FACULTY OF ENGINEERING

B.E. VIII Sem. (CBCS) (CSE) (Main) Examination, September 2020

Subject: Embedded Systems (E-IV)

Time: 2 hours   **Max. Marks: 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. How do we calculate the Dynamic Range of Digital sensor?
2. Explain the role of integrated Development Environment (IDE) for embedded software development.
3. Explain any two data types in Embedded C?
4. Explain the basic functions of a real-time kernel?
5. Explain semaphores and write a short note on it?
6. What is the use of Device Drivers?
7. Differentiate between strings and Arrays?
8. Define context switching?
9. Explain the concept of Virtual to Physical address mapping?
10. Write short notes on memory Technology.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. a) Explain in detail about different Embedded Processors?
    b) Write a short note on Interrupts and Exceptions?

12. a) Explain the process of software development on microcontroller platform.
    b) What is the difference between an assembler and a disassembler? State their use in Embedded Application development.

13. a) Define any two program issues in embedded system?
    b) Explain the importance of the following declarations: static, volatile and use of pointer and Null Pointers.

14. a) Discuss Task Priorities and Task Assignment in detail?
    b) Explain the concepts of memory mapped objects for IPC.

15. a) How does a mailbox message differ from queue message? Can you use message queue as a counting semaphore?
    b) Explain the kernel Services of VxWorks.

16. a) Explain Binary Semaphore and Mutex?
    b) Explain program modeling concept in embedded computing platform?

17. Write short notes on
    a) Memory Hierarchy.
    b) Testing Process in embedded C Program.

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FACULTY OF ENGINEERING
B.E. (CSE) VIII-Semester (CBCS)(Main) Examination, September 2020

Subject : Informational Retrieval Systems (Elective – IV)

Time: 2 hours   **Max. Marks: 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1   Define the terms Precision and Recall.
2   What is map and reduce phase in MapReduce architecture?
3   Write the importance of TF-IDF term weighting measures.
4   List the standard test collections for Information retrieval system evaluation.
5   What are the challenges in information Retrieval from XML document?
6   List various types of language models and its features.
7   What is Mutual information method for feature selection?
8   How the Normalized Mutual Information measure to evaluate the quality of clustering?
9   Write about singular value decomposition in Term-document matrices.
10 Why is it better to partition hosts between the nodes of a distributed crawl system?

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 Explain edit distance and k-gram overlap approaches for spelling correction.

12 Explain in detail vector space model for scoring the term weight.

13 What is relevance feedback? Explain the Rocchio algorithm for relevance feedback.

14 Discuss various distance measures in semantic networks. How rank is done based on constrained spread activation?

15 Explain k nearest neighbor approach for vector space classification. Why kNN handles multimodal classes better than Racchio?

16 Explain page Rank algorithm for web page link analysis.

17 Explain in detail the distribution indexing.

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FACULTY OF ENGINEERING

B. E. VIII – Semester (CBCS) (CSE) (Main) Examination, September 2020

Subject: Machine Learning

Time: 2 hours   **Max. Marks: 70**

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. Define Version Space.
2. What is decision node?
3. What is the Kernel trick?
4. What are the advantages and disadvantages of neural networks?
5. Describe Markov Chains.
6. Define Bayesian theorem.
7. Define Factor Analysis of latent variables.
8. What is Reinforcement Learning?
9. Why do you need to use cluster analysis?
10. Differentiate Agglomerative and Divisive Hierarchical Clustering.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. (a) How is Candidate Elimination algorithm different from Find-S Algorithm.
    (b) Identify the entropy, information gain and draw the decision trees for the following set of training examples.

| Gender	Car ownership	Travel cost	Income (Level)	Transportation (Class)
Male	0	Cheap	Low	Bus
Male	1	Cheap	Medium	Bus
Female	1	Cheap	Medium	Train
Female	0	Cheap	Low	Bus
Male	1	Cheap	Medium	Bus
Male	0	Standard	Medium	Train
Female	1	Standard	Medium	Train
Female	1	Expensive	High	Car
Male	2	Expensive	Medium	Car
Female	2	Expensive	High	Car

12. (a) Given the following data for the sales (in million dollars) of an Auto-mobile company for 6 consecutive years.

Year	2014	2015	2016	2017	2018	2019
Sales	110	100	250	275	230	300

Based on the above data. Predict the sales for next three consecutive years.

   (b) How a single perceptron can be used to represent the Boolean functions such as AND, OR.

13. (a) Describe Maximum Likelihood Hypothesis for predicting probabilities.
    (b) What is a hidden Markov model? What is the probability that the machine will produce, in order (2121 and 122122) for following model?
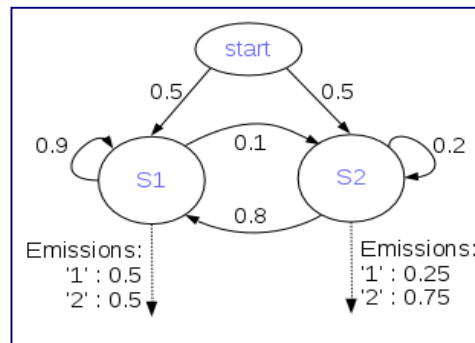
14. (a) Discuss the Basic Genetic Algorithm with example.
    (b) Generalize how principal component analysis is carried out to reduce dimensionality of data sets.

