

FACULTY OF ENGINEERING**B.E. 4/4 (Civil) II – Semester (Main) Examination, May / June 2015****Subject: Ground Improvement Techniques (Elective – II)****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 The subgrade of a proposed highway is passing through a gap graded cohesionless soil in low relative density state with low CBR value. Can it be improved by mechanical stabilization method? Answer yes or no and justify your answer. 2
- 2 “In cement stabilization method, the water for hydration requirements calculated from the water cement ratio is adequate for compaction of soil to its MDD”. Answer yes or no and justify your answer. 2
- 3 “In vibro – floatation method, the float is driven in to the ground to the desired level and subsequently densification is achieved by gradually raising the vibrofloat”. Answer yes or no and justify your answer. 2
- 4 What is “smear effect” in installation of vertical drains? How it affects the progress of consolidation process? 2
- 5 “In reinforced soil walls, it is enough to provide the reinforcement element from the facing up to the proposed rupture surface on the back fill side”. Answer yes or no and justify your answer. 2
- 6 Explain the need for cutbacks in Bitumen stabilization method. Name any two popular cut backs. 3
- 7 Define groutability ratio. Determine the same for a material having $D_{85}=0.10$ mm to be grouted in to a formation having $D_{15}=2.80$ mm and classify the grout material. 3
- 8 At a given site where vibration method of ground improvement is proposed, the cohesionless medium is in partially saturated state with water content close to capillary state. Which measure do you suggest before the vibration method is used, for maximizing the efficiency of improvement in that site? 3
- 9 Applying Carillo’s solution for the differential equation governing consolidation process aided with vertical drains, determine the overall degree of consolidation (U) if degree of consolidation due to vertical drainage and radial drainage are 20% and 80% respectively. 3
- 10 For construction of a reinforced soil retaining wall two fill materials are available. One relatively cohesionless and the other relatively cohesive. Which one do you recommend? Justify your answer. 3

PART – B (5x10 = 50 Marks)

- 11 a) Explain the procedure of “Blending of Aggregates” adopted in mechanical method of soil stabilization. 5
- b) The alignment of a highway passes through cutting up to 12 m. The site conditions are such that, the naturally safe slope of 30° for the type of soil present there, cannot be provided. Instead a slope of 75° is proposed. Discuss the need for ground improvement in this case. Identify various options for improvement of this ground and suggest the ideal ground improvement technique. 5

- 12 a) Compare the Cement and Bitumen stabilization methods including the principle, factors affecting and suitability aspects. 5
- b) Describe the applications of grouting in enhancement of bearing capacity of foundation soil with the help of neat sketches. 5
- 13 a) Differentiate "Vibro-replacement" and "Vibro-displacement" methods. Comment on merits, demerits and suitability of each. 5
- b) Describe the "Vibro-floatation" technique including its merits and demerits. 5
- 14 a) Describe different methods used for in-situ densification of cohesive soils in detail including merits, demerits and suitability of each. 5
- b) To accelerate the consolidation process of a 8 m thick fully saturated compressible clay, sand drains are provided and a preload is applied that caused an increment of 180 kPa at the middle of the clay layer. After a certain period of effective loading, the overall degree of consolidation was found to be 81.60% and that due to radial drainage was 72.90%. Determine (i) the magnitude of settlement corresponding to 81.60%, if coefficient of volume compressibility is 3.6×10^{-4} sqm/kN; (ii) Time corresponding to $U=81.60\%$, if $c_v=4.10$ sqm/year and single drainage is present. 5
- 15 a) Write a detailed note on separation function served by geosynthetics including the associated applications. 5
- b) Describe the principle of "Reinforced soil" and the factors governing the mechanism. 5
- 16 a) Explain how "Blasting" technique is effective in ground improvement? Describe the procedure in brief. 5
- b) Differentiate "Prefabricated Vertical Drains" with "Sand Drains". 5
- 17 Answer any two of the following: 10
- Classification of grout materials
 - Vacuum method of Consolidation
 - Stone columns.

FACULTY OF ENGINEERING**B.E. 4/4 (Civil) II – Semester (Main) Examination, May / June 2015****Subject: Advanced Environmental Engineering (Elective – II)****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 | Enumerate the various characteristics of industrial wastes | 4 |
| 2 | Explain the various processes involved in the pharmaceutical industry | 4 |
| 3 | Define stack height | 2 |
| 4 | List out various methods of control of air pollution | 3 |
| 5 | State the salient features in preparation of EIA report of a dam project | 3 |
| 6 | Discuss the principle involved in filtration process of suspended particulate matter | 3 |
| 7 | What is the base line data required for EIA? | 2 |
| 8 | Discuss the sources of air pollutants | 2 |
| 9 | State the effluent characteristics of dairy industry. | 2 |

