

**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) II - Semester (Main & Backlog) Examination, May / June 2019****Subject : Health Monitoring and Retrofitting of Structures  
(Elective – II)****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A and answer any five questions from Part-B.****PART – A (25 Marks)**

- 1 Define structural health monitoring. (2)
- 2 List the basic components of structural Health monitoring. (3)
- 3 Differentiate between active and passive structural health monitoring. (3)
- 4 What is capacitive sensing? (2)
- 5 Mention the applications of Non-destructive testing. (3)
- 6 What do you infer by performing a visual Inspection? (2)
- 7 Write about the different stages in condition survey. (2)
- 8 Mention the possible defects in a concrete structure. (3)
- 9 Mention the materials used for repair and rehabilitation. (2)
- 10 Define repair, rehabilitation and retrofitting of structures. (3)

**PART – B (50 Marks)**

- 11 Bring out the analogy between the nervous system of a man and a structure with SHM. (10)
- 12 Explain the health monitoring system in bridges. (10)
- 13 Write short notes on :
  - (a) Visual Inspection method (5)
  - (b) Ground penetrating radar method. (5)
- 14 What is condition survey? Explain why quality control of concrete structures is important. (10)
- 15 Explain the various steps involved in modeling of repaired composite structures. (10)
- 16 Write briefly about the applications of SHM for external post tensional cables. (10)
- 17 Explain the testing methods used for testing of strength of concrete. (10)

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**FACULTY OF ENGINEERING**  
**BE 4/4 (Civil) II Sem. (Main & Backlog) Examination, May/June 2019**

**Sub: Ground Improvement Techniques (Elective-II)**

Time: 3 Hours

Max Marks: 75

**Note: Answer All Questions From Part-A, & Any Five Questions From Part-B.**

**PART – A ( 25 Marks)**

1. What is stabilization? What are the different methods of Stabilization? 2M
2. Define “Groutability ratio”. State its significance. 2M
3. What is meant by stone columns? Explain. 2M
4. It is required to improve bearing capacity of a soil. Identify the function of geo synthetic that serves the purpose. Also name the appropriate geo-synthetic product. 3M
5. What is “Curtain grouting” and Blanket grouting”? 2M
6. What are the different methods of De-watering systems? 2M
7. What is geo-textile? What are the types of geo-textiles? 3M
8. What is the use of geo-textile in erosion control? 3M
9. What is the principle of Reinforced earth? 3M
10. Discuss the proportioning technique in Soil Stabilization. 3M

**PART – B (50 Marks)**

11. At a given site, Black cotton soil is present to a depth of 8 m below the ground level. It is proposed to construct a single storied building at this site resting it on a raft foundation laid at a depth of 2 m below ground level. Discuss the need for ground improvement of this ground and suggests the ideal ground improvement technique. 10
12. a) Explain the principle and applications of Soil-cement stabilization. 5  
b) Explain the design procedure involved in soil-cement mix for stabilization of soils. 5
13. a) Briefly discuss the basic differences between Vibro-compaction and Vibro displacement compaction. 5  
b) Describe the Vibro-flotation techniques and state its merits and demerits? 5
14. a) Write a note on Vacuum method of in-situ densification of Cohesive soils and discuss the necessary condition for its effectiveness. 5  
b) Give comment on principle and process of fabric bag filters. Explain the concept of Pre-fabricated vertical drains and what are its merits and demerits. 5
15. a) Explain the classification of geo-textile? Why the use of Geo-textile is preferred over the other construction materials. 5  
b) Explain the mechanism involved in soil reinforcement duly giving emphasis to the stability of a vertical retaining wall. 5
16. a) Define grouting? What are the different methods of grouting? Explain any one briefly? 5  
b) Write a detailed note on Compaction by blast? 5
17. Write short note on **TWO** the following. (2x5=10)  
a) Stone columns  
b) Wick drains  
c) Pre-Compression

**FACULTY OF ENGINEERING**  
**BE 4/4 (Civil) II Sem. (Main & Backlog) Examination, May/June 2019**

**Sub: Advanced Environmental Engineering (Elective-II)**

**Time: 3 Hours**

**Max Marks: 75**

**Note: Answer All Questions From Part-A, & Any Five Questions From Part-B.**

**PART – A ( 25 Marks)**

- 1 Write the assumptions required for Streeter Phelps equation. 2M
- 2 Mention the two problems of industrial effluents on land. 2M
- 3 Give comment on reuse of thermal power plant waste. 2M
- 4 Write down the various characteristics of pulp and paper industry. 3M
- 5 What are the sources of air pollution in Delhi? 2M
- 6 Write the steps involved in stack sampling. 3M
- 7 Which is the most efficient equipment to control suspended particulate matter? Justify your answer. 3M
- 8 Explain the process of gaseous pollutant control by absorption. 3M
- 9 Mention few limitations of EIA. 2M
- 10 What are the factors to be considered for the rehabilitation of affected people? 3M

**PART – B (50 Marks)**

- 11 a) Write any five points on issues involved in environmental legislation related to industrial effluents. 5M  
 b) List the various unit operations required to treat industrial wastewater. Explain any two of them in detail. 5M
12. a) Explain with a neat diagram the manufacturing process of fertilizer industry. 5M  
 b) Describe with a neat flow diagram the treatment of sugar waste. 5M
13. a) How do you analyze air pollutants? Explain the analysis of SO<sub>2</sub> pollutant. 5M  
 b) Explain the effect of air pollutants on human health, plants and on metals. 5M
14. a) Distinguish between absorption and condensation for gaseous pollutant control. 5M  
 b) Give comment on principle and process of fabric bag filters. 5M
- 15.a) Explain various methods of EIA. 5M  
 b) What is the need of EIA? Justify your answer. 5M
16. a) Write few reasons for self purification of water bodies. 5M  
 b) Elaborately explain the environmental management plan. 5M
17. Write short note on the following.
  - a) Adiabatic lapse rate 5M
  - b) Trickling filters 5M

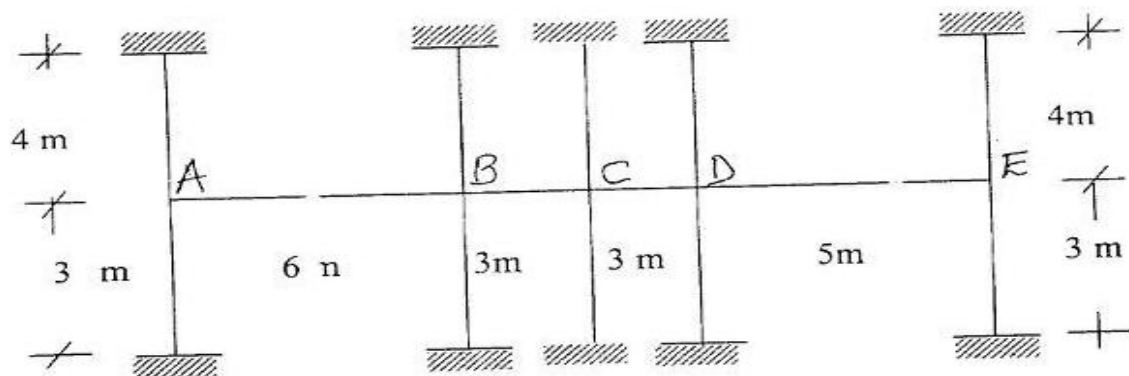
**FACULTY OF ENGINEERING****BE 4/4 (Civil) II Semester (Main & Backlog) Examination, May/June 2019****Sub: Advanced Reinforced Concrete Design (Elective-II)****Time: 3 Hours****Max Marks: 75****Note: Answer All Questions From Part-A, & Any Five Questions From Part-B.****PART – A (25 Marks)**

- |   |    |
|---|----|
| 1. Explain design concepts of curved beams?                     | 3M |
| 2. How different moments are developed in curved beams.         | 2M |
| 3. Explain how the deep beams are designed.                     | 3M |
| 4. Give design principles of deep beams.                        | 3M |
| 5. What is the substitute frame method?                         | 2M |
| 6. Give the general notes on flat slabs                         | 2M |
| 7. Explain how you arrive the final moments in building frames? | 3M |
| 8. Give IS specifications for pile foundation.                  | 2M |
| 9. Explain the need for pile foundation                         | 3M |
| 10. Give design principles of raft foundation?                  | 2M |

