FACULTY OF ENGINEERING

B.E. VII – Semester (CBCS) (Civil)(Main) Examination, December 2019

Subject: Green Building Technologies (Elective – II)

Time: 3 Hours   **Max. Marks: 70**

Note: Answer all questions from Part A. Answer any five questions from Part B.
PART – A (20 Marks)

1   State the importance of green Building.

2   What do you mean by zero ozone depending potential materials?

3   Write short notes on organic waste management on-site and off-site.

4   Explain the concept of net zero building.

5   What is indoor air quality?

6   What do you mean by embodied energy in building materials?

7   State some examples of green building materials with recycled content.

8   What does ECBC means?

9   What are the guidelines of GRIHA rating system?

10 Why do green buildings cost more than traditional buildings?

PART –B (5 x 10 = 50 Marks)

11 a) What is the concept of green building? Explain the factors considered in selecting a
    site for green building.
    b) Explain the technology of green buildings through the LEED certification system.

12. Discuss the various low energy approaches to water management in building sector.

13. Explain the different techniques of recycling of industrial waste materials and demolition
    waster for reuse.

14. a) What is meant by operational energy in building? Discuss various methods to
       reduce operational energy.
    b) Discuss the economic benefits of sustainable developments.

15. a) What are the ways to recycling and reusing building construction waste material?
    b) Explain rainwater harvesting methods for roof and non roof building.

16. a) Discuss the alternative resources for building materials.
    b) Describe the process of waste water treatment.

17. Write short notes on
    a) Urban heat island effect
    b) ASHRAE code
    c) Energy efficient building envelopes.

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FACULTY OF ENGINEERING

B.E. (CSE) VII - Semester (Main) Examination, December 2019

Subject : Data Science using R Programming

Time: 3 Hours　　　　　　　　　　　　　　　　　　　　**Max. Marks: 70**

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

Part-B and each question carries 10 Marks.

PART – A (20 Marks)

1. What is Data Science.? How it is different from Data Analysis?

2. Why Linear Algebra is significant in Data Science?

3. List out the differences between Probability Mass Functions and Probability Density Functions.

4. What is a hypothesis and how it is tested?

5. Define Predictive modeling. List out the types of Predictive modeling.

6. Write the possible ways of improving the accuracy of a linear regression model.

7. Briefly describe the data structures in R Programming Language.

8. Write a program to find the factorial of a number using R.

9. Define Object. List the methods for measuring Distance between Objects.

10. What is classification? Draw and explain learning and classification process.

PART – B (5 x 10 = 50 Marks)

11. Draw and explain the life cycle of Data Science.　　　　　　　　　　　10

12. Explain K-Means Algorithm and its implementation in R Programming Language.　　10

13. Why logistic regression is used for classification. Explain model building strategies for logistic regression.　　　　　　　　　　　　　　　　　　　　　　10

14. Define list and data frame in R and explain various operations on lists and data frames with suitable examples.　　　　　　　　　　　　　　　　　　　10

15. Explain K-Nearest Neighbours Algorithm and its implementation in R Programming Language.　　　　　　　　　　　　　　　　　　　　　　　　10

16. What is the purpose sample statistics? Explain the properties of sample statistics?　　10

17. What is statistical hypothesis? Briefly describe the various test statistics?　　　　10

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FACULTY OF ENGINEERING

B.E(ECE) VII-Semester (Main) Examinations December, 2019

Subject: Fundamentals of IoT

Time: 3 Hours   **Max. Marks: 70**

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

Part – A (10×2 = 20 Marks)

1. Why do IoT systems have to be self – adapting and self – configuring?	2
2. What are the architectural constraints of REST?	2
3. How many bytes does each class of IP addresses use to represent network and host ID'S?	2
4. Differentiate open source and closed source software.	2
5. Draw the steps involved in IoT system design methodology.	2
6. Explain MQTT, XMPP, CoAP protocols.	2
7. Explain Data types and Data structures in Python.	2
8. Write Short notes on Python packages.	2
9. Explain publish-subscribe messaging using WAMP-Autobahn.	2
10. Explain Xively cloud for IoT.	2

Part – B (5×10 = 50 Marks)

11. a) What are different IoT communication protocols? Give some examples.	5
b) Explain about Link Layer and Network Layer Protocols?	5
12. a) Write the differences between TCP and UDP?	5
b) What is prototype? What factors one should consider while upgrading from proto type to production?	5
13. a) Draw and Explain Domain model for weather monitoring IoT System.	5
b) Draw and Explain Information model for weather monitoring IoT System.	5
14. a) Write a Python program for controlling LED based on the light level sensed.	5
b) What is the use of SPI and I2C interfaces on Raspberry Pi.	5
15. a) Explain about cloud storage models.	5
b) Suggest a business model canvas for internet of street lights and controlling of operations services.	5
16. a) Explain how IoT is applied for smart Health?	5
b) Explain how IoT is applied for smart retail, logistics and Industry?	5
17. Write short notes on **any Two**	10
a) performance and Battery Life	
b) 6LoWPAN	
c) Ethical Issues in IoT	