PART – B (5x10 = 50 Marks)

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|----|---|----|
| 10 | a) Explain in detail about self-purification of water bodies. | 4 |
| | b) State the Streeter-Phelps equation and explain the effects of industrial effluents on streams. | 6 |
| 11 | a) Explain in detail the manufacturing process in a distilleries industry. | 5 |
| | b) Discuss the wastewater characteristics and the treatment processes required in paper and pulp industry. | 5 |
| 12 | a) Explain the role of meteorological elements in the dispersion of air pollutants in the atmosphere. | 6 |
| | b) Explain in detail about lapse rate and atmospheric stability. | 4 |
| 13 | Describe about the settling chambers and scrubbers as collection equipments of air pollution with neat sketches. | 10 |
| 14 | a) Discuss in detail the need and objectives of Environmental Impact Assessment. | 4 |
| | b) What are the points that need to be incorporated while preparing the environmental management plan and impact statement. | 6 |
| 15 | a) List and describe all the factors that need to be considered for selection of proper air pollution control equipment. | 5 |
| | b) What are different types of industries? Discuss the purpose and effluent standards for any two major industries. | 5 |
| 16 | Write short notes on the following: | |
| | a) Condensation and Combustion | 5 |
| | b) Issues related to Rehabilitation of affected people. | 5 |

FACULTY OF ENGINEERING**B.E. 4/4 (Civil) II – Semester (Main) Examination, May / June 2015****Subject: Advanced Reinforced Concrete Design (Elective – II)****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 | Explain the position of maximum moments in curved beams | 3 |
| 2 | Explain how the moments in semi-circular beams supported on three columns | 3 |
| 3 | Explain the need for the design of beams curved in plan of circular and rectangular types | 3 |
| 4 | Sketch the shear force and bending moment diagrams for a deep beam under uniform loading. | 2 |
| 5 | How do you arrive stiffness and distribution factors for building frames | 3 |
| 6 | Explain the need for design of openings in flat slabs | 2 |
| 7 | Write the general notes on flat slabs | 3 |
| 8 | How do you design pile caps | 2 |
| 9 | Under what circumstances raft foundations are designed | 2 |
| 10 | What is column grids, why it is required? | 2 |

PART – B (5x10 = 50 Marks)

- 11 A circular girder of water tank has a mean diameter of 10 m, and it is supported on six symmetrically placed columns. The uniformly distributed load on the girder is 200 kN/m. Design the critical sections of the girder using M-20 grade concrete and f_{e415} HYSD bars and sketch the reinforcement details. 10
- 12 A continuous deep beam spanning over three equal spans of 8 m each has an overall depth of 4 m. The width of support is 0.8 m and the width of beam = 0.4m. The beam supports a uniformly distributed live load of 160 kN/m. Using M-20 grade concrete and f_{e415} grade steel, design the suitable reinforcements for the central span of continuous deep beam. Sketch the reinforcement details. 10
- 13 A portal frame ABCD has fixed supports at A and D. The columns AB and CD are 5 m in height while the transom BC is 10 m in length. The frames are spaced at 3.5 m intervals. The live load on the roof slab which is 10 cm thick may be taken as 1.5 kN/m². Design the transom BC and sketch the details of reinforcements use M20 grade concrete and f_{e415} grade steel. 10
- 14 A four bay multistoried frame has the following details. Continuous beam ABCDE with AB = BC = CD = DE = 4m. Height between the floors = 4m. Size of the beams = 300 mm, size of columns = 300 mm x 400 mm. Thickness of floor slabs = 150 mm. Floor finish = 0.6 kN/m². Live load = 2 kN/m². Estimate the maximum design moments in the beams and columns. 10

- 15 a) Discuss the requirements of flat slabs and its reinforcements. 5
b) Explain why the drops and column heads are provided in flat slabs. 5
- 16 The foundation of a column is to consist of reinforced concrete piles, 12 in number to carry a total load of 6000 kN. The piles are to be spaced at 1.5 m apart and are to be driven through make up ground into gravel, which is at a depth of 5.5m. Assume the piles to be of 6 m overall length. Design the suitable pile and calculate the stresses during handling. Also design a suitable pile cap for the case. Use M20 and Fe415 grade steel.
- 17 Write the stepwise procedure for the design of Raft foundations. 10

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FACULTY OF ENGINEERING**B.E. 4/4 (Civil) II – Semester (Main) Examination, May / June 2015****Subject: Advanced Transportation Engineering (Elective – II)****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A. Answer any five questions from Part B.****PART – A (25 Marks)**