15. (a) Use complete link agglomerative clustering to group the data describe by the following distance matrix show the den-diagrams.

	A	B	C	D
A	0	1	4	5
B	1	0	2	6
C	4	2	0	3
D	5	6	3	0

    (b) Briefly outline how to compute the dissimilarity between objects described by the following types of variables:
    (i) Numerical (interval-scaled) variables.
    (ii) Asymmetric binary variables.
    (iii) Categorical variables.
    (iv) Ratio-scaled variables.

16. (a) Explain find-S algorithm with given example. Give its application.

S. No	Sky	Air temp	Humidity	Wind	Water	Forecast	Enjoy sport
1	Sunny	Warm	Normal	Strong	Warm	Same	Yes
2	Sunny	Warm	High	Strong	Warm	Same	Yes
3	Rainy	Cold	High	Strong	Warm	Change	No
4	Sunny	Warm	High	Strong	Cool	Change	Yes

    (b) Let the random variables X1, X2 and X3 have the covariance matrix.

$$\Sigma = \begin{pmatrix} 1 & -2 & 0 \\ -2 & 5 & 0 \\ 0 & 0 & 2 \end{pmatrix}$$

Determine the principal components of Y1, Y2, Y3.

17. (a) A data set for analysis includes only one attribute X:
    X={7,12,5,8,5,9,13,12,19,7,12,12,13,3,4,5,13,8,7,6}
    (i) What is the mean of the data set X?
    (ii) What is the median?
    (iii) Find the standard deviation for X.
    (b) Explain salient features of a Genetic Algorithm.

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FACULTY OF ENGINEERING
B.E. (CSE) VIII-Semester (CBCS) (Main) Examination, September 2020

Subject : Computational Intelligence (Elective – III)

Time: 2 hours   Max. Marks: 70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1 What are the Basic Learning Laws? List out them.

2 Define Operating range of a neuron.

3 What is meant by pattern storage?

4 Draw two layer Feed Forward Neural networks.

5 Draw a simple Competitive Neural Networks.

6 What is feature Space?

7 Write a formula for Temporal difference (TD) error.

8 What is meant by Q-learning in Reinforcement learning?

9 Find offsprings from {0, 1, 1, 0, 1, 0, 1, 1}, {1, 0, 0, 0, 1, 0, 1, 0} using two point crossover.

10 Define Fitness.

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 (a) Compare the main differences among three models of artificial neuron, namely Mcculloch-Pitts, Perception, Adaline

   (b) Update the weights using Hebbian Learning rule for the given data:

   Initial weight vector W = [1, -1, 0, 0.5]

   X_1= [1, -2, 1.5, 0]

   X_2= [1, -0.5, -2, 1.5]

   X_3= [0, 1, -1, -1.5]

   Learning Constant = 1

   Use activation function as f(net)=sgn(Net)

12 (a) Explain the implementation details of Boltzmann Learning Law.
   (b) Explain in detail about Hopfield model of a neural Network.

13 (a) What are the Principal Components? How do you find them?
   (b) Find Eigen Vectors of 3x3 , matrix [3, 2, 5], [5, 4, 9], [6, 2, 3]

14 (a) Discuss in detail about Bellman Optimality process.
   (b) Explain about TD Learning.

15 (a) Suppose we are given an equivalence relation R with the following equivalence classes.

$X_1 = \{x_2, x_4, x_8\}$

$X_2 = \{x_1, x_3\}$

$X_3 = \{x_6, x_7, x_9\}$

Compute the lower and upper approximation, the boundary and the accuracy for sets.

$Y_1 = \{x_1, x_3, x_5\}$

$Y_2 = \{x_2, x_3, x_7\}$

$Y_3 = \{x_2, x_3, x_5\}$

$Y_4 = \{x_1, x_2, x_3, x_6\}$

(b) Give topological classification for sets Y_1, Y_2, Y_3 and Y_4 considered in question.

16 (a) Explain Activation and Synaptic Dynamics.
   (b) What is meant by the below:
      (i) Transient State
      (ii) Steady State
      (iii) Equilibrium State
      (iv) Stable State

17 (a) Explain in detail about Support Vector Machines.
   (b) Differentiate between discrete and continuous Hopfield models in terms of energy landscape and stable states.

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FACULTY OF ENGINEERING

B.E. (CBCS) (IT) VIII - Semester (Main) Examination, September 2020
Subject : Information Storage and Management (E-III)

Time: 2 hours   Max. Marks: 70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1. List the factors that contributed to the growth of digital data
2. Explain compute virtualization.
3. Differentiate stripping and parity RAID techniques.
4. What is cache vaulting?
5. What is VSAN?
6. List the components of NAS.
7. What is information availability?
8. Define full backup, incremental backup and Cumulative backup.
9. Explain the Risk Triad.
10. What are the benefits of Cloud Computing?

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11. Explain Data center infrastructure? List of key characteristics of data center? What are the task involved in managing data centre?

12. a) Write about the methods used for Storage Provisioning.
    b) Compare different RAID levels.

13. Write in detail about features of Content – Addressed Storage. Give an example of CAS application in detail.

14. a) Write about Host – Based Local Replication.
    b) Write about Storage Array – Based Remote Replication.

15. a) Write about Cloud Computing Infrastructure.
    b) Write about Storage Infrastructure Management Activities.

16. a) Explain the different iSCSI Topologies.
    b) Write about NAS File sharing protocols.