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FACULTY OF ENGINEERING

B.E.(EEE) VII – Semester (CBCS) (Main) Examination, December 2019

Subject: Non-Conventional Energy Sources (Elective – II)

Time: 3 Hours   Max.Marks: 70

Note: Answer all questions form Part-A and any five questions from Part-B

PART – A (10x2 = 20 Marks)

1 Write the concept of Non-conventional Energy Sources

2 Explain about Fuel Cells.

3 Explain the electrical characteristics of silicon PV cells

4 Write the applications of wind plants?

5 Mention salient advantages of "Windmill rotors".

6 Define the term 'Biomass Energy

7 What is pyrolysis?

8 Define anaerobic digestion? What are the factors, which affect bio digestion?

9 What are the difficulties in the development of tidal power?

10 Differentiate tidal and wave power.

PART – B (5x10 = 50 Marks)

11 a) Explain in detail about the Classification of Fuel Cell with neat diagrams.
    b) What are the advantages and disadvantages of Fuel Cells?

12 a) Explain working of flat plate collector with line diagram and brief about types in that.
    b) Explain in detail about Solar Energy Storage systems with neat sketch?

14 a) Write an expression for available wind power.
    b) Explain in detail about WECS with neat diagrams.

15 a) Explain in detail about OTEC in detail.
    b) Explain the working and advantages of a biogas plant

16 a) Explain the various methods of tidal power generation.
    b) Discuss the features of geothermal energy.

16 a) Explain the factors which affect bio-digestion?
    b) State the advantages and disadvantages of Biogas Generation.

17 a) Give the details of commonly used Biogas plants used in India.
    b)   Explain about Thermal gasification of biomass.

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FACULTY OF ENGINEERING
BE VII Semester (CBCS) (Mech.) (Main) Examination, December 2019

Subject: Entrepreneurship (Elective – II)

Time: 3 Hours   **Max. Marks: 70**

Note: Answer All Questions From Part – A, & Any Five Questions from Part – B.
PART – A (10 x 2 =20 Marks)

1 Define Entrepreneurship.

2 What is Ancillary Industry.

3 Define Sole Proprietorship form of Business.

4 List out the Sources of Ideas.

5 Differences between CPM & PERT.

6 Recall the concepts of Project Formulation

7 Write a short note on Time Management.

8 Define Personality.

9 Discuss on Tax Holiday.

10 Define Leadership.

PART – B (5 x 10 = 50 Marks)

11 a) Explain the role of Entrepreneur for the economic growth of the country?   6
    b) Explain the Linkage among Small, Medium and Heavy Industry?   4

12 a) Explain the types and forms of Business Ownership?   6
    b) Explain the Characteristics of an Entrepreneur?   4

13 a) How do you identify the Market Demand for Project Formulation?   6
    b) List out the Sources of Ideas of establishing a Business?   4

14 a) Explain the concept of Financial and Technical Analysis in Project formation?   6
    b) Discuss briefly about the Environmental Influence?   4

15 a) Explain the procedure of Project Management?   6
    b) Define Network Analysis?   4

16 a) Briefly discuss the Behavioural aspects of an Entrepreneur?   5
    b) Explain Time Management Matrix? Mention various approaches to Time Management?   5

17 a) Explain how an entrepreneur should be motivated for high performance?   5

    b) Explain the Leadership Models?   5

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FACULTY OF ENGINEERING
B.E. 4/4 (Civil) I – Semester (Backlog) Examination, December 2019

Subject: Surface and Ground Water Management
(Elective – I)

Time: 3 Hours   Max.Marks: 75

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

PART – A (25 Marks)

1 Explain the concept of system and system analysis with examples.   [2]
2 Define Simulation.   [2]
3 Enumerate various groundwater basin investigations to be carried out for the analysis of groundwater.   [2]
4 Discuss the necessity of Artificial Recharge methods.   [2]
5 State the applications of modeling techniques in groundwater management.   [2]
6 What is Mathematical Programming? Discuss the steps involved in solving the problem. [3]
7 Highlight the problems of salinity and water logging related to groundwater management.   [3]
8 Enumerate the steps for formulation of Linear Programming problems.   [3]
9 Differentiate between viscous fluid models and membrane models.   [3]
10 What do you understand by basin management? Explain.   [3]

PART – B (5x10 = 50 Marks)

11 a) Discuss the characteristics and applications of Water Resources system planning and analysis.   [6]
   b) Explain where and when the objective function and constraint equations are used in evaluation techniques.   [4]

12 a) What are Lagrange multipliers, slack and surplus variables? Explain in brief.   [6]
   b) Explain in detail with an example the required formulation techniques of General approach in linear programming.   [4]

13 a) Draw the flow diagram for the Hydrologic system of groundwater for Urban and suburban development.   [4]
   b) How do you carry out the evaluation, calculation and variability of Perennial Yield? [6]