**PART – B (50 Marks)**

11. Design a circular beam a water tower which has a mean diameter of 8 m. The uniformly distributed load transmitted by 12 symmetrically placed columns on the beam being 480 kN/m. Width of the beam is 600 mm and overall depth is 1200 mm. Use M25 grade concrete and fe500 grade steel. Sketch the details of the reinforcements.  $K_1 = 0.0037$ ,  $K_2 = 0.0014$ ,  $K_3 = 0.0017$ ,  $W = 7\text{deg}$ , 15 min. 10M
12. A continuous deep beam spanning over three, equal spans of 9 m each have an overall depth of 5 m. The width of support is 1.0 m and the width of beam = 0.40m. The beam supports a uniformly distributed live load of 300 kN/m, using M 25 grade concrete and Fe 500 grade steel, Design suitable reinforcements for the central span of continuous deep beam. Sketch the details of reinforcements. 10 M
13. The substitute frame shown in figure below has to be analyzed for maximum positive and negative moments in the beam AB, BC and CD,DE. Estimate the maximum moments, in beams and columns. The beams are spaced at 4 m intervals.  
 Thickness of floor = 150 mm  
 Floor finish = 0.90 kN/m<sup>2</sup> 10M  
 Size of beams = 300x 500 mm  
 Size of columns = 300x 500 mm

contd...2



14. Design a interior panel of a flat slab carrying a super imposed load of  $5.0 \text{ kN/m}^2$ . The weight of the floor finish on the slab may be taken as  $2.0 \text{ kN/m}^2$ . The panel is supported on 500 mm diameter circular diameter circular columns. Size of panel in  $6 \text{ m} \times 7 \text{ m}$ . Use M 25 grade concrete and Fe 500 grade steel. 10M
15. Design a portal frame hinged at the base to suit the following data spacing of the portal frame  
 =  $3.5 \text{ .0 m}$   
 Height of the column =  $3.0 \text{ m}$   
 Distance between the column centres =  $6.0 \text{ m}$   
 Live load on roof =  $2.5 \text{ kN/m}^2$   
 Design the slab and portal frame.  
 Assume suitable data if required, 10M
16. a) Discuss the design concepts and stepwise procedure for the design of pile foundations. 5M  
 b) Design a pile foundation for a column load of 2500 kN. Length of the pile is 5.0 m. Use M 30 grade concrete and Fe 500 grade steel. 5M
17. Design a raft foundation for 10 columns, arranged in two rows, spaced at 7 meters c/c in the longitudinal direction and 5 meters in the transverse direction. The internal columns carry 1800 kN each and end column carry 1300 kN. The bearing capacity of the soil is  $120 \text{ kN/sq.m}$ . 10M

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**FACULTY OF ENGINEERING****B.E. 4/4 (Civil) II – Semester (New) Examination, May / June 2019****Subject: Advanced Transportation Engineering (Elective – II)****Time: 3 Hours****Max.Marks: 75****Note: Answer all questions from Part – A and any five questions from Part – B .****PART – A (25 Marks)**

- 1 What are the various field and laboratory investigations needed for soil stabilized road construction? 2
- 2 Discuss the problems in stabilization of Black cotton soils. 3
- 3 Explain the concept of ESWL with a neat sketch. 2
- 4 Explain briefly the stresses due to temperature in pavements. 3
- 5 Explain briefly about the types of skidding in pavements. 2
- 6 What are the requirements of Highway Drainage system? 3
- 7 What are the causes of accidents? 2
- 8 Explain benefit cost ratio method briefly and give the equation required for the same. 3
- 9 What are the well-known traffic management measures? 2
- 10 Explain the effects of noise pollution. 3

**PART – B (50 Marks)**

- 11 a) Discuss the scope of soft aggregate in soil stabilization. Explain Mehra's method of Stabilization. 5
- b) Explain the various techniques of soil stabilization. 5
- 12 a) Compute the ESWL for the dual wheel load assembly carrying 2044kg for pavement thickness of 15cm, 20cm and 25cm given the centre to centre tyre spacing = 27cm and distance between the walls of the tyres = 11cm. 5
- b) Explain the critical locations of loading as regards wheel load stresses in cement concrete pavement. Discuss the westergaard's concept and assumptions. 5
- 13 Explain the various types of failures in cement concrete pavements and their causes
14. a) Explain the measures to be taken to reduce the rate of accidents? 5
- b) Enumerate the various methods of Economic Evaluation and bring out the advantages and disadvantages of the same. 5
- 15 a) Briefly explain the travel demand management techniques. 5
- b) Explain the role of computer applications in traffic and transport planning. What are the softwares used for the same? 5
- 16 a) Determine the spacing between contraction joints for 3.5m slab width having thickness of 20cm and  $f = 1.5$ , for the following two cases:
  - i) For plain cement concrete, allowable  $Sc = 0.8\text{kg/cm}^2$
  - ii) For reinforced cement concrete, 1.0cm dia. Bars at 0.3m spacing 5
- b) Write an explanatory note on cross drainage and drainage structures. 5
- 17 Write short notes on any three of the following. 10
  - i) Proportioning and compaction in mechanical method of stabilization.
  - ii) GI method.
  - iii) Skid resistance.
  - iv) Concept of PCU.

**FACULTY OF ENGINEERING****BE 4/4 (EEE) II – Semester (Main & Backlog) Examination, May/June 2019****Subject: Utilization****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (25 Marks)**

1. What are advantages and disadvantages of high frequency heating?
2. What are various reasons of heating element failure?
3. What do you understand by push buttons?
4. Give the application of Float switches.
5. State and explain laws of illumination.
6. Define MHCP and MSCP.
7. Discuss various factors on which final choice of traction system depends.
8. What is meant by adhesive weight?
9. What types of motors find application in traction work?
10. Name various parts in lead acid batteries.

**PART – B (50 Marks)**

11. Define the following terms:
 

(a) Solid angle	(b) Brightness	(c) Lumen	
(d) Luminous flow	(e) Candle power		[10]
12. Explain the following with neat schematic diagram.
 

(a) Direct reversing of 3-phase induction motor.	5
(b) Two supply sources for 3-phase induction motor.	5
13. (a) Explain sodium vapour lamp with neat sketch. 5  
 (b) (i) A lamp emits a total flux of light of 1500 Lumens. What is its MSCP?  
 (ii) A plane surface is placed 3 metres from a 200-cp uniform source of light. Calculate the intensity of illumination on the surface when it is normal and inclined at  $60^\circ$ . 5
14. (a) Briefly explain about constructional details and maintenance of lead acid batteries in detail. 6  
 (b) What is specific energy consumption and what are the factors affecting the specific energy consumption? 4
15. A low frequency induction furnace operating at 10V in the secondary circuit takes 400 kw at 0.5 p.f. when the hearth is full. If the secondary voltage be maintained at 10V, estimate the power absorbed and the p.f. when the hearth is half full. Assume the resistance of the secondary circuit to be thereby doubled and the reactant to remain the same. 10
16. a) What are the advantages of series parallel control of motor over rheostatic method of starting and speed control? 5  
 b) Compare A.C and D.C systems of traction. 5
17. Write short notes on the following: 10
  - (a) Stroboscopic effects
  - (b) Mechanics of train movement
  - (c) Discharge lamps

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) II – Semester (Main & Backlog) Examination, May/June 2019****Subject: Design of Fault Tolerant 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. Find the relation between reliability and MTBF. 2
2. Explain the Bath-Tub Curve. 3
3. Define a) Availability b) Test Coverage. 2
4. Graphically show the relation of Dynamic system Reliability as a function of Simplex System Reliability. 3
5. Give the reliability expression of i) SMR ii) Triplicated TMR. 3
6. What are the requirements to obtain Graceful Degradation in a system? 3
7. Define Controllability and Observability. 2
8. Draw the logic Diagram of A 2-Rail Checker. 3
9. Explain Reliability Improvement Factor (RIF) for fixed mission Time, T. 2
10. Explain the different Intervals in System Repair Time. 2

**PART – B (50 Marks)**

11. Explain in detail the Modeling of Faults. 10
12. a) Explain the Technique Pioneered by Hewlett-Packard to detect Errors in Data Streams due to Hardware faults. 4
- b) For the given table Give the State Assignment and Fault-Tolerant State Table for Obtaining Fault Tolerance Using Error Correcting Codes? 6

Present State	Input	
	X=0	X=1
A	C,1	B,0
B	A,0	D,1
C	B,1	A,1
D	D,1	C,0

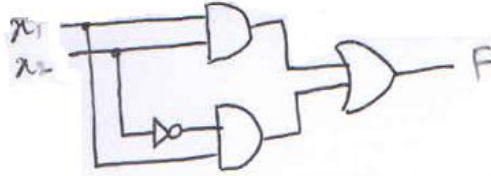
13. Explain the following Practical Fault Tolerant systems (i) FTMP (ii) COMTRAC. 10
14. What is a Fail-Safe system? Design a complete Fail-Safe Machine for the given sequential Circuit using the method proposed by CHUANG and DAS. 10