17. Write short notes on
    a) Types of Zoning
    b) Business Impact Analysis
    c) Back up operation steps

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FACULTY OF ENGINEERING
B. E. (EEE) (CBCS) VIII – Semester (Main) Examination, September 2020
Subject: Electrical Estimation Costing and Safety

Time: 2 hours   Max. Marks: 70

PART – A

Note: Answer any five questions.   (5x2 = 10 Marks)

1. Define and discuss about different types of wiring systems.
2. Define estimation and state its necessity?
3. List types of Earthing.
4. List wiring accessories used for Residential Building Electrification.
5. Differentiate between electrification of Residential and commercial Installation.
6. Factors to be considered while deciding the size of cables, bus bar and bus bar chambers while designing commercial Installation.
7. What are the Earthing schemes. List them.
8. What are the two levels of protective measures exist?
9. Explain the significance of code IP65 of an electrical equipment.
10. Differentiate between panel board and distribution board.

PART – B

Note: Answer any four questions.   (4x15 = 60 Marks)

11. (a) Discuss about any procurement system with its procedure.
    (b) With a neat sketch Discuss about different types of wires and cables.

12. (a) General rules guidelines for wiring of Residential Installation and positioning of equipment's.
    (b) With neat sketch explain in brief about pipe Earthing.

13. (a) Discuss in detail regarding design considerations of electrical Installation system for commercial building.
    (b) For distribution feeder for a commercial/industrial complex, assume a total of 250A load current is required from the incoming feeder, then calculate the size, rating and lay out of the system.
    Connected loads are (1) 32A light load (2) 32A fan load   (3) 3nos 30Hpmotor load.

14. For the workshop layout shown below estimate the cost and material required for erecting three number of 25 HP 3 phase, 415v induction motor, State the assumptions needed.
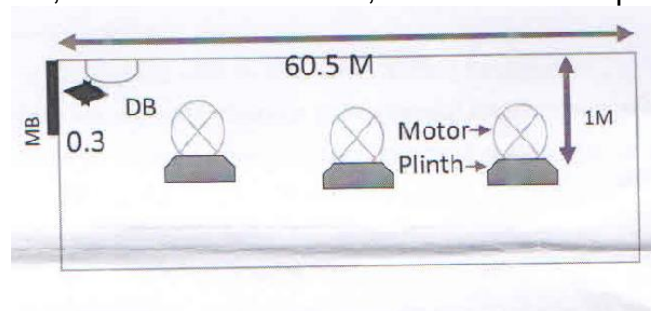
15. (a) Compare the Standardized Earthing Schemes.
    (b) Discuss characteristics of IT system. (isolated or impedance-earthed neutral).

16. (a) Discuss about different codes available for protection of devises.
    (b) What is meant by IE Rules. List any 10 of them.

17. Write a short notes on
    (i) What is miniature circuit breaker? Explain it with a sketch
    (ii) Draw mounting or arrangement of components in panel board.
    (iii) Define IP & IK code of protection?

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FACULTY OF ENGINEERING

B.E. (EEE/Inst.) VIII-Semester (CBCS)(Main) Examination, September 2020

Subject : Power Quality (E-IV)

Time: 2 hours   Max. Marks: 70

PART – A

Note: Answer any five questions.   **(5x2 = 10 Marks)**

1   What is the most common power quality Problem?
2   Differentiate between impulsive transients and oscillary transients.
3   List some IEEE standards Associated with voltage sags.
4   What are the types of voltage sags?
5   What are effects of voltage sag on synchronous motor?
6   Mention the devices for controlling harmonic distortion?
7   What are the guidelines to limit the harmonics?
8   Explain the term total harmonic distortion (THD)
9   Define voltage flicker according to IEEE standard 1159.
10 What kind of equipment is needed to measure distorted waveforms?

PART – B

Note: Answer any four questions.   **(4x15 = 60 Marks)**

11 Discuss the following characteristics of power quality events.
    (i) Short duration interruptions.
    (ii) Long duration interruptions.

12 Explain the sag performance evaluation methods in radial distribution systems.

13 With a neat sketch explain the operation of adjustable speed AC drive and mention applications of ASD's.

14 a) Explain the harmonic analysis of industrial customers.
    b) How to impact of distribution systems capacitor banks on PQ?

15 a) What are the basic requirements to monitoring the power quality?
    b) Explain site surveys of power quality.

16 a) Explain the magnitude and phase angle jump when three phase faults occurs in distribution system.
    b) Explain voltage sag magnitude analysis in meshed systems.

17 a) What are reasons increased concerned about the power quality in power system?
    b) How is PQ data base created? What are the basic requirements?

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FACULTY OF ENGINEERING
B.E. VIII-Semester (CBCS) (Inst.) (Main) Examination September 2020
Subject: Power Plant Design & Safety Management (PE-IV)

Time: 2 hours **Max. Marks: 70**

PART – A

Note: Answer any five questions. **(5x2 = 10 Marks)**

1. What are the goals of Plant Auditing?
2. Sketch the Architecture of Data Historian
3. Can you distinguish between Fisco & Entity Concept
4. Explain about Purge Flow Regulator.
5. What is meant by Emergency Response Plan?
6. Explain the concept of HAZOP
7. Based on what you know explain Encryption in Network Security.
8. What is the Level of Operating System Security Management?
9. Can you predict the outcome of Work Station Classification based on Hardware Architecture.
10. What are the requirements for Upgrading the Control Room?