14 Explain about spreading method along with its limitations and concept of Induced Recharge Method of artificial recharge.   [5+5]

15 a) Explain in detail with a neat sketch about the principle involved in any two Porous Media models.   [6]
   b) Solve the following LP problem using Graphical method.   [4]

   Max $Z = 5x_1 - 7x_2$
   Subject to $x_1 - 9x_2$ 9
                   $-2x_1 + 3x_2$ 6
                   $x_1 + x_2$ 12
                   x_1 2
                   $x_1, x_2, \geq 0$

16 A total of 7 units of water is to be allocated optimally to three users. The allocation is made in discrete steps of one unit ranging from 0 to 7. The returns obtained from the users for a given allocation are as follows. Solve the problem in Forward Recursion.   [10]

Amount of water allocated	User – 1	User – 2	User – 3
0	0	0	0
1	7	7	6
2	9	8	9
3	11	5	10
4	9	-6	17
5	7	-22	18
6	2	-30	17
7	-7	-33	14

17 a) What are the various components of Simulation models? Explain in detail.   [4]
    b) Show the schematic diagram of a systematic approach for studying conjunctive use problems along with the advantages.   [4+2]

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FACULTY OF ENGINEERING

B. E. 4/4 (EEE) I Semester (Backlog) Examination, December 2019
Subject: HVDC Transmission (Elective-I)

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

Note: Answer all questions from Part-A, & Any five questions from Part-B.
PART – A (25 Marks)

1 Discuss the corona loss in AC and DC system.   [3]

2 Give the applications of DC transmission.   [2]

3 Define pulse number.   [2]

4 Derive the expression for average DC output voltage of an uncontrolled six-pulse bridge rectifier.   [3]

5 Briefly explain the modification implemented on the inverter characteristics.   [3]

6 What is meant by power reversal?   [2]

7 Explain what is meant by a smoothing reactor.   [2]

8 Mention the causes for arc back.   [3]

9 Draw typical parallel MTDC system.   [3]

10 State the application of MTDC system.   [2]

PART – B (5 x 10 = 50 Marks)

11 Explain different types of HVDC links.   [10]

12. a) Give the analysis of bridge converter with grid control and overlap.   [6]
     b) Explain the operation of a HVDC converter as an inverter.   [4]

13. a) Obtain the equivalent circuit of a HVDC bridge rectifier from fundamentals.   [5]
     b) Explain the combined characteristics of rectifier and inverter.   [5]

14. a) Derive an expression for reactance of DC reactor to prevent commutation failure.   [6]
     b) Give a brief note about bypass values.   [4]

15. a) Explain different types of MTDC systems comparing their salient features.   [5]
     b) Explain constant voltage control of parallel MTDC system.   [5]

16. a) Give the comparison between AC and DC transmission systems.   [5]
     b) Deduce the equivalent circuit of a rectifier.   [5]

17. Write short notes on: [10]
     a) DC filters
     b) Limitations of manual control.

                                                [5]

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FACULTY OF ENGINEERING

BE 4/4 (Inst.) I-Semester (Backlog) Examination, December 2019

Subject : Automation in Process Control (Elective-I)

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

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

PART- A (25 Marks)

1　Name the two types of relays used in digital signal conditioning	2
2　What are RTU's? Briefly explain	2
3　What is the common Implementation of Opto coupler?	2
4　Write the advantages of DCS system	2
5　Briefly write about local terminal units of CDS system	2
6　What are the different types of protocols in process control?	3
7　What is the difference between sensor and smart sensor?	3
8　What is the physical realization of digital PID algorithm?	3
9　Explain the topology of field bus system	3
10　Write the advantages and disadvantages of EMR's over SSR's	3

PART - B (50 Marks)

11 a) With a neat block diagram explain DAS and DDS	6
b) Explain the loading effects due to series and shunt connected instruments	4
12 With a neat diagram explain the DCS system what are the applications of DCS systems?	10
13 With a neat block diagram explain the computer control of Temperature control of plastic injection molding process	10
14. With a neat diagram explain Smart positioned for control valves	10
15. a) Explain the Heirarchy of field bus system	5
b) Explain what is HART protocol	5
16 Draw and explain the hierarchy of DCS system	10
17 Write short notes on any two	10
a) Direct digital control	
b) Computer control of liquid level system	
c) Smart Pressure transmitter	

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FACULTY OF ENGINEERING
B.E 4/4 I-Semester (ECE) (OLD) Examination, December 2019

Subject : Optical fiber Communication (Elective-I)

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	Define Meridional rays and skew rays.	(2)
2	Differentiate between single mode and multi mode fibers.	(3)
3	Compare step index and graded index fibers.	(3)
4	Differentiate between inter and intra modal dispersion.	(2)
5	Draw the schematic of high radiance surface emitting LED.	(3)
6	Define internal quantum efficiency of an optical source.	(2)
7	Define responsivity of photo detectors.	(2)
8	Compare APD and PIN diodes?	(3)
9	What are different error sources in optical communication system?	(3)
10	What is rise time budget?	(2)