Present State	Input	
	X =0	X=1
A	E,0	B,0
B	C,0	D,0
C	A,0	D,0
D	E,0	D,1
E	A,0	D,1

Contd...2



15. (a) For  $F(A, B, C, D, E, F) = BEF + BCF + ACF + BDE + ACDE + ABCD$  give a testable design using three level OR-AND-OR Technique. 4  
 (b) Give a Testable Realization of the function  $F = A'B'C + AB'C'$  using control logic. 6
16. (a) Find the Boolean Difference with respect to  $X_2$  in the Circuit given below. Also find Test vectors to test  $X_2(S-A-0)$  and  $X_2(S-A-1)$ . 5



- (b) Design A 2-Out of -4 checker circuit. 5
17. Explain the following:  
 a) Designing Testability into Logic Boards. 5  
 b) Self- Purging Redundancy. 5

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**FACULTY OF ENGINEERING**  
**B.E. 4/4 (ECE/CSE/AE/IT) II-Semester (Main & Backlog) Examination,**  
**May / June 2019**

**Subject : Entrepreneurship (Elective-II, III & V)**

**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 qualities of Successful Entrepreneur?   | 2 |
| 2 Identify types of Enterprises found in vogue.  | 2 |
| 3 Explain briefly about first generation entrepreneur.                                       | 3 |
| 4 What are the general sources of secondary information available in India?                  | 3 |
| 5 What are simple forecasting techniques for product?  | 2 |
| 6 Discuss about significant features of marketing analysis.                                  | 3 |
| 7 State the features of PERT network management.   | 2 |
| 8 Define a project and mention different parameters to be considered in project formulation. | 2 |
| 9 What is behavior? And explain the role of motivation in behavior of an entrepreneur.       | 3 |
| 10 Write short notes on personality models and determinants.                                 | 3 |

**PART – B (50 Marks)**

- |  |    |
|--|----|
| 11 a) What are the Central incentives and subsidies available in an entrepreneur in India and explain?                                       | 5  |
| b) What role do you envisage for SSI sector in the present economic scenario?  | 5  |
| 12 a) Explain the role of women entrepreneurship in the economic growth of the country especially India with respect to societal background. | 5  |
| b) What are the different problems faced by woman entrepreneurs and explain how to overcome them?  | 5  |
| 13 a) Are socioeconomic factors responsible for entrepreneurship development. Justify.   | 5  |
| b) Explain different steps involved in technical analysis of a project.  | 5  |
| 14 a) Enumerate the technical analysis for project formulation.  | 5  |
| b) What are the differences between PERT and CPM?  | 5  |
| 15 What is urgency addiction? Is it good for an entrepreneur? How it influences the market?  | 10 |
| 16 a) Explain about the concept and influence or behavioural aspects in entrepreneur's life.   | 5  |
| b) Explain how a entrepreneur should be motivated for high performance. Explain the time management matrix of entrepreneur.                  | 5  |
| 17 Write short notes on any three of the following :   | 10 |
| a) Technical Feasibility   |    |
| b) Market Assessment   |    |
| c) Working Capital   |    |
| d) Time Management Matrix  |    |

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**FACULTY OF ENGINEERING**  
**BE 4/4 (ECE) II Semester (Main & Backlog) Examination, May/June 2019**

**Subject: Real Time Operating Systems (Elective-II)**

**Time: 3 hrs**

**Max Marks: 75**

**Note: Answer all questions From Part –A & any Five questions from Part-B**

**PART – A (25 Marks)**

- |   |   |
|---|---|
| 1. Brief on evolution of OS.                            | 3 |
| 2. Explain the role of Thread scheduling.               | 3 |
| 3. List and compare the deadlock avoidance strategies.  | 3 |
| 4. Differentiate among the memory partitioning methods. | 3 |
| 5. Brief the use of RTOS in control system application. | 3 |
| 6. Describe virtual computers?                          | 2 |
| 7. Write the drawbacks of Round Robin scheduling.       | 2 |
| 8. What is a semaphore?                                 | 2 |
| 9. Explain the role of disk cache.                      | 2 |
| 10. Mention the features of cos RTOS                    | 2 |

**PART – B (50 Marks)**

- |   |    |
|---|----|
| 11. a) Describe the Operating system objectives and functions.                  | 5  |
| b) Explain the interaction of OS and hardware architecture.                     | 5  |
| 12. (a) Explain SJF and priority scheduling algorithm.                          | 5  |
| (b) Explain the concepts of multiprocessor scheduling.                          | 5  |
| 13. a) Brief the Readers-writers and producer consumer problem.                 | 5  |
| b) Describe deadlock prevention mechanisms.                                     | 5  |
| 14. (a) Illustrate Memory segmentation.   | 5  |
| (b) What are the different page replacement policies? Explain any two policies. | 5  |
| 15. Discuss the role of embedded RTOS for VOIP application.                     | 10 |
| 16. (a) Explain any two architectures of operating systems.                     | 5  |
| (b) Discuss about Unix multi-level feedback queue scheduling.                   | 5  |
| 17. Write short notes on  | 10 |
| (a) Integrated deadlock strategies.   |    |
| (b) Disk scheduling strategies.   |    |

**FACULTY OF ENGINEERING**  
**BE 4/4 (ECE) II – Semester (Main & Backlog) Examination, May/June 2019**

**Subject: Wireless Sensor Networks (Elective- II)**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer all questions from Part-A, & any five Questions from Part-B.**

**PART – A (25 Marks)**

1. Why multihop wireless communication is required for WSN? (3)
2. What is data centric network? Explain with suitable diagram. (3)
3. Differentiate active and passive sensors. (2)
4. State the mathematical model of energy consumption during transmission and reception of a transceiver. (3)
5. List the factors that are required for PHY design of WSN (2)
6. Briefly explain IEEE 802.15.4 MAC Layer. (3)
7. State the fundamental task of address management in WSN. (2)
8. Can ASIC be used in Wireless Sensor Networks? (2)
9. Compare MANET and WSN. (3)
10. Briefly explain about SMACS. (2)

**PART – B (50 Marks)**

11. Write notes on
  - (i) Dynamic Energy and power management (3)
  - (ii) TinyOS and nesC (4)
  - (iii) Programming Models in WSN (3)
12. (i) Explain the design approaches and performance of S-MAC protocol. (5)  
 (ii) Explain the concept of TRAMA protocol. (5)
13. (i) Discuss the characteristic requirements of WSN. (5)  
 (ii) Explain the innovative mechanisms to realize the characteristic requirements of WSN. (5)
14. (i) Briefly discuss about the applications of WSNs. (4)  
 (ii) Discuss in detail the Transceiver characteristics and structure. (6)
15. (i) Explain about various clustering mechanisms in WSN. Also detail about the sensor tasking and Control. (7)  
 (ii) What are differences between Zigbee and Bluetooth Technology? (3)
16. (i) Discuss in detail about design principles of WSN. (4)  
 (ii) Elaborate on energy scavenging techniques for sensor nodes. (6)
17. (i) What is WSN Tunneling? Explain with example. (4)  
 (ii) Explain the concept of gateway with different scenarios in WSN. (6)

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**FACULTY OF ENGINEERING****BE 4/4 (ECE) II – Semester (Main & Backlog) Examination, May/June 2019****Subject: Speech Processing (Elective – II)****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (25 Marks)**

1. Define short Time Energy function. [2]
2. Define the terms quefrency and liftering. [3]
3. Give the applications of Autocorrelation Function in speech Processing. [3]
4. Give the nearer pitch frequency ranges for men, Women, and children. [2]
5. What are the requirements of a speech synthesis-by-rule system? [3]
6. What are formants? [2]
7. What is morph dictionary? [2]
8. Draw the equivalent circuit of glottal region? [3]
9. What is copy synthesis? [3]
10. What are Phonemes? [2]

**PART – B (50 Marks)**

11. a) Classify speech sounds. [5]  
b) With a schematic, describe the speech production mechanism. [5]
12. a) Explain auto correlation method for pitch extraction. [5]  
b) Give the algorithm for end point detection of speech. [5]
13. a) Explain the technique of linear predictive analysis of speech by autocorrelation method. [5]  
b) Explain Homomorphic filtering of speech. [5]
14. a) Explain transform coding in detail. [5]  
b) Explain linear predictive vocoder. [5]
15. a) Explain the Two mass model of vocal cords developed by Ishizaka and Flanagan. [5]  
b) Give the LPC 10 algorithm [5]
16. a) Write the DTW algorithm. [7]  
b) List the three basic problems in Hidden Markov Model. [3]
17. Write short notes on the following:  
(a) Speaker verification and identification. [5]  
(b) ADPCN. Adaptive Differential Pulse code Modulation. [5]

**FACULTY OF ENGINEERING****BE 4/4 (ECE) II Semester (New) (Main & Backlog) Examination, May/June 2019****Subject: Real Time Operating Systems (Elective-III)****Time: 3 Hrs****Max Marks:75****Note: Answer all questions from Part –A, & any Five questions from Part-B.****PART – A (25 Marks)**