PART – B

Note: Answer any four questions. **(4x15 = 60 Marks)**

11 a) Explain the importance of I & C documentation with example.
   b) Give an Overview of Commissioning activity

12 What is the function of Purging and Inerting System? Explain the Different types of Purging system

13 Would you explain about elements of Process Safety Management? Explain briefly about process Hazard Analysis

14 a) Demonstrate Physical Security Measure of a network in term of Encryption.
   b) What is your opinion about importance of Digital Certificate?

15 a) With a neat diagram explain Manufacturing Platform Hierarchy.
   b) Based on what you know, How would you explain about Virtual Reality Software requirement for design and testing?

16 a) Describe the basic function of the Control System HMI.
   b) Can you elaborate the meaning of securing the Network with Firewalls, Discuss briefly the different types of Firewalls.

17 Write a short note on :
   a) HIPPS Justifications
   b) Integration of Process Data with Maintenance System
   c) Hazardous Area Classification

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FACULTY OF ENGINEERING

B.E. 4/4 (CE) II – Semester (Backlog) Examination, September 2020

Subject: Health Monitoring & Retrofitting of Structures (Elective II)

Time: 2 hours   Max. Marks: 75

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1. List the components of a Structural Health Monitoring (SHM) system.
2. What is Biomimetic? How is it related to SHM?
3. Explain the operating principle of the capacitive methods for SHM.
4. List the components of a typical capacitive probe used for SHM applications.
5. Give the classification of the NDT procedures in terms of their application.
6. Name at least four tools or equipment to be carried by a visual inspector to the site.
7. Give the definition of condition survey.
8. What are the possible defects in concrete structures? List at least three.
9. Define the term retrofitting of structures.
10. What are some materials used for repairs of cracks in structures?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. Distinguish between Passive and Active methods of Structural Health Monitoring explaining the components used in these methodologies.

12. Explain the principle, sensing technology, diagnostic feature extracted and assessment of the capacitive method in moisture seepage monitoring in structures.

13. Write in detail components and methodology of the Ultrasonic Pulse Velocity (USPV) tests on concrete.

14. What are the objectives of condition survey? Explain the various stages involved in a condition survey of structures.

15. Describe the Repair & Retrofitting strategies used in columns, beams and slabs.

16. Write short notes on ANY TWO of the following repair methods
    a. Repairs using mortars.
    b. Pre-placed aggregate concrete (PAC).
    c. Shotcrete.

17. Write short notes on ANY TWO of the following NDT methods.
    a. Rebound Hammer Test.
    b. Carbonation Depth Measurement Test.
    c. Infrared Thermography.

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FACULTY OF ENGINEERING

B.E. 4/4 (Civil) II – Semester (Backlog) Examination, September 2020

Subject: Ground Improvement Techniques (Elective – II)

Time: 2 hours   Max. Marks: 75

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1 What are the objectives of "Blending of Aggregate" in Mechanical stabilization?
2 Explain the role of ground improvement in foundation engineering.
3 What are the factors influencing the selection of chemicals in ground improvement ?
4 What is the possible reaction that may take place in soil-lime stabilization?
5 What is Dynamic Compaction?
6 What do you understand by suitability number?
7 What is dewatering? What are various methods of dewatering?
8 What are the salient features of sand drains and Geodrains?
9 Name the components of reinforced earth.
10 What are the types of Geo-textiles?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 a) Explain in detail the mechanical soil stabilization.
   b) What are the different applications of Ground improvement?

12 Define grouting. What are the objectives of grouting? Discuss in detail Jet grouting.

13 a) What are the factors affecting In situ densification?
   b) Explain in brief about the installation and working of a vibro-replacement stone column.

14 Explain in detail about the method of pre-loading. How do vertical drains improve the functioning of preloading technique?

15 Explain different functions of Geotextiles with neat sketches.

16 With neat sketches explain in detail the various applications of reinforced earth for ground improvement.

17 Write in brief about any Two:
   a) Need for Ground Improvement
   b) Vibro-Compaction
   c) Soil-cement stabilization.

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FACULTY OF ENGINEERING
B.E. 4/4 (Civil) II-Semester (Backlog) Examination, September 2020

Subject : Advanced Environmental Engineering (Elective – II)

Time: 2 hours   Max. Marks: 75

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1 List out the characteristics of industrial wastes and discuss how they are different from sewage waste.
2 Name the various chemical processes used for treating industrial waste.
3 List out pollutants emitted from thermal power plants and distillery industry.
4 Give a workable definition of hazardous waste, including the basic properties that are characteristics of such wastes.
5 Define the term environmental lapse rate and super adiabatic lapse rate.
6 Discuss the effect of air pollution on meteorological conditions.
7 What is the main function of a scrubber, when it is preferred in the thermal power plants?
8 Define smog and discuss two types of smog their causes and effects.
9 Comment on the need for environmental impact assessment.
10 What are the capabilities of EIA, also comment on its limitations?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 (a) Describe in detail with the aid of neat sketches the three different non intrusive field sampling methods used to investigate hazardous waste disposal sites.
   (b) Describe the purpose and major steps of a waste minimization audit and assessment.

12 (a) Draw a neat flow diagram to manufacture the sugar and discuss the waste water treating system.
   (b) List out the characteristic of waste water coming out from pulp and paper mill and explain the treatment used with the help of a flow chart.