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|----|--|---|
| 1 | What is the assumption made by Fuller in getting the dense mix? | 2 |
| 2 | List out different field control tests to be carried after the construction of soil cement base. | 3 |
| 3 | What should be the criteria choosing filter material by considering permeability condition? | 2 |
| 4 | What are the different roughness coefficients used in the hydraulic design of drainage system? | 3 |
| 5 | What are the interest rates to be considered during project evaluation? | 2 |
| 6 | What do you understand by Level of Service? | 3 |
| 7 | Discuss the role of VDF in the design of Flexible pavements. | 3 |
| 8 | What is the location at which the maximum wheel load stress occurs due to corner loading? | 2 |
| 9 | Discuss about the affect of bottle necks in traffic movements | 3 |
| 10 | Discuss the role of parking inventories in parking management | 2 |

PART – B (5x10 = 50 Marks)

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|-------|--|---|
| 11 a) | Explain triangular chart method of soil stabilization with help of a neat sketch. | 5 |
| b) | Explain soil bitumen stabilization. | 5 |
| 12 a) | What is the assumption made by Westergaard in the analysis of stresses in rigid pavements? | 3 |
| b) | The maximum increase in temperature is expected to be 28°C after the completion of CC pavement construction. If the expansion joint gap is 2.5 cm, design the spacings between expansion and contraction joints. Assume plain CC construction with thermal expansion of 10×10^{-6} per °C, unit weight of concrete is 2400 kg/m ³ , allowable stress in tension during initial period of curing = 0.8 kg/cm ² and the coefficient of friction of interface 1.35. Adopt IRC recommendations. | 7 |
| 13 a) | Discuss about the necessity of skid resistance in highways and explain various types of skid resistance. | 5 |
| b) | What are the requirements of highway drainage system? | 5 |

- 14 A new bypass is to be constructed at a busy city. The length of bypass will be 7.5 km and the length of the existing road is 6.9 km. The cost of the project is likely to be Rs. 12,000,000. The speed of the traffic through the town is 48 kmph. And the present traffic is 800 vph. The predicted traffic after completion of project is 8500 vehicles / day out of which 55% will use bypass. It is computed if the bypass is not built the traffic through the city will move at a speed of 42 kmph due to increased traffic. If the bypass is built the traffic on the bypass will be 80 kmph and that through the city will be 55 kmph. The travel costs for different speeds are 42 kmph – Rs. 3.50, 55 kmph – Rs. 3.50/- and 80 kmph – Rs. 3.0/-.
- It is expected that the cost of construction of the bypass will bring down the accident rate from 1.8 per million vehicle km on the existing route to 0.5 per million vehicle km on the bypass. The cost of accident can be taken as Rs. 50,000 and the maintenance cost per km is Rs. 25,000/-. Compute the first year of return. Justify the project based on the minimum 50% return in first year.
- 15 Discuss about different Traffic Management Systems. 10
- 16 a) Discuss about the different problems associated with traffic in the cities. 7
b) Discuss the use of Benkelman beam in highways. 3
- 17 Write short notes on any three of the following: 10
- Factors influencing level of service
 - Measures for prevention of accidents in highways
 - Critical combination of stresses in rigid pavements
 - ESWL

FACULTY OF ENGINEERING**B.E. 4/4 (EEE) II - Semester (Main) Examination, May / June 2015****Subject : Electrical Power Distribution Engineering (Elective – II)****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 Define : Diversity factor and Demand factor. (3)
- 2 Depending on what factors the rating of the substation will be selected. Explain. (3)
- 3 What is secondary banking? Explain its advantages. (3)
- 4 Explain the effect of series capacitor when connected in the distribution system. (3)
- 5 Mention the advantages of the Distribution and Automation control system. (3)
- 6 Mention the types of Distribution transformers. (2)
- 7 Define a sub-transmission system. (2)
- 8 Write the TAC equation and explain each term in it. (2)
- 9 Mention the applications of capacitors. (2)
- 10 List out any five functions of SCADA. (2)

PART – B (50 Marks)

- 11 (a) Explain about the Booster transformers. (5)
(b) Explain various types of rate structures. (5)
- 12 With neat sketches explain the substation bus schemes in detail. (10)
- 13 (a) Explain any three types of secondary system with neat sketches. (7)
(b) Explain the network type of primary system. (3)
- 14 Derive the equations for voltage drop and power loss for single phase two wise lateral with (i) ungrounded laterals (ii) uni-grounded laterals. (10)
- 15 Explain the various control functions of Distribution Automation in detail. (10)
- 16 (a) Explain how the economic justification for capacitors can be determined. (5)
(b) Derive an expression for finding the % VD of a distribution substation with 'n' primary feeders. (5)
- 17 Write short notes on the following: (10)
(a) AMR
(b) Best capacitor location Algorithm

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B.E. 4/4 (EE/Inst./M/P) II – Semester (Main) Examination, May / June 2015

Subject : Intellectual Property Rights (Elective – II)

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 Distinguish between TRIPS and TRIMS.
- 2 Name any four international treaties related to IPR.
- 3 State the obligations of a patentee.
- 4 What is meant by patentable subject?
- 5 State the rights and duties of proprietor of a design.
- 6 What is meant by piracy of registered design?
- 7 What do you mean by Trademark?
- 8 What is meant by infringement of copyright?
- 9 What are the inventions that are not patentable?
- 10 What is the nature and scope of copy rights?