- |    |   |   |
|----|---|---|
| 1  | Brief the evolution of Operating systems.                     | 3 |
| 2  | Define Release time, Deadlines and Timing constraints of Job. | 3 |
| 3  | Explain the principle of concurrency.                         | 3 |
| 4  | Draw the task state transition diagram.                       | 3 |
| 5  | How to setup boot loader?                                     | 3 |
| 6  | What are the objectives of RTOS?                              | 2 |
| 7  | Define thread scheduling.                                     | 2 |
| 8  | Mention the deadlock prevention strategies.                   | 2 |
| 9  | Brief about interrupts in Unix OS                             | 2 |
| 10 | What are the different types of boot configurations?          | 2 |

**PART – B (50 Marks)**

- |     |   |    |
|-----|---|----|
| 11  | Describe in detail the various structures of Operating system.        | 10 |
| 12  | a) Distinguish between hard and soft Real Time system.                | 5  |
|     | b) Discuss about SJF and Round Robin types of scheduling algorithm    | 5  |
| 13. | Explain the classical problems of synchronization.                    | 10 |
| 14. | a) Illustrate the Task control routines in VxWorks                    | 5  |
|     | b) Explain the UNIX kernel file system.                               | 5  |
| 15. | a) Demonstrate the types of host/target development and debug setups. | 5  |
|     | b) Explain the generic architecture of an embedded Linux system.      | 5  |
| 16. | a) Explain the objectives and functions of operating systems.         | 5  |
|     | b) Explain the hardware support for mutual exclusion.                 | 5  |
| 17. | Write short notes on any two of the following:                        | 10 |
|     | a) Real time scheduling concepts.                                     |    |
|     | b) Process management in UNIX OS                                      |    |
|     | c) Linux development tools  |    |

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**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) II – Semester (Main & Backlog) Examination, May / June 2019****Subject: Design of Fault Tolerant Systems (Elective –III)****Time: 3 Hours****Max. Marks: 75****Note Answer all questions from Part – A & any five questions from Part-B.****PART – A (25 Marks)**

1. Differentiate between fault detection and fault location. 2
2. State the principle of random testing. 3
3. Write the need for fault tolerant design. 2
4. What is hybrid redundancy? 3
5. List out some practical fault tolerant systems. 2
6. Define the terms
  - i) Time redundancy and
  - ii) Software redundancy. 2
7. What is meant by “Strongly fault secure” circuits? 2
8. Write the properties of testable circuits. 3
9. Find Boolean difference of the function  $F = x_1x_2 + x_1x_2'$ . 2
10. Mention advantages of Berger codes. 3

**PART – B (50 Marks)**

11. a) Derive an expression for the overall reliability of the system when the subsystems are connected in
  - i) Series and
  - ii) Parallel. 5
 b) Write a brief note on feed-back Bridge faults. 5
12. a) What is self-purging redundancy? Derive an expression for reliability of self purging system having N modules with perfect switch and voters. 5
- b) Explain the operation of 5MR scheme under
  - i) Single fault
  - ii) Double fault and
  - iii) Treble fault scenario. 5
13. Explain the operation of software implemented fault tolerant scheme in detail. 10
14. a) Explain the procedure for test generation to test a self checking circuit C, designed using Berger codes with a suitable example. 5
- b) Explain check bit generation using low cost residue codes. 5
15. a) Explain how a given combinational circuit can be converted into a syndrome testable design. 5
- b) Explain the use of control logic to enhance testability. 5
16. a) Explain the scheme for fault tolerant design of VLSI chips in detail. 5
- b) Explain the scheme of error checking and correction in a 16-bit word memory with ECC. 5
17. Answer any TWO of the following. 10
  - a. State and prove any two Boolean difference properties.
  - b. Transition count testing.
  - c. Self checking PLA design.

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**FACULTY OF ENGINEERING****B.E. 4/4(ECE) II – Semester (Main & Backlog) Examination, May / June 2019****Subject: Radar Systems (Elective –III)****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part A and any five questions from Part B****PART – A (25 Marks)**

- |   |    |
|---|----|
| 1. What is Radar? What are the various applications of Radar    | 3M |
| 2. Write the simpler version of Radar range equation.           | 3M |
| 3. Draw the block Diagram of CW Doppler radar.                  | 2M |
| 4. What is the Doppler Effect?                                  | 2M |
| 5. Explain the principle of operation of MTI Radar              | 3M |
| 6. Write the description of Range gate Doppler filters?         | 2M |
| 7. Explain how AGC is achieved in conical Scan?                 | 3M |
| 8. Write about phase-comparison Mono Pulse Radar.               | 3M |
| 9. Write short notes on matched filter                          | 2M |
| 10. Describe any two types of duplexers used in radar receivers | 2M |

**PART – B (50 Marks)**

- |   |    |
|---|----|
| 11. (a) Explain the working of radar with the help of block diagram and hence bring out the role of transmitter and receiver          | 6M |
| (b) Explain at least five applications of radar in detail   | 4M |
| 12. (a) Draw and explain the block diagram of side band super heterodyne CW radar.  | 6M |
| (b) Explain the principle of operation of FMCW altimeter with suitable diagram  | 4M |
| 13. (a) Explain the Butterfly effect that is produced by MTI  | 6M |
| (b) Draw the block diagram of non-coherent MTI  | 4M |
| 14. (a) Explain lobe switching technique with antenna patterns.   | 6M |
| (b) Draw the block diagram of conical scan tracking radar and explain its operation.  | 4M |
| 15. (a) Explain the block diagram of amplitude comparison mono pulse radar for extraction error signals in both elevation and azimuth | 6M |
| (b) What are the advantages of mono pulse radar over conical scan radar?  | 4M |
| 16. a) Explain the characteristics of a matched filter receiver with necessary equations.   | 6M |
| b) Discuss about efficiency of non-matched filters  | 4M |
| 17. (a) What is a Linear Array; a planar array and phased array antenna, on what factors radiation pattern depends.                   | 6M |
| (b) How do you achieve Beam steering and beam width changes in a phased array Antenna?  | 4M |

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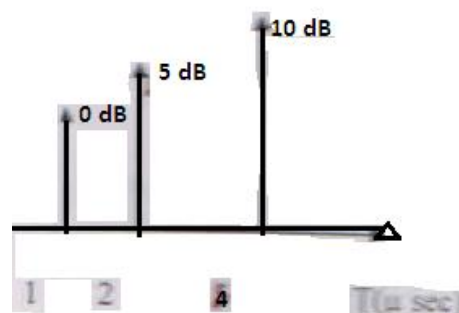


**FACULTY OF ENGINEERING****B.E. 4/4 (ECE) II – Semester (NEW)(Main & Backlog) Examination, May/June 2019****Subject: Mobile & Cellular Communications (Elective –III)****Time: 3 Hours****Max. Marks: 75****Note Answer all questions from Part – A & any five questions from Part-B.****PART – A (25 Marks)**

1. For a cluster  $N=12$ , What is the Co-channel reuse ratio? [2]
2. What is the difference between crosstalk and interference? [2]
3. Assume a receiver is located 100 meters from a 50 W transmitter. The carrier frequency is 900 MHz, free space propagation is assumed.  $G_t = 2$  and  $G_r = 2$ , Find (a) the power received at the receiver, (b) the rms voltage applied to the receiver input assuming that the receiver antenna has a purely impedance of 50 and is matched to the receiver. [3]
4. Mention different types of cell site antennas. [2]
5. If a normal GSM slot consists of 5 trailing bits, 8 guard bits and 10 synchronization bits. It consists of three bursts of data each 156 bits. Find the frame efficiency of this model of GSM system. [3]
6. What do you mean by 1-persistent CSMA? [2]
7. Give the frame structure for GSM. [3]
8. What is the function of Data Scrambler in CDMA systems? [2]
9. Write characteristics features of Bluetooth technology. [3]
10. Mention disadvantages of 1G Mobile technology. [3]

**PART – B (50 Marks)**

11. a) Explain frequency reuse planning in mobile communication systems. [5]  
b) Derive the expression for signal-to-interference ratio in terms of co-channel reuse ratio for a seven-cell cluster system. [5]
12. a) Explain the diffraction mechanism for propagation in a cellular system. [5]  
b) Compute rms delay spread for the following Power-Delay profile. [5]



13. (a) Determine the maximum throughput that can be achieved using ALOHA and slotted ALOHA protocols. [7]  
(b) Differentiate between TDMA and FDMA systems. [3]
14. Explain the working of GSM system architecture with neat diagram. [10]
15. Write short notes on (i) PAN (ii) WLAN. [5+5]
16. Explain the types of small-scale fading in detail. [10]
17. Explain handoff procedures in different generations. [10]

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**FACULTY OF ENGINEERING****BE 4/4 (ECE) II – Semester (Main & Backlog) Examination, May/June 2019****Subject: Intellectual Property Rights (Elective – III)****Time: 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (25 Marks)****I. Multiple Choices:****(3x1=3)**

- The rights conferred on a patentee are purely statutory rights conferred by-
  - Patents Act 2002
  - Patents Act 1970
  - Patents Act 1999
  - Patents Act 2005
- India is a member of \_\_\_\_\_
  - Berne Convention
  - Universal Copyright Convention
  - Both
  - None
- Passing-off is a Phenomenon generally associated with \_\_\_\_\_
  - Patents
  - Trade marks
  - Copyright
  - Design

**II. Fill in the Blanks:****(3x1=3)**

- The period of copy right for a photograph is \_\_\_\_\_ years of its publication year.
- Intellectual Property rights fall under the exclusive Jurisdiction of the \_\_\_\_\_ Government.
- World Book and Copyright Day celebrated by UNESCO on \_\_\_\_\_.