Part – B (50 Marks)

11 a) With a neat sketch explain the elements of a fiber optic communication link.   (6)
   b) If the core layer of an optical fiber is made from silica with refractive index 1.45
      and if the refractive index of the cladding layer is 1% less than that of the core,
      calculate
      i) Refractive index of cladding   ii) Critical angle   (4)
      iii) Max. acceptance angle   iv) Numerical Aperture

12 a) Explain briefly different types of losses observed in optical fibers.   (6)
   b) Write a brief note on material dispersion.   (4)

13 a) What is the need for double hetero-junction structure in optical sources.   (4)
   b) Sketch and explain Fabry – Perot resonator cavity of a laser diode.   (6)

14 a) Explain the principle and construction of reach through APD with a neat sketch.   (6)
   b) Explain briefly the three different mechanical misalignments that can occur
      between two joined fibers.   (4)

15 a) Elaborate on the structure of SONET/SDH protocols.   (6)
   b) With a neat sketch explain Wavelength Division Multiplexing structure.   (4)

16 a) Discuss Point to point optical fiber link and link budget analysis.   (5)
   b) Explain the principle of operation of optical receiver with the help of a diagram.   (5)

17 Write short notes on any TWO of the following:
   i) Erbium Doped Fiber amplifiers.   (5)
   ii) Power launching and coupling   (5)
   iii) Light Source Materials.   (5)

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FACULTY OF ENGINEERING
B.E 4/4 I – Semester (Old)(Backlog) Examination, December 2019

Subject: Digital Image Processing (Elective – I)

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 sampling and quantization? 2
2. Find the number of bits required to store a 1024 x 1024 image with 16 grey levels. 2
3. Give the properties of 2-D DCT. 3
4. Find 2x2 Haar matrix H_2. 3
5. What will be the value of the centre pixel, if it is smoothened by a mask of size 3x3 2

9	7	12
12	6	7
1	8	7

6. Give the mask for Laplacian for image enhancement in spatial domain. 3
7. What is noise? State the various noise models. 3
8. Differentiate Image enhancement and Image Restoration. 2
9. Explain coding redundancy. 3
10. What is Fidelity Criteria? 2

PART – B (50 Marks)

11. a) Discuss various steps in image processing system. 5
    b) Explain various Distance Measures. 5

12. a) State and prove the following properties of 2-D DFT 4
       i) Separability Property
       ii) Translation Property
    b) Generate the Hadamard Basis Matrix for N=8 and specify its Sequency. 6

13. a) Explain Histogram Specification for Image Enhancement. 6
    b) Find the histogram of the following image. 4

1	2	4
1	4	5
4	3	4

14. a) Explain Homomorphic Filtering. 7
    b) Write the Basic Steps for filtering in Frequency Domain. 3

15. a) What is meant by image restoration ? Explain the model of Image degradation. 6
    b) What is inverse filtering? 4

16. a) Construct Arithmetic code for the word "INDEPENDENT". 6
    b) Draw and explain the block diagram of Transform coding in detail. 4

17. Write a short notes on
    a) Image Zooming techniques 3
    b) Speckle noise and removal techniques 4
    c) Lossy Predictive coding 3

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I - Semester (Backlog) Examination, December 2019

Subject : Optical Fiber Communication (Elective-I)

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

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

PART – A (25 Marks)

1   A step index fiber has a normalized frequency 26.6 at 1300 nm wavelength. If the
    core radius is 25 µm, find numerical aperture.   2
2   Compare step index and graded index fibers.   3
3   What is group delay?   2
4   Briefly discuss about dispersion in optical fibers.   3
5   Write the desirable properties of an optical source.   2
6   Compare edge emitting LED and surface emitting LED.   3
7   Explain avalanche multiplication.   2
8   Mention the advantages of avalanche photo diode.   3
9   What is the purpose of rise time budget analysis?   2
10 Explain Wavelength Division Multiplexing.   3

PART – B (50 Marks)

11 a) Explain the phenomenon of linearly polarized modes.   5
    b) What is V-number? Show that the number of modes in step index fiber is given
       by $M = V^2 / 2$.   5

12 a) With necessary expressions discuss the pulse broadening in graded index fibers.
                                                                                                                      6
    b) A continuous 12 Km long optical fiber link has a loss of 1.5 dB/Km. What is the
       minimum optical power level that must be launched into the fiber to maintain an
       optical power level of 0.3 µW at the receiving end?   4

13 a) Explain the different lensing schemes used for coupling improvement.   5
    b) Explain single mode laser with basic architecture.   5

14 a) Explain the principle of a typical optical receiver with necessary mathematical
       expressions.   5
    b) Explain the operation of pin photodiode.   5

15 a) Explain in detail about noise effects on system performance.   5
    b) Write a note on SONET / SDH.   5

16 a) Explain about Erbium doped fiber amplifier.   5
    b) Write a note on fiber-to-fiber joints.   5