PART – B (50 Marks)

- 11 a) What is Industrial design? List out its salient features.
b) What is meant by revocation? What is the procedure used for registration of designs?
- 12 Explain briefly the role of WTO and explain the functions and objectives of WTO.
- 13 a) What do you mean by compulsory licencing?
b) Explain in detail the procedure followed for the registration of a patent, with a flow chart.
- 14 a) Distinguish between publication and patent.
b) Explain briefly the assignment and transmission of copy rights.
- 15 a) What are trademarks? And classify them.
b) What do you mean by passing off? What are the author's special rights?
- 16 a) Explain briefly the patent cooperation Treaty, 1970.
b) What is the purpose of protecting trademarks?
- 17 Write short notes on :
 - a) Kinds of Intellectual property rights
 - b) Specification of a patent
 - c) Rights conferred by copy rights

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B.E. 4/4 (Inst.) II - Semester (Main) Examination, May / June 2015

Subject : Advance PLC Programming**(Elective – II)****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 Draw PLC system layout and connection. (2)
- 2 Draw the different switch and pushbutton switch configuration and typical connections. (3)
- 3 Draw the basic gates and their PLC equivalents. (3)
- 4 Explain the contact (input) functions of the PLC. (2)
- 5 With suitable example explain how the PLC handles overflow and negative numbers for the ADD and SUBTRACT functions. (3)
- 6 Draw the block diagram of PLC's binary –to-BCD conversion program. (2)
- 7 Explain the how JUMP differs from MCR and SKIP function. (3)
- 8 Describe the MOVE function. (2)
- 9 Differentiate between discrete and analog operations of a PLC. (3)
- 10 Define CIM and show how it is used. (2)

PART – B (50 Marks)

- 11 (a) Describe with neat diagram in detail about devices to which PLC outputs are connected. (5)
(b) Describe in detail about the rules for proper construction of PLC ladder diagram. (5)
- 12 (a) List out the major types of registers used in PLC. Use a block diagram to show where each type fits into the PLC scheme of operation. (5)
(b) With suitable example explain large process ladder diagram construction. (5)
- 13 (a) Find the square roots by using the PLC SQUARE ROOT function. (5)
(b) Two conveyors, A and B, feed a main conveyor C. A third conveyor, R removes rejects a short distance down the main conveyor. The counts for conveyors A, B and R each input into holding registers in the PLC. Construct a PLC program to obtain the total output, C part count. Use s timer to update the total for every 12 seconds. (5)
- 14 (a) Describe the operation of the MASTER CONTROL RELAY function. (5)
(b) Illustrate a process requiring a jump with return instruction and draw the ladder logic diagram. (5)
- 15 (a) Explain in detail about OSI model of communication architecture. (5)
(b) Describe the data flow and number conversions involved in PLC analog operation. (5)

- 16 (a) Describe the BITPICK CONTACT function and its use. (5)
- (b) Two BCD numbers are to be inputted. The first is to be divided by the second. The result is to be shown on the output BCD display. Trace the computation if A is 458 and B is 35. (5)
- 17 (a) Draw the equivalent gate diagram and PLC ladder diagrams for the Boolean expression. (5)
- $$[(P + \bar{Q} + R) \cdot (U + V) \cdot \bar{W} \cdot X] + (S + T) \cdot Y = Z$$
- (b) Write the PLC program for a motor and its lubrication pump motor are both running. Lubrication for main motor bearing is required during motor coast-down. After the main motor is shut off, the lubricating pump remains on for a time corresponding to coast-down time. A lubricant pump remains on for 20 seconds after the main system is shut down. (5)

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B.E. 4/4 (ECE / CSE) II – Semester (Main) Examination, May / June 2015

Subject : Entrepreneurship (Elective – II)

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 basic characteristics of entrepreneur? 3
- 2 What are qualities of successful entrepreneur? 2
- 3 State the features of PERT network management. 3
- 4 State the features of CPM network in project management. 3
- 5 Given the project activities – construct the network. 3

Activity	A	B	C	D	E	F	G	H
Predecessor	--	A	A	B	B,C	E	D, F	G

- 6 What is break-even point in production planning? 2
- 7 What are the attributes of entrepreneur? 2
- 8 Explain the role of time in entrepreneurial activities. 2
- 9 What are simple forecasting techniques for product? 3
- 10 What are different agencies help in export promotion of SSI products? 2