**III. True or False:****(3x1=3)**

- A computer programme is not considered a patentable invention. ( )
- Patents, Registered design and copyright are protected for unlimited period. ( )
- Copyright works of International Organizations have a term of 60 years. ( )

**IV. Match the following:****(3x1=3)**

- |                          |                              |
|--------------------------|------------------------------|
| 1. Patent Monopoly       | (a) Minima Convention.       |
| 2. Trade Mark Law Treaty | (b) 50 Years                 |
| 3. Berne convention      | (c) Geneva 1994              |
|                          | (d) The statute of Anne 1710 |
|                          | (e) quid pro quo             |

**V. Problem based Questions:****(3x1=3)**

- A's painting is bought by B later throws it in the dustbin. Can A claims any damage.
- 'M' designs a new diagnostic technique useful for detecting Cancer at an early stage. Can he get a patent for the same?
- A member country of TRIPS agreement committed a breach of its obligations under the agreement. What are the possible consequences?

Contd..2

**VI. Short Notes:**

**(5x2=10)**

1. Invention
2. Formation of Treaty
3. Designs
4. Complications and copyrights.
5. Property Marks.

**PART – B (50 Marks)**

11. Describe various forms of intellectual property.
12. Distinguish between the Port of Passing off and infringement of trademark.
13. What amounts to infringement of Designs? What are the remedies therefore?
14. A Patent is a techno legal document- Explain.
15. Copyrights protect expressions and not ideas – Elaborate.
16. What are related rights – Explain with suitable examples.
17. Examine the growing importance of Intellectual Property Rights.

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**FACULTY OF ENGINEERING****B.E. 4/4 (AE) II - Semester (Main & Backlog) Examination, May / June 2019****Subject : Earth Moving Vehicles (Elective – III)****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (25 Marks)**

- 1 Classify Scrapers. (2)
- 2 List out elements in the production cycle of a shovel. (3)
- 3 What is articulate Dump Truck? (2)
- 4 Compare the applications of Wheel type and crawler type tractors. (3)
- 5 How do you rate Tractors? (2)
- 6 What are the functions of graders? (3)
- 7 Differentiate between Hydraulic and Cable Dozers. (2)
- 8 Define Under carriage Unit. (3)
- 9 What do you mean by Ditch Cutting? (2)
- 10 What is a Dragline? Classify them. (3)

**PART – B (50 Marks)**

- 11 What are the different types of Multi Axle Vehicles used in Earth Moving? Explain the working of any them. (10)
- 12 Explain about i) Trollies and ii) Fork Lift Truck (10)
- 13 Explain the working principle of Jack Hoisting equipment with a neat sketch. (10)
- 14 Explain the control mechanism of Caterpillar Motor Grader. (10)
- 15 Explain the operation of a pusher-loaded scraper with a neat sketch. (10)
- 16 Explain the working principle of A Rotary bucket Loader with a neat sketch. (10)
- 17 Explain the working principle of a Hydraulic shovel with a neat sketch. (10)

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**FACULTY OF ENGINEERING**  
**BE 4/4 (CSE) II Semester (Main & Backlog) Examination, May/June 2019**

**Subject: Software Quality and Testing (Elective-II)**

**Time: 3 Hours**

**Max. Marks: 75**

**Note: Answer all questions from Part-A & any five questions from Part-B**

**PART – A (25 Marks)**

- |   |   |
|---|---|
| 1. Define quality and software quality Assurance.               | 2 |
| 2. Differentiate 3 sigma and 6 sigma                            | 3 |
| 3. How to implement software quality metrics?                   | 2 |
| 4. What is function point? How do you compute it?               | 3 |
| 5. Why the defects are hard to find?                            | 2 |
| 6. Distinguish validation and verification                      | 2 |
| 7. Compare glass box testing and black box testing.             | 3 |
| 8. Write short notes on Pareto analysis.                        | 2 |
| 9. Which testing is done on executed code? Give its objectives. | 3 |
| 10. Discuss about work bench concept with an example.           | 3 |

**PART – B (50 Marks)**

- |   |    |
|---|----|
| 11.a) Define and explain about the steps in software quality Assurance plan.      | 5  |
| b) Discuss about CMM and CMMI.  | 5  |
| 12. What is the need of software quality metrics? Explain In-process metrics.     | 10 |
| 13. How to build a structural approach to software testing?                       | 10 |
| 14. Explain the methodology to evaluate automated testing tools.                  | 10 |
| 15. What is V testing? Explain the work bench used to test client/server systems. | 10 |
| 16.a) Explain eleven steps of testing process.                                    | 5  |
| b) Discuss Load Runner testing tool.  | 5  |
| 17. Write shot notes on following:  |    |
| a. Testing Tactics Checklist  | 4  |
| b. JAD  | 3  |
| c. Boundary Value Analysis  | 3  |

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) II - Semester (Main & Backlog) Examination, May / June 2019****Subject : Human Computer Interaction (Elective – II)****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (25 Marks)**

- 1 Define analyzing Interaction paradigms. (2)
- 2 What is internal consistency? (3)
- 3 List out different input devices and explain what is a logical input device. (3)
- 4 What is wizard? (2)
- 5 What are the different Interaction Design models? (3)
- 6 Define different types of boards. (3)
- 7 Classify computer mediated communication. (2)
- 8 Evaluate usability goals. (2)
- 9 Explain about GOMS. (3)
- 10 Define “user- centered approach”. (2)

**PART – B (50 Marks)**

- 11 a) Define the business function. What guidelines are used to understand the business function. (5)  
b) Describe the characteristics of Web user interfaces? (5)
- 12 a) What are different Navigation aids in web system? (6)  
b) Explain about Iterative Design. (4)
- 13 Explain briefly about Interface Design Standards. (10)
- 14 Write short notes on  
a) Writing scripts. (5)  
b) Running a pilot test. (5)
- 15 Discuss about technical issues Concerning haptics? (10)
- 16 a) Explain about tele operation. (5)  
b) Define “scientific visualization”. (5)
- 17 a) Explain what is dual nature of Icons. (4)  
b) Explain about web text and Dynamic text presentation. (6)

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**FACULTY OF ENGINEERING**  
**BE 4/4 (CSE) II – Semester (Main& Backlog) Examination, May / June 2019**

**Subject: Software Reuse Techniques (Elective – II)**

**Time: 3 hours**

**Max. Marks: 75**

**Note: Answer all questions from part A & Answer five questions from part – B.**

**PART – A (25 Marks)**

- |   |   |
|---|---|
| 1. What are the basic principles of software reuse?                 | 3 |
| 2. Define domain engineering?                                       | 2 |
| 3. List the consequences of factory Pattern?                        | 2 |
| 4. Define Delegation?   | 2 |
| 5. Write the difference between Adapter pattern and Bridge pattern? | 3 |
| 6. What are the advantages of chain of responsibility pattern?      | 3 |
| 7. What is the intent and context of broker architecture pattern?   | 2 |
| 8. Define architecture pattern and list them?                       | 3 |
| 9. What is the intent and context of black board?                   | 3 |
| 10. Mention advantages of software reuse?                           | 2 |

**PART – B (5 x 10 = 50 Marks)**

- |  |       |
|--|-------|
| 11. a) Explain how software engineering is a systematic model building?                              | 6     |
| b) How usecase model shapes the rest of the system?  | 4     |
| 12. Explain the intent, motivation, applicability structure and implementation of prototype pattern? | 10    |
| 13. Draw the structure and specify the participants for following pattern:                           | 4+3+3 |
| a) Composite pattern      b) Decorator pattern      c) command pattern                               |       |
| 14. How to use several kinds of variability mechanisms?  | 5     |
| 15. a) Explain about Model – View - Controller?  | 5     |
| b) Explain about Presentation – Abstraction- Control?  | 5     |
| 16. Write in detail about Adaptable system?  | 10    |
| 17. Justify “Application families allows significant reuse” with example?                            | 10    |