17 Write short note on :
    a) Evolution of fiber optic system   5
    b) Core-cladding losses   5

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I-Semester(Backlog) Examination, December 2019

Subject: Digital Image Processing (Elective-I)

Time: 3Hours   Max. Marks: 75

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

PART-A (25 Marks)

1. What is meant by digital image processing? Explain how digital images can be
   represented?   (3)
2. Write about Hadamard transform?   (3)
3. Write about the basic relationship between pixels?   (2)
4. Explain degradation model with a neat diagram.   (3)
5. What is the use of spatial domain high pass filtering?   (3)
6. Write short notes on region merging and splitting.   (2)
7. Define image compression. Explain about the redundancies in a digital
   image.   (3)
8. Write about inter-pixel redundancy.   (2)
9. What is mean by morphological image processing?   (2)
10. Give some important applications of Digital Image Processing.   (2)

PART- B (50 Marks)

11.   Define 2D-DFT? State and prove separability property of 2D-DFT   (10)

12 .   Determine the Haar transform for N=4.   (10)

13. (a) Define histogram of a digital image. Explain how histogram is useful in
    image enhancement?   (6)
    (b) Explain the basic steps in filtering in frequency domain.   (4)

14. (a) Explain a Model of the Image Degradation/Restoration Process?   (6)
    (b) Explain the algebraic approaches for image restoration?   (4)

15. (a) Explain arithmetic encoding process with an example.   (6)
    (b) Explain about lossless predictive coding?   (4)

16. (a) Write about edge detection approaches?   (4)
    (b) Explain about region based segmentation.   (6)

17. (a) What is thresholding? Explain about global thresholding?   (6)
    (b) Write short notes on water – shed algorithm for image segmentation   (4)

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FACULTY OF ENGINEERING

B.E. 4/4 (ECE) I – Semester (Backlog) Examination, December 2019

Subject: Artificial Neural Networks (Elective – I)

Time: 3 Hours   Max. Marks: 75

Note: Answer all questions from Part-A & Any Five Questions from Part-B

PART – A (25 Marks)

1. Draw the mathematical model of an artificial Neuron and explain.   3M
2. Define activation function and what is its significance?   2M
3. Write any two basic learning laws for training the Neural Networks.   2M
4. Differentiate activation and synaptic dynamics of Neural Networks.   2M
5. What are the requirements of learning laws?   2M
6. Contrast between LTM and STM.   3M
7. What is interpolative Neural Network memory?   2M
8. Draw a multi-layer perception model and explain briefly.   3M
9. What is the perception Neural Networks solution of XOR problem?   3M
10. With neat diagrams, explain feed forward and feedback Neural Networks.   3M

PART – B (5 x 10 = 50 Marks)

11. a) Explain in detail Mcculloh pitts Neuron model with its topology and applications.   5M

    b) Implement AND logic gate with the same.   5M

12. Explain in detail additive activation model.   10M

13. a) Explain in detail pattern association task with an example.   5M

    b) Contrast in detail Auto-Associate and Hetero-Associative Neural network memories. 5M

14. Staff and prove perceptron convergence theorem.   10M

15. Explain in detail Back propagation Neural Network with its architecture, training

    algorithm, features, limitations and extensions.   10M

16. Explain in detail Hopfield Neural networks with its topology, training algorithm,

    energy function and its topology.   10M

17. Explain in detail Boltzman machine with its topology, training algorithm and its

    issues in implementation.   10M

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FACULTY OF ENGINEERING

B.E. 4/4 (M/P) I – Semester (Backlog) Examination, December 2019

Subject: Automobile Engineering (Elective – I)

Time: 3 hours   Max. Marks: 75

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

PART – A (25 Marks)

1. How is the engine balancing related to firing order?

2. What are the functions of piston rings to perform in an engine?

3. What is crank case ventilation?

4. Define battery efficiency and battery voltage.

5. Name and describe the four different types of steering linkage.

6. What are the functions wheel rim and wheel tyres?

7. Explain the functions of clutch plate.

8. Why are mechanical brakes are used in parking and emergency?

9. What are the pollution norms used in India?

10. Explain the parameters to be consider for reducing pollutants from an automobile.

PART – B (50 Marks)

11. Draw a neat sketch of fuel injector and name its different parts. Describe its working & list the advantages and disadvantages.

12. What is the difference between motor and generator? With a help of neat diagram explain the construction and working of starting motor.

13. What are the requirements of suspension system? How does a rigid axle front end suspension differ from an independent front-end suspension?

14. With a help of neat sketch explain the working principle of propeller shaft and universal joint.

15. What are the different methods to analyse the exhaust gasses and explain each of them?

16. With a suitable sketch explain the working of pressure cooling system and explain the functions of thermostat.

17. Describe the followings with neat sketch and write the functions of it.
    (a) Master cylinder.
    (b) Catalytic convertors.