PART – B (50 Marks)

- 11 a) Explain the Government policy towards entrepreneurship of skilled manpower. 5
 b) Explain of role of entrepreneurs in economic growth of economy with respect of social empowerment. 5
- 12 a) What are the techniques of evaluation of new product ideas for entrepreneurs? 5
 b) Explain the choice of technology selection with respect to today entrepreneurs 5
- 13 a) How entrepreneurs should do market analysis and its demand for a new product or innovated product for project formulation? 5
 b) Explain the institutions for project financing in India for small and medium scale entrepreneurs. 5
- 14 Find the critical path of the network and find total slack activities. 10

Activity	A	B			E	F	G	H	I	J	K
Duration	13	8			11	10	8	6	7	14	18
Immediate Predecessor	--	A			B	E	D,F	E	H	G,I	J

- 2 -

- 15 a) Explain how an entrepreneur should be motivated for high performance. 5
 b) Explain the time management matrix of an entrepreneur. 5

- 16 a) Find the critical path of the network and find total slack activities. 5

Activity	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
Duration	2	2	4	6	1	1	3	5	10	7	6	2	2	1	2
Immediate Predecessor	--	--	--	B	B	A,E	C,D	G	H	I	C,D	C,D	C,D	J	M

- b) Explain various aspects of project formulation. 5
- 17 a) Explain how an entrepreneur faces competition and challenges. 5
 b) Find the critical path of the network and find total slack activities. 5

Activity	A	B	C	D	E	F	G	H
Duration	4	5	6	3	2	4	1	2
Immediate Predecessor	--	--	--	A	B	C	D,E	F,G

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B.E. 4/4 (ECE) II – Semester (Main) Examination, May / June 2015

Subject : Real Time Operating Systems (Elective – II)

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 Mention the criteria to select the PU-scheduling algorithms. 2
- 2 What are the five major activities of an operating systems in regard to process management? 3
- 3 What are the three main purposes of an operating system? 2
- 4 Define the essential properties of the following types of operating systems. 3
 - a) Batch
 - b) Real time
 - c) Parallel
- 5 Write the necessary conditions for deadlock situation. 3
- 6 Define critical section and mention the problems associated with critical section. 2
- 7 Consider a logical-address space of eight pages of 1024 words each, mapped onto a physical memory of 32 frames. 2
 - a) How many bits are in the logical address?
 - b) How many bits are in the physical address?
- 8 Write the basic functionalities of μ C-OS-II 3
- 9 Under what circumstances do page fault occur? 2
- 10 Define the following terms : 3
 - a) Thrashing
 - b) Multitasking
 - c) RTOS
 - D) System call

PART – B (5 x 10 = 50 Marks)

- 11 a) Briefly explain the services of operating system. 5
- b) Discuss about layered approach of OS and Micro Kernel structure of OS. 5
- 12 Consider the following set of processes, with the length of the CPU-burst time given in milli seconds. 10

Process	Burst time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3 P4, P5 all at time 0.

- a) Draw four Gantt charts illustrating the execution of these processes using FCFS, SJF, nonpreemptive priority, and RR (quantum = 1) scheduling.
- b) Calculate average waiting time and turn around time for each of scheduling in part a.

- 2 -

- 13 a) Explain the principles of deadlock and deadlock prevention. 5
b) Discuss about readers-writers problem. 5
- 14 a) Briefly explain the concept of paging with an example. 6
b) Write about segmentation with paging. 4
- 15 a) Explain the basic features of VX-works. 5
b) Discuss about RTOS applications for control systems. 5
- 16 Briefly explain the disk scheduling and Disk caches. 10
- 17 Write a short notes on any **two** :
a) Virtual memory
b) Multiprocessor scheduling
c) Semaphores and mutex

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B.E. 4/4 (ECE) II – Semester (Main) Examination, May / June 2015

Subject : Speech Processing (Elective – II)

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 advantages of ADPCM over DPCM. | 2 |
| 2 | Real cepstrum is the part of the complex cepstrum. | 3 |
| 3 | What is Bandwidth of the rectangular window with $N = 256$, and $F_s = 16000$? | 2 |
| 4 | What is fundamental frequency of a speech signal? | 3 |
| 5 | TTS stands for | 2 |
| 6 | What is articulator speech synthesis? | 3 |
| 7 | The information about the formants will be available in the part of the cepstrum (lower/higher). | 2 |
| 8 | Draw the block diagram of sub-band encoder and decoder. | 3 |
| 9 | What are the features that distinguish speakers? | 2 |
| 10 | What is the difference between speech and speaker recognition? | 3 |

PART – B (50 Marks)