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**FACULTY OF ENGINEERING****B.E. 4/4 (CSE) II – Semester (Main & Backlog) Examination, May / June 2019****Subject: Simulation & Modeling (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 discrete systems.                  | 2 |
| 2 Define simulation. Give an example.       | 3 |
| 3 Define queuing systems.                   | 2 |
| 4 What is statistical model?                | 3 |
| 5 Define uniform distribution.              | 2 |
| 6 What are pseudo-random numbers?           | 2 |
| 7 Define chi-square test.                   | 3 |
| 8 What is KS test?                          | 2 |
| 9 What is Output Data Analysis?             | 3 |
| 10 Define stochastic nature of output data. | 3 |

**PART – B (5x10 = 50 Marks)**

- |  |   |
|--|---|
| 11 Discuss:                                      |   |
| a) Advantages and disadvantages of simulation.   | 5 |
| b) Steps in simulation study.                    | 5 |
| 12 Explain:                                      |   |
| a) GPSS  | 5 |
| b) SLAM  | 5 |
| 13 Explain:                                      |   |
| a) Properties of random numbers.                 | 5 |
| b) Poisson distribution.                         | 5 |
| 14 Discuss:                                      |   |
| a) Time series input models.                     | 5 |
| b) Input validation using tuning test.           | 5 |
| 15 Explain:                                      |   |
| a) Measures of performance and their estimation. | 5 |
| b) Output analysis for steady state simulations. | 5 |
| 16 Discuss:                                      |   |
| a) Areas of application                          | 5 |
| b) Gamma distribution                            | 5 |
| 17 Write short notes on:                         |   |
| a) Weibul's distribution                         | 5 |
| b) Verification and validation.                  | 5 |

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**FACULTY OF INFORMATICS****B.E. 4/4 (I.T.) II - Semester (Main & Backlog) Examination, May / June 2019****Subject : Software Project Management (Elective – V )****Time : 3 Hours****Max. Marks: 75****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (25 Marks)**

- 1 What are the five components of software cost models? (3)
- 2 List out the various Management artifacts. (3)
- 3 What are the advantages and disadvantages of commercial components versus custom software? (3)
- 4 Write short notes on Modern Project Profiles. (3)
- 5 Define Roundtrip Engineering (2)
- 6 Explain stakeholders Environment. (3)
- 7 Define Process maturity. (2)
- 8 Write the primary objectives of inception and elaboration phases. (2)
- 9 List out the three aspects of architecture from the management perspective. (2)
- 10 List out the seven top level workflows. (2)

**PART – B (50 Marks)**

- 11 a) Write short notes on pragmatic software cost estimation. (5)  
b) How do we improve team effectiveness? (5)
- 12 Discuss the principles of modern software management. (10)
- 13 Explain default project organization and responsibilities. (10)
- 14 Discuss the various engineering artifacts in modern software project management. (10)
- 15 a) Discuss the management indicators. (4)  
b) Discuss the quality indicators. (6)
- 16 Explain the following:
  - a) Domain Experience (4)
  - b) Process flexibility or Rigor (3)
  - c) Architectural Risk (3)
- 17 Discuss the next generation software cost models. (10)

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**FACULTY OF ENGINEERING****B.E (Civil) V-Semester (CBCS) (Suppl.) Examination, May / June 2019****Subject : Concrete Technology****Time: 3 Hours****Max. Marks: 70****Note : Answer all questions from part – A and any five questions from Part-B****PART– A (10 x 2 = 20 Marks)**

1. Explain the initial setting time of cement? 2
2. Define workability of the concrete 2
3. Explain the Abraham's law 2
4. What do you understand from segregation and bleeding of concrete 2
5. What is field strength and target strength 2
6. What is shrinkage of concrete? 2
7. Define ready mix concrete? 2
8. Why admixtures are used in concrete 2
9. What is polymer concrete? 2
10. Give any three advantages of fiber reinforced concrete? 2

**PART – B (5 x 10 = 50 Marks)**

11. a) Discuss the major and minor compounds of cement and their reactions 5  
b) Explain in detail the physical properties of fine and coarse aggregates needed for a good concrete 5
12. a) Discuss what are the factors that are affecting the workability of the concrete. 5  
b) Explain the temperature effects on OPC and PPC based concrete at site. 5
13. a) Explain the durability and quality control aspects of high strength concrete 5  
b) Design a mix for M25 grade concrete and assume all the data required 5
14. a) Discuss in detail the mineral and chemical admixtures 5  
b) Explain the durability aspects of the high strength fly ash concrete 5
15. a) Discuss the long term properties of the concrete with suitable examples. 5  
b) Differentiate between high density concrete and light weight aggregate concrete 5
16. Discuss in detail the properties and application of recycled aggregate concrete 10
17. Explain the alkali aggregate reaction and its applications in concrete deterioration. 10

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**FACULTY OF ENGINEERING****B.E V – Semester(CBCS) (EEE/Inst.)(CBCS)(Suppl.) Examination, May/June 2019****Subject: Electrical Measurements and instrumentation****Time: 3 hours****Max. Marks: 70****Note: Answer all questions from Part – A & Answer any five questions from Part – B.****PART – A (2 x 10 = 20 Marks)**

1. What is “Swamping Resistance”? Give the reason why swamping resistance is not required in Voltmeters?
2. The current through a current coil of a wattmeter is  $i(t)=1+2\sin t$  A and the voltage across the potential coil is  $v(t)= 2+3\sin t$  V. Determine the power measured by the wattmeter.
3. Give the reason why eddy current damping cannot be used in moving iron instruments.
4. A 230V, 50A, 50Hz single phase house service energy meter has a meter constant of 520rev/kWh. The meter takes 37secs for making 61 revolutions at unity power factor load. Determine the error in the reading of the meter.
5. What do you mean by lag adjustment? Why it is required in energy meters?
6. The value of a high resistance is measured by the loss of charge method. A capacitor having a capacitance of  $2.5\mu\text{F}$  is charged to a potential of 500V d. c. and is discharged through the high resistance. An electrostatic voltmeter, kept across the high resistance, reads the voltage as 300V at the end of 60 seconds. Calculate the value of high resistance.
7. State the various methods of measurement of low resistance. Why is the voltmeter and ammeter method unsuitable for the precise measurement of low resistance?
8. List why magnetic measurements are inaccurate than other type of measurements.
9. Define the following:
  - a) Nominal ratio
  - b) Turns ratio for a potential transformer.
10. A coordinate type potentiometer is used for determination of impedance of a coil and the results obtained are: voltage across  $1\Omega$  resistor in series with coil, 0.24V on in-phase dial and -0.09V on quadrature dial. Voltage across 10:1 potential divider used with coil +0.37V on in-phase dial and +0.32V on quadrature dial. Determine the resistance of the coil.

**Part-B (5X10 = 50 Marks)**

- 11.a) Draw the diagrams showing Heterostatic and Idiostatic connections of Electrostatic voltmeters. Derive the torque expression. 5
- b) A 0-100mA moving iron ammeter is converted to a 0-500V, 50Hz voltmeter by adding a series resistance with the coil. The coil has negligible resistance and an inductance. 5

$$L = \frac{0.01 + 0.2\theta}{4f}$$

henry, where  $\theta$  is the deflection in radian. The total angular span of the meter is  $100^\circ$ .

Compute the spring constant of the meter and the series resistance required. 5

Contd....2

- 12 a) An electro-dynamic wattmeter has a voltage circuit of resistance of  $8000\Omega$  and inductance of  $63.6\text{mH}$  which is connected directly across a load carrying  $8\text{A}$  at a  $50\text{Hz}$  voltage of  $240\text{V}$  and power factor of  $0.1$  lagging. Estimate the percentage error in the wattmeter reading caused by the loading and inductance of the voltage circuit. 5
- b) Draw the construction diagram of a two element energy meter and explain its working. 5
- 13 a) Describe the construction and working of ferro dynamic frequency meter. 5
- b) A correctly adjusted, single phase,  $240\text{V}$  induction watt hour meter has a meter constant of  $600$  revolutions per  $\text{kWh}$ . Determine the speed of the disc, for a current of  $10\text{A}$  at a power factor of  $0.8$  lagging. 5
- 14 a) With a neat circuit diagram explain how low resistance is measured by using kelvin's double bridge. 5+5
- b) A bridge has the following constants:  
 Arm AB – Capacitor of  $0.5\mu\text{F}$  in parallel with  $1\text{k}\Omega$  resistance;  
 Arm BC – Resistance of  $3\text{k}\Omega$ ;  
 Arm CD – Unknown capacitor  $C_x$  and  $R_x$  in series;  
 Arm DA – Capacitor of  $0.5\mu\text{F}$ ;  
 Frequency –  $1\text{kHz}$ . Determine the following:  
 a) Unknown resistance and capacitance.  
 b) Dissipation factor.
- 15 a) Describe the Lloyd Fisher square method of measuring iron losses in ferro magnetic material. 5
- b) The following data relates to a  $1000/100\text{V}$  potential transformer:  
 Primary resistance= $94.5\Omega$ ; Primary reactance= $66.2\Omega$ ; Secondary resistance= $0.86\Omega$ ; Total equivalent resistance= $110\Omega$ . Calculate:  
 i) Phase angle error at no load.  
 ii) Burden in  $\text{VA}$  at unity power factor at which the phase angle will be zero. 5
- 16 a) With a neat circuit explain the working of Drysdale polar type potentiometer. 4
- b) The e.m.f of a standard cell used for standardization is  $1.0186$  volts. If the balance is obtained at  $60\text{cm}$ . Determine  
 i) The e.m.f of the cell which balances at  $75\text{cm}$   
 ii) The current flowing through a standard resistance of  $2\Omega$  if the potential difference across it balances at  $66\text{cm}$   
 iii) The voltage of the supply main which is reduced by a volt-ratio box to one hundred<sup>th</sup> and balance is obtained at  $84\text{cm}$   
 iv) The percentage error in ammeter reading  $0.28$  ampere when balance is obtained at  $40\text{cm}$  with potential difference across a  $2.5\Omega$  resistance in the ammeter circuit. 6
17. Explain any two of the following  
 a) Alternating type power factor meter 5  
 b) Measurement of phase and amplitude by using CRO 5  
 c) Strain gauges. 5