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FACULTY OF ENGINEERING

B.E. 4/4 (Mech.) I – Semester (Backlog) Examination, December 2019

Subject: Non Conventional Energy Sources (Elective – I)

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

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

1. What are primary and secondary energy sources?

2. How do you assess the potential of Solar Energy?

3. Explain the electrical characteristics of silicon PV cells.

4. Write the applications of wind plants?

5. Discuss the advantages and disadvantages of horizontal and vertical axis windmills.

6. Write the advantages and applications of geothermal energy.

7. Explain the merits and demerits of biomass fuels.

8. What is meant by anaerobic digestion?

9. Explain the difficulties in tidal power development

10. Explain the environmental impacts of OTEC.

PART – B (5 x 10 = 50 Marks)

11. (a) Write the advantages and limitations of Renewable energy sources?

    (b) What are the prospects of non conventional energy sources in India.

12. (a) Explain in detail about Solar Energy Collectors with neat diagrams.

    (b) Briefly explain about the solar radiation measurement devices.

13. (a) Derive the expression for maximum efficiency of a horizontal axis wind turbine.

    (b) Explain in detail about the components of Wind Energy Conversion System (WECS)

14. (a) Classify the geothermal energy sources and explain them in brief..

    (b) Explain the constructional details of gasifier with neat sketch.

15. (a) What are biomass conversion technologies? Explain in detail.

    (b) Explain the working and advantages of a biogas plant

16. (a) Explain the factors which affect bio-digestion?

    (b) Give a brief note on prospects of Geothermal energy in context to India.

17. (a) Write working principle of Claud and Anderson OTEC systems.

    (b) Explain about Thermal gasification of biomass

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FACULTY OF ENGINEERING
BE 4 / 4 (AE) I Semester (Backlog) Examination, December 2019

Subject : Production and Operations Management (Elective – I)

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

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

PART - A (10 x 2.5 = 25 Marks)

1 What is meant by Incentive? Enlist any two types of Incentive plans.
2 Explain the importance of work Study as a tool for improving productivity.
3 What are the advantages of Forecasting?
4 State about dependent and independent demand.
5 What are the measures to be taken for a good Master Production Schedule (MPS) design?
6 What are the benefits of material requirement planning?
7 Define term Inventory. State reorder point.
8 Write about fixed order quantity system.
9 Distinguish between 'Activity' and 'Event'.
10 Why CPM is called deterministic model and PERT as probabilistic model?

PART - B (50 Marks)

11 a) List the factors which affect plant location. Point out any two important merits of rural location over city location.
    b) What do you mean by plant layout? Briefly explain the product and process layout.

12 What is mean by Exponential smoothing? Alaric Industries Ltd. has experienced the following demand for its "Personal Finance" software package.

Month	April	May	June	July	August	September	October	November
Period	1	2	3	4	5	6	7	8
Units	56	61	55	70	66	65	72	75

Develop an exponential smoothing forecast using =0.4 and an adjusted exponential smoothing using =0.4 and =0.2

13 (a) Explain the Deterministic and Stochastic inventory model.

    (b) Alaric Industries Ltd. Uses 10,000 units per year of an item. The purchase price is Rs. 1/- per item. Ordering cost is Rs25/- per order. Carrying cost per year is 12% of the inventory value.
      i) The EOQ
      ii) The number of orders per year.
      iii) If the lead time is 4 (four) weeks and assuming 50 (fifty) working weeks per year, find the reorder point.

14 What do you mean by Master Production Schedule (MPS) plan? What are the measures to be taken for a good master production schedule design? Explain the objectives and functions of MPS.

15 (a) Explain the various techniques of wage payment plans.

(b) Explain the methodology of forecasting by least square.

16 A small marketing project consists of the jobs in the table given below. With each job listed its normal time and a minimum of crash time (in days) and the cost (Rs. per day) of crashing each job are also given.

Job	Normal duration (days)	Min. (Crash) duration (days)	Cost of Crashing (Rs. Per day)
1 - 2	9	6	20
1 – 3	8	5	25
1 – 4	15	10	30
2 – 4	5	3	10
3 – 4	10	6	15
4 – 5	2	1	40

1) What is the normal project length and min. project length?
2) Determine the minimum crashing costs of schedules ranging from normal length down to, and including, the minimum length schedule, find the costs of schedules which are L, L1, L2 and so on days long. Overhead costs total Rs. 60/- per day. What is the optimum length schedule duration on each job for optimum solution?