- | | | |
|----|---|---|
| 11 | a) Explain the source filter model for speech production. | 5 |
| | b) Explain the difference between the production of voiced and unvoiced speech sounds. | 5 |
| 12 | a) Explain the pitch period estimation using auto correlation function. | 5 |
| | b) Explain the end point detection (silent and non-silent) algorithm using short term energy and ZCR. | 5 |
| 13 | a) Explain an algorithm for formant based speech synthesis. | 5 |
| | b) What is Phone-use-synthesis. | 5 |
| 14 | a) Explain the channel encoder and decoder for speech compression. | 5 |
| | b) Explain the encoder and decoder of sub-band speech coding with neat diagrams. | 5 |
| 15 | a) What are the three basic problems in Hidden Markov models? | 5 |
| | b) Align the two words SPICH Vs SPEECH using dynamic programming. | 5 |
| 16 | a) What are advantages and disadvantages for cepstrum vocoder over formant Vocoder? | 5 |
| | b) Write short note on pitch synchronous analysis. | 5 |
| 17 | a) Explain the ADPCM based encoder and decoder using adaptive prediction. | 5 |
| | b) Write a short note on Dynamic Programming Vs. Dynamic Time Warping. | 5 |

FACULTY OF ENGINEERING

B.E. 4/4 (Mech. / Prod.) II – Semester (Main) Examination, May / June 2015

Subject: Machine Tool Design (Elective – II)

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 advantages of ball screws?
- 2 Draw the schematics structure of screw cutting machine.
- 3 Explain productivity loss
- 4 What are the merits and demerits of hydraulic drives?
- 5 What are the various stepless drives used in practice?
- 6 Explain various shapes used for guide ways in machine tools
- 7 How the rigidity of columns be improved?
- 8 How the clearances affect the overall performance of spindle?
- 9 Sketch the working mechanism of reciprocating pump
- 10 What is the range ratio and how the highest speed is found?

PART – B (5x10 = 50 Marks)

- 11 a) How the machine tools are classified and explain their applications?
b) Sketch and explain the construction and working of ratchet and pawl mechanism used for intermittent motion.
- 12.(a) Differentiate between linear and rotary transfer machines and mention their relative applications.
(b) How the highest and lowest speeds for a machine tool are selected and explain the importance of range ratio?
- 13 a) How the optimum speed chart is drawn for 12 speed gear box?
b) Describe the design procedure in selecting gears and shafts.
- 14 a) Differentiate between sliding cluster drives and clutched drives.
b) Sketch and explain the construction and working of meander drives used in feeds.
- 15 a) Derive an equation to find overall compliance of machine tool structure.
b) Describe the design procedure for the beds of machine tool structures.
- 16 a) How the spindle for milling machine is designed and sketch the arrangement?
b) Differentiate between hydrostatic and hydrodynamic bearings.
- 17 Write short notes on the following:
 - a) Electrical and electronic controls
 - b) Gear pumps
 - c) Design of columns.

FACULTY OF ENGINEERING**B.E. 4/4 (Mech./Prod.) II – Semester (Main) Examination, May / June 2015****Subject: Mechatronics (Elective – II)****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part A. Answer any five questions from Part B.****PART – A (10x2.5 = 25 Marks)**

1. Indicate the sensor, signal conditioner and display elements in the measurement of temperature by mercury-in-glass thermometer.
2. What are the various elements of mechatronics system? Explain the importance of each briefly.
3. Specify the relative merits and demerits of various types of actuation systems for generating rotation motion.
4. What are the properties a fluid should possess to become a fluid used in fluid power systems?
5. What are the requirements of a signal conditioning system and why is it required?
6. What are the various commonly used data representation elements and sketch any one type of data representing element?
7. Differentiate between microcontroller and micro processor.
8. What are the important constraints in the development of mechatronics system design?
9. What are the various components used in a Program Logic Controller?
10. Explain with a neat sketch any one type of pressure sensor.

PART – B (5x10 = 50 Marks)

- 11.(a) Compare and contrast the traditional design of a watch with that of a mechatronics designed product involving a microprocessor. 6
- (b) What is the purpose of interfacing electrical devices with mechanical system? What are its advantages and disadvantages? 4
- 12.(a) Design a mechanical system to transform a rotation of a shaft into rotation of another parallel shaft some distance away. 4
- (b) Explain with a neat sketch the working principle of stepper motor in half step mode. 6
- 13.(a) Explain the working of a shuttle valve with a neat sketch, mention its applications. 4
- (b) Design a simple hydraulic circuit for operating a punching operation. 6
- 14.(a) Explain with a neat sketch the working principle of magnetic recording on a hard disk. 3
- (b) Explain with neat sketch the use of an operational amplifier as an inverter. 7
15. Explain the basics of ladder diagram in PLC programming. 10