**FACULTY OF ENGINEERING**

B.E. V – Semester (CBCS) (ECE) (Supple.) Examination, May / June 2019

**Subject: Digital Signal Processing****Time: 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A, & Any FIVE questions from Part-B.****Part – A (20 Marks)**

1. Write any two differences between Linear Convolution and Circular convolution? (2M)
2. Compute the DFT of a sequence  $x(n)=\{1,2,-3,4\}$  using DIFFFT algorithm? (2M)
3. State any two properties of Twiddle factor? (2M)
4. Write two properties of Chebyshev filter? (2M)
5. Differentiate between Bilinear Transformation and Impulse Invariant Transformation (2M)
6. What are advantages and disadvantages of FIR filter? (2M)
7. What is Gibb's Phenomenon? (2M)
8. List the application of multirate signal processing. (2M)
9. What is the difference between Von Neumann and Harvard architecture? (2M)
10. Explain circular addressing mode for DSP processor. (2M)

**Part-B (50 Marks)**

11. Determine the 8-Point DFT of the sequence  $x(n) = \{2,1,3,4,5,4,2,3\}$  using DITFFT algorithm? (10M)
12. Design a Butterworth digital IIR low pass using Bilinear transformation by taking  $T=1$  sec, to satisfy the following specifications. (10M)
 

$0.707$	$H(e^{j\omega})$	$1.0$	;	for	$0 \leq \omega \leq 0.45$
	$H(e^{j\omega})$	$0.2$	;	for	$0.65 \leq \omega \leq \pi$
13. Design a linear phase FIR high pass filter using Hamming window with a cutoff frequency  $\omega_c=0.8$  rad/sample and  $N=11$ ? (10M)
14. (a) What is interpolation and decimation? (4 M)  
 (b) Consider a discrete time signal given by  $x(n)=\{1,3,2,5,6,4,7,9\}$ . Determine the down sampled version of the signal for the sampling rate reduction factor  $D = 2$  (6 M)
15. Explain various CPU components of TMS32054XX processor with the help of a neat diagram. (10M)
16. (a) Differentiate between RISC vs CISC architecture (6 M)  
 (b) Explain bilinear transformation briefly and draw mapping from S-plane to Z-plane? (4M)
17. Write short notes on following.
  - (a) Overlap save method of convolution. (5 M)
  - (b) Sampling rate conversion by an arbitrary factor (5 M)

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**FACULTY OF ENGINEERING****B.E. (M / A.E) V – Semester (CBCS) (Suppl.) Examination, May / June 2019****Subject: Heat Transfer****Time: 3 Hours****Max.Marks: 70****Note: Answer all questions from Part – A and any five questions from Part – B.****PART – A (10x2 = 20 Marks)**

- 1 Define thermal diffusivity. Explain
- 2 Write expression for general conduction equation in Cartesian co-ordinates and deduce it to one dimensional steady state condition with no internal heat generation.
- 3 List out the applications of lumped parameter analysis?
- 4 How to improve the effectiveness of the fin?
- 5 What do you understand by the hydrodynamic and thermal boundary layers?
- 6 Differentiate between free and forced convection.
- 7 Differentiate between specular and diffuse reflections.
- 8 Explain the terms absorptivity, reflectivity and transmissivity.
- 9 Write the expression for LMTD in Counter flow heat exchanger
- 10 Explain nucleate boiling.

**PART – B (5x10= 50 Marks)**

- 11 The wall of a residential building is made of 10.2 cm brick ( $k= 0.70 \text{ W/mK}$ ) and 3.8 cm gypsum plaster ( $k=0.48 \text{ W/mK}$ ). Calculate the thickness of rockwool insulation layer ( $k=0.065 \text{ W/mK}$ ) that should be provided to bring down the rate of heat transfer through the wall by 80%. (10)
- 12 The aluminium square fins (0.5 mm X 0.5 mm). 10 mm long are provided on the surface of semiconductor electronic device to carry 1 W of energy generated: The temperature at the surface of the device should not exceed 80 C, when the surrounding temperature is 40°C.  $K(\text{aluminium}) = 200 \text{ W/m}^2\text{C}$ ;  $h = 15 \text{ W/m}^2\text{C}$  Determine the number of fins required to carry out the above duty. Neglect the heat loss from the end of the fin. (10)
- 13 a) Air enters at a temperature of 60°C and flows through a 2.5 cm diameter tube with a velocity of 0.8m/s. It can be heated either by (a) condensing the steam on its outer surface or (b) By electric resistance heating, calculate the value of heat transfer coefficient in both cases. Assume fully developed flow. (6)
- b) Air 30°C flows across a cylinder of 5cm diameter with a velocity of 25m/s. If the surface temperature is maintained at 120°C, calculate the rate of heat transfer per meter length. (4)
- 14 Two very long concentric cylinders of diameters  $D_1 = 0.2 \text{ m}$  and  $D_2 = 0.5 \text{ m}$  are maintained at uniform temperatures of  $T_1 = 950 \text{ K}$  and  $T_2 = 500 \text{ K}$  and have emissivities  $\epsilon_1 = 1$  and  $\epsilon_2 = 0.7$ , respectively. Determine the net rate of radiation heat transfer between the two cylinders per unit length of the cylinders. (10)

- 15 Air having  $C_p=1.005$  KJ/Kg K is used to cool water in a parallel flow heat exchanger. Air enters at  $20^{\circ}\text{C}$  with a flow rate of 3 Kg/s and water enters at  $90^{\circ}\text{C}$  at the rate of 1Kg/s. Determine the heat transfer rate and outlet temperatures of hot water and cold air. Assume overall heat transfer coefficient  $300\text{W/m}^2\text{K}$  and surface area  $10\text{ m}^2$ . (10)
- 16 a) Explain the Boiling Heat transfer Phenomena with a neat sketch. (4)
- b) Two parallel black plates of  $0.5 \times 1\text{ m}$  are separated by  $0.5\text{m}$  distance one plate is at  $1100^{\circ}\text{C}$  and other at  $600^{\circ}\text{C}$  what is the net radiant heat exchange between two plates. (6)
- 17 a) Explain Wein's displacement law of radiation. (10)
- b) Explain the Fouling effects in heat exchanger.
- c) Distinguish between Black body and Gray body.