17 Write short notes on the following.
   1) Cost in Aggregate Planning

   2) Fixed Order Quantity System

   3) Network fundamental

   4) Forecast errors

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FACULTY OF ENGINEERING

B.E. 4/4 (CSE) I – Semester (Backlog) Examination, December 2019

Subject: Image Processing (Elective – I)

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	Define resolution in digital processing.	2
2	What do you mean by aliasing in the context of image sampling?	3
3	What does the standard deviation of a histogram tells us about the image?	2
4	Explain about the CMY color models.	3
5	State any three applications of image segmentation.	3
6	What is image filtering?	2
7	List two reasons why image compression is important.	2
8	What are the drawbacks of inverse filtering?	3
9	Define Fidelity Criteria?	2
10	Define color image compression method.	3

PART – B (5x10 = 50 Marks)

11	Explain the fundamental steps involved in typical digital image processing.	10
12.	Distinguish between spatial domain techniques and frequency domain techniques of Image Enhancement.	10
13.	Explain in detail about region based segmentation methods.	10
14. a)	Explain source encoder and decoder in detail?	5
b)	Explain channel encoder and decoder in detail?	5
15.	What is pseudo color image processing? Discuss various pseudo color techniques?	10
16 a)	Briefly explain the Image sampling and Quantization.	5
b)	Explain how the butter worth filters can be converted to ideal LPF.	5
17 a)	Explain about sharpening spatial filtering.	5
b)	Compare RGB color model with HSI Color model.	5

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FACULTY OF ENGINEERING
B.E. 4/4 (CSE) I-Semester (Backlog) Examination, December 2019

Subject : Software Project Management (Elective – I)

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

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

Part – A (25 Marks)

1 List the software metrics to measure the conventional software management

   performance?   2

2 Explain the modern process approaches for solving conventional problems?   3

3 Summarize the differences between engineering stages and production stages?   3

4 Explain a build sequence associated with a layered architecture?   2

5 Write the evolution of planning fidelity in the work breakdown structure over the life

   cycle?   3

6 Explain round trip engineering?   3

7. Write a note on next generation cost models?   2

8. Briefly outline the types of contracts and its advantages and disadvantages?   3

9. Write the maturity questionnaire for software project planning at CMM level 2?   2

10. Explain Agile methodology for software development process?   2

Part – B (50 Marks)

11 a. Explain the Advantages and disadvantages of commercial components and
      custom software?   5
   b. Compare conventional process with modern iterative process with various quality
      drivers for quality improvement?   5   5

12. Explain in detail the five distinct sets of life-cycle software artifacts?   10

13. a. Explain the artifacts and life cycle emphases associated with each workflow?   7
    b. Write a note on workflow of iteration?   3

14.   Explain the project organization teams and their responsibilities with its artifacts
       and activities?   10

15. a. Explain the differences in artifacts between small and large projects?   3
    b. Describe quality indicators based on software change across engineering data?   7

16. Explain Boehm's software metrics in the economic context of modern software
    management framework?   10

17. a. Explain the ISO 12207 approach for acquisition process?   4
    b. Explain CMM levels in detail?   6

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FACULTY OF ENGINEERING
BE 4/4 (CSE) I Semester (Backlog) Examination, December 2019

Subject: Mobile Computing (Elective – I)

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 user mobility and device mobility? [3]

2) Write a short note on spread spectrum? [2]

3) Write about different Broadcast models? [3]

4) What is the reason for the failure of CSMA/CD in wireless networks? [3]

5) Write any two advantages and disadvantages of WLAN? [2]

6) Explain the concept of reverse tunnelling? [3]

7) Explain about Infrared vs radio transmission? [3]

8) Why standard TCP is not suitable for wireless networks? [2]

9) Write the advantages and disadvantages of Indirect-TCP? [2]

10) Give an example for WML script? [2]

PART – B (5 x10=50 Marks)

11. a) Compare SDMA, FDMA, TDMA and CDMA? [5]
　　b) Explain about signal propagation. Why do radio waves do not follow straight line? Why is reflection both useful & harmful? [5]

12. a) Explain about GPRS system in detail? [4]
　　b) With the help of a diagram, explain system architecture of GSM ? [6]

13. a) Describe the steps in configuring IP addresses in DHCP? [5]
　　b) Explain about Localization and calling? [5]

14. a) Explain different types of orbits briefly? [5]
　　b) Explain handover scenarios in GSM? [5]

15. a) Explain about architecture of Hyperlan1 briefly? [5]
　　b) Describe briefly the layers in Bluetooth protocol with a neat sketch? [5]

16. a) Explain snooping TCP. What are its advantages and disadvantages? [5]
　　b) Explain the concept of fast transmit/fast recovery in traditional TCP? [5]

17. Explain the Features of Operating Systems for mobile devices briefly? [10]

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FACULTY OF ENGINEERING
B.E. (I.T.) 4/4 I - Semester (Backlog) Examination, December 2019

Subject : Digital Image Processing (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 List the components of a general-purpose Image Processing System.   (2)

2 Define adjacency, connectivity, regions and boundaries of a digital image.   (3)

3 Differentiate between smoothing spatial filters and sharpening spatial filters. (3)

4 List image enhancement methods using arithmetic/logic operations.   (2)

5 Define opening and closing of morphological Image processing.   (2)

6 What is Wiener filter?   (3)

7 How a line is detected using Image segmentation methods?   (3)

8 What are shape numbers?   (2)

9 Give the differences between lossy and lossless compression.   (3)

10   List color models.   (2)

PART – B (50 Marks)

11 (a) Explain intensity transformation functions in detail.   (6)
   (b) Explain Histogram processing.   (4)