13 (a) Write a detailed note on the biosphere and environment. How temperature and pressure vary with altitude.?
   (b) Explain with the help of diagrams, various types of plume behaviour.

14 (a) Discuss the advantage and disadvantages of electrostatic precipitation and scrubber when it is to be used in power plant using coal of high ash content and high sulphur.
   (b) What do you understand by acid rains, discuss its effects?

15 Give a detailed note on the methods of environmental impact assessment, the prediction of impacts and also the evaluation of impacts.

16 (a) Discuss the adverse health effects of the six criteria air pollutants. What are some other harmful effects of air pollution in addition to those on human health?
   (b) Briefly explain the principle and procedure to calculate stack height.

17 Write short notes on any **two** of the following: (4+3+3)
   (a) Steeter Phelps equations
   (b) Characteristics of leather and tanning industries
   (c) Air quality standards

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FACULTY OF ENGINEERING
BE 4/4 (Civil) V-Semester (Backlog) Examination, September 2020

Subject: Advanced Reinforced Concrete Design (Elective-II)

Time: 2 hours   Max. Marks: 75

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1 How many moments are developed in curved beams?
2 Give IS codal provisions for the design of deep beams?
3 How do you arrive stiffness and distribution factors for building frames?
4 Write the general notes on flat slabs.
5 Define Raft foundation.
6 What do you understand by column grid?
7 What is a pile? What are the forces acting on it?
8 Explain the procedure of finding the B.M coefficient in direct design method, for an exterior panel of flat slab whose two adjacent edges are discontinuous.
9 Differentiate piles and pile caps.
10 Write the IS code provision for the size of the Drop in the flat slab.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 A circular beam of radius 4.5m supported over 5 equally spaced columns is of overall size 230mm x 450mm. It is subjected to an all inclusive factored load of 35kN/m. Analyse the beam and design a section of maximum torsion. Use M25 and Fe500 grade of concrete and steel. The coefficients of support moment, span moment and tensional moment C1, C2 and C3 are 0.108, 0.054 and 0.014 respectively.

12 A continuous deep beam spanning over three equal spans of 10m each have an overall depth of 5m. The width of support of 0.9m and width of beam=0.45m. The beam supports a uniformly distributed live load of 225kN/m, using M30 grade concrete and Fe500 grade steel. Design suitable reinforcements for the central span of continuous deep beam. Sketch the details of reinforcement.

13 A portal frame ABCD has fixed supports at A and D. The columns AB and CD are 4.5m in height while the transverse BC is 9m in length. The frames are spaced at 3.0m intervals. The live load on the roof slab which is 10cm thick may be taken as 1.0kN/m^2. Design the transverse BC and sketch the details of reinforcements use M20 grade concrete and Fe415 grade steel.

14 A four bay multistoried frame has the following details. Continuous beam ABCDE with AB=BC=CD=DE=4m. Height between the floors=3.5m. Size of the beams=300mm, Size of columns=250mm x 350mm. Thickness of floor slabs=150mm. Floor finish=0.7kN/m^2. Live load=2kN/m^2. Estimate the maximum design moments in the beams and columns.

15 Design a portal frame fixed at the base to suit the following data
   Spacing of the portal frame=3.5m
   Height of the column=3.0m
   Distance between the column centres=10.0m
   Live load on roof=2.5kN/m^2
   Design the slab and portal frame. Assume suitable data if required.

16 Design a pile foundation for a column load of 1200kN. Length of the pile is 7.0m. Use M20 grade concrete and Fe415 grade steel.

17 Explain the stepwise procedure of design of Raft foundation.

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FACULTY OF ENGINEERING

B. E. 4/4 (Civil) II – Semester (Backlog) Examination, September 2020

Subject: Advanced Transportation Engineering (Elective – II)

Time: 2 hours   Max. Marks: 75

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1. What are the different materials used for soil stabilization?
2. What are the factors to be considered for mechanical stabilization of soils?
3. A soil subgrade has the following properties: soil portion passing 0.075mm sieve is 50%, liquid limit is 40% and plasticity index is 20%.What is the group index of the soil?
4. What are the methods used in the design of flexible pavements?
5. Mention the different types of distresses occurring in pavements.
6. What is an overlay? What are the types of overlays?
7. What is the concept of PCU?
8. What are the different costs to be analysed for economic evaluation of pavements?
9. What are the advantages and disadvantages of providing tidal flow operations?
10. What do you understand by TSM?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. a) Explain briefly about soil cement stabilization.
    b) Discuss about the Triangular method of proportioning of soils.

12. a) Explain the concept of ESWL.
    b) Determine the warping stress at interior, edge and corner regions in a 25cm thick cement concrete pavement with transverse joint at 11m interval and longitudinal joint at 3.6m interval. The modulus of subgrade reaction is 6.9Kg/cm^3.Assume temperature differential for day conditions to be 0.6°C /cm slab thickness. Assume radius of loaded area as 15cm. Take poissons ratio as 0.15 Modulus of elasticity of cement concrete as 3*10^{5}Kg/cm^2 Thermal coefficient of concreteas10x10^{-6}per°C.

13. Explain in detail about Benkelman Beam deflection method used for pavement evaluation.

14. a) Explain about Level of service concept and also factors affecting it?
    b) Briefly explain about the Net Present Value method used for highway evaluation.