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**FACULTY OF ENGINEERING**

**B.E. (Prod.) V – Semester (CBCS)(Suppl.) Examination, May / June 2019**

**Subject: Machine Tool Engineering**

**Time: 3 Hours**

**Max.Marks: 70**

**Note: Answer all questions from Part – A and any five questions from Part – B.**

**PART – A (10x2 = 20 Marks)**

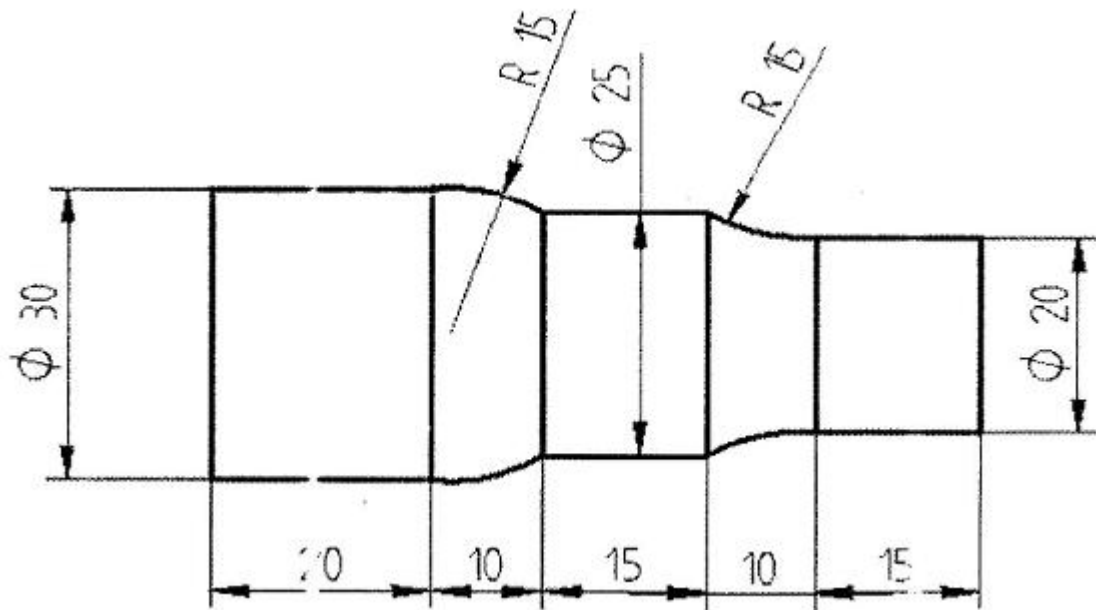
- 1 Why cutting inserts are used over solid tools?
- 2 Sketch orthogonal cutting and its chip formation.
- 3 State indirect methods for estimating its tool life.
- 4 State all tool wear mechanisms.
- 5 Sketch LH and RH thread.
- 6 State six types of mandrels used in the lathe.
- 7 State four special types of milling machines.
- 8 State four generating methods in the production of gears.
- 9 State the features of M codes in computer aided manufacturing.
- 10 State the different grades of grinding wheels.

**PART – B (5x10 = 50 Marks)**

- 11 a) Determine the shear plane angle in orthogonal cutting.  
b) Explain chip velocity in oblique cutting.
- 12 a) Explain tool life using multi-pass criteria with neat diagram.  
b) Explain tool wear mechanism by adhesive mechanism.
- 13 a) State the specification of the capstan and turret lathe.  
b) Explain with sketch the mechanism of thread cutting on lathe.
- 14 a) Sketch the setup arrangement for milling bevel gear.  
b) State six cutting holding devices in used milling machines.



15 a) For the given dia 38mm and length 80mm write a CNC programming for the part.



- b) State the classification of grinding wheel. Explain with sketch the different surface grinding methods.
- 16 a) Explain the various elements of manual part programming in machining a component.
- b) Explain the OPTIZ coding of part classification using Group Technology.
- 17 a) Explain adaptive control systems in Computer aided manufacturing.
- b) Explain the simple indexing for milling 26 teeth by milling operation with neat sketch.

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**FACULTY OF ENGINEERING****B.E. (CSE) V - Semester (CBCS) (Main) Examination, May / June 2019****Subject : Automata Language and Computation****Time : 3 Hours****Max. Marks: 70****Note: Answer all questions from Part-A & any five questions from Part-B.****PART – A (20 Marks)**

- 1 Give a Regular expression for the set of all strings whose length is at least 2, given  $\Sigma = \{0,1\}$ .
- 2 Mention the closure properties of Regular languages.
- 3 What do you mean by inherently ambiguous languages?
- 4 What are the normal forms of CFG's?
- 5 State Myhill-Nerode Theorem.
- 6 What is ID of a TM?
- 7 State Church's hypothesis.
- 8 How is a TM used as a computer of non negative integer functions?
- 9 What do you mean by Undecidability?
- 10 Compare right linear and left linear grammars.

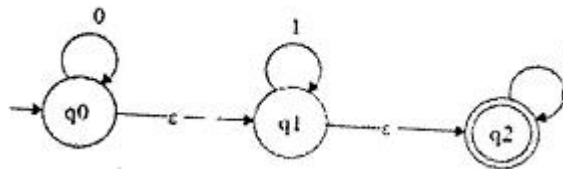
**PART – B (50 Marks)**

- 11 (a) Give  $\epsilon$ -NFA to accept  $\{0^n 1^n 2^n \mid n \geq 0\}$  and give the  $\epsilon$ -closures of all states. [6]  
(b) Differentiate between Moore and Mealy machines. [4]
- 12 (a) State pumping lemma for CFLs. [5]  
(b) Give LMD, RMD and Parse tree for the string  $w = a^* b + a^* b$  given  $S \rightarrow S + S \mid S^* S \mid a \mid b$  [5]
- 13 How can a PDA be converted to a CFG? Explain the methodology with the help of an example. [10]
- 14 (a) Design a TM which recognizes palindromes. [6]  
(b) Describe the programming techniques for the construction of the a TM. [4]
- 15 (a) Explain Chomsky Hierarchy of languages. [6]  
(b) What are the reasons for TM not accepting input? [4]
- 16 (a) Explain UTM. [6]  
(b) Prove the equivalence of DFA and NFA. [4]
- 17 Explain the following processes in detail. [10]  
(a) How to find out if a grammar is LR(0) or not by taking an example.  
(b) How to find out if a string belongs to a grammar or not using CYK algorithm.

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**FACULTY OF ENGINEERING****B.E. (IT) V-Semester (CBCS) (Suppl.) Examination, May / June 2019****Subject : Automata Theory****Time : 3 hours****Max. Marks : 70****Note: Answer all questions from Part-A. Answer any FIVE questions from Part-B.****PART – A (10 x 2 = 20 Marks)**

- 1 Construct  $\epsilon$ -NFA for the regular expression  $ab(a+b)^*$ .
- 2 Draw DFA for  $L = \{w/w \in \{a,b\}^* \mid N_a(w) > N_b(w)\}$ .
- 3 Explain following ENFA.



- 4 Define CFG and give example.
- 5 Explain Multitape Turing machine.
- 6 Write about recursive language.
- 7 Summarize the closure properties of CFG's.
- 8 Construct NFA to accept the language  $L = \{w/w \in \{a,b\}^* \mid w = abb^n \text{ or } aba^n \text{ where } n > 0\}$ .
- 9 Explain intractability with example.
- 10 Define Rice theorem.

**PART – B (5 x 10 = 50 Marks)**

- 11 Demonstrate a Turing machine to accept a palindrome of odd length. 10
- 12 Construct a PDA equivalent to the following grammar 10  
 $S \rightarrow aAA, \quad A \rightarrow aS / bS / a$
- 13 a) Predict and Eliminate left recursion from the following grammar 4
  - i)  $S \rightarrow (L)/a$  ii)  $S \rightarrow Aa/b$
  - $L \rightarrow L,S/S$   $A \rightarrow Ac/Aad/db/\epsilon$
- b) Examine the given PDA  $P = (\{q_0, q_1, q_2, q_3\}, \{0, 1\}, \{X, Y, Z\}, \delta, q_0, Z, \{q_3\})$  6
  - 1  $\delta(q_0, \epsilon, Z) = (q_1, XZ)$  6  $\delta(q_2, 0, Y) = (q_2, \epsilon)$
  - 2  $\delta(q_1, 0, X) = (q_1, YX)$  7  $\delta(q_2, \epsilon, X) = (q_2, \epsilon)$
  - 3  $\delta(q_1, 0, Y) = (q_1, YY)$  8  $\delta(q_1, \epsilon, Z) = (q_3, Z)$
  - 4  $\delta(q_1, 1, Y) = (q_2, Y)$  9  $\delta(q_2, \epsilon, Z) = (q_3, Z)$
  - 5  $\delta(q_2, 1, Y) = (q_2, Y)$

Show the sequence of IDs to demonstrate the processing of the strings "01100".

- 2 -

- 14 a) Describe programming techniques for Turing machines. 4  
 b) Evaluate the PCP instance and find the solution. 6

	List A	List B
i	w <sub>i</sub>	x <sub>i</sub>
1	10	101
2	011	11
3	101	011

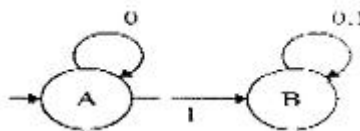
- 15 a) Construct minimum state automata for following using Table filling Algorithm. 7

Q	0	1
→Q1	Q2	Q3
Q2	Q3	Q5
*Q3	Q4	Q3
Q4	Q3	Q5
*Q5	Q2	Q5

- b) Convert following DFA to RE using State Elimination 3

	0	1
q0	q0	q1
q1	q2	q1
q2	-	q2

- 16 Convert following DFA to RE using KLEENE theorem 10



- 17 a) Identify whether traveling salesman problem is a NP complete problem or not. 8  
 b) Reproduction the DFA to accept the substring 'ab' for  $\Sigma = \{a, b\}$ . 2

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