12 Explain smoothening filters in both spatial domain and frequency domain. (10)

13 Explain the model of Image degradation/restoration process using noise models. (10)

14 (a) Explain region-based segmentation in detail.   (5)
   (b) Explain Fourier descriptors in detail.   (5)

15 (a) Explain lossless compression methods in detail.   (5)
   (b) Explain pseudo color image processing in detail.   (5)

16 (a) Explain Image sharpening in frequency domain in detail.   (5)
   (b) Explain some basic relationships between pixels.   (5)

17 Answer any *two* of the following:
   (a) Explain erosion and dilation of an image.   (5)
   (b) Explain minimum distance classifier of image recognition process.   (5)
   (c) Explain how an lossy compression of an image is measured? Explain
       all the methods used.   (5)

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FACULTY OF ENGINEERING

B.E. 4/4 (I.T.) I – Semester (Backlog) Examination, December 2019

Subject: Software Reuse Techniques (Elective – III)

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 List out the principles necessary to achieve systematic software reuse.   (2)
2 Discuss about a facade in detail.   (3)
3 Write about the types of Design Patterns.   (2)
4 List the circumstances under which Factory Method is used.   (3)
5 Define a singleton pattern and how it can be created.   (2)
6 Write about two-way adapters.   (3)
7 State two instances where chain of responsibility pattern is useful.   (2)
8 Write the motivation of strategy pattern.   (3)
9 List and explain the essential steps of Component System engineering process.   (2)
10 Compare the tasks of application engineers and component engineers.   (3)

PART – B (50 Marks)

11 Discuss reuse with respect to change in process, changes in organization.   (10)

12 Explain how to group components into component systems and how component
   systems export components via facades?   (10)

13 Describe about following: (5+5)
   a) Proxy pattern
   b) Business use cases

14 Explain purpose, structure, variants and known uses of the following patterns   (5+5)
   a) Layers pattern   b) Blackboard pattern?

15 Explain how to build flexible component systems.   (10)

16 Explain the participants, consequences and implementation of the following
   patterns.   (5+5)
   (a) Mediator Pattern
   (b) Momento Pattern

17 Write about the following :   (5+5)
   a) Observer interface and Observable class.
   b) Motivation and consequences of iterator pattern.

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FACULTY OF ENGINEERING

B.E.4/4 (IT) I-Semester (Backlog) Examination, December 2019

Subject: Grid Computing (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. What is Grid computing?   (2M)
2. What is the difference between grid computing and cluster computing?   (3M)
3. What is check pointing?   (3M)
4. Define Data confidentiality, Data integrity.   (2M)
5. What is a SOA? (Service Oriented Architecture)   (2M)
6. Differentiate between stateful web service and stateless web service.   (3M)
7. Define Remote Procedure call.   (2M)
8. What is Grid Enabling?   (2M)
9. Write about MPI_Recv () function.   (3M)
10. Write about MPI_Bcast () function.   (3M)

PART – B (50 Marks)

11. a) Explain the benefits of Grid computing.   (5M)

    b) Explain the file staging with a neat diagram.   (5M)

12. Explain the internal steps to execute a job in Condor with a neat diagram. (10M)

13. a) What is WSDL? Explain.   (5M)

    b) Explain the Fault tolerance Feature of scheduler with a neat diagram. (5M)

14.   How to use multiple grid computers to solve a single problem.   (10M)

15. a) Explain the steps to access a Web service in a SOA.   (5M)

    b) How resource management is done using Grid way   (5M)

16. a) Explain about data partitioning   (5M)

    b) Explain about arguments Enumerated in a List   (5M)

17. Write short notes on

    a) Service oriented architecture   (5M)

    b) Job Submission   (5M)

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FACULTY OF ENGINEERING

B.E. 4/4 (IT) I-Semester (Backlog) Examination, December 2019

Subject : Semantic Web (Elective-III)

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

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

PART – A (25 Marks)

1	What is a semantic Web?	2
2	Specify what is not a semantic web.	3
3	Define RDF schema.	2
4	Write RDF triples notation.	3
5	What is a Datalog, term and atom in rule languages.	3
6	Define data property and object property in OWL.	2
7	List out web service security standards.	2
8	Show OWL-S profit ontology.	3
9	What is a Mobile Agent?	2
10	State various upper ontologies in Semantic web.	3

PART – B (50 Marks)

11 a) Discuss about classification of ontologies according to Information Represented.   7

b) Distinguish the taxonomies, thesauri and ontology.   3

12 a) Write about various ontology description languages along with neat sketch.   7

b) Specify the inference problems for concept descriptions.   3

13 Explain the RuleML, SWRL and Triple in detail along with an example.   10

14 Describe the OWL-S service ontology.   10

15 a) Explain agent architecture in semantic web along with neat sketch.   8

b) What is Metadata?   2

16 a) What is KACTUS project ontology development method?   4

b) State about classes, property and individuals of RDF scheme along with an example.   6

17 Write short notes on :

a) XML essentials   5

b) Agent forms   5

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