15. a) Discuss about tidal flow operations.
    b) Briefly explain about one way streets highlighting its advantages and disadvantages.

16. a) Briefly explain the objectives of economic evaluation of highway projects.
    b) Discuss about the critical combination of stresses in rigid pavements.

17. Write short notes on following:
    a) Mehras method of soil stabilization.
    b) Methods of providing sub surface drainage.
    c) Measures to reduce accidents.

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FACULTY OF ENGNEEERING

B.F. 4/4 (EEE) II SEMESTER (Backlog) Examination, September 2020

Subject : Utilization

Time: 2 hours   Max. Marks: 75

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1 List the advantages of Electric heating.
2 Recall various types of electric arc welding.
3 Underline the difference between limit switch and float switch.
4 Recognize the difference between contactor and push button.
5 Quote the difference between solid angle and normal angle.
6   List the various discharge lamps.
7 Cite the difference between trapezoidal and quadrilateral speed time curves.
8 Define specific energy consumption in traction.
9 Recall charging and discharging of batteries.
10 Reproduce the DC series motor characteristics.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 List the various types of furnaces in use with their applications .Describe with neat
    diagram the working principle of
    i) vertical core furnace ii) coreless induction furnace.

12 a) Explain the following with neat schematic diagram a) direct reversing of 3- phase induction
       motor b) Two supply source for 3-phase induction. Motor.
   b) Explain the process of starting synchronous motors.

13. a) Explain the following lamps with neat schematic diagrams: a) Mercury
       vapour lamp b)Fluorescent lamp.
    b) A lamp having uniform CP of 200 in all directions is provided with reflector with direct 60%
       of total light uniformly onto a circular area of 10 M diameter. The lamp is hung 6 M above the
       area . Calculate the illumination i) at center ii) at the edge of the surface with and without
       reflector. Determine also the average illumination over the area without reflector.

14. a) What are the advantages of electric drive and state the limitations to its use.
    b) A electric train to have acceleration and braking retardation of 0.8 kmphps and 3 kmphps
        respectively. If the ratio of average to maximum speed is 1.3 and time for stops is 26 secs.
        Find scheduled speed for a run of 1.5 km. assume simplified trapezoidal speed time curve.

15. a) Explain various characteristics that an ideal traction motor should possess.
    b) Write short notes on charging and rating of batteries.

16. a) Describe with neat sketches the various methods of electric resistance heating.
    b) Define MHCP and MSCP.

17. a) A 30 kw. 3 phase , 400 V, resistance oven is to employ Nickel-chrome strip of 0.025 cm thick
        for a three phase star connected heating elements . If the wire temperature is to be 1100^0 C,
        estimate the suitable width of strip. Assume radiating efficiency of 0.6 and emissivity of 0.9.
        The specific resistance of nichrome alloy is 1.03×10^{-6} Ω -m. State any assumption made.
    b) Define luminance and candle power.

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) II – Semester (Backlog) Examination, September 2020

Subject: Design of Fault Tolerant Systems (Elective – II)

Time: 2 hours   **Max. Marks: 75**

PART – A

**Note: Answer any seven questions.**   **(7x3 = 21 Marks)**

1. Given function $f(x_1, x_2, x_3) = x_1 x_2 + x_2 x_3$ construct fault table for the detection of s-a-1 fault on line x_1.
2. Derive relationship between reliability and MTBF.
3. Explain transition count testing method with diagram.
4. Define the reliability R for dynamic redundant systems.
5. Draw neat diagram of the pluribus system.
6. Explain importance of time redundancy in fault tolerant systems.
7. Classify self-checking checkers.
8. Describe operation of 2-out-4 checkers.
9. Draw block diagram of MISR.
10. Define controllability and observability in design for testability.

PART – B

**Note: Answer any three questions.**   **(3x18 = 54 Marks)**

11. a) Explain reliability of series and parallel systems.
    b) Find set test vectors for detecting the fault a (s-a-0) using Boolean difference method.
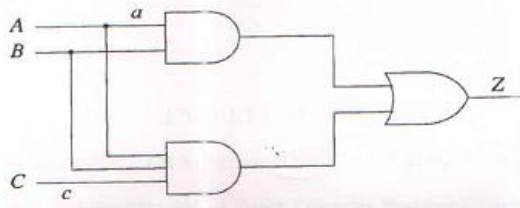
12. a) Draw signature analyzer circuit and explain its operation.
    b) Find test vector for detecting the fault s-a-0 on line "a" using path sensitization.
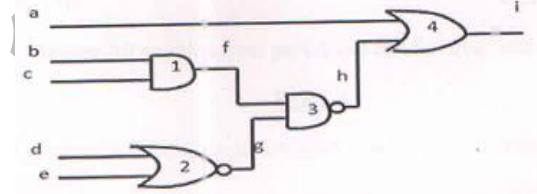
13. a) Discuss use of error correcting code in redundant systems.
    b) Explain operation of self-purging redundancy with neat diagram.

14. Explain any two practical fault tolerant systems with neat diagram.

15. a) Explain totally self-checking checker using m out of n code3 for n!=2m.
    b) Discuss faults occurs in Programmable Logic Array (PLA) in detail.

