effects of these in case of three phase unbalanced sags. 10

12 a) Explain the types of voltage sags with phasor diagrams.
   b) What is the effects of voltage sags on induction motors? 10

13 Explain the method to calculate harmonic levels in an industrial distribution systems. 10

14 a) What are the considerations and limitations for connecting power quality monitors?
   b) What is the purpose of site surveys in PQ monitoring? 10

15 a) What is importance and need of power quality study.
   b) Explain the guidelines for limiting voltage harmonics. 10

16 Write short notes on : 10
   i) Data base structure
   ii) Sources of harmonics

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FACULTY OF ENGINEERING

B.E. 4/4 (EEE/Inst.) I – Semester (New) (Supplementary) Examination, July 2014

Subject : Embedded Systems (Elective – I)

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.
PART – A (25 Marks)

1	Define an Embedded system Mention any two applications of embedded system.	2
2	Mention any six quality attributes of embedded system.	3
3	Explain the difference between CISC and RISC features.	2
4	List out the instruction set of RISC ARM processor.	3
5	What is preprocessor directive?	2
6	Brief the significance of Device driver ISR.	3
7	Explain the difference between thread and process.	2
8	Explain the different possible states of a task under Vxworks RTOs.	3
9	Explain the difference between simulator and emulator.	2
10	What is embedded product development life cycle, (EDLC)? Explain its objectives.	3

PART – B (50 Marks)

11 a) Explain various challenges in embedded system design in detail.   5
    b) Explain characteristics of an embedded system.   5

12 Explain embedded micro controller architectural features of CISC motorolla 68+1C11.   10

13 a) With a suitable example explain embedded system for control application.   6
    b) Write about the data frame format of I^2C protocol.   4

14 a) Explain the basic functions of a real time Kernel.   5
    b) Explain interrupt handling mechanisms under VxWorks RTOs.   5

15 a) Explain hardware software co-design issues in embedded system with a neat
       diagram.   5
    b) Explain different product enclosure development techniques.   5

16 What are the different files generated during cross compilation of an embedded C file?
Explain in detail.   10

17 a) Explain the use of scopes and logic analyzers for embedded system hardware test.   5
    b) What is thumb mode of ARM core CPU? Write any five advantages of it.   5

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FACULTY OF ENGINEERING
B.E. 4/4 (EEE) I – Semester (New) (Supplementary) Examination, July 2014

Subject : High Voltage Engineering (Elective – I)

Time : 3 hours   Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.
PART – A (25 Marks)

1	Define Paschen's law.	2
2	Define time lag for breakdown of gas.	3
3	What are the special features of high voltage rectifies valves?	3
4	Give the expression of voltage ripple in Cockroft Walton voltage multiplier circuit.	2
5	Draw the schematic diagram of Marx circuit arrangement for multistage impulse generator.	2
6	What are the components of a multistage impulse generator?	3
7	Mention the methods of measurement of high DC, AC and impulse currents.	2
8	Write short notes on sphere gap.	3
9	Explain briefly about impulse testing of power transforms.	3
10	Mention various tests to be carried out on circuit breaker.	2

PART – B (50 Marks)

11	Explain the various theories that explain breakdown in commercial liquid dielectrics.	10
12	With a neat sketch explain working of a Cockroft Walton voltage multiplier circuit.	10
13	Explain the working of Marx circuit with a neat sketch.	10
14	Explain the principle of operation of a generating voltmeters. Mention its advantages and limitations.	10
15	Explain the various tests conducted on power transforms.	10
16	a) What are the tests conducted on a circuit breaker? Explain.	5
	b) Explain the difference between photo-ionisation and photo electric emission.	5
17	Write short notes on : a) Chubb Fortescue method b) Van-de-Graaf generator	10

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FACULTY OF ENGINEERING

B.E. 4/4 (EEE/Inst./ECE) I – Semester (Old) Examination, July 2014

Subject : VLSI Design (Elective – I)

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.
PART – A (25 Marks)