- 16.(a) Explain the advantages of flexible manufacturing system over conventional production layout. 3
- (b) Explain in detail the construction and working of LVDT. Draw the characteristics of output voltage for different core positions of LVDT. 7
17. Write short notes on any three of the following: 3+3+4
- i) Types of valves
 - ii) Silicon controlled rectifiers
 - iii) Types of indexing mechanisms
 - iv) Modern CNC machines
 - v) First order transient response

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FACULTY OF ENGINEERING

B.E. 4/4 (Mech. / Prod.) II – Semester (Main) Examination, May / June 2015

Subject: Power Plant Engineering (Elective – II)

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 Which is the current major renewable resource of energy in India?
- 2 Why coal storage is given importance?
- 3 List important properties of Indian coal
- 4 What is a overfeed fuel bed?
- 5 What is the function of a spill way in hydroelectric power plant?
- 6 What do you understand by hydrological cycle?
- 7 List major advantages of a nuclear power plant
- 8 What is a gas cooled nuclear reactor?
- 9 List the pollutants emitted from power plants
- 10 What is a delivery factor of a power plant?

PART – B (5x10 = 50 Marks)

- 11 Discuss various types of coal handling systems suitable for power plants.
- 12 Explain the working principle of a cooling tower used in steam power plant.
- 13 Discuss about the classification of Gas turbine power plants.
- 14 What are the considerations for deciding a location for setting up of a hydro electric power plant?
- 15 Explain the working principle of a fast breeder nuclear reactor.
- 16 Discuss in detail about power plant economics.
- 17 Write short notes on:
 - a) Sodium graphite reactor
 - b) Feed water treatment

FACULTY OF ENGINEERING**B.E. 4/4 (CSE) II – Semester (Main) Examination, May / June 2015****Subject: Information Storage and Management (Elective – II)****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 logical block addressing? | 2 |
| 2 | Which are the components of SAN? | 3 |
| 3 | What is FCIP explain? | 3 |
| 4 | Define backup granularity and mention the types of it | 3 |
| 5 | List out the uses of local replicas | 2 |
| 6 | What is performance management? | 2 |
| 7 | Mention the logical components of the host | 2 |
| 8 | What is zoning? | 2 |
| 9 | What are the key challenges in managing information? | 3 |
| 10 | Explain three-site replication. | 3 |

PART – B (5x10 = 50 Marks)

- | | | |
|----|--|----|
| 11 | a) What is storage? Explain evolution of storage technology and its architecture. | 6 |
| | b) List out the key requirements for data center elements. | 4 |
| 12 | a) Explain ISCSI protocol stack. | 5 |
| | b) What is storage virtualization and explain forms of virtualization? | 5 |
| 13 | What is remote replication? Explain remote replication technologies? | 10 |
| 14 | a) Mention the characteristics of cloud computing and explain the benefits of cloud computing. | 6 |
| | b) List out the cloud challenges in detail. | 4 |
| 15 | a) What are the ways of achieving fibre channel connectivity in SAN? | 5 |
| | b) Explain NAS environments. | 5 |
| 16 | a) How are backup and restore operations performed? Explain with neat diagrams. | 7 |
| | b) Mention the 3 driving factors to take a backup. | 3 |
| 17 | Write short notes on: | |
| | a) RAID | 3 |
| | b) Server virtualization | 3 |
| | c) Capacity monitoring | 4 |

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B.E. 4/4 (CSE) II – Semester (Main) Examination, May / June 2015

Subject: Human Computer Interaction (Elective – II)

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 interaction architecture
- 2 What are mental models?
- 3 Distinguish between horizontal and vertical prototypes
- 4 What are personas?
- 5 How are learnability and comprehensibility related?
- 6 State Hick's law
- 7 what is the drawback of using positive color contrast?
- 8 Give different sizes an icon need to be supplied in Microsoft windows applications
- 9 What are different states of hyperlinks that can be specified in CSS?
- 10 What is tactile information?

PART – B (5x10 = 50 Marks)

- 11 a) What is wearable computing? What are the three different spaces it integrates?
b) List the advantages and disadvantages of command line interfaces.
- 12 a) List the main principles of DSDM framework.
b) Explain the usage of wireframes in physical design.
- 13 a) Explain the tradeoff between usability and screen complexity as found by Comber and Maltby.
b) What is Glimpse Model? List various applications of this model.
- 14 a) What are the advantages and disadvantages of MDI window interface?
b) List the physical attributes that can affect the way we can perceive icons.
- 15 a) List the factors involved in pressure sensation.
b) Distinguish between scrolling and paging.
- 16 a) Describe different types of menus.
b) Explain 5W+H in analyzing interaction paradigms.
- 17 Write short notes on:
 - a) Affordances
 - b) Icon grammar.