16. a) Explain use of control logic concept to improve testability.
    b) Explain Syndrome testable design and find syndrome value of figure shown
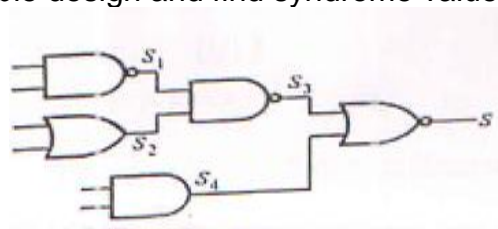
17. Write short notes on the following:
    i) TMR systems   ii) A scheme for fault tolerant design for VLSI chips

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FACULTY OF ENGINEERING
BE 4/4 (ECE) I-Semester (Backlog) Examination, September 2020

Subject: Entrepreneurship

Time: 2 hours   Max. Marks: 75

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1 How are the opportunities in identified?
2 List two strengths and two weaknesses of micro-enterprises.
3 State a few incentives available for women entrepreneurs.
4 What is Collaborative Technology Development?
5 What do you want to achieve by performing Market Analysis?
6 How do you decide the requirements of finance for a Project?
7 What happens when a Project slips beyond the estimated time-line?
8 What is a Critical-Path?
9 List four attributes required of entrepreneurs.
10 How do you manage Time? Narrate the importance of Time-Management.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 (a) How are entrepreneurs required to manage opportunities and challenges in the
       time of crisis?
   (b) Why do entrepreneurs need investment?

12 (a) Discuss sources of ideas from Space-Industry that are suitable for Small-scale
       Industry.
   (b) List some common mistakes Micro and Small entrepreneurs make, and   discuss.

13 (a) What factors do you consider while preparing 'Financial and Profitability
       Analysis'. Present a case and discuss.
   (b) Present a Demand-Supply chart for a product of your choice.

14 (a) Explain the process of preparation for a Project Report.
   (b) Present a case and explain how you control a Project.

15 (a) Explain the significance of Communications and Accounting skills required for
       entrepreneurs.
   (b) How do you measure the success of implementing Time-Management?
       Explain.

16 Discuss:
   (a) Technology Selection
   (b) Project Planning
   (c) Organization Structure

17 Write notes on the following:
   (a) Job Specification and Productivity
   (b) Internal Rate of Return

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FACULTY OF ENGINEERING
B.E. 4/4 (ECE) II – Semester (Backlog) Examination, September 2020

Subject: Wireless Sensor Networks (Elective – II)

Time: 2 hours   **Max. Marks: 75**

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1. How are Ad-Hoc networks different from WSN?
2. What is a wake up radio?
3. Give examples of non radio frequency wireless communications.
4. Justify why ASIC is not a suitable candidate as a controller for ESN.
5. What is random walk?
6. Classify the routing protocols and give example.
7. Give examples of Berkeley motes.
8. Give examples of node level software platforms and explain very briefly.
9. What is jamming attack?
10. Classify the attacks in sensor networks.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. a) Briefly discuss about the applications of ESNs.
     b) Explain the characteristic requirements of Wireless sensor networks.

12. a) Explain dynamic voltage scaling.
     b) What are the approaches to energy scavenging in WSN.

13. a) Explain Sparse topology and energy management.
     b) Explain mediation device protocol.

14. Explain IEEE 802.15.4 MAC layer.

15. Explain timing sync protocol for sensor networks.

16. Explain the different types of attacks at different layers.

17. Write short notes on
     (a) LEACH.
     (b) Sensor node architecture.

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FACULTY OF ENGINEERING
B.E 4/4 (ECE) II-Semester (Backlog) Examination, September 2020

Subject : Speech Processing (Elective – II)

Time: 2 hours   **Max. Marks: 75**

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1. Explain the terms intonation and rhythm
2. Give applications of auto correlation function in speech processing
3. Define the terms quefrency and liftering
4. Define the terms phoneme and pitch.
5. Draw the equivalent circuit for radiation from mouth.
6. What are the basic elements of HMM?
7. What is isochronous foot theory?
8. Why nonlinear quantization is preferred for speech signals?
9. Resonant frequencies of the vocal tract are called as.
10. What is speech synthesis by rule?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. (a) Explain speech production mechanism
    (b) How is STFT different from Fourier Transform? Explain the difference with respect to speech signal.

12. (a) Explain the general discrete time model for speech production
    (b) What are formants? Explain Formant tracking

13 (a) With related equations explain (1) short time energy (2) short time average magnitude and (3) short time zero crossing rate
    (b) How do you distinguish voiced and unvoiced segments based on the above parameters?

14 (a) Draw the block diagram of a parallel formant synthesizer and explain each block.5
    (b) Explain the LPC based synthesizer with a block schematic.

15 (a) Explain channel encoder and decoder for speech compression.
    (b) Explain sub band coding of speech with neat block diagrams.

16 (a) What are the problems with speech recognition systems?
    (b) How do you compare two speech signals using dynamic time warping algorithm?