1	What is Latch-up in CMOS circuits?	3
2	What is X in VLSI design? It λ = 0.25 µm for a given technology, what is the minimum feature dimension.	3
3	Differentiate between simulation and synthesis.	2
4	What is transmission gate? Draw the circuit diagram and list the advantages of transmission gate over pass transistor.	3
5	What is switch logic?	2
6	Draw the circuit diagram of Wilson current mirror.	2
7	Draw the stick diagram of 1-bit shift register.	2
8	Briefly explain chemical vapor deposition process in fabrication of VLSI circuits.	3
9	Draw the circuit diagram of BICMOS inverter.	3
10	Classify the memories.	2

PART – B (50 Marks)

11	a)	What is threshold voltage? Derive an expression for threshold voltage for a P - channel MOSFET.	7
	b)	Explain the characteristics of a MOS-capacitor.	3
12	a)	What are the different pull-up structures used in CMOS based inverters? What are the relative advantages of each of these structures.	7
	b)	Explain the importance of aspect ratio in FETS.	3
13	a)	Draw the layout of NOR gate.	4
	b)	What is multiplexer? Draw the stick diagram of 4 x 1 mux using nMOS switches.	6
14	a)	What is doping? List the two methods of doping techniques and briefly explain about Ion-implantation with neat sketch.	7
	b)	Briefly explain oxidation process used in IC fabrication.	3
15		Elaborate the design considerations of ALU with neat sketch.	10
16	a)	Explain the operation of various CMOS current mirrors with neat sketches.	8
	b)	List out the features of a basic op-amp.	2

17 Write short notes on following :
   a) Emitter area in BJTs
   b) Testing of VLSI circuits
   c) Bipolar current mirrors

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FACULTY OF ENGINEERING

B.E. 4/4 (EEE/Inst.) I – Semester (Old) Examination, July 2014

Subject : Principles and Applications of Embedded Systems (Elective – I)

Time : 3 hours   **Max. Marks : 75**

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.

PART – A (25 Marks)

1	Write the steps involved in designing the Embedded system.	3
2	What are the steps required to handle interrupts?	3
3	What are the functions of A/D converter.	3
4	Write the features of RTOs.	3
5	List the working modes of serial communication devices.	3
6	Write the register structure of 8051.	2
7	Write the various types of flags in 8051.	2
8	Define the terms task and task states.	2
9	Write the requirement specifications to design a mobile device.	2
10	Discuss any two applications of pipes.	2

PART – B (50 Marks)

11 a) Write the functions of counter and timer devices.   5
   b) Explain the addressing modes in 8051.   5

12 a) Write an assembly language program to print the contents of bank 1 from location 40H to 60H.   5
   b) Illustrate the procedure to execute the conditional instructions in 8051.   5

13 a) Write the functions of memory manager.   5
   b) Explain how inter process communication takes place using semaphores.   5

14 a) What are the factors to measure the performance of Embedded systems?   5
   b) Write the differences between Hard and Soft real-time scheduling.   5

15 a) Develop a procedure and discuss the implementation issues to design smart card system.   5
   b) List the functions of CAN bus.   5

16 a) Illustrate how instruction-level parallelism improves performance of processor.   5
   b) What are the characteristics of Embedded system?   5

17 Write short notes on :   10
   a) SHARC architecture
   b) Message queues

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FACULTY OF ENGINEERING

B.E. 4/4 (EEE/Inst./AE) I – Semester (New) (Supplementary) Examination, July 2014

Subject : Information Security (Elective – I)

Time : 3 hours   Max. Marks : 75

Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.
PART – A (25 Marks)

1	Differentiate the terms information security.and computer security.	2
2	What is a worm?	3
3	Mention the different types of Laws.	2
4	Define risk appetite.	2
5	Categorize the firewalls by their structure.	3
6	List the components of enterprise ISP.	3
7	Distinguish between symmetric and asymmetric encryption.	2
8	State the purpose of access control devices.	2
9	Justify the need for internal control strategies.	3
10	Write about Bull's-Eye model.	3

PART – B (50 Marks)

11 Describe the process of selecting risk control strategy.

12 a) Discuss about any five critical characteristics of information.
     b) Write about Sec SDLC.

13 Explain in detail about the incident response planning.

14 Discuss about digital forensics.

15 a) Write about the importance of VPN.
     b) Discuss about the different kinds of attack on crypto systems.

16 a) Write about any five kinds of attacks.
     b) List the Ten Commandments of Computer Ethics.

17 a) How do you measure the effectiveness of IDPSs.
     b) Discuss different types of IDPS.

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