FACULTY OF ENGINEERING**B.E. 4/4 (CSE) II – Semester (Main) Examination, May / June 2015****Subject: Software Reuse Techniques (Elective – II)****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 | Compare domain engineering and application system engineering | 3 |
| 2 | Compare components and abstract components | 2 |
| 3 | Define RSEB (Reuse Driven Software Engineering Business) | 2 |
| 4 | List the essential elements of a pattern. | 2 |
| 5 | Draw the structure of prototype pattern. Mention the participants in prototype pattern. | 3 |
| 6 | What are the advantages of chain responsibility pattern? | 2 |
| 7 | When do we use adapter pattern. | 3 |
| 8 | Explain the applicability of Abstract Factory pattern. | 3 |
| 9 | What is the motivation for singleton pattern? | 3 |
| 10 | Name six creational patterns. | 2 |

PART – B (5x10 = 50 Marks)

- | | | |
|----|---|----|
| 11 | a) What is reuse driven software engineering? Explain its advantages. | 5 |
| | b) Explain about applications and components subsystems. | 5 |
| 12 | a) Describe the design patterns in detail. | 5 |
| | b) How to select a design pattern and use a design pattern? Give examples. | 5 |
| 13 | a) Describe some useful techniques for implementing the abstract factory pattern. | 5 |
| | b) Explain the key consequences of the builder pattern. | 5 |
| 14 | a) Explain the intent, motivation, applicability, collaboration and consequences of prototype patterns. | 5 |
| | b) Explain about the applicability, consequences and collaborations of singleton pattern. | 5 |
| 15 | Draw binder class diagram. Explain the consequences of builder pattern. | 10 |
| 16 | Write short notes on: | 10 |
| | a) Decorator | |
| | b) Proxy | |
| | c) Composite | |
| 17 | Write short notes on: | 10 |
| | a) Model-view controller | |
| | b) Reflection | |
| | c) Broker | |

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B.E. 4/4 (IT) II – Semester (Main) Examination, May / June 2015

Subject : Information Storage and Management (Elective-IV)**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 What are the challenges in Data Management? (2)
- 2 Give the requirements of Data Center elements. (3)
- 3 What are the components of storage system environment? (2)
- 4 Explain the benefits of LVM. (2)
- 5 Explain components of SAN. (3)
- 6 Differentiate Integrated NAS and Gateway NAS. (2)
- 7 Explain Backup Topologies. (3)
- 8 What is host based Replication (Remote)? (3)
- 9 How can we secure of BURA? (2)
- 10 Explain the purpose of (3)
(a) E-port (b) NL-port (c) N-port

PART – B (50 Marks)

- 11 Explain in detail about Information life cycle management Implementation and Benefits. (10)
- 12 (a) Describe physical components of disk drive and their functions. (5)
(b) Describe Logical partitioning of physical drives. (5)
- 13 Explain the significance of RAID Technology by using all RAID levels. (10)
- 14 Explain the features and benefits of CAS solutions. (10)
- 15 Explain BC planning lifecycle and BC technology solutions. (10)
- 16 Explain the Techniques used for Local Replication. (10)
- 17 What is virtualization? Explain the forms of virtualization in detail. (10)

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B.E. 4/4 (I.T.) II – Semester (Main) Examination, May / June 2015

Subject: Information Retrieval Systems (Elective – IV)

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 information retrieval model | 2 |
| 2 | What is TREC? | 2 |
| 3 | What is association cluster? | 2 |
| 4 | Define entropy of statistical methods of text compression | 3 |
| 5 | How query can be expanded based on statistical thesaurus | 3 |
| 6 | What is the objective of the compression method? List out the different compression methods | 3 |
| 7 | Define Inverted File | 2 |
| 8 | What is query syntax tree? Give an example. | 3 |
| 9 | Define rank search | 2 |
| 10 | How query is processed in Distributed Information Retrieval? | 3 |

PART – B (5x10 = 50 Marks)

- | | | |
|----|--|---|
| 11 | a) Explain the retrieval process in detail. | 6 |
| | b) What is vector model? | 4 |
| 12 | a) Explain different models for browsing. | 6 |
| | b) What are the different query protocols? | 4 |
| 13 | a) What is the user relevance feedback? Explain. | 6 |
| | b) Explain Information Theory. | 4 |
| 14 | a) What are the different statistical methods in text compression. | 7 |
| | b) What is signature file. | 3 |
| 15 | a) How string matching is done based on dynamic programming. | 6 |
| | b) Explain collection partitioning in distributed IR. | 4 |
| 16 | a) What is an inverted file. | 3 |
| | b) Explain other indices for text searching. | 7 |
| 17 | Write short notes on: | |
| | a) Recall and precision | 4 |
| | b) Probabilistic model | 3 |
| | c) Parallel IR | 3 |