17 Write a short notes on
    (a) Homomorphic filtering of speech
    (b) Auto correlation method of pitch extraction

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FACULTY OF ENIGNEERING
B.E. 4/4 II-Semester. (ECE) (Backlog) Examination, September 2020

Subject : Radar Systems (Elective-III)

Time: 2 hours   **Max. Marks: 75**

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1. Discuss radar range w.r.t. pulse repetition frequency.
2. Neatly draw Radar block diagram.
3. Name any two duplexers used in radar.
4. A target is closing on a radial of a radar site with a relative velocity of 200 knots. The radar transmits continuous wave energy at a wavelength of 5 cm. What will be the Doppler shift of the target? What will be the Doppler shift be if the target a alters its course by 45°?
5. Illustrate "Butterfly effect" in radars.
6. Explain three pulse canceller, with a diagram.
7. What is the difference between Continuous Tracking Radar and Track While Scan Radar?
8. Explain split range gate tracking.
9. Define effective aperture of the antenna.
10. Explain about f/D ratio in antenna.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. a. Draw and explain block diagram and operation of radar.
    b. What is "probability of false alarm"? Write equation for false alarm time.
12. a. How to measure range using Multiple frequency CW radar.
    b. Explain A-scope, B-scope, PPI and RHI displays.

13 a. Draw and explain the block diagram for MTI radar with power oscillator transmitter.
    b. Explain Non-coherent MTI radar with block diagram.

14 a. With neat diagram explain sequential lobbing.
    b. Brief about Amplitude Comparison Monopulse tracking radar.

15 a. Write short notes on Cassegrain antenna.
    b. Explain Cosecant squared antenna pattern.

16 a. Explain any four system losses in radars.
    b. Write short notes on Isolation between transmitter and receiver in CW radar.

17. Write short notes on
    a. Blind speeds
    b. Acquisition search patterns
    c. Line of Sight

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FACULTY OF ENGINEERING
B. E. 4/4 (CSE) II – Semester (Backlog) Examination, September 2020

Subject: Software Quality and Testing

Time: 2 hours   **Max. Marks: 75**

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1. Define Software Quality Assurance?
2. What are the steps involved for software quality metrics methodology?
3. Differentiate Defect and failure?
4. What is Malcom Balridge?
5. What is performance testing?
6. Distinguish between verification and validation?
7. Which testing is done on executed code? Give its objectives.
8. Discuss about JAD in brief.
9. What is the work bench for Data Warehousing testing?
10. Differentiate functional and structural testing?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11. Explain various metrics for software maintenance in detail?

12. a) Explain clearly the software quality assurance plan?
     b) Discuss about CMM and 6 sigma?

13. a) Explain Various Methods of establishing Testing Policies?
     b) Explain Economics of SDLC testing with numerical examples?

14. Explain the workbench used to test a web application?

15. What is V-testing? Explain 11 step testing process in detail?

16. a) Distinguish between black box and white box testing?
     b) Explain cause effect graphing with an example?

17. Write short notes on the following
     a) CMMI
     b) White box testing?
     c) CRUD

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FACULTY OF ENGINEERING
BE 4/4 (CSE) II - Semester (Backlog) Examination, September 2020

Subject: Human Computer Interaction (Elective-II)

Time: 2 hours   Max. Marks: 75

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1 What is the importance of Mental Model?
2 Define Metaphors with example?
3 Differentiate between SDI & MDI?
4 What are Wizards? What are the applications
5 What are interaction design models?
6 What is GMOS model? Where is it used.
7 What are the advantages and disadvantages of Speech?
8 List the Phases of Usability Test?
9 Describe the WIMP interface?
10 Describe the use of color in interaction design?

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**

11 a) Explain the different types of Interaction Styles?
   b) What is 5W+H?

12 a) What is the DSDM framework Principles?
   b) Explain what is Semantic Network? What is it's significance.

13 a) What is Interpretation? Explain the Tools used in it?
   b) Describe keyboard level model with suitable examples.

14 a) What are Icons? Discuss the factors that Influence Icons Usability?
   b) Differentiate between Cascading Menus and Pop up Menus?

15 Describe Collection? Explain the methods of Collection?

16 a) Explain human issues concerning text?
   b) Explain Tabbed Document Interface?

17 Write shot notes on following:
   (a) Brain Storming?
   (b) Web Interfaces vs. GUIs.
   (c) Haptics.

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FACULTY OF ENGINEERING
BE 4/4 (CSE) II-Semester (Backlog) Examination, September 2020

Subject : Software Reuse Techniques (Elective – II)

Time: 2 hours   **Max. Marks: 75**

PART – A

Note: Answer any seven questions.   **(7x3 = 21 Marks)**

1   With example emphasize the advantage of .object oriented software engineering.
2   What are the basic principles of software re-use.
3   Write the intent of abstract factory and builder patterns.
4   What are the participants and benefits of singleton pattern?
5   Draw the structure and participants of prototype pattern.
6   Write the intent and structure of Façade Pattern.
7   What is the basic idea behind model-view-controller architectural pattern?
8   Describe an example of Whole-part pattern.
9   Discuss about importance of requirements capture unit.
10 Describe about simple applications of master – Slave architecture.

PART – B

Note: Answer any three questions.   **(3x18 = 54 Marks)**
11. a. Explain how analysis model shapes system architecture.
    b. Explain how software re-use can be adapted systematically and incrementally.

12. Discuss in detail about the factory pattern.

13. Describe about in detail about the following.
    a. Chain of responsibility pattern.
    b. Command pattern.

14. Write about the motivation, implementation, sample code and consequences of
     Visitor Pattern.

15. Write the intent, motivation, structure and known uses of the following patterns
    a. Master – slave   b. Mediator.

16 Describe in detail about the Layered Architectural pattern.

17. a. Explain briefly about publisher – subscriber design pattern.
    b. Explain how whole – port hierarchies are represented with underlying structure.

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